Permit Application

# Environmental Impact Assessment

## White Pine North Project

## Volume IIN

***Appendix E-6***

**White Pine Copper LLC**

White Pine, Michigan

September 2026

Project I.D.: 23W200

**Solving our clients' toughest science and engineering challenges.**

# E-6

# 2025 Underground Mining Area Wetland and Stream Baseline Characterization Report

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*White Pine North Project, Carp Lake Township, Ontonagon County, Michigan*

Prepared for
White Pine Copper, LLC.

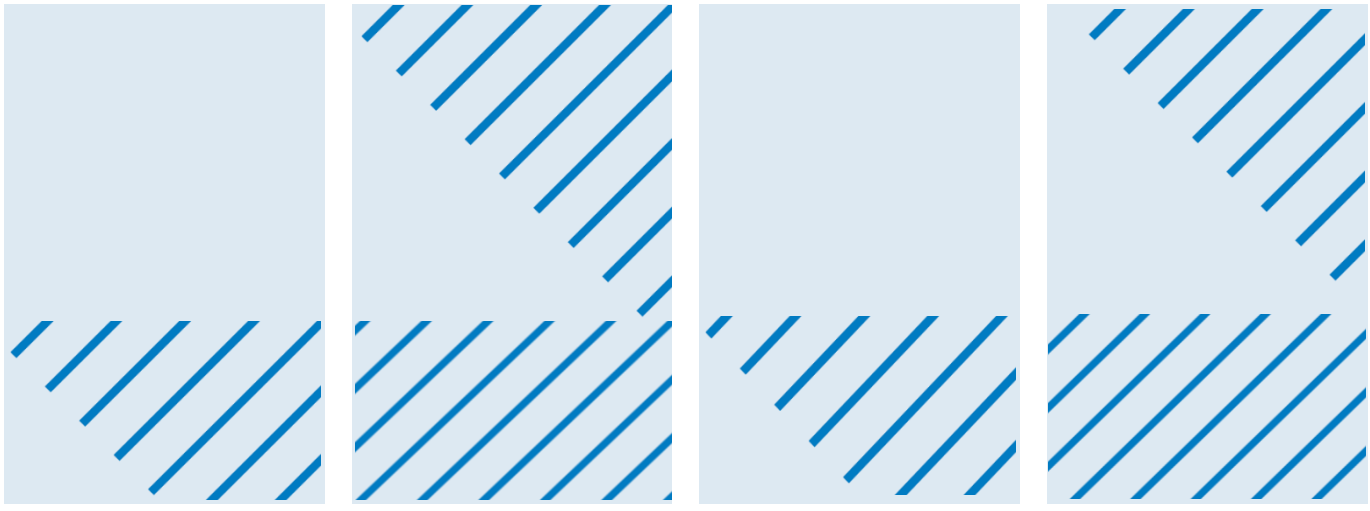
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Revision B, April 2026

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# 2025 Underground Mining Area Wetland and Stream Baseline Characterization Report

White Pine North Project

Revision B, April 2026

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# 1 Introduction

## 1.1 Study Purpose

Barr Engineering Michigan, LLC (Barr) was retained by White Pine Copper, LLC (WPC) to develop baseline characterization of wetlands* and streams† within an approximately 6,000 acre "underground mine area" at the White Pine North Project (the Project). The baseline characterization is rooted in the requirements for the Part 632 Environmental Impact Assessment specified in R 425.101 et seq., Part 303 Wetlands Protection, and Part 301 Inland Lakes and Streams. The baseline studies are required to provide a comprehensive data set for assessing potential environmental effects from the Project as would be needed to satisfy applications under Part 632, and potentially under Part 303 and 301.

This report presents data and observations from field surveys conducted in summer 2025.

## 1.2 Study Team

This study was completed by a qualified team of experienced professionals with background in wetland and stream assessments. Study team members and their roles are listed in Table 1-1 and Table 1-2.

**Table 1-1 Study Team**

| Name | Title | Project Role |
|---|---|---|
| Randy Phillips | Senior Ecologist | Field investigations lead and field crew leader |
| Alison McClear | Environmental Scientist | Field crew leader |
| Kinnan Stauber | Senior Ecologist | Field crew leader |
| Charlie Eckers | Wetland/Regulatory Specialist | Field crew leader |
| Jess Moog | Environmental Scientist | Field crew leader |
| Gage Kriese | Environmental Scientist | Field crew |
| Collin Krochalk | Environmental Field Technician | Field crew |
| Alissa Johnson-Zabel | Environmental Specialist | Field crew |
| Matt Doneux | Ecologist | Field crew |
| Brynn Jackson | Water Resource Intern | Field crew |
| Colleen Long | Senior GIS Specialist | Data management and communication |
| Erin Mauk | GIS Specialist | Data management and communication |

* NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, Act 451 of 1994
324.30301 Definitions; technical wetland delineation standards.
Sec. 30301.
(n) "Wetland" means a land or water feature, commonly referred to as a bog, swamp, or marsh, inundated or saturated by water at a frequency and duration sufficient to support, and that under normal circumstances does support, hydric soils and a predominance of wetland vegetation or aquatic life.

† NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, Act 451 of 1994
324.30101 Definitions.
Sec. 30101.
(i) "Inland lake or stream" means…:
(ii) A natural or artificial lake, pond, or impoundment; a river, stream, or creek which may or may not be serving as a drain as defined by the drain code…or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water, including the St. Mary's, St. Clair, and Detroit Rivers.

**Table 1-2 Project Leadership**

| Name | Title | Project Role |
|---|---|---|
| Tim Greenleaf | Vice President | Principal in Charge |
| Matt Stone-Palmquist | Senior Landscape Architect/Ecologist | Project Manager |

## 1.3 Background and Project Description

The Project is a brownfield being developed by WPC, a subsidiary of Kinterra Copper USA, LLC. The Project is located approximately 12 miles north of M-64 in Carp Lake Township, Ontonagon County, Michigan (Figure 1).

White Pine Mine was part of the Upper Peninsula of Michigan's historical copper mining district. Underground mining on site began in the late 1800's. In 1952, the Copper Range Company began construction of a fully functioning underground mine and surface processing facilities including a concentrator, smelter, and refinery. Tailings were placed in three tailings areas: North Dam 1, North Dam 2, and the South Dam. Mining and processing ceased in 1997, and a State of Michigan Consent Decree was established. WPC is planning to mine underground east of, and separate from, the historic underground mine workings of White Pine Mine. Copper ore will be extracted using conventional drill and blast room and pillar mining methods. A processing plant will be constructed on site to produce a copper concentrate, and processing will include crushing, grinding, flotation, concentrate thickening, and filtration. Tailings will be managed through re-use of one or more of the existing tailings dams.

Based on the Project concept, WPC would need to secure several environmental permits and approvals from the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Those permits and approvals relevant to the baseline studies include:

- A Mining Permit and Environmental Impact Assessment issued and approved under Part 632 of Michigan's Natural Resources and Environmental Protection Act (NREPA), and rules specified in R 425.101 et seq.
- A Wetlands Permit for dredge and fill impacts to wetlands issued in accordance with Part 303 of NREPA and rules specified in R 282.921 et seq.

The baseline studies required for the Project are rooted in the requirements for the Part 632 Environmental Impact Assessment specified in R 425.202 et seq., Part 303 Wetlands Protection, and Part 301 Inland Lakes and Streams. The baseline studies are required to provide a comprehensive data set for assessing potential environmental effects from the Project as would be needed to satisfy applications under Part 632, and potentially under Part 303 and 301.

## 1.4 Study Area

The Study Area for the baseline study contains an area of approximately 6,000 acres (Figure 2) and is comprised of the surface above the proposed underground mine footprint, excluding: 1) those portions of the footprint that are beneath the existing North Dam 1 and North Dam 2; and 2) those portions of the underground mine footprint that were evaluated in 2024.

# 2 Desktop Review

Barr conducted a desktop review of relevant, publicly available data within the Study Area including:

- Aerial Imagery: Review of current (Figure 2) and historic (Figure 3) aerial imagery revealed that the Study Area is heavily forested, with a predominantly hardwood/deciduous cover and some areas with more coniferous cover. There are many stream features running in roughly the south to north direction. Many of these streams appear heavily influenced by beaver impoundments with standing water. There also appears to be many wetlands on site, generally in association with streams. In addition to these natural features, there are a number of private residences located within the study area, many with mowed/maintained areas. The Study Area appears to be relatively unchanged in the last 20 years, with few distinguishable disturbances during that time period.

- Topography: Topography and LiDAR data were evaluated revealing that the Study Area is dominantly a pattern of north – south oriented in valleys (with wetlands and streams), upland ridges, and light to moderate elevation changes in between (Figure 4). There do not appear to be any notable areas of extreme terrain, or rapid topographical changes.

- Soil Types: The National Resources Conservation Service Web Soil Survey (WSS) was used to query soil information within the Study Area (Figure 5). This information was reviewed to identify likely locations of hydric soils, which could be cross referenced in the field during on-site soil sampling. The WSS indicates a number of soil units are present in the Study Area; more than 60% of the soils within the Study Area are classified as somewhat poorly drained, to very poorly drained.

- Mapped Wetlands: There are also several mapped wetlands in the Study Area, which are closely associated with the valley and stream features. The Michigan Final Wetlands Inventory mapping combines wetland resources identified in the National Wetlands Inventory (and the Michigan Resource Inventory map) with hydric soil information to develop un-verified, approximate wetland locations (Figure 6). The National Wetlands Inventory indicates many mapped wetlands in the Study Area, all oriented in a north – south fashion and occurring in between the aforementioned upland ridges. These mapped wetlands include freshwater emergent, scrub-shrub, and forested habitats (Figure 7). This data was reviewed to identify potential wetland locations, which could also be cross referenced in the field during on-site characterizations.

In addition to the publicly available information, the following reports were included in the desktop review:

- 2024 Barr Wetland Delineation and Stream Characterization Efforts: Reports documenting adjacent wetland delineation efforts (ref. (1)) and stream characterization (ref. (2)) provided context for vegetation and community types that could be encountered in the proposed Study Area as part of the 2025 field investigation.

# 3 Methodology

The wetland characterization, natural plant community determination, and stream characterization were consistent with the methodology outlined in the Work Plan (ref. (3)) except for the following deviation:

- Transect Changes: Due to property access constraints, certain portions of Transects 3 and 4 were shifted north or south to continue the transect survey.

## 3.1 Wetland Characterization

### 3.1.1 Field Methodology

Wetland characterization was completed in a manner generally consistent with the Corps of Engineers Wetlands Delineation Manual (ref. (4)), specifically the transect-based approach for wetland delineations found in Part IV Section D, and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (ref. (5)). To align this study with methods WPN discussed with EGLE, Barr's wetland characterization approach included deviations from the referenced procedures relative to the total number of transects, the spacing of transects, and limiting the number of wetland determination observation points to only locations where upland/wetland boundaries were encountered.

The following wetland determination protocols were followed:

- Hydrologic Characteristics: Hydrologic conditions were evaluated at each wetland data point. Presence or absence of primary and/or secondary hydrologic indicators were recorded in wetland determination forms.

- Soils: Soil borings were hand-dug in and adjacent to wetlands to a depth of at least 18 inches below the ground surface or until bedrock or large rocks were encountered. Representative soil samples from each boring were examined for the presence of hydric soil indicators. Soil textures were determined by feel. Soil colors were determined using a Munsell® soil color chart and recorded in the wetland data forms.

- Vegetation: The plant species at each sample location were identified and dominant species were determined by use of the 50/20 rule and the Prevalence Index (where applicable). Wetland indicator status of each species was taken from the current National Wetland Plant List (ref. (6)) for the Northcentral and Northeast region.

Photos were taken of each wetland and adjacent upland from the point where the transect intersected the wetland boundary. Wetland boundary points were recorded using a Global Positioning System (GPS) Unit capable of sub-meter accuracy.

### 3.1.2 Data Analysis Methodology

The extent of individual wetlands were estimated using a combination of data from in-field investigation and desktop evaluation. These wetland limits are stratified based on two separate categories: 1) wetlands identified directly along transects with a high degree of confidence for spatial extent; and 2) wetlands based on interpolation methods with a lesser degree of confidence for spatial extent.

- Wetlands Identified on Transects: Along each transect, wetland boundary points were collected in the field with a GPS and imported into Geographic Information System (GIS). This established a precise easterly/westerly extent of each wetland located on transects. Then, to estimate the northerly/southerly extent of those wetlands, GIS analysis incorporated desktop data (Section 2) to identify correlations between in-field data points and desktop data characteristics such as aerial photo signature, topographic break lines, and/or soil type boundaries. The complete limits of wetlands encountered along transects were then estimated and mapped accordingly.

- Wetlands Interpolated Between Transects: To estimate wetland extent between transects, GIS analysis was limited to those wetlands that could be estimated off-transect with a moderate level of confidence, such as a spatial correlation between aerial photo signatures, topographic break lines, and/or soil type boundaries. This limitation is assumed to more-reliably identify and map wetlands within the riparian valleys of the Study Area and under-identify wetlands outside of those riparian valleys as potential isolated wetlands between the valleys could not be reliably predicted with the data available and therefore not estimated. Interpolation of wetland extents continued until the identifying features used to estimate extents were no longer present, at which point the wetland feature would end. Furthermore, wetland boundaries that may extend outside of the Study Area were stopped at the Study Area limits, with those apparent continuations excluded from the baseline reporting.

## 3.2 Natural Plant Community Determination

Natural plant community types were determined in a manner generally consistent with the Michigan Natural Features Inventory's "Key to the Natural Community Types" (ref. (7)). In cases of ambiguous or transitional plant community types, professional judgement was used to approximate the observed plant community. In the case of unnatural or disturbed plant community type, brief qualitative descriptions were noted (e.g., lawn, logged forest).

Wetland community types encountered were designated based on field staff observations. In the case of large wetlands that crossed multiple transects, and contained multiple community types across those transects, desktop evaluation was used to identify apparent changes in community type from aerial imagery, and wetland type polygons were apportioned based on the desktop analysis boundary estimates.

## 3.3 Stream Characterization

Streams were characterized based on an estimation of bankfull channel width and depth, general observations of channel stability/instability, and observations of bedform diversity. For purpose of this study, a "stream" is a linear feature interpreted as meeting the definition of that term under the Michigan NREPA with having definite banks, a bed, and visible evidence of a continued flow of water.

Stream characterization occurred near the location where the transect intersects the stream to generally represent the overall stream reach. Stream characterization protocols generally followed applicable parts of Michigan Stream Quantification Tool (MiSQT) procedures (ref. (8)), however a full MiSQT evaluation was not completed. The following parameters were evaluated:

- Rosgen Channel Type: Channel type based on visual assessment and assignment of a Rosgen letter designation (A through G). Pebble counts and similar means to determine numeric bed material modifiers to Channel Type were not included in the assessments. In circumstances where streams were impounded from beaver activity, the stream channel was categorized as a Rosgen D channel, although the observation point may be functioning ecologically as a pond or lake.
- Bankfull width: The bankfull width was measured to the nearest half-foot.
- Bankfull height: The bankfull height was measured to the nearest half-foot.

- Observations of Channel Stability/Instability: A Pfankuch Channel Stability assessment was completed that characterizes the stream in the vicinity of the transect.
- Photographs: Photos were taken looking upstream and downstream from the point where the transect intersects the stream.

# 4 Results

The study identified, characterized, and mapped wetland and stream features within the Study Area along approximately 13.5 miles (70,983 linear feet) of transect. Of the transects, approximately 18,304 linear feet (approximately 26%) were found to be wetland; extrapolating this to the entire 6,000 acres estimates approximately 1,500 to 1,600 acres of wetland within the Study Area (Appendix B). Additionally, 30 unique streams were encountered (Figure 8). Table 4-1 summarizes the occurrence of upland, wetland, and streams along each transect. Mapping of transect results is provided in Appendix A.

**Table 4-1 Summary of Transect Segments**

| Transect | Segment Type | Number of Unique Segments | Total Length (Linear Feet) | Total Length of Identified Stream Within Wetland (Feet) | Percent of Transect |
|---|---|---|---|---|---|
| Transect 1 | Stream | 4 | 99 | - | <1% |
| | Upland | 49 | 12,309 | - | 70% |
| | Wetland | 71 | 5,260 | 727 | 30% |
| Transect 2 | Stream | 10 | 338 | - | 2% |
| | Upland | 63 | 11,582 | - | 67% |
| | Wetland | 82 | 5,325 | 470 | 31% |
| Transect 3 | Stream | 6 | 85 | - | <1% |
| | Upland | 50 | 15,078 | - | 80% |
| | Wetland | 57 | 3,810 | 183 | 20% |
| Transect 4 | Stream | 9 | 127 | - | 1% |
| | Upland | 54 | 13,062 | - | 76% |
| | Wetland | 62 | 3,908 | 276 | 23% |

[1] Some flagged wetlands along transects contain one or both stream bank points. In these instances, length of stream along that transect within wetland is inventoried as wetland. Refer to "Total Length of Identified Stream within Wetland" for the subdivision of wetland that is stream.

[2] Segment Type = Stream: refers to length of stream segment outside of wetland.

[3] Values considered approximate as in-field stream points not directly on the transect lines were projected onto transects.

## 4.1 Wetland Characterization

Frequently encountered wetlands in the Study Area were either located adjacent to streams or they were identified in an isolated location associated with shallow depressions in the ground surface. The wetlands located along mapped streams were generally associated with defined corridors that limited the spatial extent of the wetlands. Other than topography, the presence of beaver dams was the factor that most

greatly influenced the extent of wetlands associated with mapped streams. In contrast, isolated wetlands encountered along the transects were located at shallow depressional features. On occasion these wetlands were associated with the mapped topography. However, the more common observation was that the surface depressions were less than the topographic survey resolution and as a result was not identifiable or predictable from the LiDAR data used in this study.

Summary mapping of wetlands is provided in Appendix A. For each wetland occurrence, typical photos are provided in Appendix C with supporting data, including Wetland Determination Forms, in Appendix D.

Eight distinct wetland community types were encountered during the wetland characterization, including emergent marsh, floodplain forest, northern hardwood swamp, northern shrub thicket, northern wet meadow, southern shrub-carr, and other – P. tremuloides PFO. A summary description of each wetland natural community type is provided in Section 4.2.

## 4.2 Natural Community Characterization

The natural community classification is a system established by the Michigan Natural Feature Inventory (MNFI) that is used to divide Michigan's natural landscapes into distinct communities. MNFI defines a natural community as "an assemblage of interacting plants, animals, and other organisms that repeatedly occurs under similar environmental conditions across the landscape and is predominantly structured by natural processes rather than modern anthropogenic disturbances" (ref. (9)). A determination of the natural communities present within the Study Area relied on a combination of vegetation, soils, hydrologic characteristics, and overall landscape context.

The natural communities identified within the Study Area are described in Section 4.2.1 through 4.2.9, along with frequently encountered vegetation and hydrologic characteristics within each community type. Appendix A provides a comprehensive mapbook of every wetland boundary point identified along each transect within the Study Area, along with the wetland community type encountered at each wetland boundary. Appendix B combines the wetlands identified on transects with the wetlands interpolated between transects as discussed in Section 3.1.2, which provides an estimate of potential wetland polygons within the Study Area. A full list of vegetation, hydrologic characteristics, and soil types encountered are provided in Appendix D.

### 4.2.1 Emergent Marsh

The emergent marsh community type was a frequently encountered community type within the Study Area. This community type is prevalent in Ontonagon County and characterized as shallow-water wetlands that often occur along shores of lakes or streams and contain emergent vegetation (ref. (9)). The natural processes that influence emergent marshes include flooding, periods of low water, beaver dams, muskrat feeding, and wildfires.

Examples of vegetation encountered within the emergent marsh community type included sensitive fern (*Onoclea sensibilis*), broom sedge (*Carex scoparia*), nodding sedge (*Carex gynandra*), pussy willow (*Salix discolor*), woolgrass (*Scirpus cyperinus*), blue joint grass (*Calamagrostis canadensis*), soft rush (*Juncus effusus*), and spotted jewelweed (*impatiens capensis*).

The hydrology indicators observed included high water table, saturation, water-stained leaves, geomorphic position, and passing the FAC-neutral test. Hydric soil indicators included loamy mucky mineral, depleted matrix, and depleted below dark surface.

### 4.2.2 Floodplain Forest

The floodplain forest community type was infrequently encountered within the Study Area. This community occupies low lying areas next to streams and is a deciduous or deciduous-conifer forest community (ref. (10)). This community type is subject to frequent over bank flooding, including cycles of erosion and deposition. The natural processes that influence this community type are generally a result of over bank flooding and channel migration.

Examples of vegetation encountered within the floodplain forest community type included quaking aspen (*Populus tremuloides*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), *speckled* alder (*Alnus incana*), nodding sedge (*Carex gynandra*), bladder sedge (*Carex intumescens*), ostrich fern (*Matteuccia struthiopteris*), and purple meadow-rue (*Thalictrum dasycarpum*).

The hydrology indicators observed included sediment deposits, drift deposits, inundation visible on aerial imagery, saturation, water marks, geomorphic position, microtopographic relief, and passing the FAC-neutral test. Hydric soil indicators included depleted matrix and red parent material.

### 4.2.3 Northern Hardwood Swamp

The northern hardwood swamp community type was occasionally encountered within the Study Area. This community type occurs north of the climatic tension zone and is commonly encountered in depressions, glacial tills, and outwash plains and are found in a diverse array of landscape settings. This community type is dominated by deciduous trees and occur on poorly drained soils and in areas prone to seasonal flooding or have high water tables. The natural processes that influence this community include seasonal flooding, windthrow, and beaver activity (ref. (10)).

Examples of vegetation encountered within the northern hardwood swamp community type include red maple, quaking aspen, black ash, green ash, yellow birch (*Betula alleghaniensis*), silver maple (*Acer saccharinum*), bladder sedge, broom sedge, dwarf red raspberry (*Rubus pubescens*), and Canada mayflower (*Maianthemum canadense*).

The hydrology indicators observed included high water table, saturation, water marks, water-stained leaves, geomorphic position, microtopographic relief, and passing the FAC-neutral test. Hydric soil indicators included depleted below dark surface, depleted matrix, redox dark surface, and 2 cm muck.

### 4.2.4 Northern Mesic Forest

The northern mesic forest community type was commonly encountered in uplands within the Study Area. This community type occurs north of the climatic tension zone and is primarily found on coarse textured ground and end moraines. It is characterized by the dominance of hardwood trees and soils are typically loamy sand to sandy loam. The natural processes that influence this community type include small scale wind disturbance and occasional large scale wind events (ref. (10)).

Examples of vegetation encountered within the northern mesic forest community type include quaking aspen, red maple, sugar maple, balsam fir (*Abies balsamea*), basswood (*Tilia americana*), American hophornbeam (*Ostrya virginiana*), black cherry (*Prunus serotina*), partridgeberry (*Mitchella repens*), long-stalked sedge (*Carex pedunculata*), wild sarsaparilla (*Aralia nudicaulis*), and green ash.

Hydrology and hydric soil indicators were not encountered within the sampled northern mesic forest community type.

### 4.2.5 Northern Shrub Thicket

The northern shrub thicket community type was frequently encountered throughout the Study Area. This community type is found north of the climatic zone and commonly occurs along streams, lakes, and beaver flooded areas. This community type is typically established following severe disturbance to forested wetlands resulting from flooding, fire, disease, and windthrow. Northern shrub thickets typically remain saturated throughout the growing season and are flooded in the spring (ref. (10)).

Examples of vegetation encountered within the northern shrub thicket community type included speckled alder, quaking aspen, green ash, bladder sedge, tall meadow-rue (*Thalictrum pubescens*), sensitive fern, lady fern (*Athyrium filix-femina*), and dwarf red raspberry.

The hydrology indicators observed included high water table, water-stained leaves, geomorphic position, microtopographic relief, and passing the FAC-neutral test. Hydric soil indicators included depleted below dark surface, thick dark surface, loamy mucky mineral, and redox dark surface.

### 4.2.6 Northern Wet Meadow

The northern wet meadow community type was occasionally encountered in the Study Area. This community type occurs north of the climatic zone and is an open, groundwater-influenced wetland that is characterized by an abundance of sedges and grasses. The northern wet meadow community type typically occurs along streams but can also be found adjacent to beaver caused, ponded areas. The natural processes that influence this community include seasonal groundwater fluctuations, beaver induced flooding, and fire (ref. (10)).

Examples of vegetation encountered within the northern wet meadow community type included variegated scouring-rush (*Equisetum variegatum*), sensitive fern, water horsetail (*Equisetum fluviatile*), spotted jewelweed, blue joint grass, late goldenrod (*Solidago gigantea*), stinging nettle (*Urtica dioica*), common boneset (*Eupatorium perfoliatum*), cut-leaf water-horehound (*Lycopus americanus*), pussy willow, and great blue lobelia (*Lobelia siphilitica*).

The hydrology indicators observed included high water table, saturation, drainage patterns, and passing the FAC-neutral test. Hydric soil indicators included loamy mucky mineral.

### 4.2.7 Other – P. tremuloides PFO

A frequently encountered palustrine forested (PFO) wetland type within the Study Area that does not align with an MNFI community type is dominated by quaking aspen (*Populus tremuloides*). For purpose of this study these areas are denoted as “Other - P. tremuloides PFO.” The other - P. tremuloides PFO wetland type represents an early successional community that is expected to transition into northern hardwood swamp, which is described above in Section 4.2.3. This transitional community differs from the northern hardwood swamp community type as the overstory is dominated by quaking aspen, an early successional and relatively short-lived tree, that is not a common overstory species within the hardwood swamp community. This community type was encountered within the Study Area in wetlands that were influenced by seasonal flooding and beaver activity. Evidence of previous logging activity indicates that this community has been previously disturbed.

Examples of vegetation encountered within the Other - P. tremuloides PFO wetlands included quaking aspen, green ash, red maple, black chokeberry (*Aronia melanocarpa*), European alder (*Alnus glutinosa*), fowl manna grass (*Glyceria striata*), interrupted fern (*Osmunda claytoniana*), nodding sedge, bladder

sedge, field horsetail (*Equisetum arvense*), dwarf red raspberry, sensitive fern, yellow marsh-marigold (*Caltha palustris*), and rough bedstraw (*Galium asprellum*).

The hydrology indicators observed included surface water, high water table, saturation, water-stained leaves, drainage patterns, geomorphic position, microtopographic relief, and passing the FAC-neutral test. Hydric soil indicators included loamy mucky mineral and 2 cm muck.

### 4.2.8 Other – Upland Meadow

The other - upland meadow community type is not a MNFI identified community type as it is encountered in areas with previous human disturbance, such as historic earthmoving activities that may result in the presence of an unnatural soil type. Although this community was encountered in the upper peninsula of Michigan, it most closely resembles the prairie MNFI community group in plant community (ref. (10)). This community type appears to be characterized entirely by human disturbance and earthmoving activities.

Example of vegetation encountered within the upland meadow community type include quaking aspen, boxelder (*Acer negundo*), pussy willow, nodding trillium (*Trillium cernuum*), bird's-foot trefoil (*Lotus corniculatus*), Timothy grass (*Phleum pratense*), tall goldenrod (*Solidago altissima*), grass-leaved goldenrod (*Euthamia graminifolia*), sweet vernal grass (*Anthoxanthum odoratum*), and common blackberry (*Rubus allegheniensis*).

Hydrology and hydric soil indicators were not encountered within the sampled upland meadow community type.

### 4.2.9 Southern Shrub-Carr

The southern shrub-carr community type was infrequently encountered within the Study Area. This community type is a long persistent successional community that is intermediate to a variety of herbaceous and forested wetlands. The southern shrub-carr community type commonly occurs as part of a large wetland complex and can range from small pockets of wetlands to extensive in size. The natural processes that allow this community type to establish include alterations to the fire or hydrologic regimes, which may include fire suppression and beaver activity (ref. (10)).

Examples of vegetation encountered within the southern shrub-carr community type included quaking aspen, meadow willow (*Salix petiolaris*), gray willow (*Salix bebbiana*), red maple, thread rush (*Juncus filiformis*), woolgrass, soft rush, broom sedge, and grove blue grass (*Poa alsodes*).

The hydrology indicators observed included high water table, saturation, geomorphic position, and passing the FAC-neutral test. Hydric soil indicators included depleted below dark surface.

## 4.3 Stream Characterization

A total of 27 named streams and 3 unnamed streams were encountered within the Study Area, representing 30 stream and tributary systems. Most streams encountered correlated with National Hydrography Dataset (NHD) flow lines as identified during the desktop assessment. Those not correlated with NHD flow lines were incorporated into the project mapping based on field survey stream points, topographic evidence, and aerial imagery. For purposes of naming, stream names found within NHD mapping are used within this report. If a stream was not named within NHD, numerical tributary names were assigned with "Tributary 1" associated with the downstream-most tributary and with sequential

increases until all mapped streams were named. Mapped stream features and assigned names can be found in Figure 8.

Stream observation data is included in Appendix E and in Subsections 4.3.1 through 4.3.9. For purposes of this report, stream “type” refers to Rosgen Stream Classification System (ref. (11)) and channel dimensions refer to approximate bankfull width/depth in feet.

A photo log documenting each stream bank is provided in Appendix C.

Descriptions of each stream system (main stem and tributaries, as applicable) are presented in the subsequent subsections organized from west to east.

## 4.3.1 Pine Creek System

The main stem of Pine Creek and one suspected tributary were encountered within the Study Area. Additionally, Caribou Creek is a tributary to Pine Creek and was encountered within the Study Area.

### 4.3.1.1 Caribou Creek

Caribou Creek is a tributary to Pine Creek and was encountered at Transect 1 within the Study Area. Caribou Creek at this location was a D6-type stream a channel of 13 feet/0.8 feet and with Good (stable) stability.

### 4.3.1.2 Pine Creek

Pine Creek was encountered at Transects 1, 2, 3, and 4. At Transect 1, Pine Creek was a D6-type stream, influenced by beaver dams, and was not assigned a stability rating. At Transect 2, Pine Creek was a free flowing C4-type stream with channel of 24.5 feet/6.0 feet and with Good (stable) stability. Transect 3 was a C3-type stream with a channel of 20 feet /2.0 feet and Good (stable) stability. Transect 4 was a C4-type stream with a channel of 31 feet/2.5 feet and had Good (stable) stability.

### 4.3.1.3 Suspected Tributary to Pine Creek

Within the Study Area, an unmapped stream was encountered at Transect 2, classified as a D6-type stream with a channel of 95 feet and unknown depth. Aerial photo interpretation suggests this stream is a tributary to Pine Creek, although the actual confluence was not observed as part of this study. This stream appeared to be influenced by beaver dams and was not assigned a stability rating.

## 4.3.2 Duck Creek System

Within the Study Area, the main stem of Duck Creek is split into two tributaries Duck Creek Tributary 1 and Tributary 2. Tributary 2, in turn subdivides into a total of 5 tributaries.

### 4.3.2.1 Tributary 1 to Duck Creek

Tributary 1 was encountered by Transects 2, 3, and 4 and in all cases was influenced by beaver dams, so was not assigned stability ratings.

#### 4.3.2.2 Tributary 2 to Duck Creek

Tributary 2 was encountered by Transect 4 and was a C5-type stream with a channel of 15 feet/7.5 feet and had Good (stable) stability.

#### 4.3.2.3 West and East Branch Duck Creek

Tributary 2 to Duck Creek splits upstream of Transect 4 into the West and East Branches to Duck Creek.

##### *West Branch Duck Creek*

West Branch of Duck Creek was encountered at Transect 1, 2 and 3. At Transect 1, West Branch Duck Creek was a C3-type stream with a channel of 15 feet/3.5 feet and Fair (moderately unstable) stability. At Transect 2, the Creek was a C4-type stream with a channel of 13 feet/1.7 feet and Fair (moderately unstable) stability. At Transect 3, the Creek was a C3-type stream with a channel of 17 feet/2.0 feet and Good (stable) stability.

##### *East Branch Duck Creek*

East Branch Duck Creek was encountered at Transect 3, which was a C4-type stream with a channel width of 46 feet that was influenced by beaver dams, so channel depth was not measured nor was a stability rating assigned.

##### *Tributaries to the East Branch Duck Creek*

Upstream of Transect 2, East Branch Duck Creek splits into two tributaries, named Tributary 1 of East Branch Duck Creek and Tributary 2 of East Branch of Duck Creek for the purpose of this plan.

Tributary 1 of East Branch Duck Creek was encountered at Transect 1 and Transect 2. At Transect 1, Tributary 1 of East Branch Duck Creek was an E5-type stream with channel of 5.5 feet/1.2 feet and with Fair (moderately unstable) stability. At Transect 2, Tributary 1 of East Branch Duck Creek was a D6-type stream with channel of 125 feet/10 feet and influenced by beaver dams so not assigned a stability rating.

Tributary 2 of East Branch Duck Creek was encountered at Transect 1 and Transect 2. At Transect 1, Tributary 2 of East Branch Duck Creek was a E6-type stream with a channel of 6 feet/0.8 feet with Poor (unstable) stability. At Transect 2, Tributary 2 of East Branch Duck Creek was a C5-type stream with a channel width of 12 feet and Fair (moderately unstable) stability.

Upstream of Transect 2, Tributary 2 of East Branch Duck Creek further divides with Tributary 3 of East Branch Duck Creek encountered at Transect 1. At Transect 1, Tributary 3 of East Branch Duck Creek is a C5-type stream with a channel of 16.5 feet/3.4 feet and Poor (unstable) stability.

### 4.3.3 Bolo Road Creek

Within the Study Area, Transects 1, 2, 3, and 4 encountered Bolo Road Creek. At Transect 1, Bolo Road Creek was influenced by beaver dams and was not assigned a stability rating. At Transect 2, Bolo Road Creek was an E6-type stream with a channel of 8 feet/0.8 feet and Fair (moderately unstable) stability. Transect 3 was an E6-type stream (with a channel of 1 feet /0.5 feet, primarily vegetated, and little to no water) with Good (stable) stability. Transect 4 was an E6-type stream with a channel of 8 feet/2.0 feet and appeared inundated with no flow due to an undersized culvert downstream, therefore no stability rating was given.

### 4.3.4 West Branch Halfway Creek

Within the Study Area, Transects 1, 2, 3 and 4 encountered West Branch Halfway Creek. At Transect 1, West Branch Halfway Creek was influenced by beaver dams and did not reflect a stream channel, so channel measurements and a stability rating were not applicable. At Transect 2, West Branch Halfway Creek had an E6-type stream with a channel of 5 feet/0.4 feet and Good (stable) stability. At Transect 3, West Branch Halfway Creek was a C5-type stream with a channel of 6 feet /1.5 feet and Fair (moderately unstable) stability and at Transect 4 West Branch Halfway Creek was a C5-type stream with a channel of 8 feet /1.5 feet and Poor (unstable) stability.

West Branch Halfway Creek divides into two tributaries upstream of Transect 3.

#### 4.3.4.1 Tributary 1 West Branch Halfway Creek

At Transect 1, Tributary 1 West Branch Halfway Creek Tributaries 1 was influenced by beaver dams and did not reflect a stream channel, so channel measurements and a stability rating were not applicable. At Transect 2, Tributary 1 West Branch Halfway Creek was a D6-type stream with a channel of 2 feet/0.3 feet and Good (stable) stability.

#### 4.3.4.2 Tributary 2 West Branch Halfway Creek

At Transect 1, Tributary 2 West Branch Halfway Creek Tributary had an E6-type stream with a channel of 7 feet/0.3 feet with little to no flow of water.

### 4.3.5 Tolfrey Creek System

Within the Study Area, the main stem of Tolfrey Creek and a suspected tributary to Tolfrey Creek were encountered.

#### 4.3.5.1 Tolfrey Creek

Within the Study Area, Tolfrey Creek was encountered with by Transects 1 through 4. At Transect 1, Tolfrey Creek was free flowing (C5-type stream with channel of 10 feet/2.2 feet) and with Fair (moderately unstable) stability. At Transect 2, Tolfrey Creek was free flowing (C4-type channel of 13.5 feet/2.0 feet) and with Good (stable) stability. At Transect 3, Tolfrey Creek was free flowing (C4-type stream with channel of 12 feet/1.5 feet) and with Good (stable) stability. At Transect 4, Tolfrey Creek was free flowing (C5-type stream with channel of 12 feet/1.7 feet) and with Good (stable) stability.

#### 4.3.5.2 Suspected Tributary to Tolfrey Creek

Within the Study Area, an unlabeled stream was encountered at Transect 4, classified as a D6-type stream with a channel of 105 feet and unknown depth. This stream appeared to be influenced by beaver dams and was not assigned a stability rating.

### 4.3.6 Argentine Creek System

Within the Study Area, the main stem and three tributaries of Argentine Creek were encountered. For purposes of this report, the tributaries are designated Tributary 1 to Argentine Creek, Tributary 2 to Argentine Creek and Suspected Tributary To Argentine Creek for purposes of this report).

#### 4.3.6.1 Argentine Creek

Argentine Creek was encountered by Transects 3 and 4. At Transect 3, Argentine Creek was free flowing (C5-type stream with channel of 13 feet/1.5 feet) and with Good (stable) stability. At Transect 4, Argentine Creek was influenced by beaver dams (D5-type channel with channel of 15 feet/0.5 feet) and since the bottom was unable to be evaluated, was not assigned a stability rating.

#### 4.3.6.2 Tributary 1 Argentine Creek

Upstream of Transect 3, Argentine Creek splits into two tributaries with each tributary intersected by both Transects 1 and 2. At Transect 1, Tributary 1 Argentine Creek was an E6-type stream with channel of 6 feet/1.0 foot and Fair (moderately unstable) stability. At Transect 2, Tributary 1 Argentine Creek was a C4-type stream with channel of 7 feet/1.5 feet and Good (stable) stability.

#### 4.3.6.3 Tributary 2 Argentine Creek

At Transect 1, Tributary 2 Argentine Creek was a C5-type stream with channel of 7 feet/1.0 foot with Good (stable) stability. At Transect 2, Argentine Creek Tributary 2 was a C4-type stream with channel of 10 feet/2.0 feet with Good (stable) stability.

#### 4.3.6.4 Suspected Tributary to Argentine Creek

Within the Study Area, an unnamed stream was encountered at Transect 2 with probable connection to Argentine Creek. This stream is classified as a D6-type stream with a channel of 14 feet/0.2 feet and Good (stable) stability.

### 4.3.7 Halfway Creek

Within the Study Area, Transects 2, 3, and 4 encountered the main stem of Halfway Creek. At Transect 2, Halfway Creek was free flowing (C5-type stream with channel of 10 feet/2.0 feet) and with Good (stable) stability. Transect 3 was a D6-type stream with a channel of 15 feet /0.5 feet and since the bottom was unable to be evaluated, was not assigned a stability rating. At Transect 3, Halfway Creek was a C5-type stream with a channel of 14 feet/3.0 feet and had Good (stable) stability. Transect 4 was a C5-type stream with a channel of 15 feet/0.8 feet and Good (stable) stability.

### 4.3.8 Townline Creek System

Within the Study Area, Transects 1, 2, 3, and 4 encountered three tributaries of Townline Creek (designated Tributary 1, Tributary 2, and Tributary 3 for purposes of this report). Additionally, downstream of Transect 4, Tributary 3 to Townline Creek branches into a fourth NHD-mapped stream, however field review indicated this feature lacked stream characteristics, is better characterized as wetland, and was excluded from this stream survey. with no stream classification given.

#### 4.3.8.1 Tributary 1 to Townline Creek

At Transect 1, Tributary 1 to Townline Creek was a D6-type stream with a channel of 7 feet/0.25 feet and a Good (stable) stability. At Transect 2, Tributary 1 to Townline Creek was free flowing (C5-type stream with channel of 7 feet/0.8 feet) and with Good (stable) stability. At Transect 3, Tributary 1 to Townline Creek was a E5-type stream with a channel of 4 feet/1.0 foot and had Fair (moderately unstable) stability. At Transect 4, Tributary 1 to Townline Creek was a C5-type stream with a channel of 15 feet/0.5 feet and a Good (stable) stability.

#### 4.3.8.2 Tributary 2 to Townline Creek

At Transect 1, Tributary 2 to Townline Creek was a C5-type stream with a channel of 12 feet/2.0 feet and a Good (stable) stability.

#### 4.3.8.3 Tributary 3 to Townline Creek

At Transect 2, Tributary 3 to Townline Creek was an E6-type stream with a channel of 5 feet/0.5 feet and Good (stable) stability. At Transect 3, Townline Creek Tributary 3 was a D6-type stream with a channel of 18 feet /1.5 feet) and Fair (moderately unstable) stability.

### 4.3.9 Little Cranberry River System

Within the Study Area, six tributaries to the Little Cranberry were encountered (designated Tributary 1, Tributary 2, Tributary 3, Tributary 4, Tributary 5, and Tributary 6 for purposes of this report)

#### 4.3.9.1 Tributary 1 to Little Cranberry River

At Transect 2, Tributary 1 to Little Cranberry River was a D6-type stream with channel of 25 feet/0.4 feet and appeared influenced by beaver dams, so no stability rating was given. At Transact 3, Tributary 1 to Little Cranberry River was a C5-type stream with a channel of 12 feet/1.5 feet and Good (stable) stability. At Transect 4, Tributary 1 to Little Cranberry River was free flowing C4-type stream with a channel of 20 feet/2 feet and Good (stable) stability.

#### 4.3.9.2 Tributary 2 to Little Cranberry River

At Transect 2, Tributary 2 to Little Cranberry River was a D6-type stream with channel width of 25 feet and appeared influenced by beaver dams, so no stability rating was given. At Transect 3, Tributary 2 to Little Cranberry River was free flowing C4-type stream with channel of 7 feet/1.2 feet and Good (stable) stability.

#### 4.3.9.3 Tributary 3 to Little Cranberry River

At Transect 2, Tributary 3 to Little Cranberry River was an E5-type stream with channel of 2 feet/0.2 feet and Good (stable) stability. At Transect 3, Tributary 3 to Little Cranberry River. At Transect 3, Tributary 3 to Little Cranberry was free flowing C4-type stream with channel of 11 feet/0.7 feet and Good (stable) stability.

#### 4.3.9.4 Tributary 4 to Little Cranberry River

At Transect 3, Tributary 4 to Little Cranberry was encountered three times (due to channel sinuosity) and had three C3-type streams with 11.5 feet/3.4 feet, 13.5 feet/2.7 feet, 13.5 feet/3.0 feet, all with Fair (moderately unstable) stability

#### 4.3.9.5 Tributary 5 to Little Cranberry River

At Transect 4, Tributary 5 to Little Cranberry was encountered two times (due to channel sinuosity) and had C4-type streams with channels of 3 feet/0.7 feet and 2 feet/0.7 feet, with Good (stable) stability.

**Table 4-2 Summary of Stream Characteristics**

| Stream Name | Transect Observation Location | Rosgen Channel Type | Bankfull Width (feet) | Bankfull Height (feet) | Pfankuch Channel Stability Score |
|---|---|---|---|---|---|
| Caribou Creek | T1W-S09 | D6 | 13 | 0.8 | 45 |
| Pine Creek | T1W-S07 | D6 | NR | NR | N/A* |
| | T1W-S08 | D6 | NR | NR | N/A* |
| | T2W-S11 | C4 | 24.5 | 6.0 | 82 |
| | T3W-S05 | C3 | 20 | 2.0 | 64 |
| | T4W-S04 | C4 | 31 | 2.5 | 87 |
| Tributary 1 to Duck Creek | T2W-S08 | D6 | 35 | NR | N/A* |
| | T3W-S04 | D6 | 80 | 1.0 | N/A* |
| | T4W-S03 | D6 | 65 | 5.0 | N/A* |
| Tributary 2 to Duck Creek | T4W-S02 | C5 | 15 | 7.5 | 67 |
| West Branch Duck Creek | T1W-S06 | C3 | 15 | 3.5 | 91 |
| | T2W-S07 | C4 | 13 | 1.7 | 93 |
| | T3W-S03 | C3 | 17 | 2.0 | 57 |
| East Branch Duck Creek | T3W-S02 | C5 | 18 | 3.0 | 76 |
| | T2W-S09 | C4 | 46 | NR | N/A* |
| Tributary 1 to East Branch Duck Creek | T1W-S04 | E5 | 5.5 | 1.2 | 91 |
| | T1W-S05 | E6 | 5 | 0.7 | 72 |
| | T2W-S04 | D6 | 125 | NR | N/A* |
| | T2W-S05 | D6 | 10 | NR | N/A* |
| | T2W-S06 | E6 | 23 | NR^ | 67 |
| Tributary 2 to East Branch Duck Creek | T1W-S02 | E6 | 6 | 0.8 | 88 |
| | T1W-S03 | D6 | NR | NR | N/A* |
| | T2W-S02/T2W-S03 | C5 | 12 | NR^ | 94 |
| Tributary 3 to East Branch Duck Creek | T1W-S01 | C5 | 16.5 | 3.4 | 122 |
| Bolo Road Creek | T1E-S01 | D5 | 210 | NR | N/A* |
| | T2W-S01 | E6 | 8 | 0.8 | 68 |

| Stream Name | Transect Observation Location | Rosgen Channel Type | Bankfull Width (feet) | Bankfull Height (feet) | Pfankuch Channel Stability Score |
|---|---|---|---|---|---|
| | T3W-S01 | E6 | 1 | 0.5 | 46 |
| | T4W-S01 | E6 | 8 | 2.0 | N/A* |
| Tributary 1 West Branch Halfway Creek | T1E-S02 | D5 | NR | NR | N/A+ |
| | T2E-S01 | D6 | 2 | 0.2 to 0.3 | 47 |
| Tributary 2 West Branch Halfway Creek | T1E-S03 | D5 | NR | NR | N/A* |
| | T2E-S02 | E6 | 5 | 0.4 | 53 |
| | T3E-S01 | C5 | 6 | 1.5 | 97 |
| | T4E-S01 | C5 | 8 | 1.5 | 115 |
| Tributary 3 West Branch Halfway Creek | T1E-S04 | E6 | 7 | 0.3 | N/A+ |
| Tolfrey Creek | T1E-S05 | C5 | 10 | 2.2 | 90 |
| | T2E-S03 | C4 | 13-14 | 2.0' | 66 |
| | T3E-S02 | C4 | 12 | 1.5 | 81 |
| | T4E-S03 | C5 | 12 | 1.7 | 98 |
| Tributary 1 to Argentine Creek | T1E-S06 | E6 | 6 | 1.0 | 80 |
| | T2E-S05 | C4 | 7 | 1.5 | 66 |
| Tributary 2 to Argentine Creek | T1E-S07 | C5 | 7 | 1.0 | 31 |
| | T2E-S06 | C4 | 10 | 2.0 | 74 |
| Argentine Creek | T3E-S03 | C5 | 13 | 1.5 | 81 |
| | T4E-S04 | D5 | 15 | 0.5 | N/A* |
| Halfway River | T2E-S07 | C5 | 10 | 2.0 | 85 |
| | T2E-S08 | D6 | 6 | 0.5 | 59 |
| | T3E-S04 | C5 | 14 | 3.0 | 89 |
| | T4E-S05 | C5 | 15 | 0.8 | 58 |
| Tributary 1 to Townline Creek | T1E-S08 | D6 | 7 | 0.3 | 54 |
| | T2E-S09 | C5 | 7 | 0.8 | 52 |
| | T3E-S05 | E5 | 4 | 1.0 | 80 |
| | T4E-S06 | C5 | 15 | 0.5 | 28 |

| Stream Name | Transect Observation Location | Rosgen Channel Type | Bankfull Width (feet) | Bankfull Height (feet) | Pfankuch Channel Stability Score |
|---|---|---|---|---|---|
| Tributary 2 to Townline Creek | T1E-S09 | C5 | 12 | 2.0 | 86 |
| Tributary 3 to Townline Creek | T2E-S10 | E6 | 5 | 0.5 | 57 |
| | T3E-alt-S001 | D6 | 18 | 1.5 | 105 |
| | T4E-S07 | C4 | 12 | 1.5 | 66 |
| Tributary 1 to Little Cranberry River | T2E-S11 | D6 | 25 | 0.4 | N/A* |
| | T3E-alt-S002 | C5 | 12 | 1.5 | 74 |
| | T4E-S08 | C4 | 20 | 2.0 | 72 |
| Tributary 2 to Little Cranberry River | T2E-S12 | D6 | 25 | NR | N/A* |
| | T3E-S06 | C4 | 7 | 1.2 | 83 |
| Tributary 3 to Little Cranberry River | T2E-S13 | E5 | 2 | 0.2 | 59 |
| Tributary 4 to Little Cranberry River | T3E-S07 | C4 | 11 | 0.7 | 79 |
| | T4E-S09 | C3 | 11.5 | 3.4 | 88 |
| | T4E-S10 | C3 | 13.5 | 2.7 | 88 |
| | T4E-S11 | C3 | 13.5 | 3.0 | 92 |
| Tributary 5 to Little Cranberry River | T4E-S12 | C4 | 3 | 0.7 | 74 |
| | T4E-S13 | C4 | 2 | 0.7 | 59 |
| Suspected Tributary to Argentine Creek | T2E-S04 | D6 | 14 | 0.2 | 53 |
| Suspected Tributary to Pine Creek | T2W-S10 | D6 | 95 | NR | N/A* |
| Suspected Tributary to Tolfrey Creek | T4E-S02 | D6 | 105 | NR | N/A* |

Notes: Some streams' stability ratings scored below Good (stable) range. These streams were assigned Good stability ratings.
NR=Not Recorded N/A=Not Assigned;
*Indicates a transect point that appeared ponded and did not exhibit stream flow. Therefore, no rating was assigned.
⁺Indicates a transect point that was predominantly vegetation with little to no water. Therefore, no rating was assigned.
^Indicates a depth measurement that was not recorded due to unsafe field conditions.

# 5 Regulatory Considerations

## 5.1 Wetlands

Based on data reviewed and field observations of topography, vegetation, soil, and indicators of hydrology, Barr has determined that wetland habitat is present within the Survey Area. In Michigan, wetlands are regulated by the State of Michigan EGLE under Part 303, Wetlands Protection, of the Michigan NREPA, 1994 PA 451, as amended (Part 303). Additionally, federal regulation of wetlands exists under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1972.

### 5.1.1 Michigan Wetland Regulations

Under Part 303, wetlands are regulated by the State of Michigan if the wetlands meet one or more of the following conditions:

1. Located within 500 feet of, or having a direct surface water connection to, an inland lake, pond, river, or stream; or
2. Greater than 5 acres in size; or
3. Located within 1,000 feet of, or having a direct surface water connection to, the Great Lakes or Lake St. Clair; or
4. A water of the United States, as that term is used in section 502(7) of the Federal Water Pollution Control Act, 33 USC 1362; or
5. Known to have a documented presence of an endangered or threatened species under Part 365 of State of Michigan 1994 PA 451, as amended or the Federal Endangered Species Act of 1973, Public Law 93-205; or
6. Rare or imperiled.

To approximate potential EGLE regulation of wetlands in the Study Area, 500-foot offsets from centerline of the mapped streams were projected throughout the Study Area (Figure 9). This approach underestimates actual proximity to a regulating feature in that those measurements are to be taken from the edge of the feature for regulating Condition 1 and Condition 3, but is provided as a estimation of potential regulation. The result is that a significant portion of land, and the majority of estimated wetland locations within the Study Area, are within 500 feet of a stream. As a result, it is Barr's opinion that most wetlands identified in this study would be regulated under Part 303 based on regulating Condition 1.

Additionally, it is anticipated that many wetlands not meeting Condition 1 would also likely be regulated under Condition 2 based on a size of more than 5 acres. However, definitive conclusions regarding Condition 2 regulation are not possible given the level of wetland boundary mapping precision relied upon for this study. If regulated activities are proposed within the underground mine area, Barr recommends wetland boundary mapping based on point-by-point delineation technique (e.g. "wetland flagging") to confirm precise wetland boundaries and determine if wetlands meet the regulatory threshold of being larger than 5 acres in size and not within 500 feet from a regulating inland lake, pond, river, or stream.

### 5.1.2 Federal Wetland Regulations

Wetlands with a nexus to navigable waters are regulated under Section 10 of the Rivers and Harbors Act of 1899 and/or Section 404 of the Clean Water Act of 1972 as Water of the United States (WOTUS). Within Michigan, navigable waters are the Great Lakes and the mouths of specific rivers where the river flows into a Great Lake. Barr's review of the navigable waters list maintained by the U.S. Army Corps of Engineers (ref. (12)) indicates that Lake Superior is the lone navigable water that is relevant to the WPN site. Therefore, Barr concluded that wetlands in the Study Area that would meet the definition of WOTUS, are those wetlands that have nexus to Lake Superior.

Current federal agency guidance (ref. (13)) limits the WOTUS designation of wetlands to "only those adjacent wetlands that have a continuous surface connection because they directly abut the requisite jurisdictional water" and provides a two-part test:

1. The adjacent body of water must be a "water of the United States," which generally means traditional navigable waters, or a relatively permanent body of water connected to a traditional navigable water; and

2. The wetland…must have a continuous surface connection to a requisite covered water making it difficult to determine where the water ends, and wetland begins.

Section 10 of the Rivers and Harbors Act of 1899 governs activities in navigable waters. It regulates construction, excavation, or filling activities in those navigable waters, including wetlands with nexus to navigable waters, and requires authorization from the U.S. Army Corps of Engineers. Given that the WPN site lies approximately 2 miles inland from Lake Superior, direct connection to Lake Superior is considered unlikely and any WOTUS within the Study Area would not be a traditional navigable water and therefore not likely to be regulated under Section 10 Rivers and Harbors Act.

Section 404 of the Clean Water Act of 1972 governs activities in all WOTUS. Therefore, Barr considered the two-part test to determine if those wetlands that have a continuous surface connection to Lake Superior, or a continuous surface connection to a relatively permanent body of water (RPW) that in turn has a surface connection to Lake Superior. To identify potential RPW connections to Lake Superior, Barr considered the streams mapped in this study to create those connections. Therefore, wetlands within the Study Area with connection to a mapped stream are likely to be regulated by Section 404. However, similar to previous discussion regarding Michigan regulating Condition 2, the level of mapping precision possible with this study precludes definitive statements regarding jurisdiction under Section 404. Please also be aware that under a Memorandum of Agreement between the federal government and the State of Michigan, Section 404 permitting of wetlands would occur under Part 303 with permitting administered by Michigan EGLE.

## 5.2 Streams

Based on observations, Barr has determined that stream habitat is present within the Survey Area. In Michigan, streams are regulated by EGLE under Part 301, Inland Lakes and Streams Protection, of the Michigan NREPA, 1994 PA 451, as amended (Part 301). Additionally, federal regulation of streams exists under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1972.

### 5.2.1 Michigan Stream Regulations

Part 301 regulates features as streams if they are “a river, stream, or creek which may or may not be serving as a drain as defined by the drain code…or any other body of water that has definite banks, a bed, and visible evidence of a continued flow or continued occurrence of water, including the St. Mary’s, St. Clair, and Detroit Rivers.” It is Barr’s opinion that the features mapped and identified as “streams” in this report meet this statutory definition.

### 5.2.2 Federal Stream Regulations

Section 10 of the Rivers and Harbors Act of 1899 governs activities in navigable waters. As discussed in Section 5.1.2, there are no identified navigable waters within the Study Area.

Section 404 of the Clean Water Act of 1972 governs activities in all WOTUS. As discussed in Section 5.1.2, Barr considers the streams mapped in this study to be RPW with surface connection to Lake Superior and therefore would be WOTUS. Please also be aware that under a Memorandum of Agreement between the federal government and the State of Michigan, Section 404 permitting of activities affecting RPWs would occur under Part 301 with permitting administered by Michigan EGLE.

## 5.3 Regulatory Limitations

Barr’s conclusions reflect our professional opinion based on the site conditions within the Survey Area observed during the site visits described in this report. Discrepancies may arise between current and future wetland determinations and delineations due to changes in vegetation and/or hydrology as the result of land use practices or other environmental factors, whether on-site or on adjacent or nearby properties. Barr provides no warranty, guarantee, or other agreement in respect to the period of time for which this wetland determination will remain valid.

# 6 References


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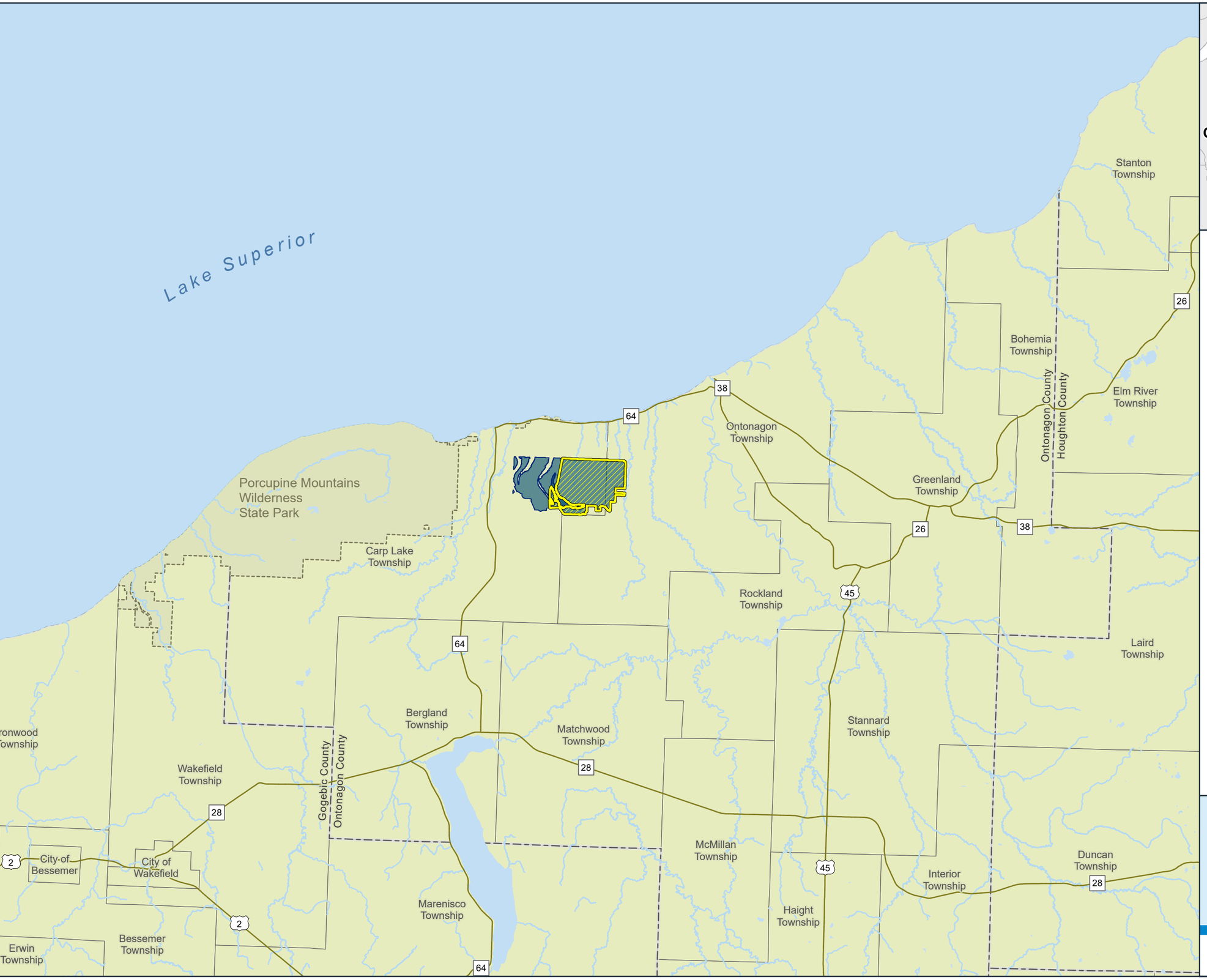
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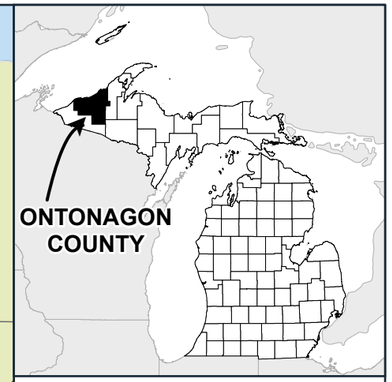
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# Figures




- Survey Area
- Apx. Limit of Underground Mine Area
- Porcupine Mountains Wilderness State Park
- Municipal Boundary
- County Boundary

0 5 10
Miles

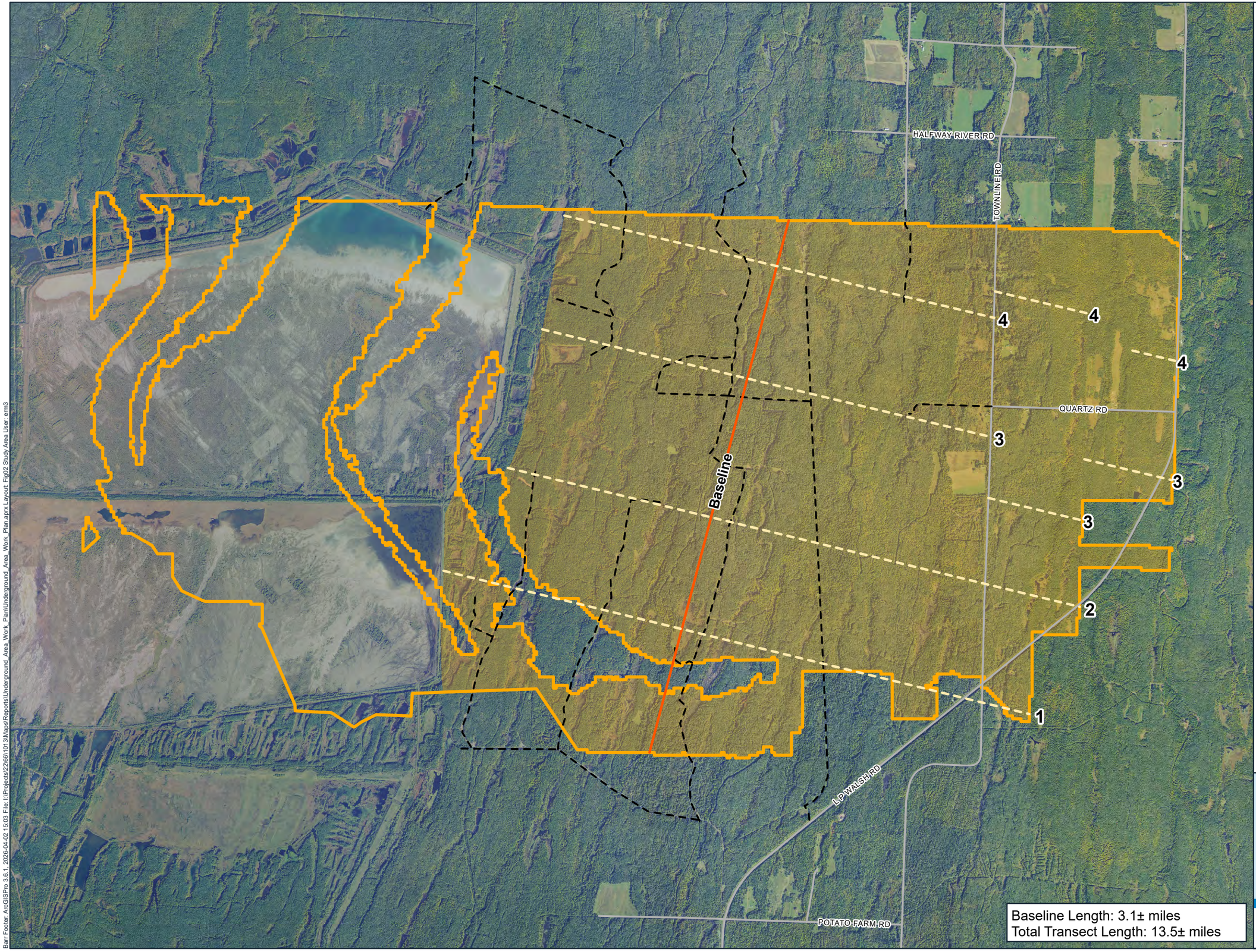
Basemap: World Street Map (Esri)

**Site Location**
White Pine North
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 1

BARR

Barr Footer: ArcGISPro 3.6.2, 2026-04-09 13:07, File: I:\Projects\23266\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Detail_Mapbook\Transect_Detail_Mapbook.aprx, Layout: Fig01 - Site Location, User: CML3




Apx. Limit of Underground Mine Area

Public Road

Existing 2-Track Trail Network

Survey Area/Study Area
*(Underground Mine Area excluding 2024 wetland delineation area and Existing North Dam 1 and 2)*

Baseline

Transect

Baseline Length: 3.1± miles
Total Transect Length: 13.5± miles

0 0.5 1
Miles

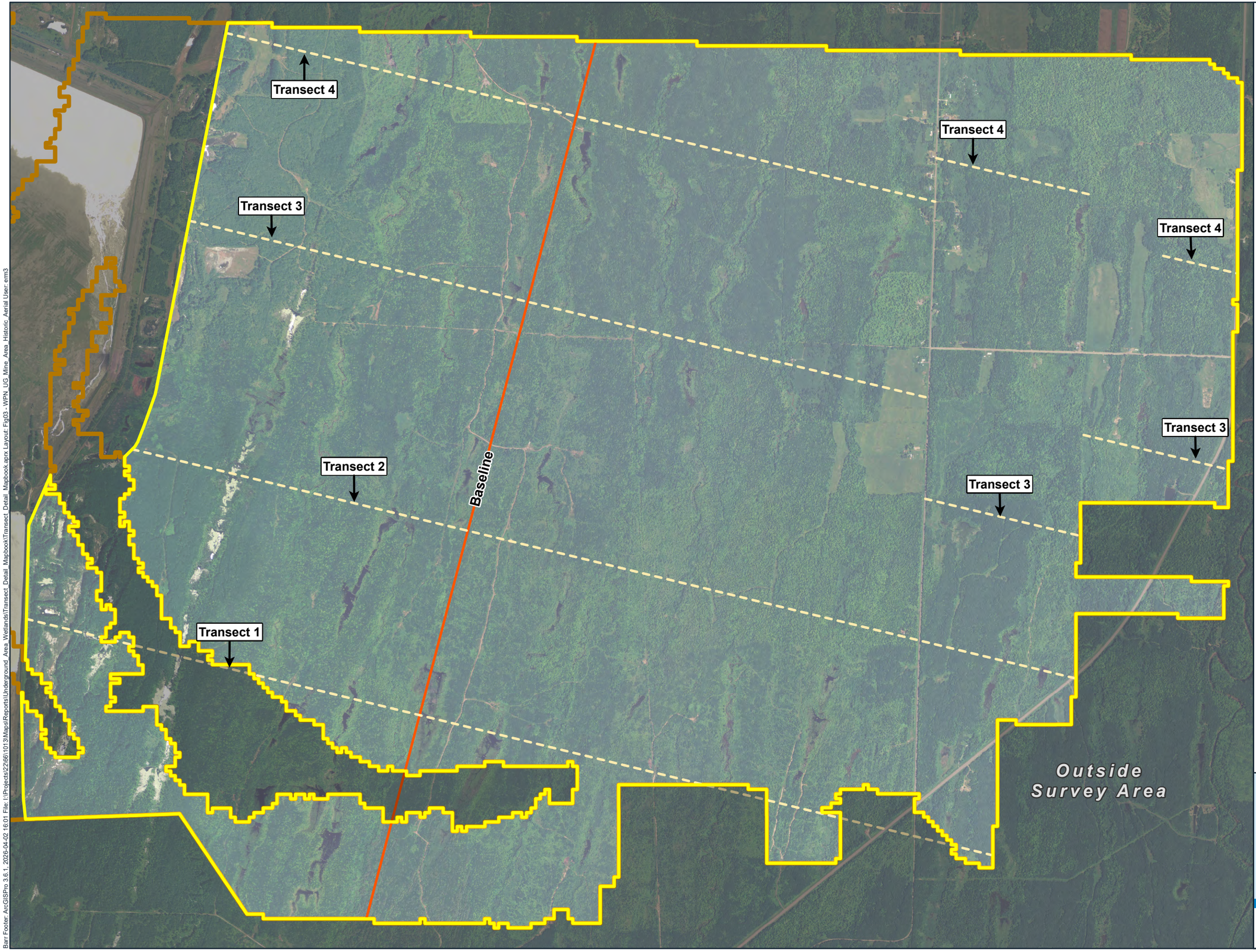
Imagery: USDA NAIP 2024

**Study Area**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 2

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-04-02 15:03 File: I:\Projects\22\66\1013\Maps\Reports\Underground_Area_Work_Plan\Underground_Area_Work_Plan.aprx Layout: Fig02 Study Area User: erm3




Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect

N

0 1,600 3,200
Feet

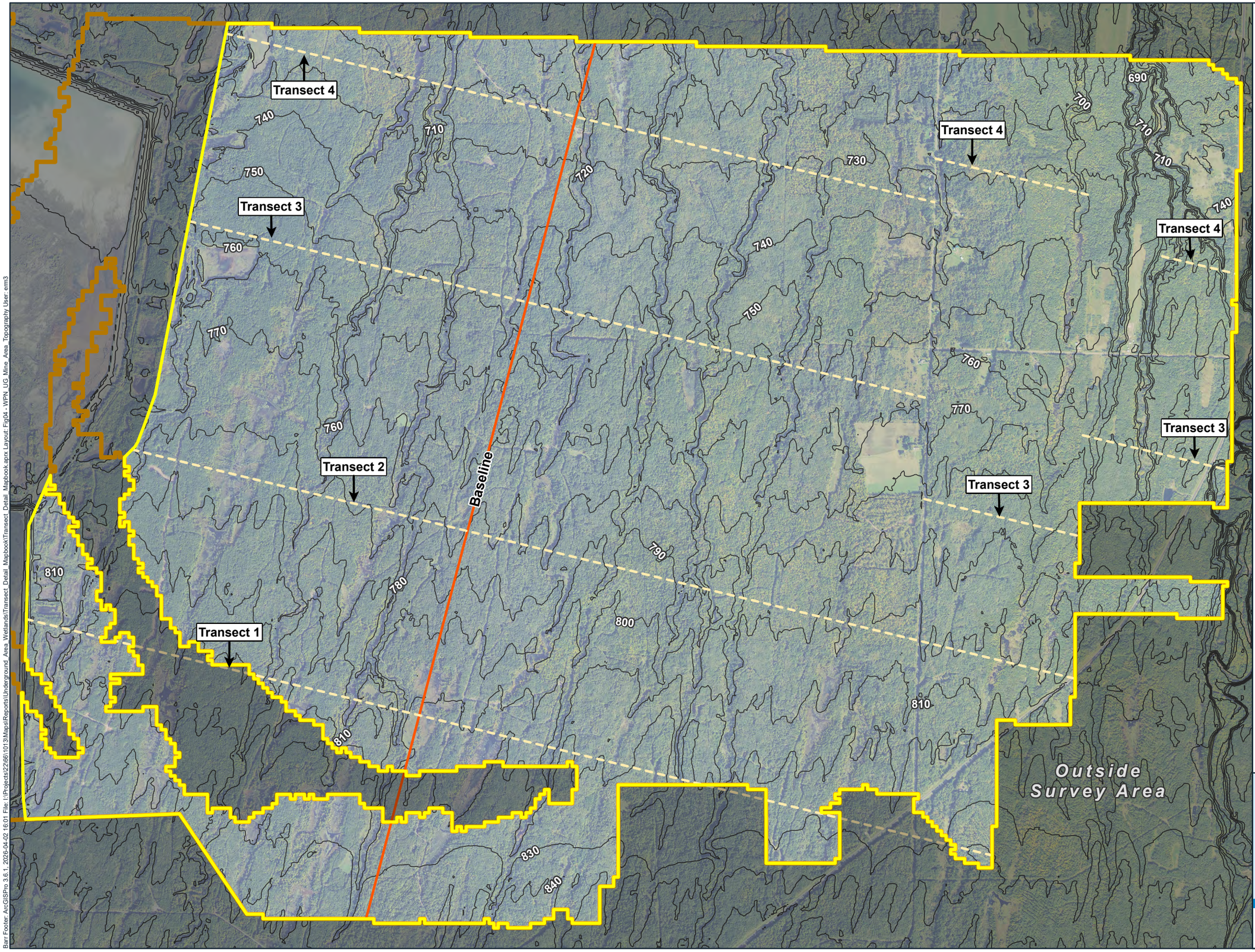
Imagery: USDA NAIP 2005

**Underground Mine Area**
**Historic Aerial**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 3

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-04-02 16:01 File: I:\Projects\22\66\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Detail_Mapbook\Transect_Detail_Mapbook.aprx Layout: Fig03 - WPN_UG_Mine_Area_Historic_Aerial User: erm3




Apx. Limit of Underground Mine Area

Survey Area

Baseline

Transect

Elevation Contour (U.S. Geological Survey, 2024) *(10-ft interval)*

0 1,600 3,200

Feet

Imagery: USDA NAIP 2024

**Underground Mine Area Topography**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 4

BARR

Barr Footer ArcGISPro 3.6.1, 2026-04-02 16:01 File: I:\Projects\22\66\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Detail_Mapbook\Transect_Detail_Mapbook.aprx Layout: Fig04 - WPN_UG_Mine_Area_Topography User: erm3




Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect
Soil Unit
Water

**Soil Drainage Class**

- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- NA

Note:
• Soil Unit, Water, and Soil Drainage Class data published by U.S. Department of Agriculture, Natural Resources Conservation Service in 2020, and accessed from the Web Soil Survey website. Available here: https://websoilsurvey.sc.egov.usda.gov/

N

0 1,600 3,200
Feet

Imagery: USDA NAIP 2024

**Underground Mine Area Soils**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 5

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-04-02 16:01 File: I:\Projects\22\66\101\3\Maps\Reports\Underground_Area_Wetlands\Transect_Detail_Mapbook\Transect_Detail_Mapbook.aprx Layout: Fig05 - WPN_UG_Mine_Area_Soils_Overview User: emm3

Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect
Stream/River (NHD)

**Part 303 State Wetland Inventory (EGLE)**

Wetland as identified on NWI and MIRIS maps
Soil areas which include wetland soils
Wetlands as identified on NWI and MIRIS maps and soil areas which include wetland soils

Transect 1
Transect 2
Transect 3
Transect 4
Baseline
Outside Survey Area
Caribou Creek
Pine Creek
Tributary 1 to Duck Creek
Tributary 2 to Duck Creek
West Branch Duck Creek
East Branch Duck Creek
Tributary 1 to East Branch Duck Creek
Tributary 2 to East Branch Duck Creek
Tributary 3 to East Branch Duck Creek
Bolo Road Creek
West Branch Halfway Creek
Halfway Creek
Tolfrey Creek
Argentine Creek
Tributary 1 to Argentine Creek
Tributary 2 to Argentine Creek
Halfway River
Tributary 1 to Townline Creek
Tributary 2 to Townline Creek
Tributary 3 to Townline Creek
Tributary 1 to Little Cranberry River
Tributary 2 to Little Cranberry River
Tributary 3 to Little Cranberry River
Tributary 4 to Little Cranberry River
Tributary 5 to Little Cranberry River

0 1,600 3,200
Feet

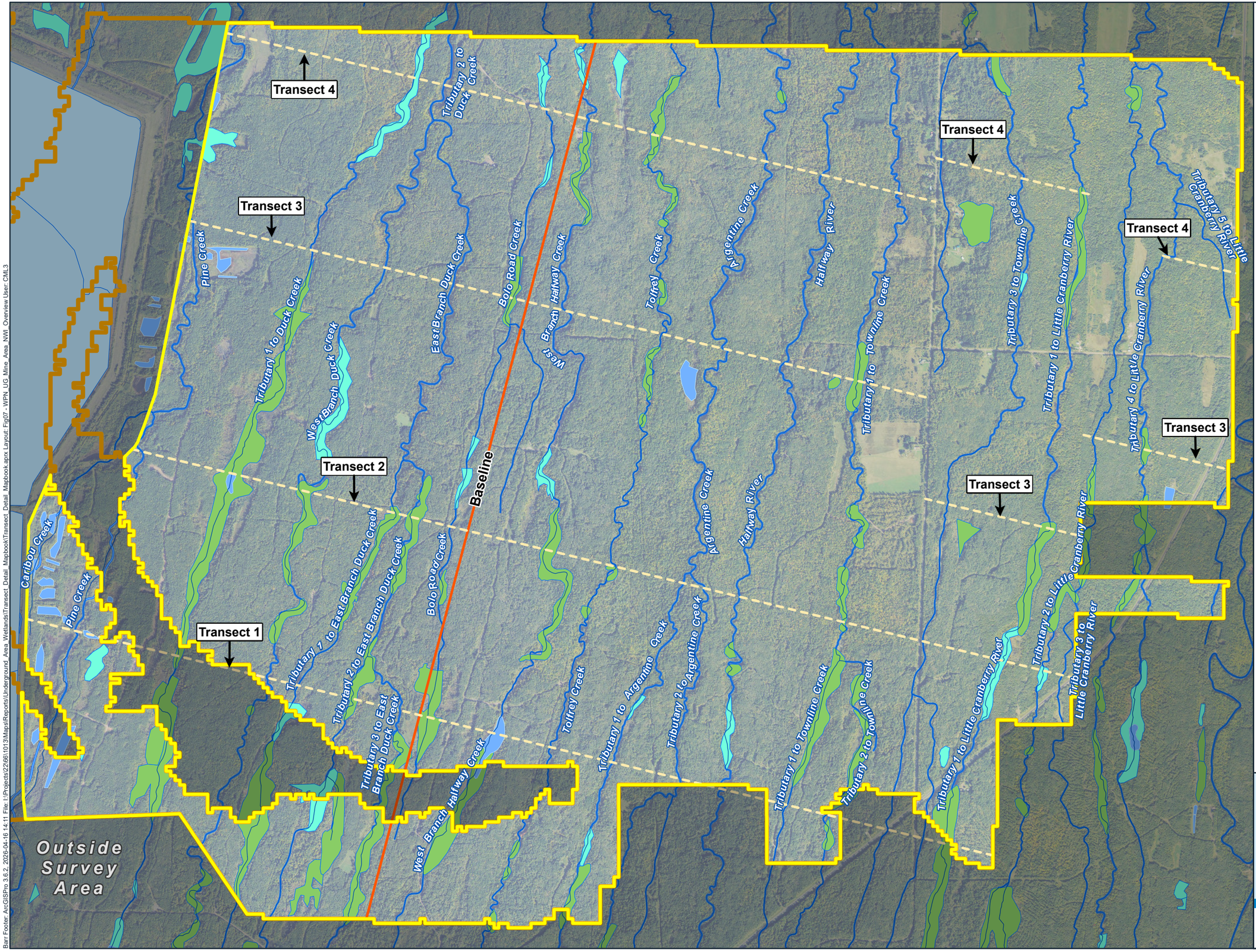
Imagery: USDA NAIP 2024

**Underground Mine Area**
**Michigan Wetlands Inventory**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 6

BARR

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Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect
Stream/River (NHD)

**Wetlands (NWI)**
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Riverine

0 1,600 3,200
Feet

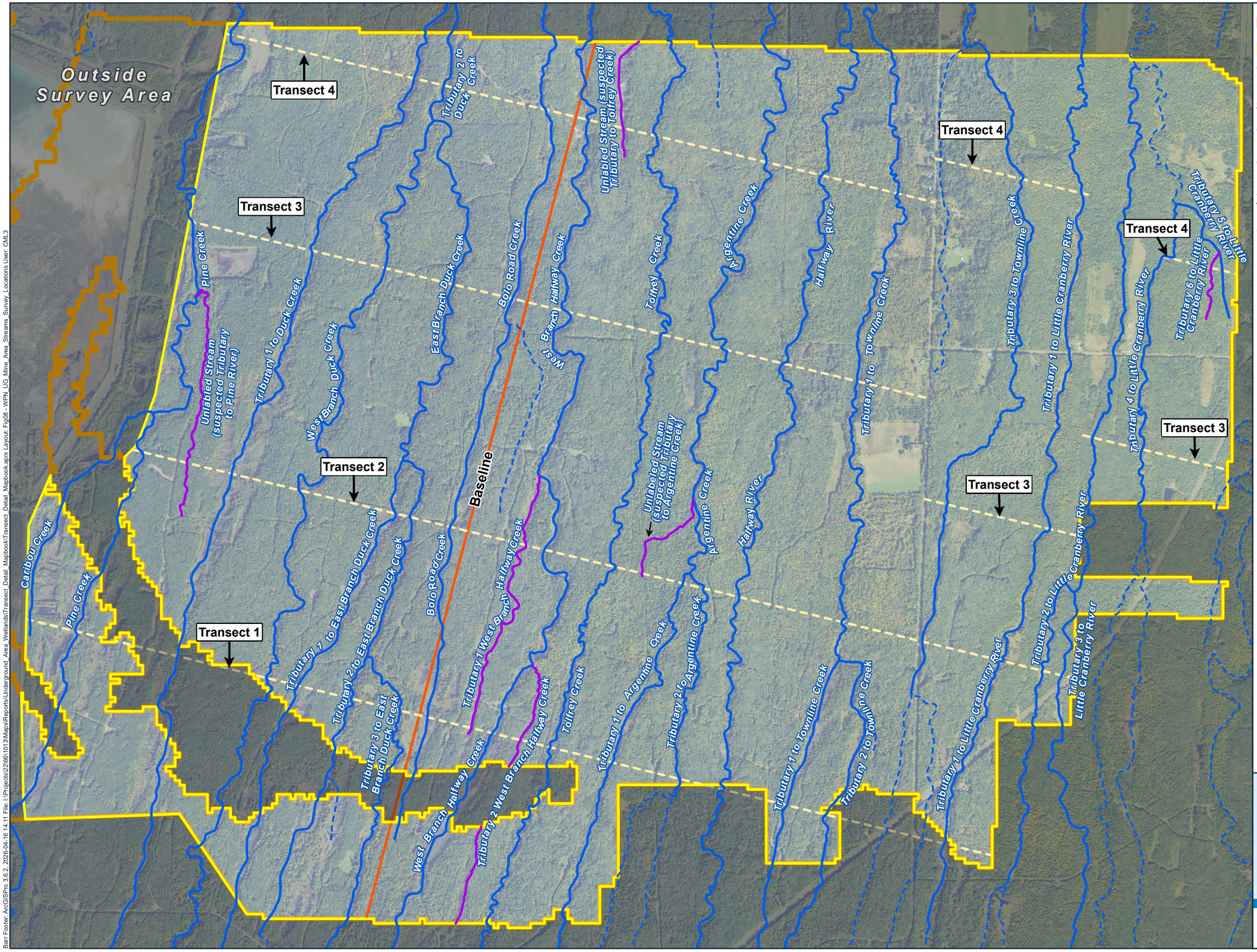
Imagery: USDA NAIP 2024

**Underground Mine Area**
**National Wetlands Inventory**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 7

BARR

Barr Footer: ArcGISPro 3.6.2, 2026-04-16 14:11 File: I:\Projects\22\66\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Detail_Mapbook\Transect_Detail_Mapbook.aprx Layout: Fig07 - WPN_UG_Mine_Area_NWI_Overview User: CMI.3




Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect

**Streams Encountered in Survey**

Stream line from the USGS NHD
Stream line digitized from aerial imagery (not in NHD)

**Streams That Do Not Intersect Any Transects**

Stream line from the USGS NHD

N

0 1,600 3,200
Feet

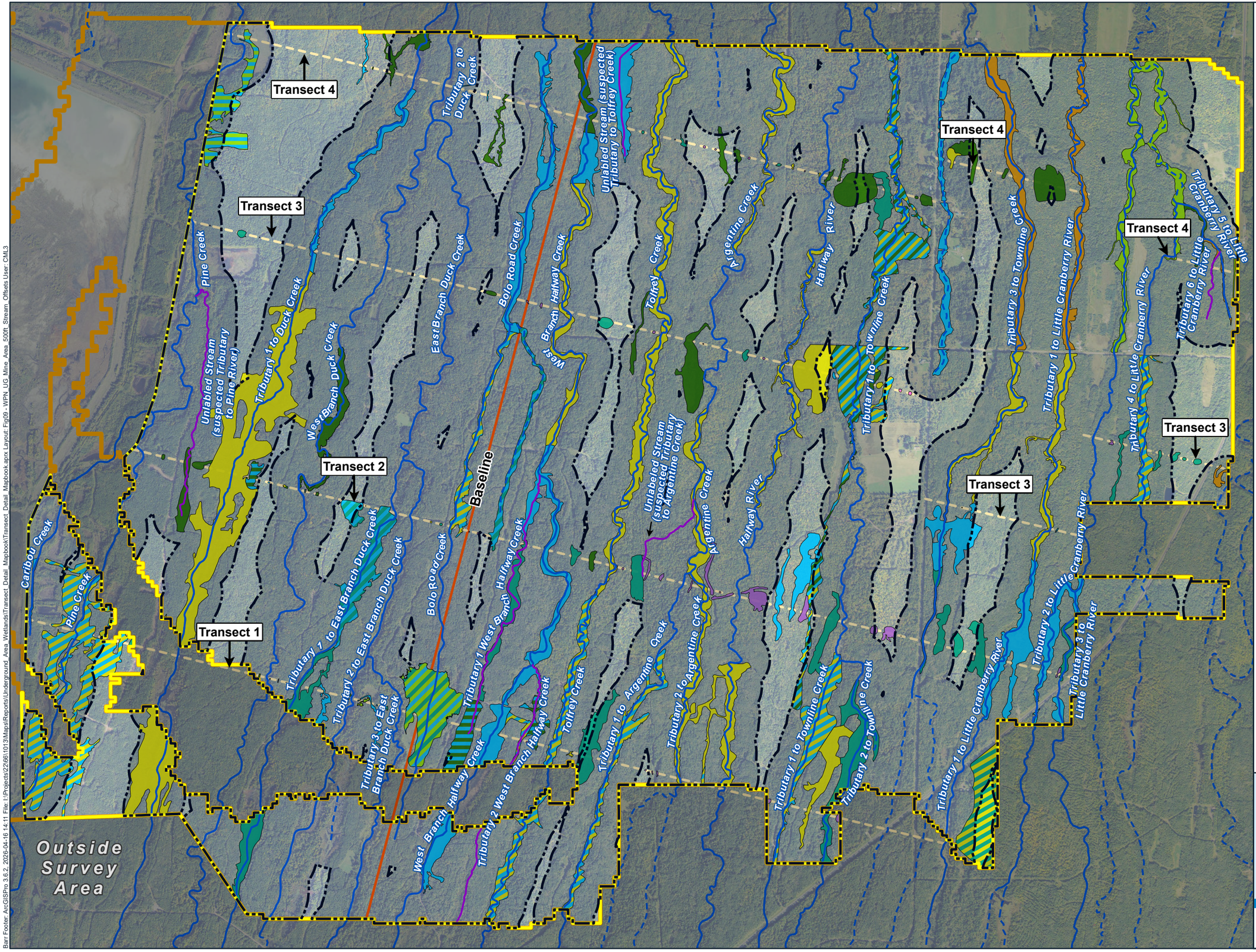
Imagery: USDA NAIP 2024

**Underground Mine Area Stream Survey Locations**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

FIGURE 8

BARR

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Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect
+/-500ft Stream Offset
*(offset based on NHD and should be considered approximate)*

**Streams Encountered in Survey**
Stream line from the USGS NHD
Stream line digitized from aerial imagery (not in NHD)

**Streams That Do Not Intersect Any Transects**
Stream line from the USGS NHD

**Wetlands**
Floodplain Forest
Northern Wet Meadow
Northern Wet Meadow/Other - *P. tremuloides* PFO/Emergent Marsh
Northern Wet Meadow/Emergent Marsh
Emergent Marsh
Emergent Marsh//Other - *P. tremuloides* PFO
Emergent Marsh/Northern Hardwood Swamp
Emergent Marsh/Northern Shrub Thicket
Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket
Northern Hardwood Swamp
Northern Hardwood Swamp/ Northern Shrub Thicket
Northern Shrub Thicket
Northern Shrub Thicket/Other - *P. tremuloides* PFO
Other - *P. tremuloides* PFO
Other - Excavated/Compacted
Southern Shrub Carr

N

0 1,600 3,200
Feet

Imagery: USDA NAIP 2024

**Underground Mine Area Wetland Locations and 500ft Stream Offsets**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan
FIGURE 9

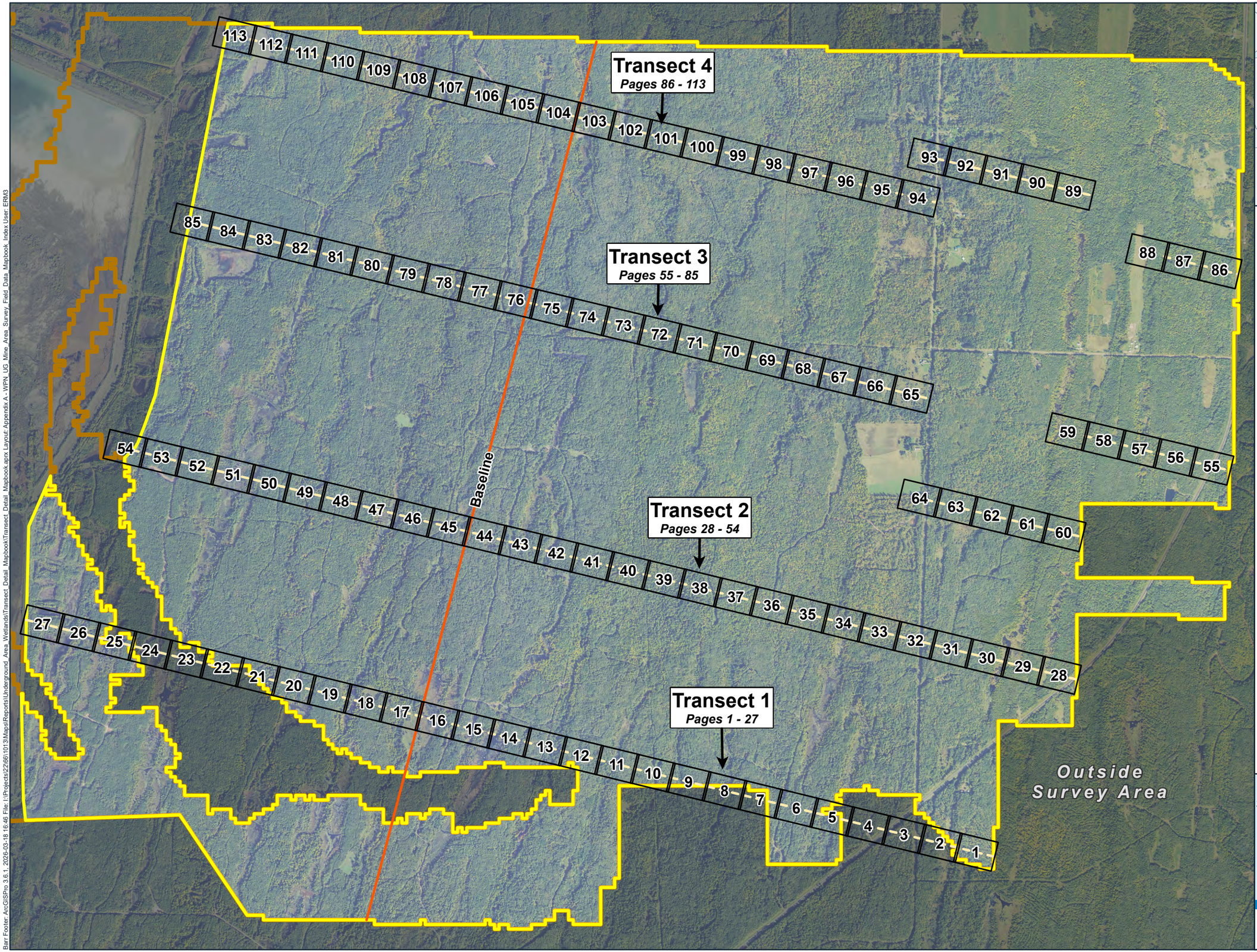
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# Appendices

# Appendix A

## Transect Detail Maps







Apx. Limit of Underground Mine Area

Survey Area
*(Underground Mine Area excluding 2024 wetland delineation area and Existing North Dam 1 and 2)*

Baseline

Transect

Mapbook Page Index

0 1,600 3,200
Feet

Imagery: USDA NAIP 2024

**Underground Mine Area Survey Field Data Mapbook Index**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENDIX A

BARR

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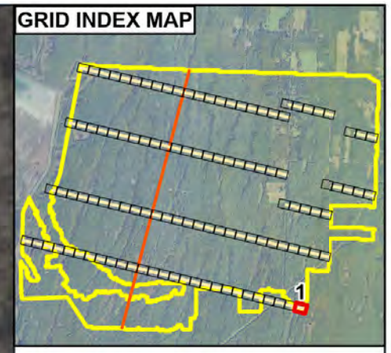
T1E-BP21-A

T1E-BP21-B

Page 2

Outside Survey Area

GRID INDEX MAP




Survey Area

Baseline

Transect

Wetland Boundary Point

**Wetlands**

Northern Shrub Thicket/ Other - *P. tremuloides* PFO

0 50 100

Feet

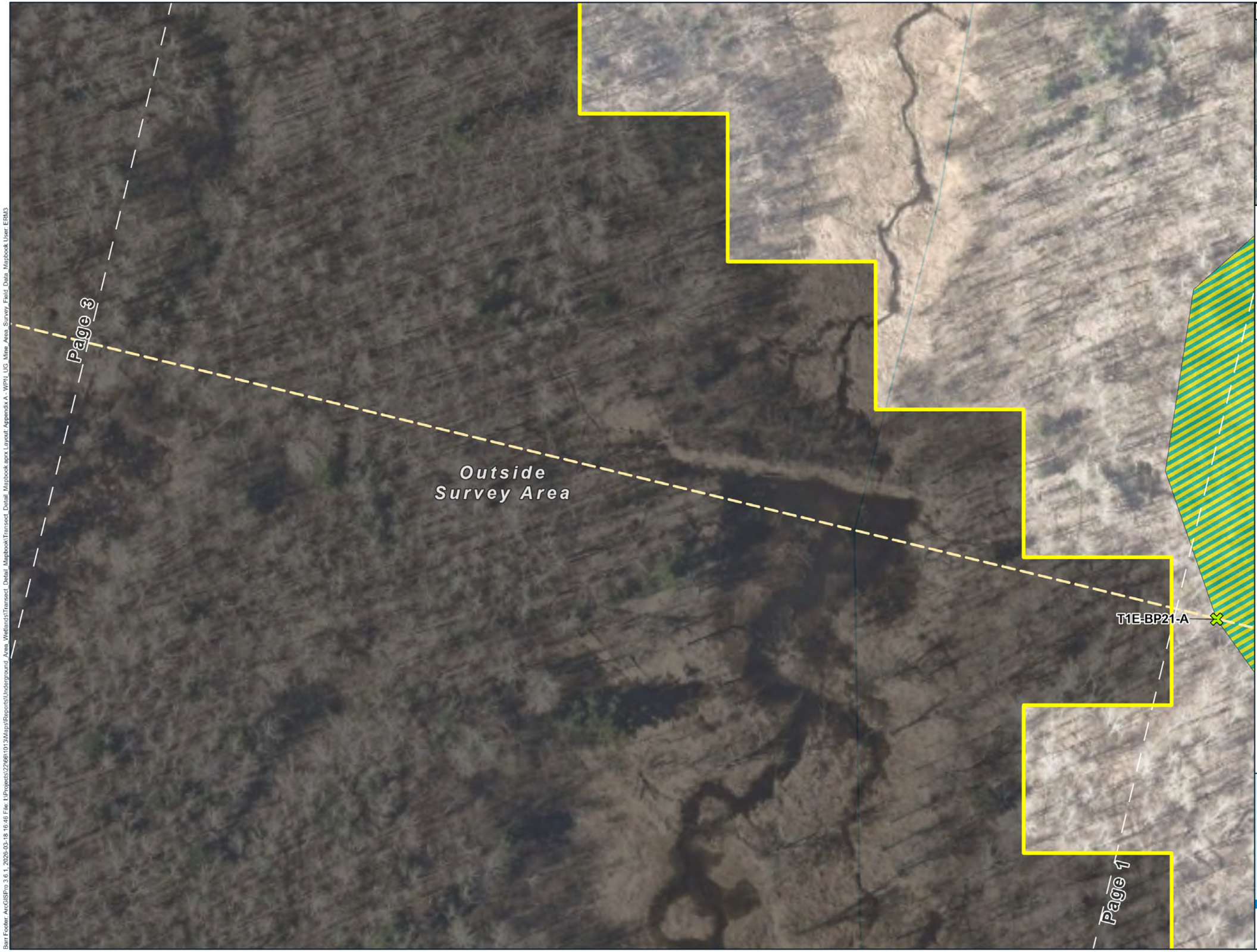
Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

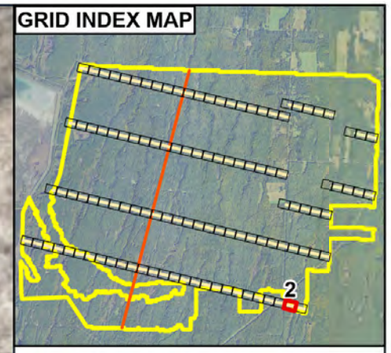
APPENDIX A - PAGE 1

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GRID INDEX MAP




Survey Area

Baseline

Transect

Wetland Boundary Point

**Wetlands**

Northern Shrub Thicket/ Other - *P. tremuloides* PFO

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area Survey Field Data Mapbook**

White Pine Mine

White Pine Copper, LLC

Carp Lake Township

Ontonagon County, Michigan

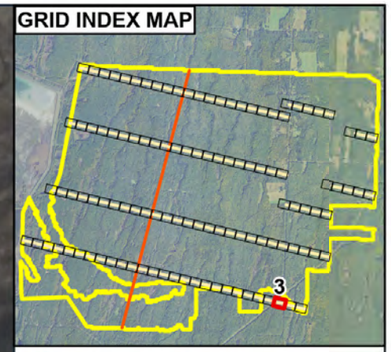
APPENDIX A - PAGE 2

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GRID INDEX MAP




Survey Area
Baseline
Transect

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENDIX A - PAGE 3

BARR

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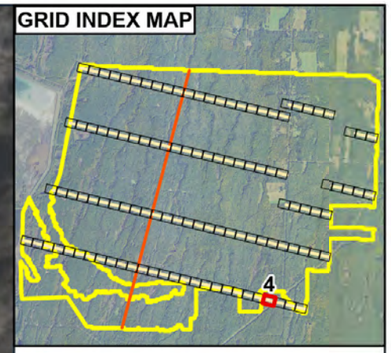
Page 5

Outside Survey Area

Page 3

L P Walsh Rd

GRID INDEX MAP




Survey Area
Baseline
Transect

N

0 50 100
Feet

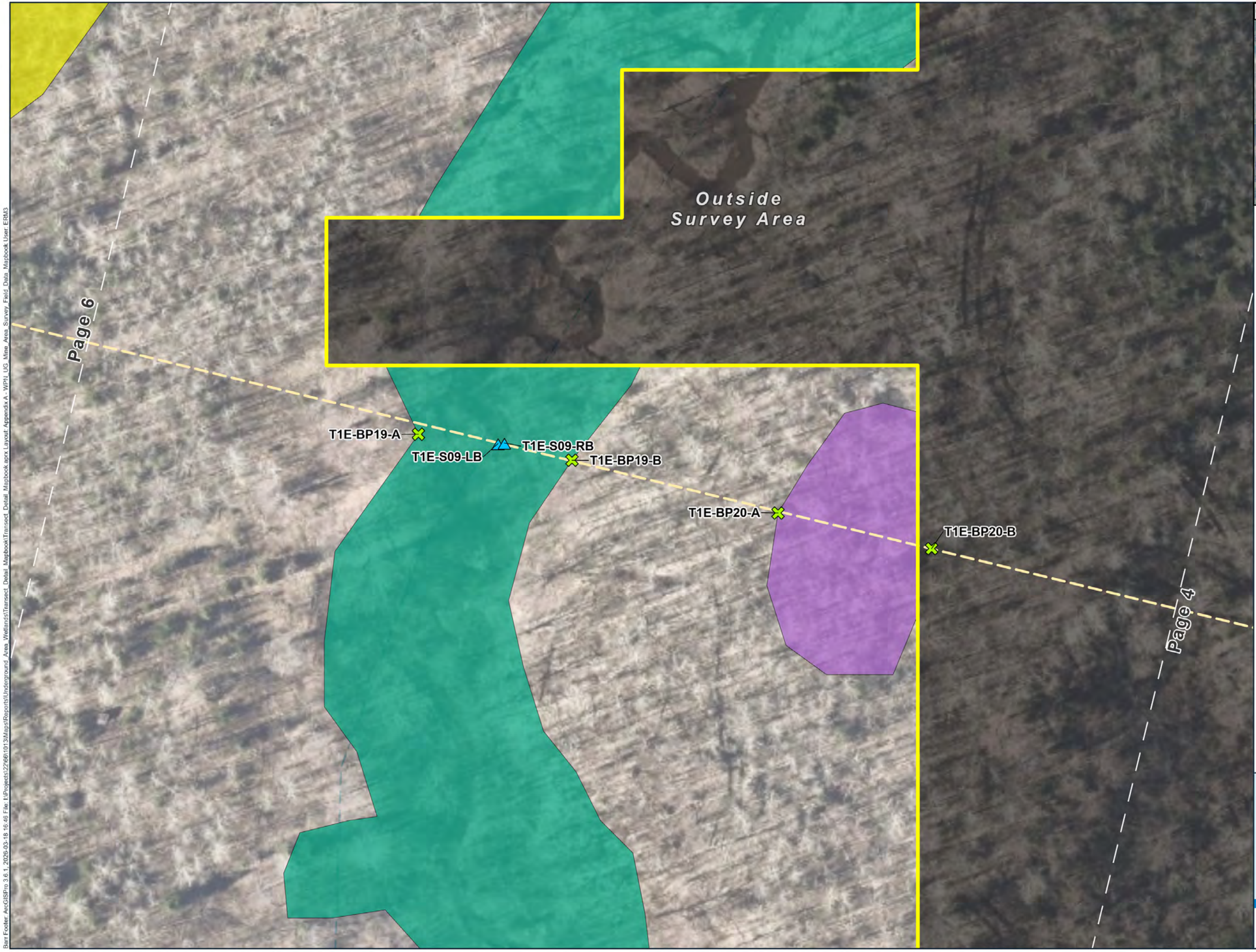
Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

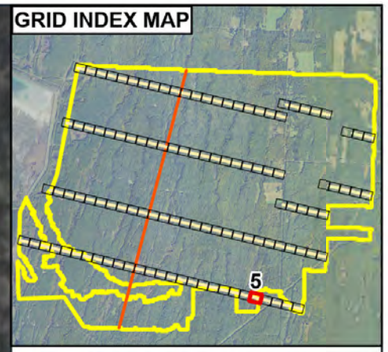
APPENDIX A - PAGE 4

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

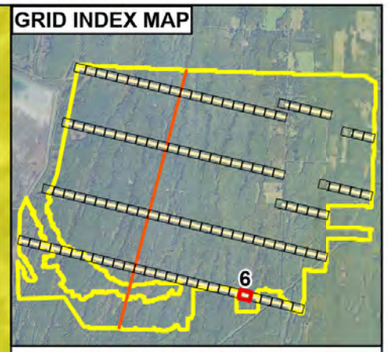
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GRID INDEX MAP




Survey Area
Baseline
Transect
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Emergent Marsh/Northern Shrub Thicket
Northern Shrub Thicket

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

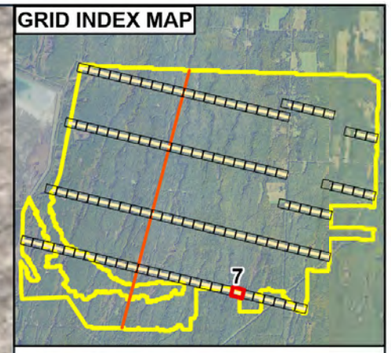
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Wetland Boundary Point

**Wetlands**

- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

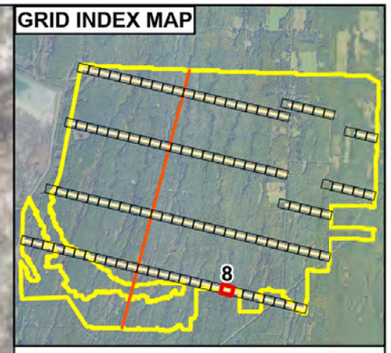
APPENDIX A - PAGE 7

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GRID INDEX MAP




Survey Area

Baseline

Transect

Wetland Boundary Point

**Wetlands**

Emergent Marsh/Northern Shrub Thicket

Northern Shrub Thicket

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

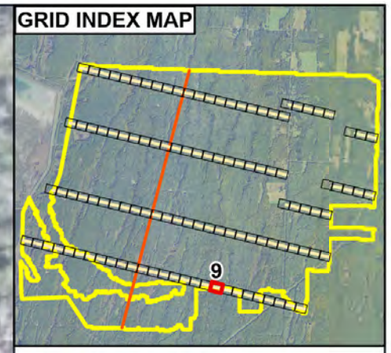
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket
- Northern Shrub Thicket

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

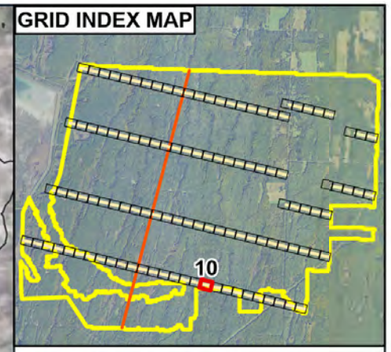
**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Other - Excavated/ Compacted

N

0 50 100

Feet

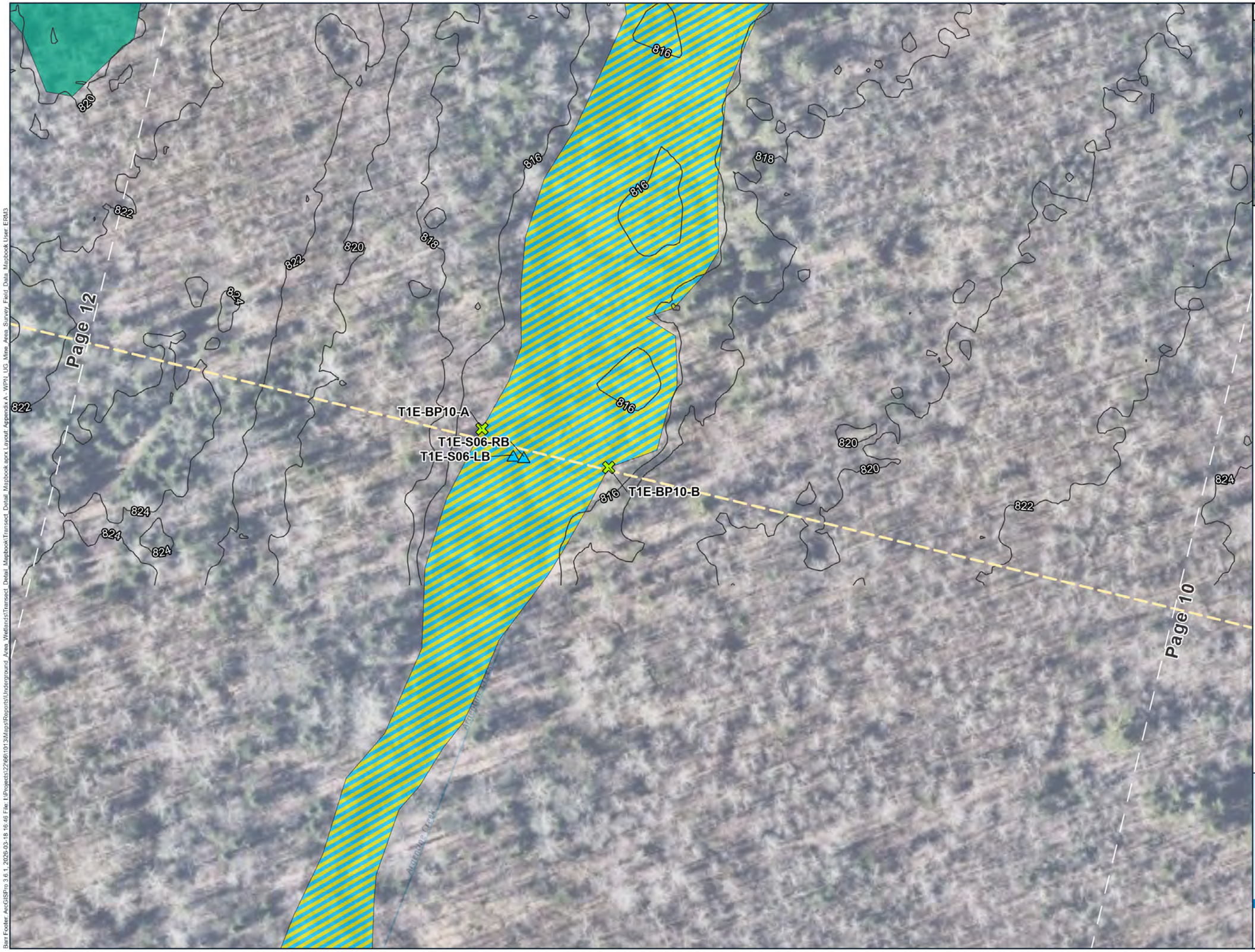
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

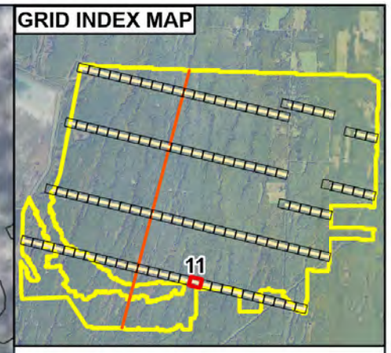
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket
- Other - *P. tremuloides* PFO

0 50 100
Feet

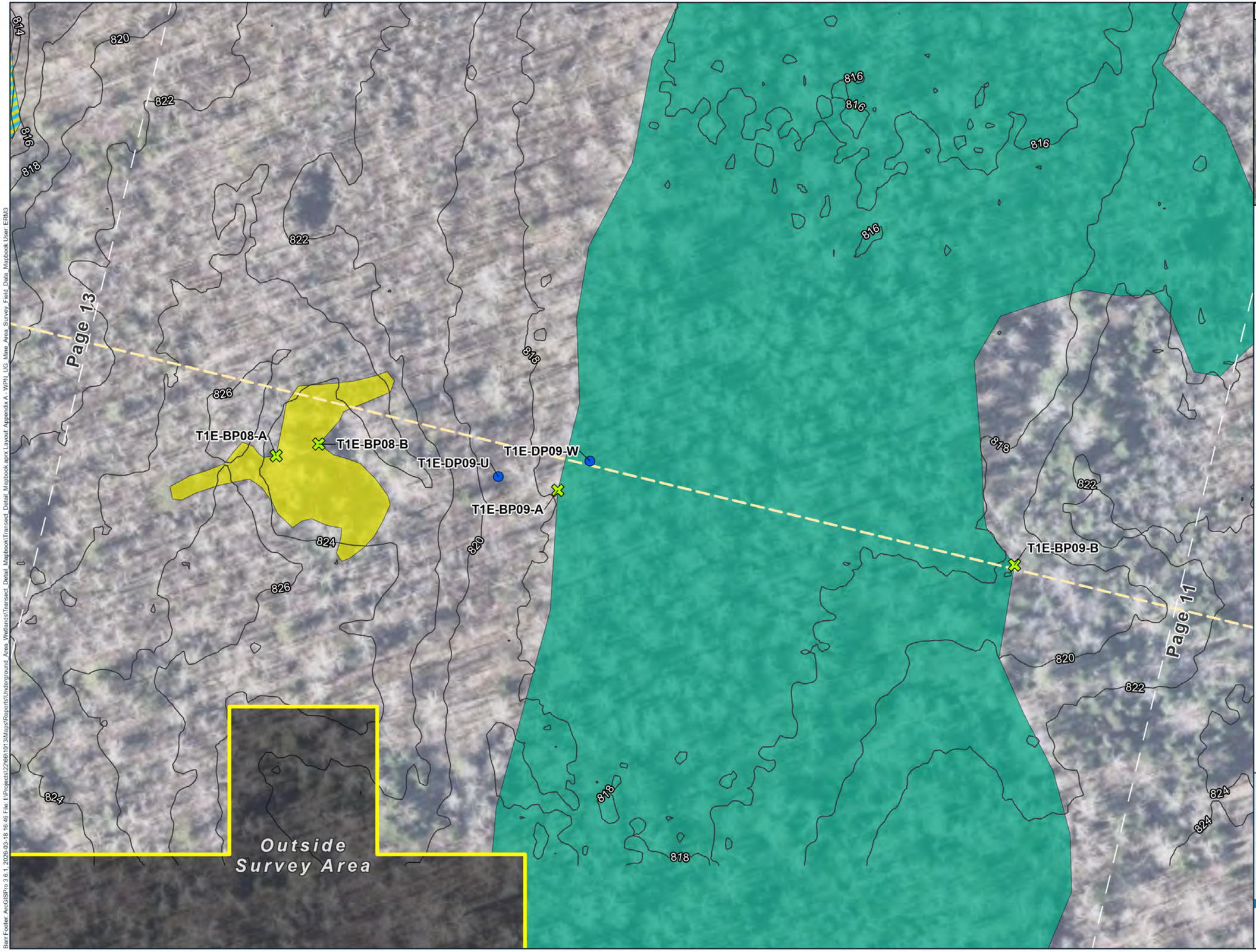
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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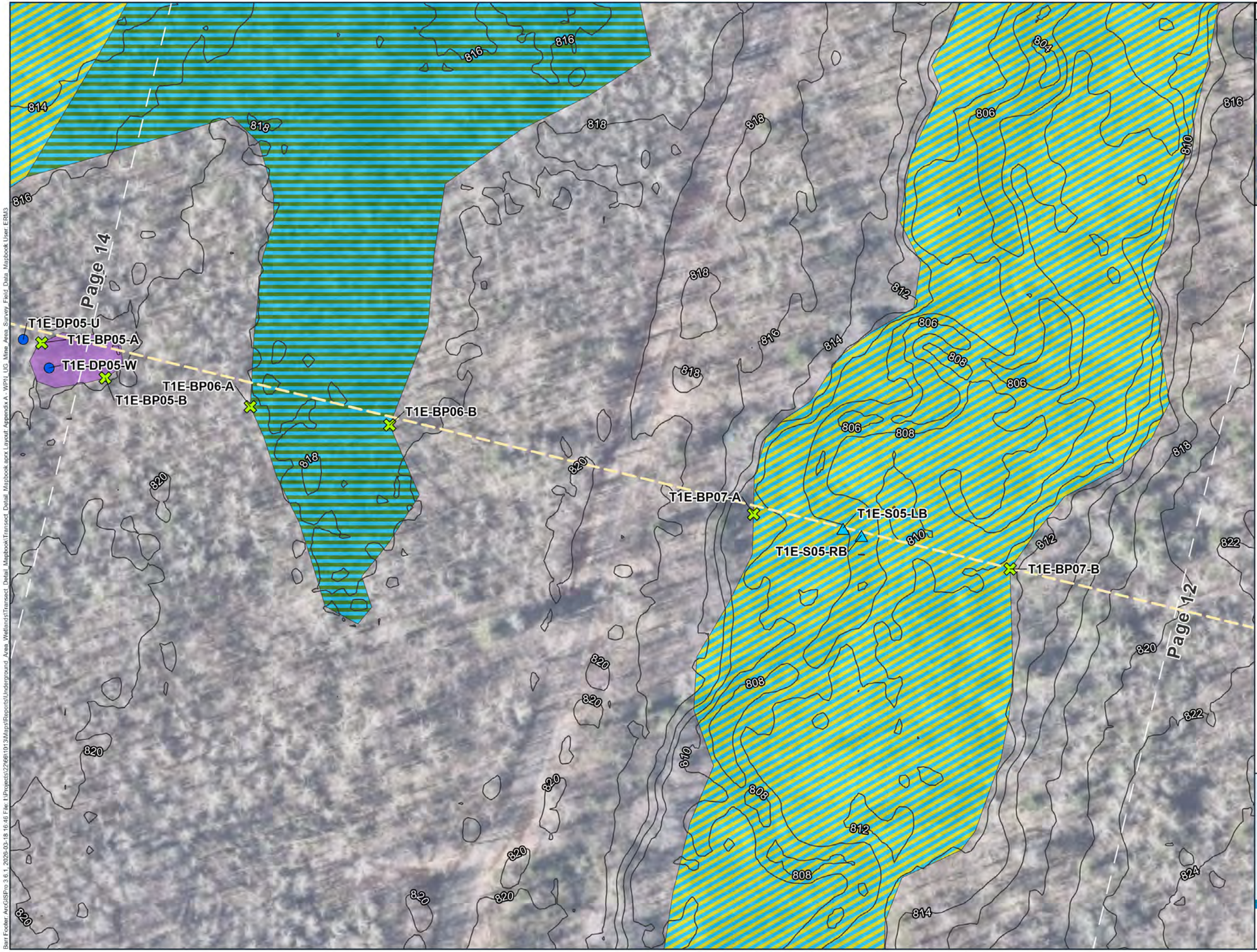



**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

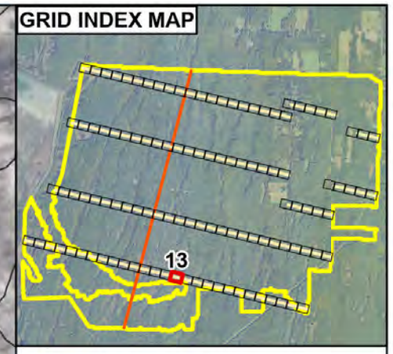
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Hardwood Swamp
- Emergent Marsh/Northern Shrub Thicket
- Other - Excavated/ Compacted

0 50 100
Feet

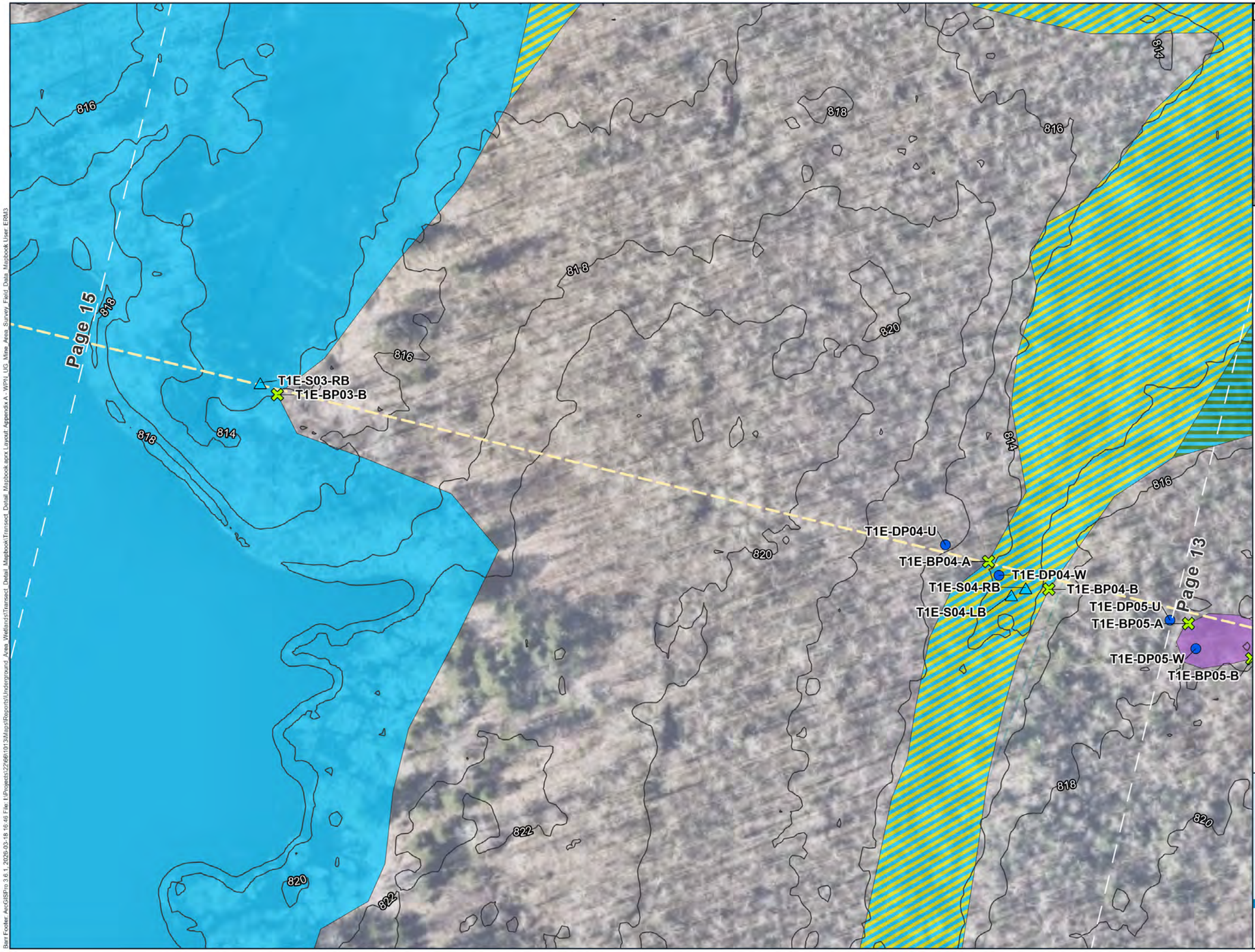
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

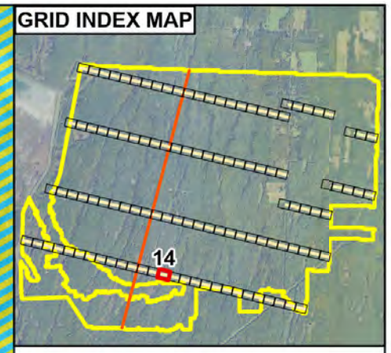
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**GRID INDEX MAP**




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Emergent Marsh/Northern Hardwood Swamp
- Emergent Marsh/Northern Shrub Thicket
- Other - Excavated/ Compacted

N

0 50 100
Feet

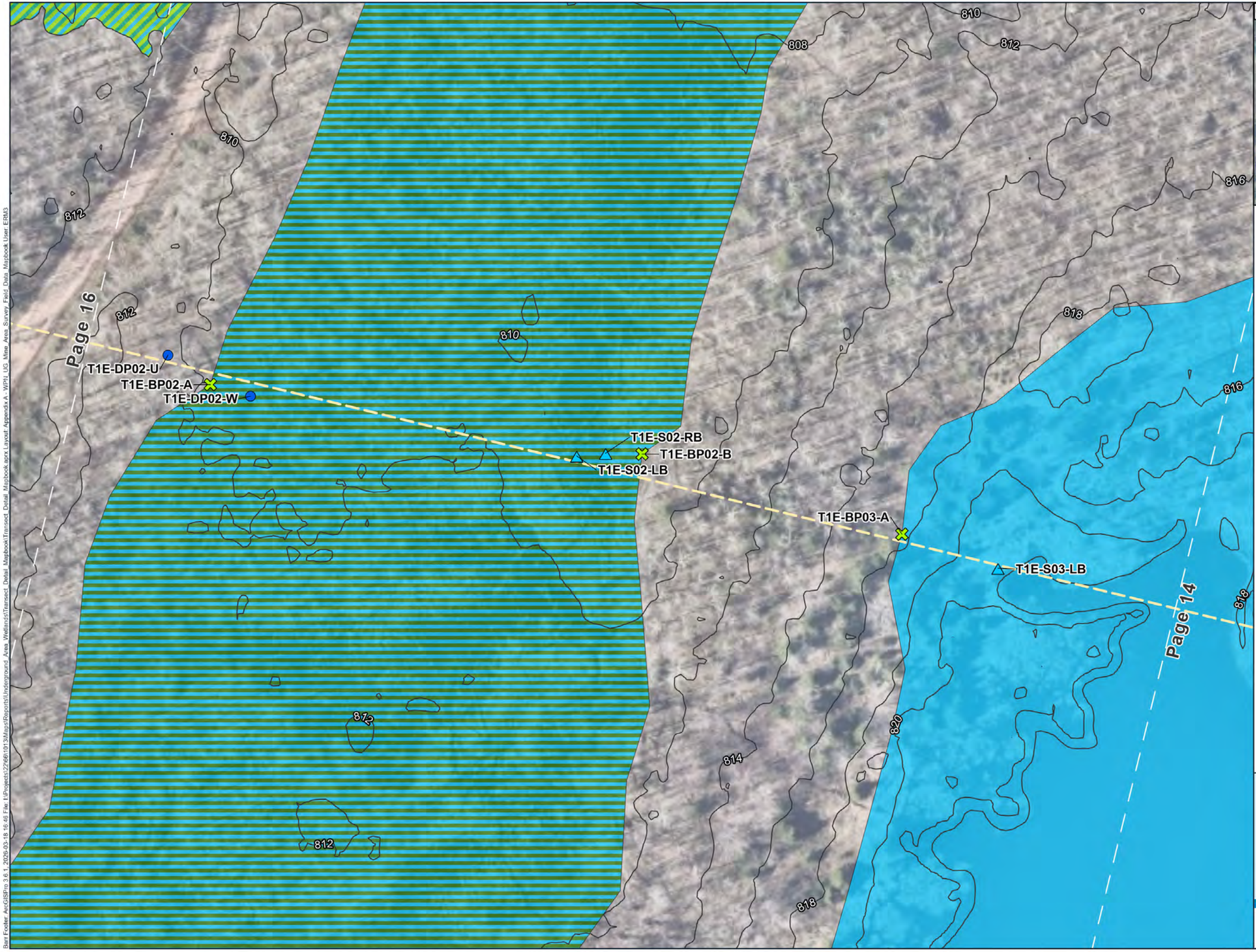
Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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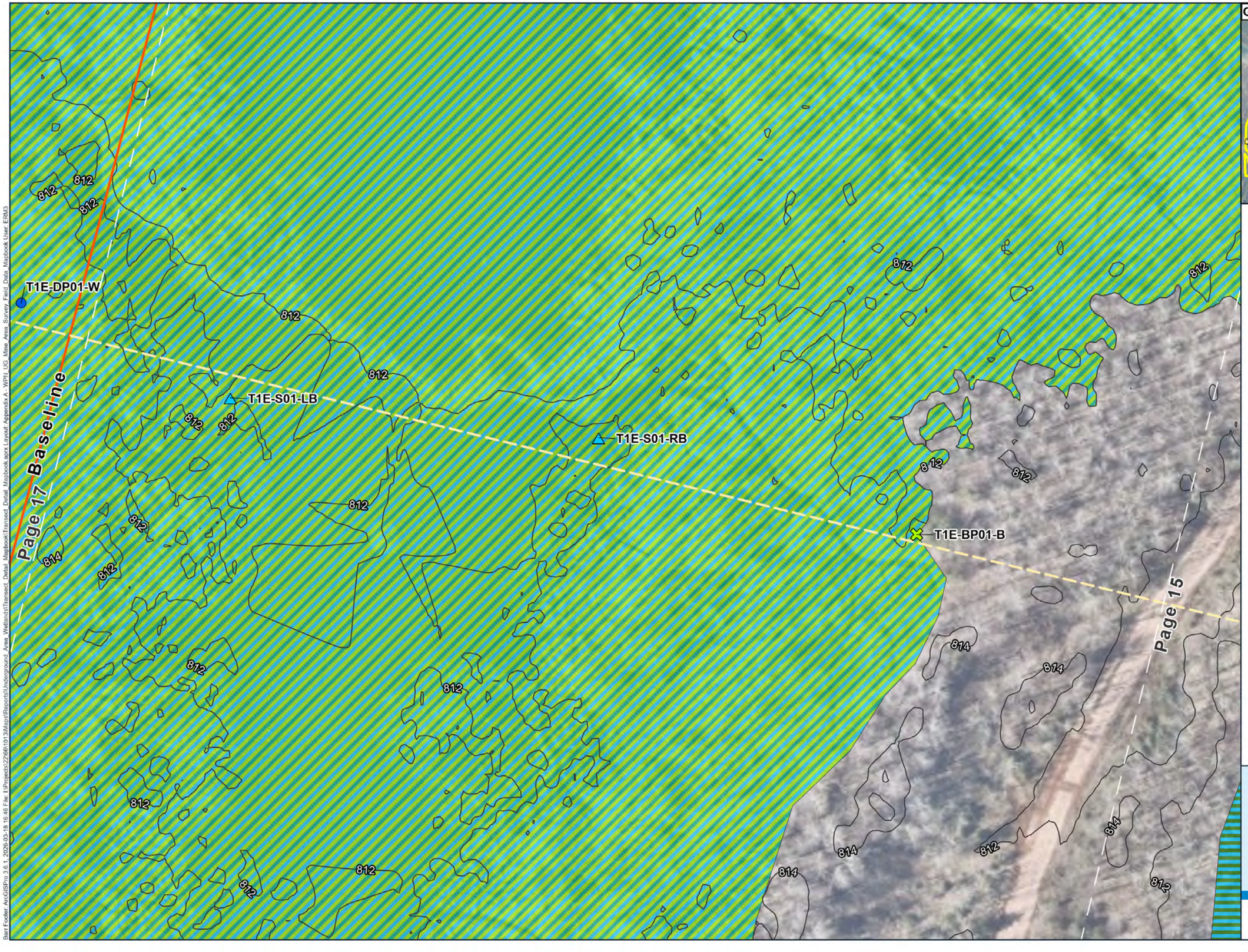


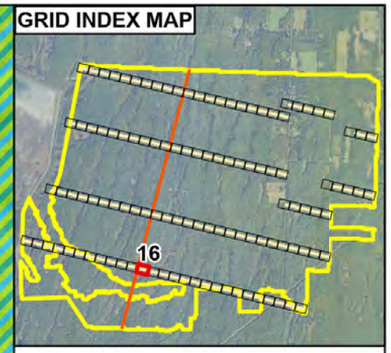

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Data Point

Wetland Boundary Point

Stream Bank Point

**Wetlands**

Northern Wet Meadow/ Other - *P. tremuloides* PFO/Emergent Marsh

Emergent Marsh/Northern Hardwood Swamp

N

0 50 100
Feet

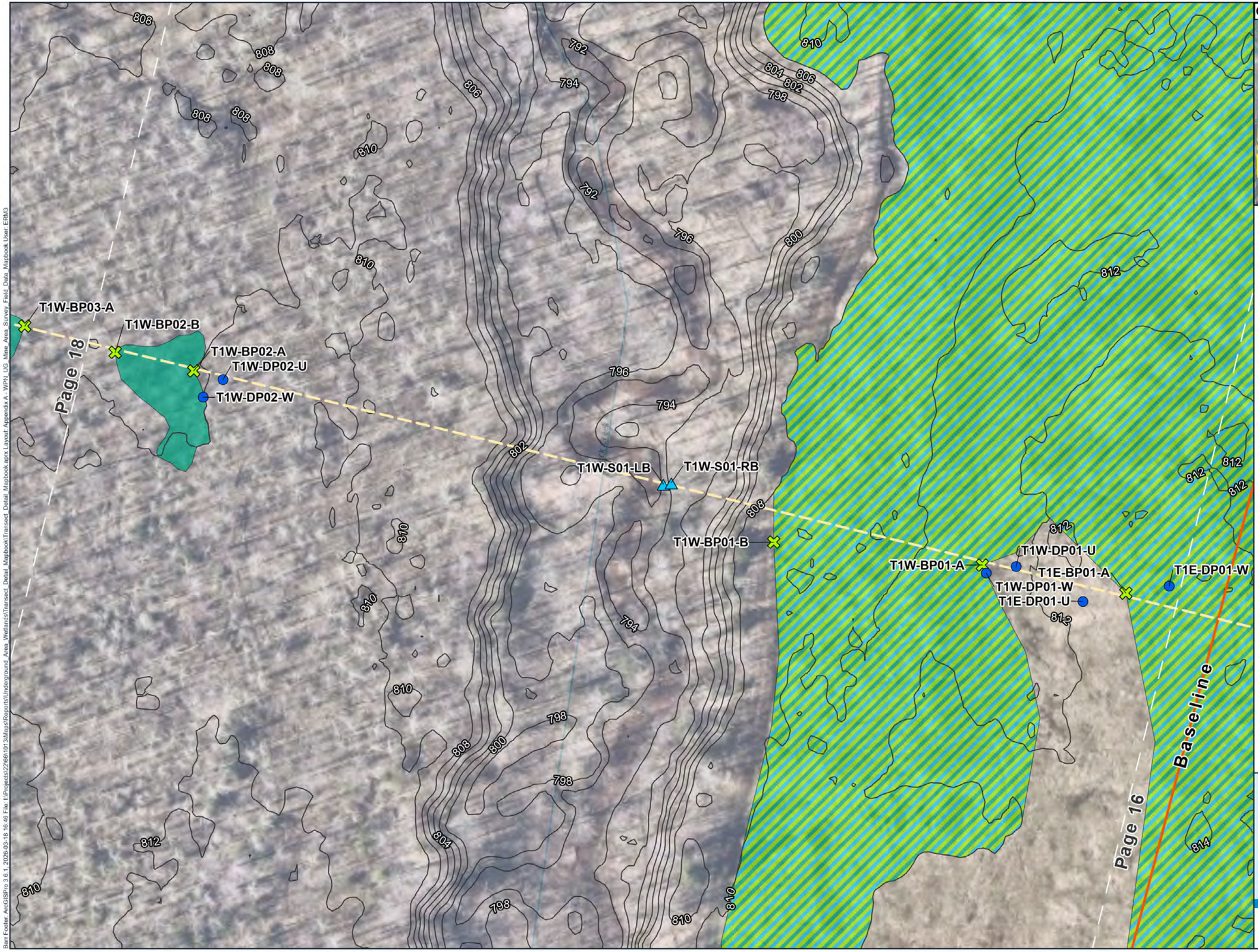
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

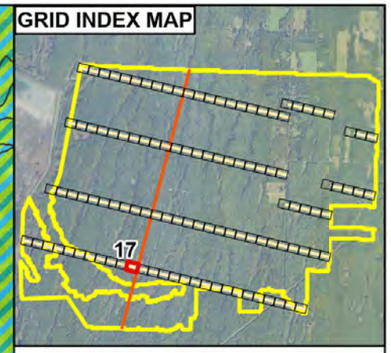
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Wet Meadow/ Other - *P. tremuloides* PFO/Emergent Marsh
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

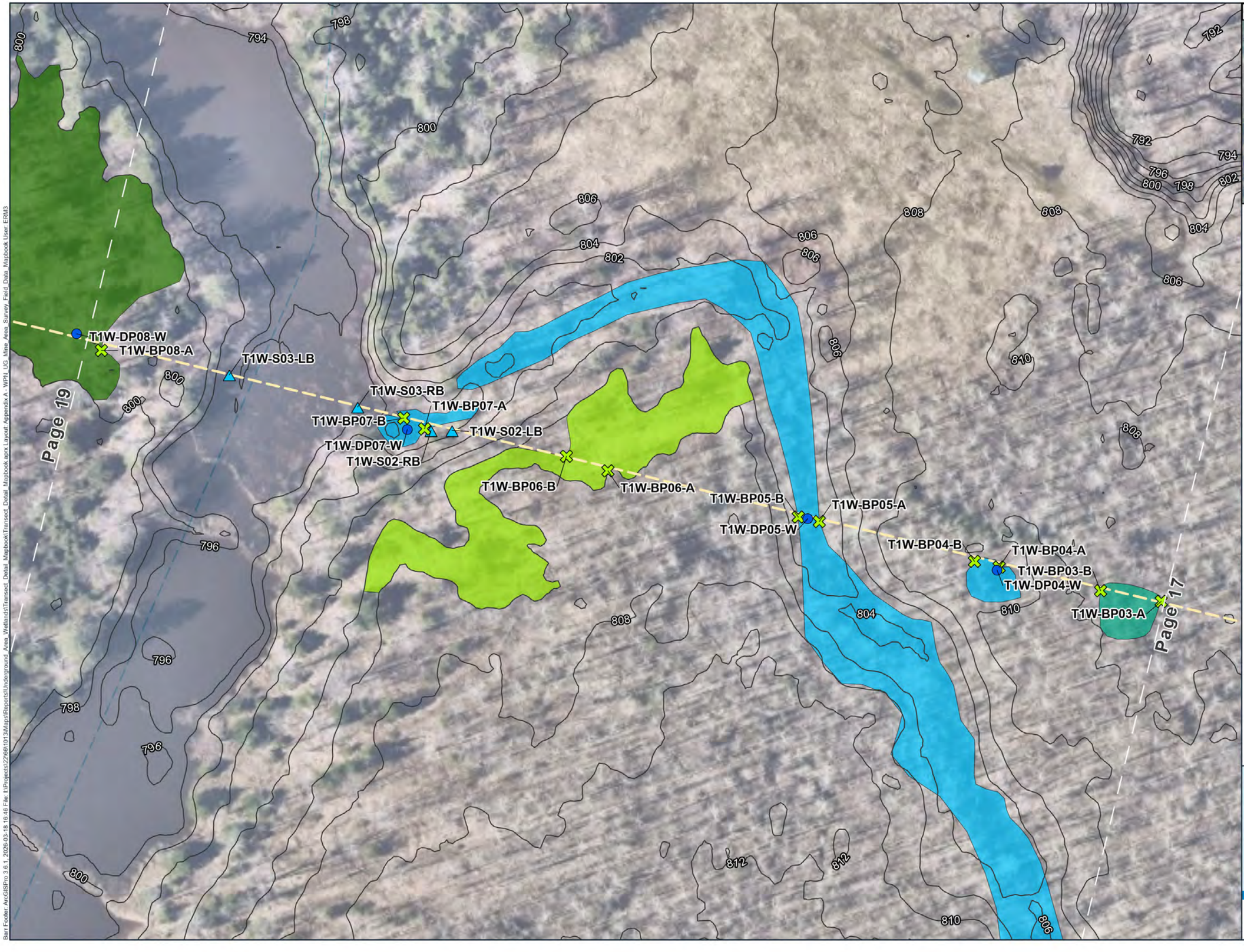
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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Survey Area
Baseline
Transect
Elevation Contour *(2-ft interval)*
Wetland Data Point
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Northern Wet Meadow
Emergent Marsh
Northern Hardwood Swamp
Other - *P. tremuloides* PFO

0 50 100
Feet

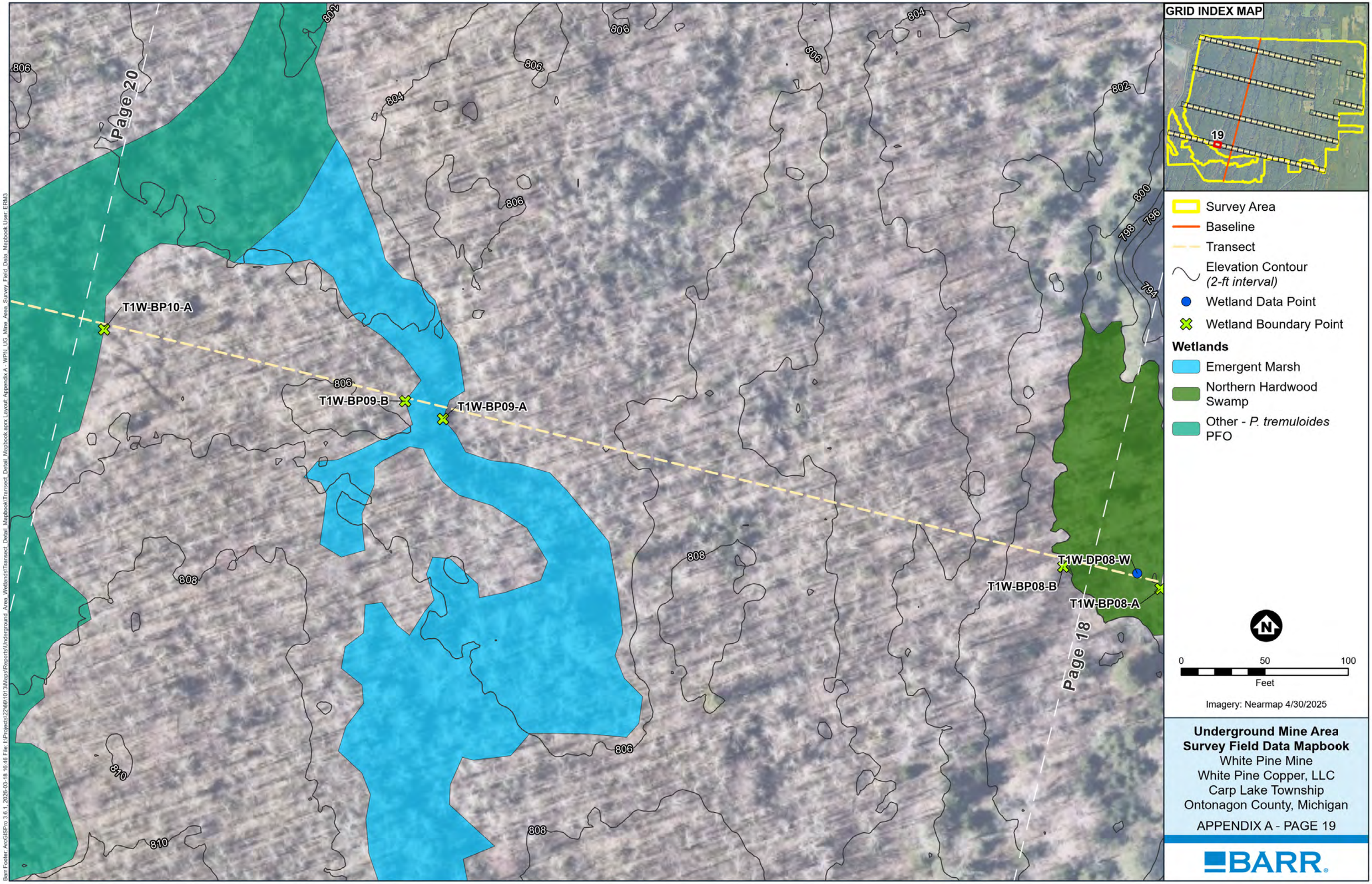
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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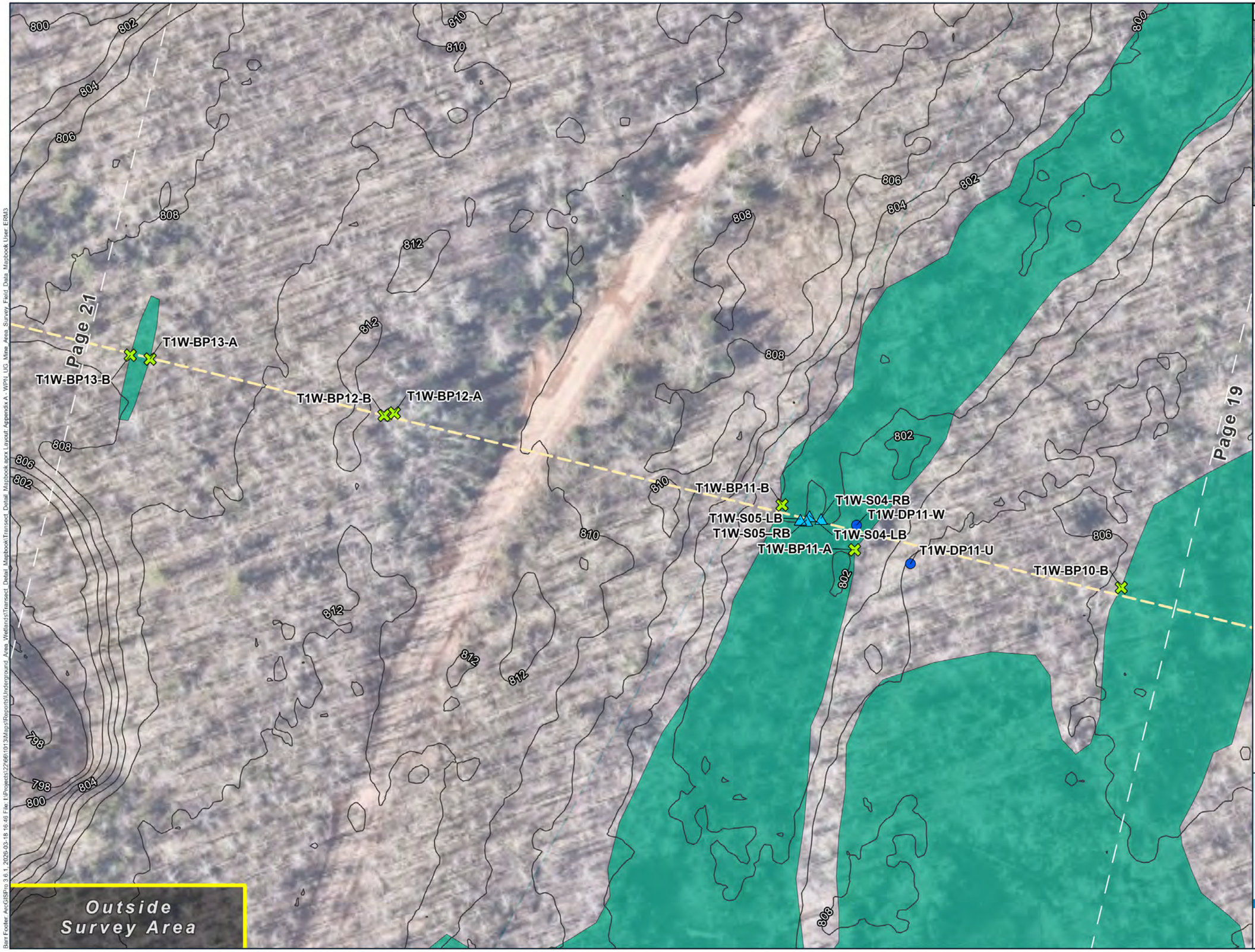



**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

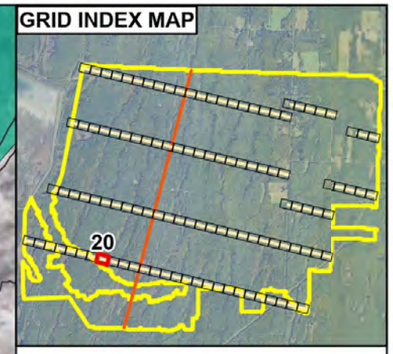
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - *P. tremuloides* PFO

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

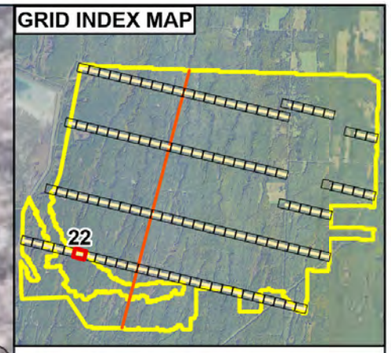
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

0 50 100
Feet

Imagery: Nearmap 4/30/2025

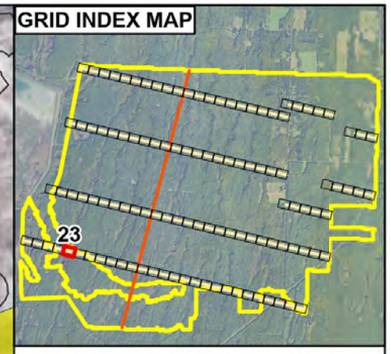
**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

**Wetlands**

Northern Shrub Thicket

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

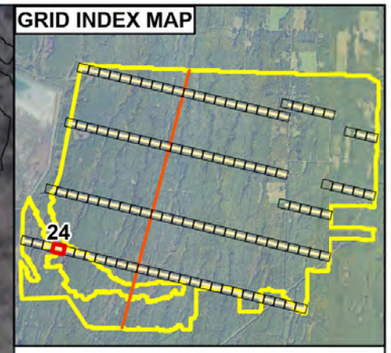
APPENDIX A - PAGE 23

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Other - *P. tremuloides* PFO

N

0 50 100
Feet

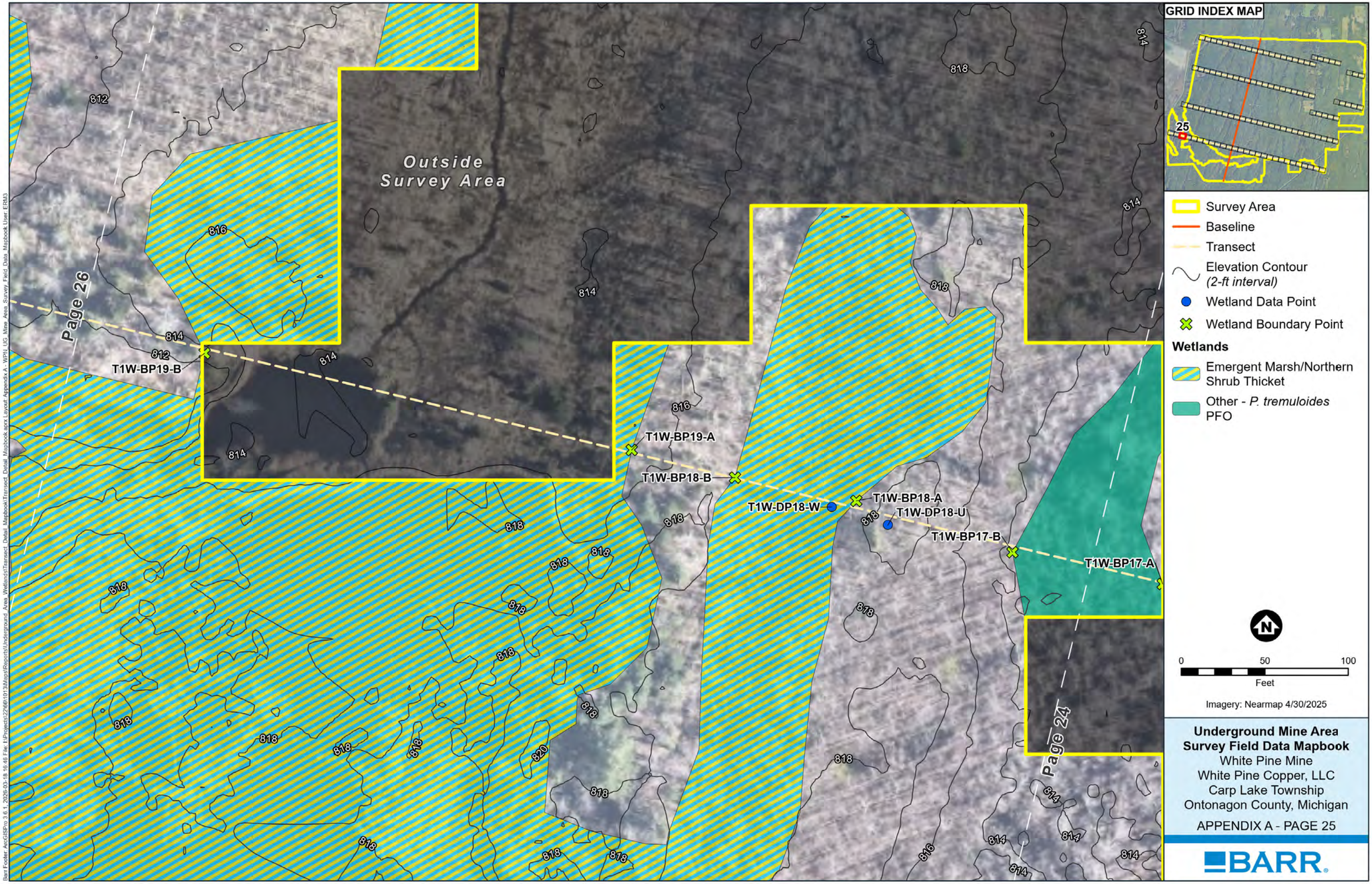
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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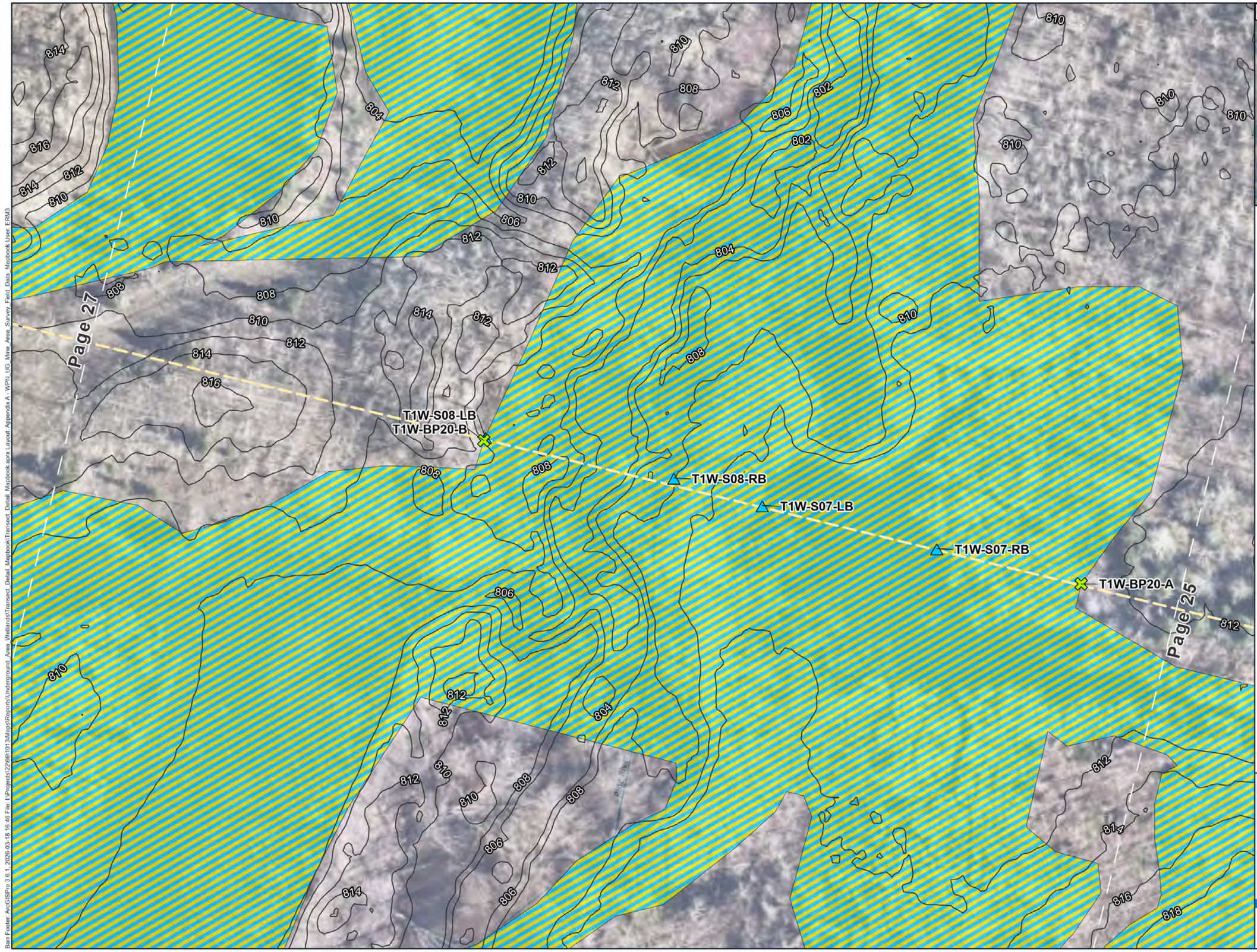



**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

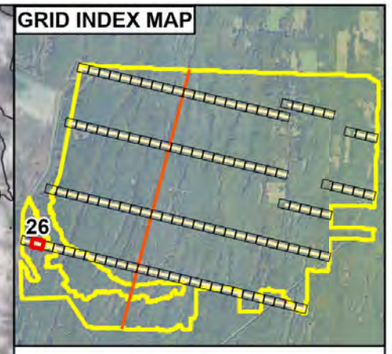
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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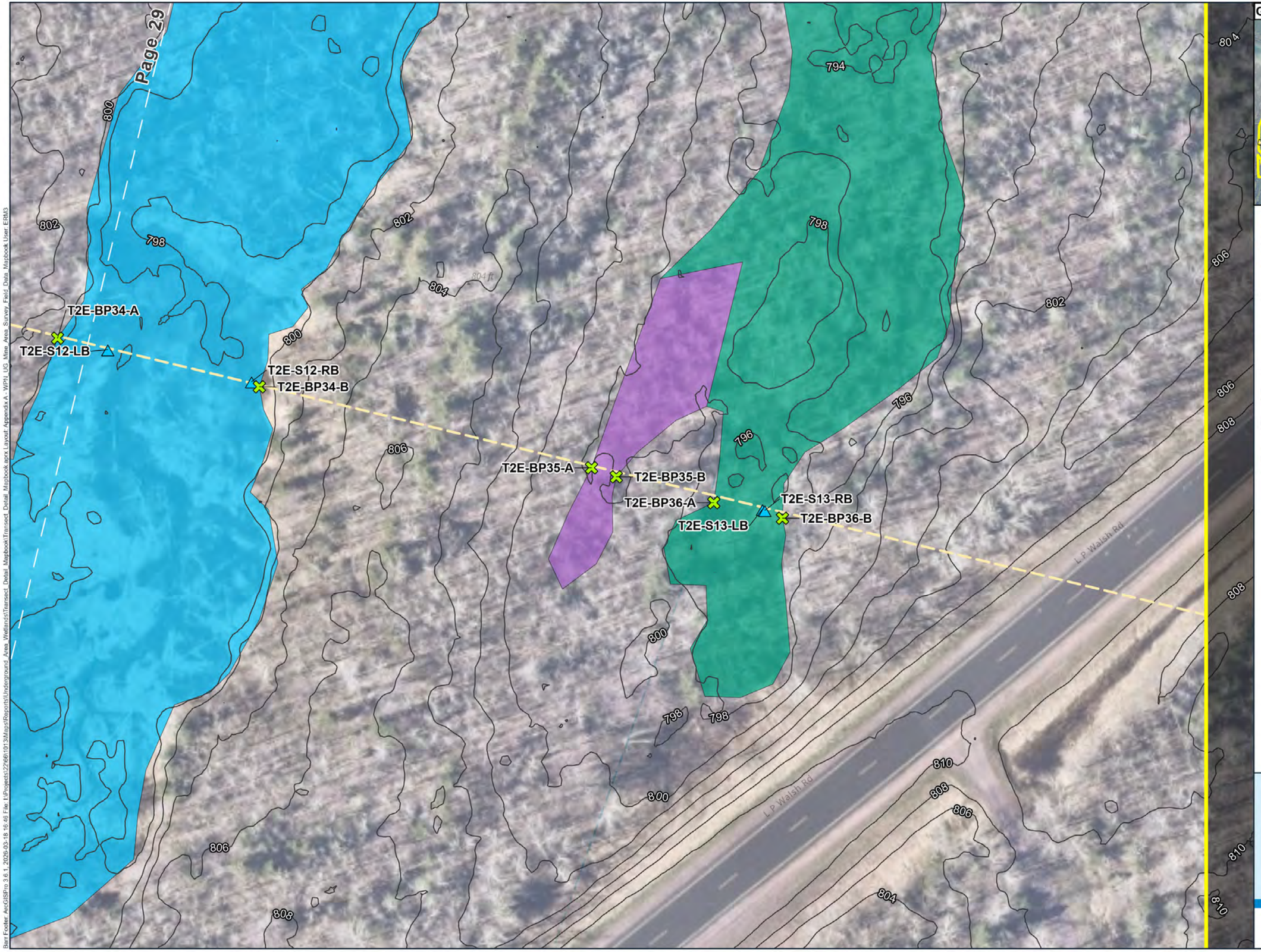



**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

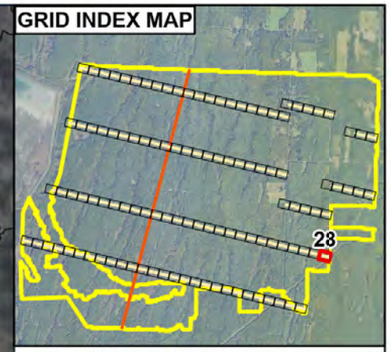
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

0 50 100
Feet

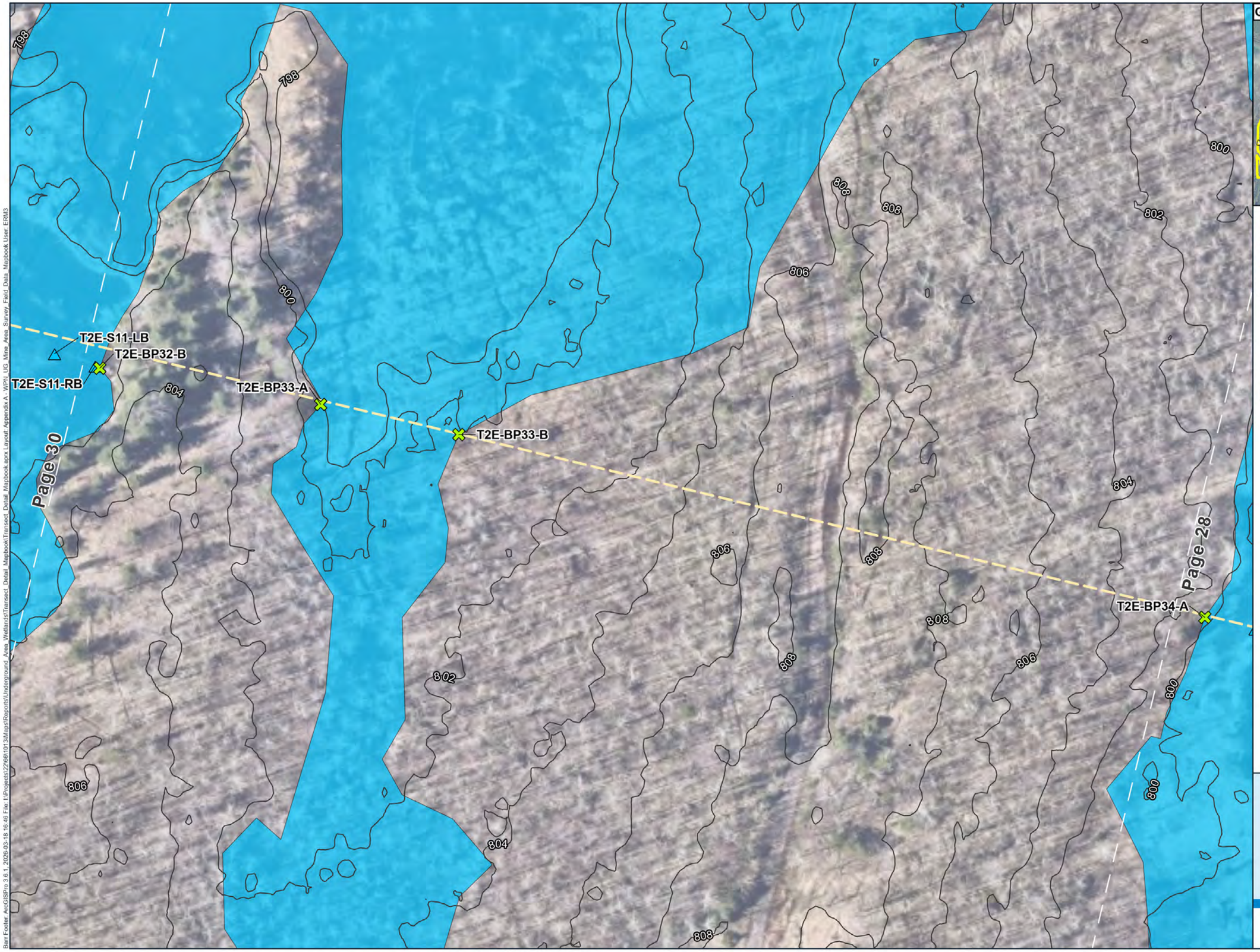
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

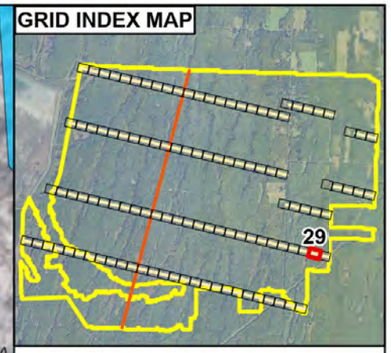
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh

N

0 50 100
Feet

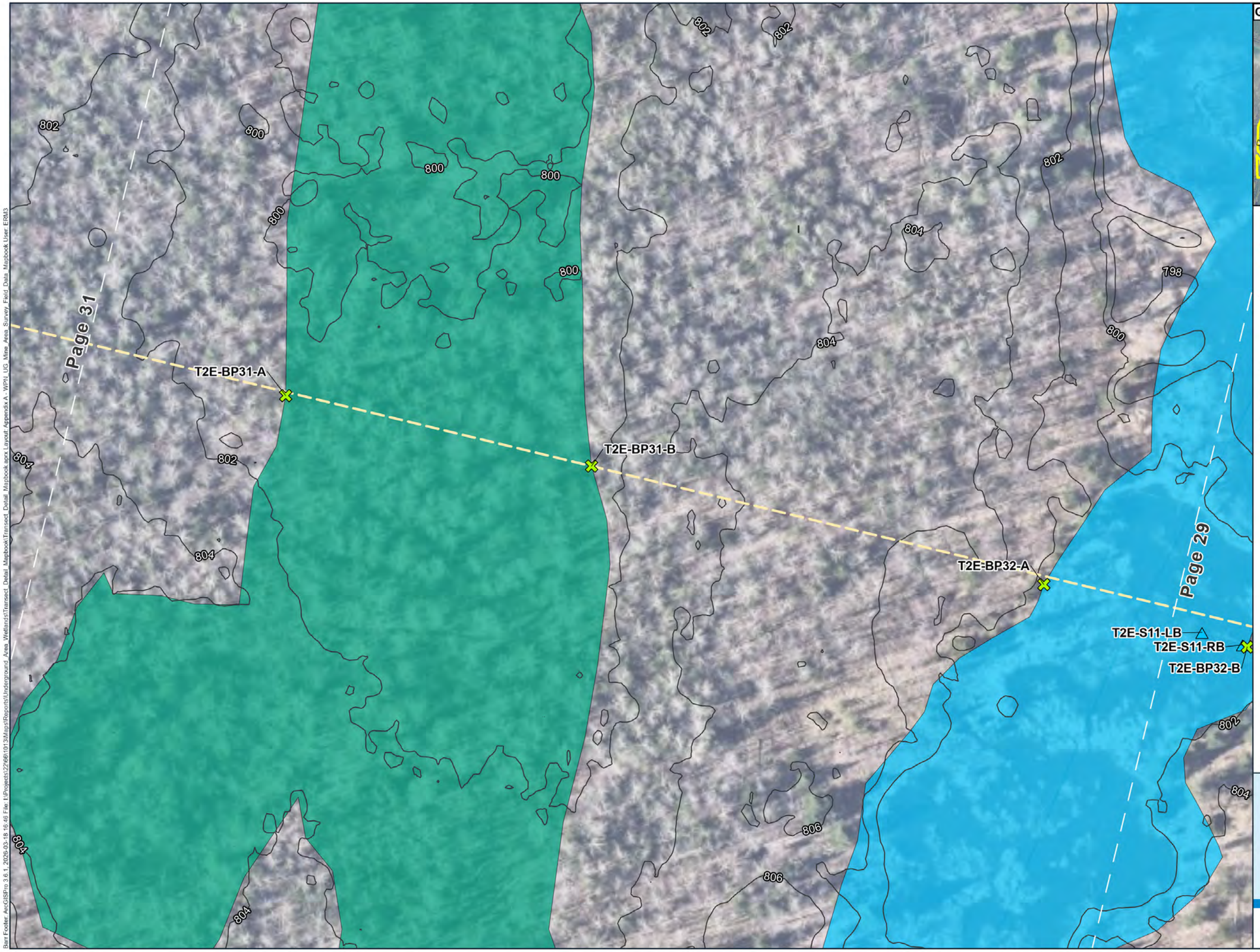
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

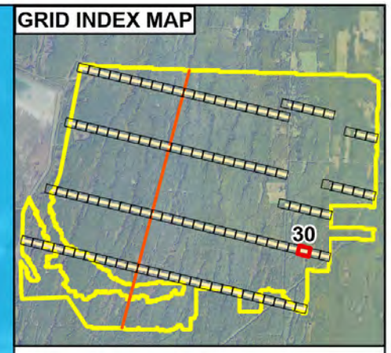
APPENDIX A - PAGE 29

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

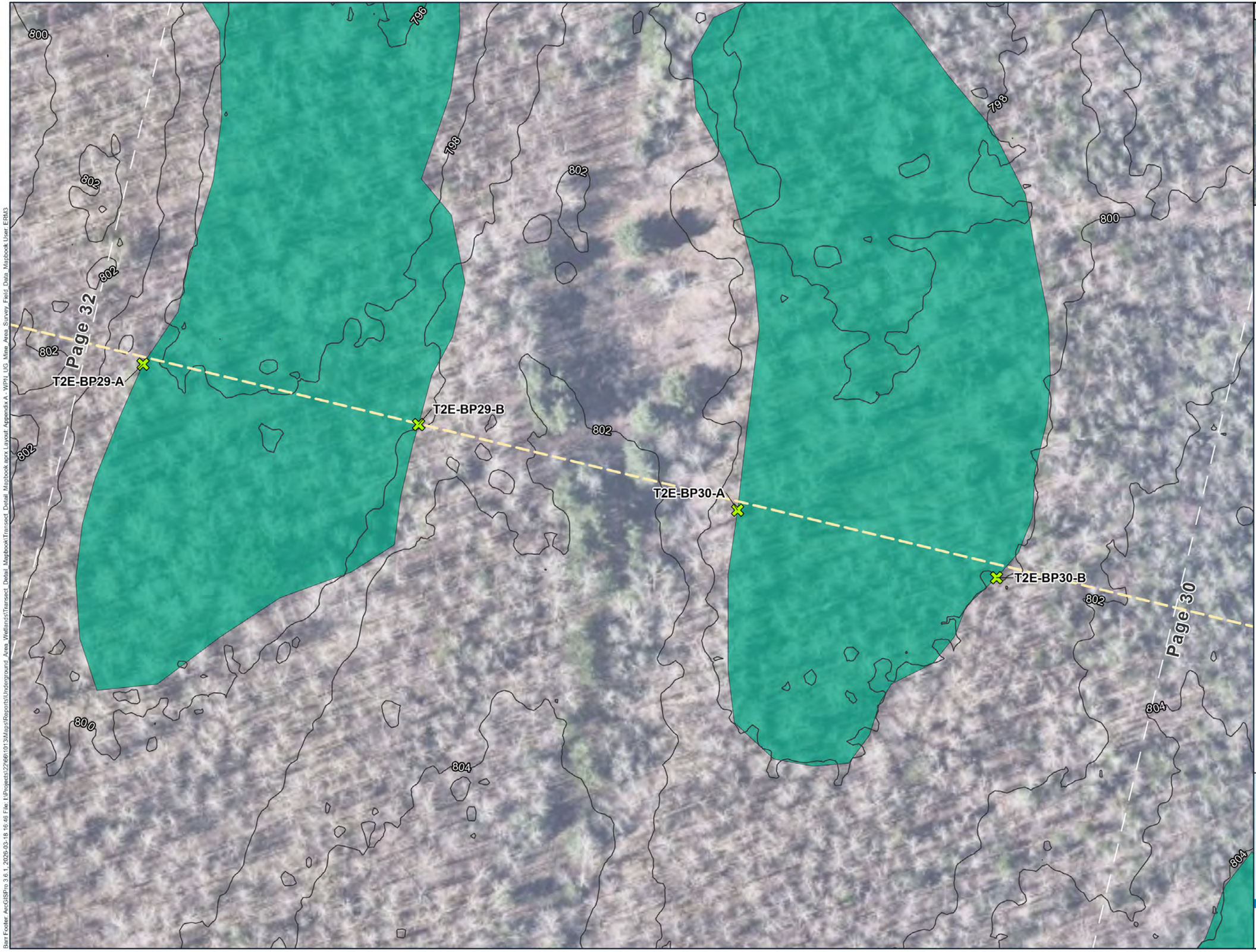
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

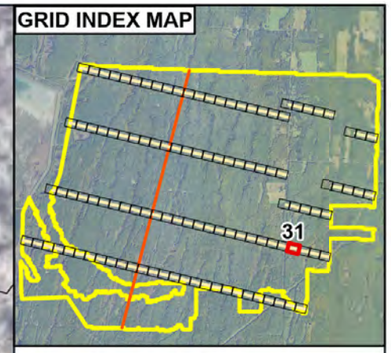
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

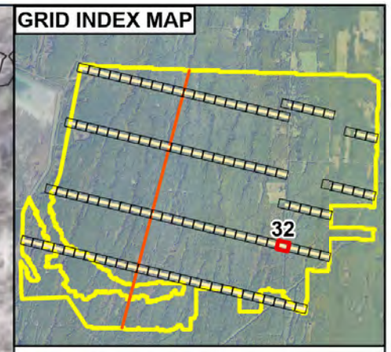
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Other - Excavated/ Compacted

N

0 50 100
Feet

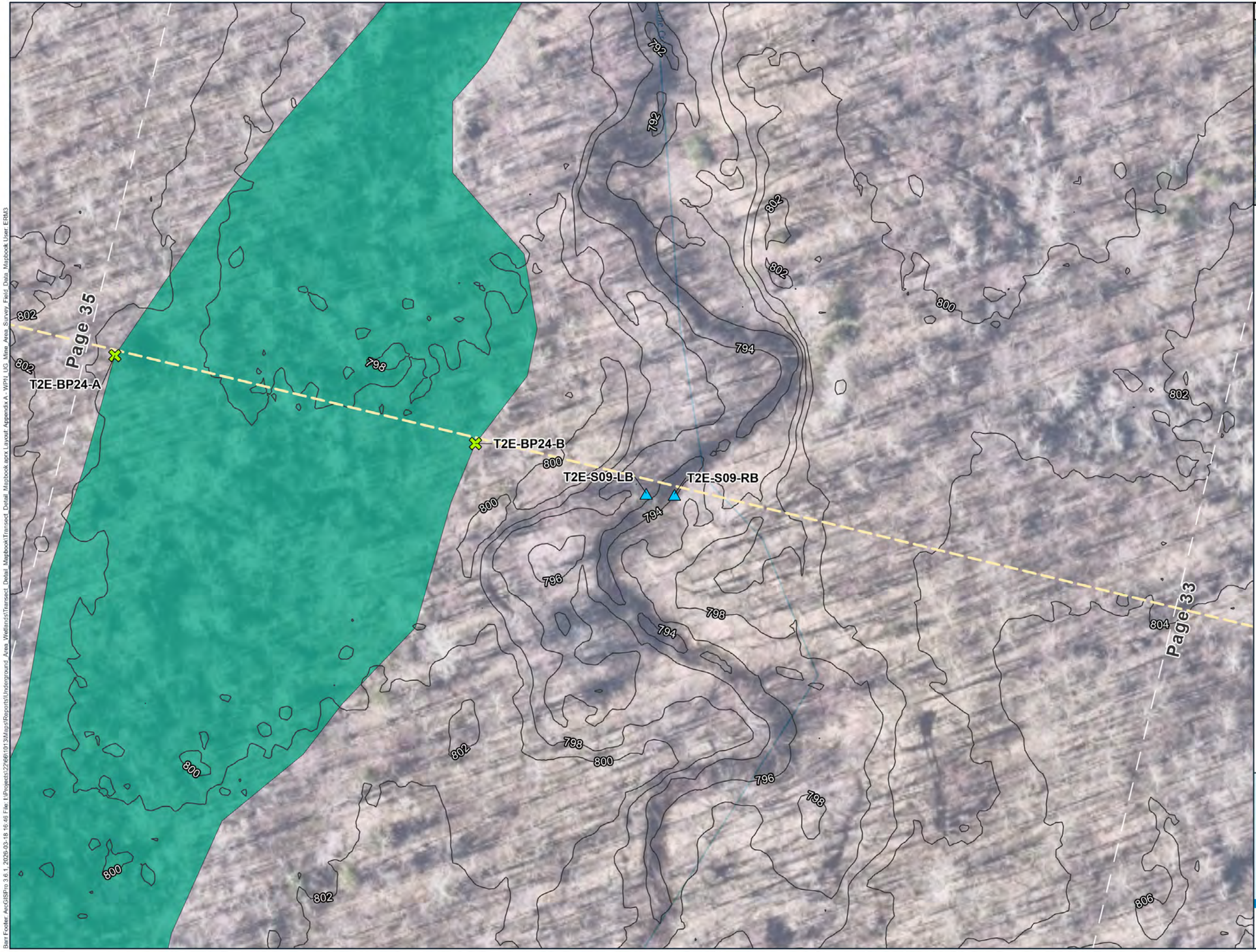
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

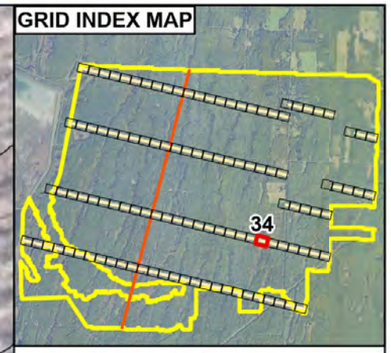
APPENDIX A - PAGE 33

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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Other - *P. tremuloides* PFO

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

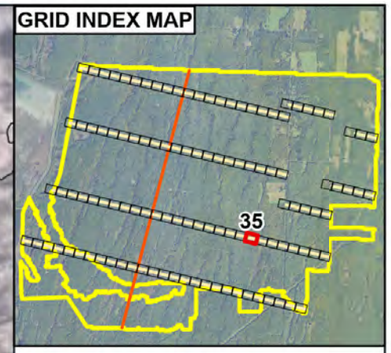
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh
- Emergent Marsh/Northern Hardwood Swamp/ Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100
Feet

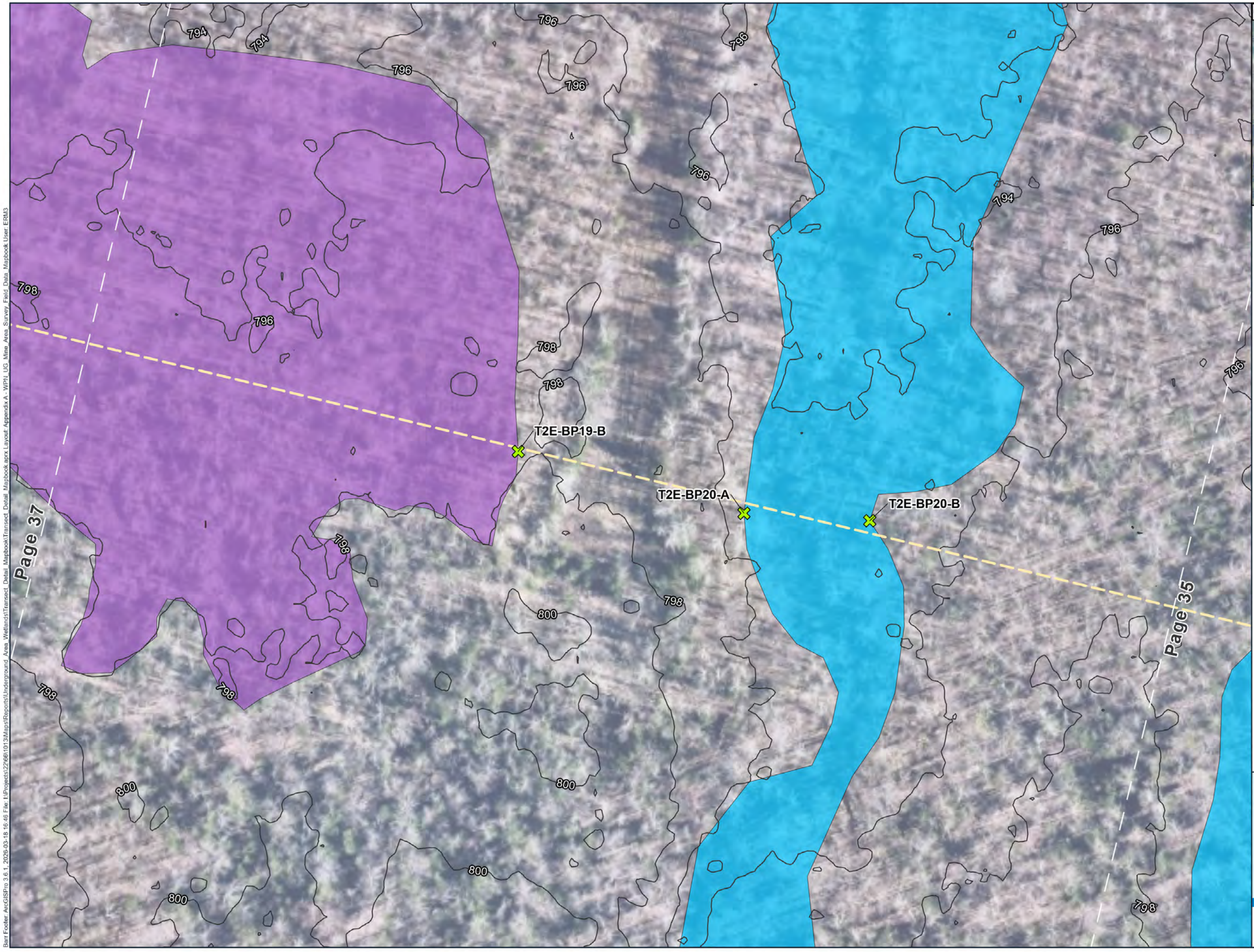
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

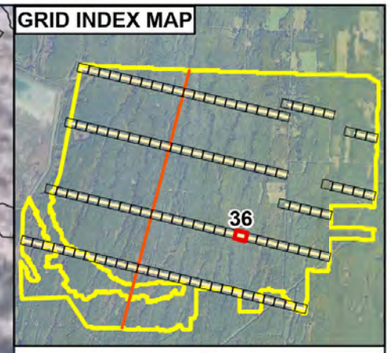
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Emergent Marsh

Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Other - Excavated/ Compacted

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

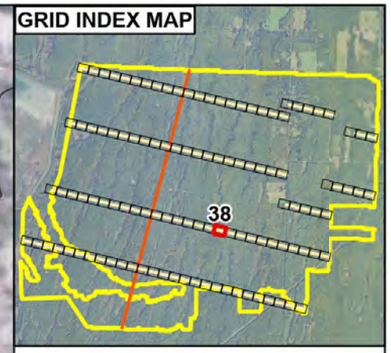
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T2E-S05-RB
T2E-S05-LB
T2E-BP14-A
T2E-BP14-B
T2E-BP15-A
T2E-S06-RB
T2E-BP15-B
T2E-S06-LB
T2E-BP16-A
T2E-BP16-B
Page 39
Page 37

GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Northern Shrub Thicket
Other - Excavated/ Compacted

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

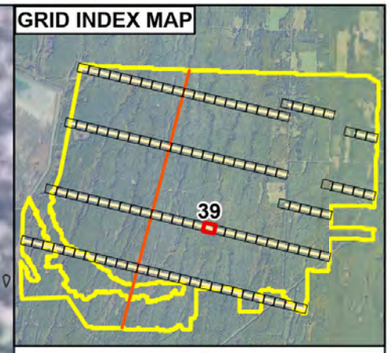
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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Other - Excavated/ Compacted

0 50 100
Feet

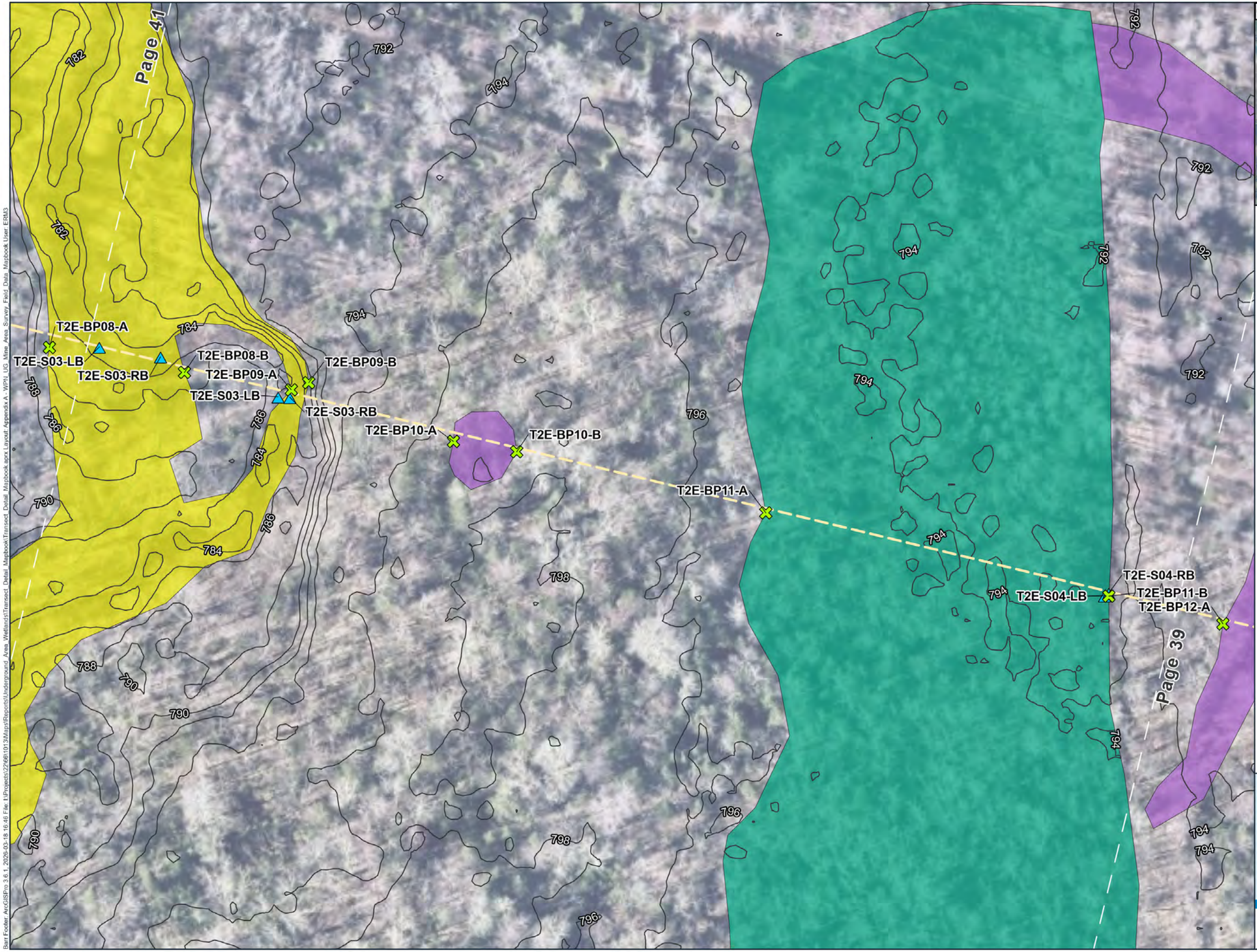
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

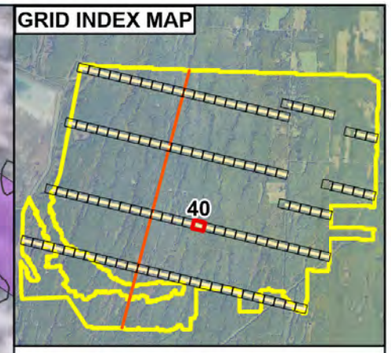
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

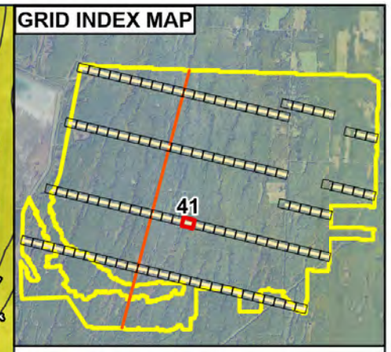
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

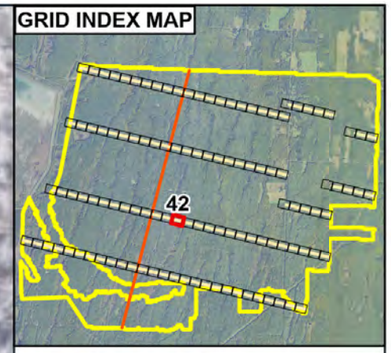
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Other - *P. tremuloides* PFO

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

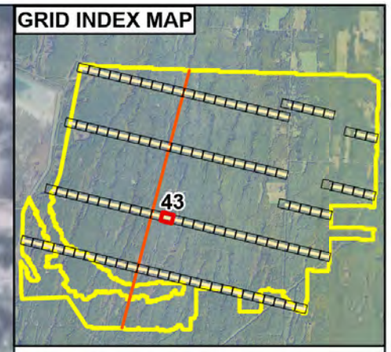
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Emergent Marsh/Other - *P. tremuloides* PFO
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

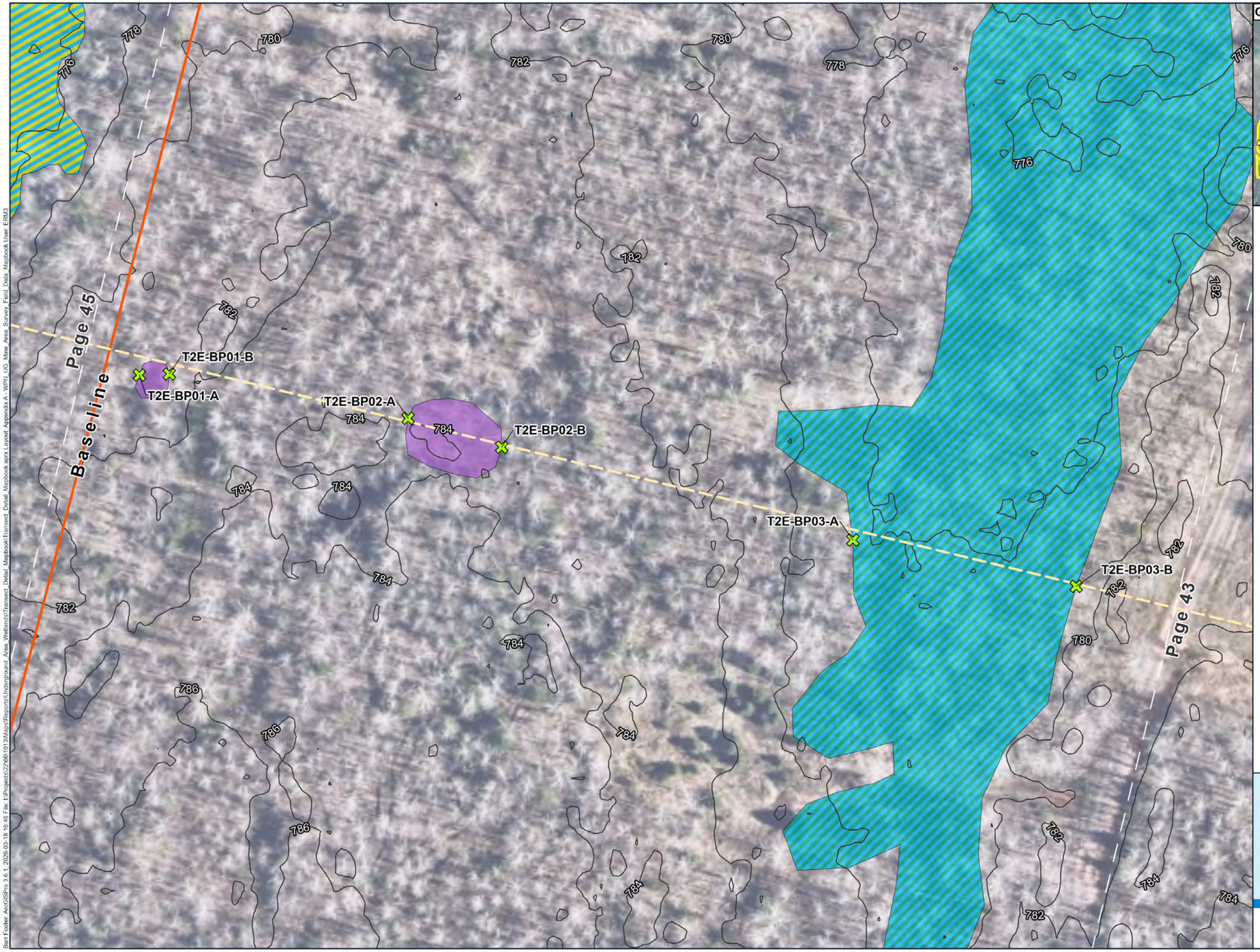
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

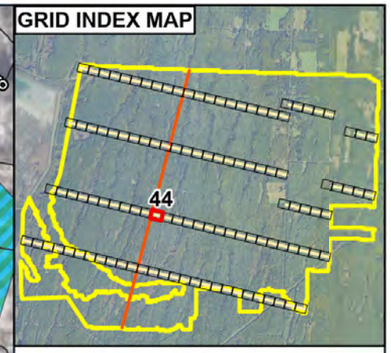
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh/Other - *P. tremuloides* PFO
- Emergent Marsh/Northern Shrub Thicket
- Other - Excavated/ Compacted

N

0 50 100
Feet

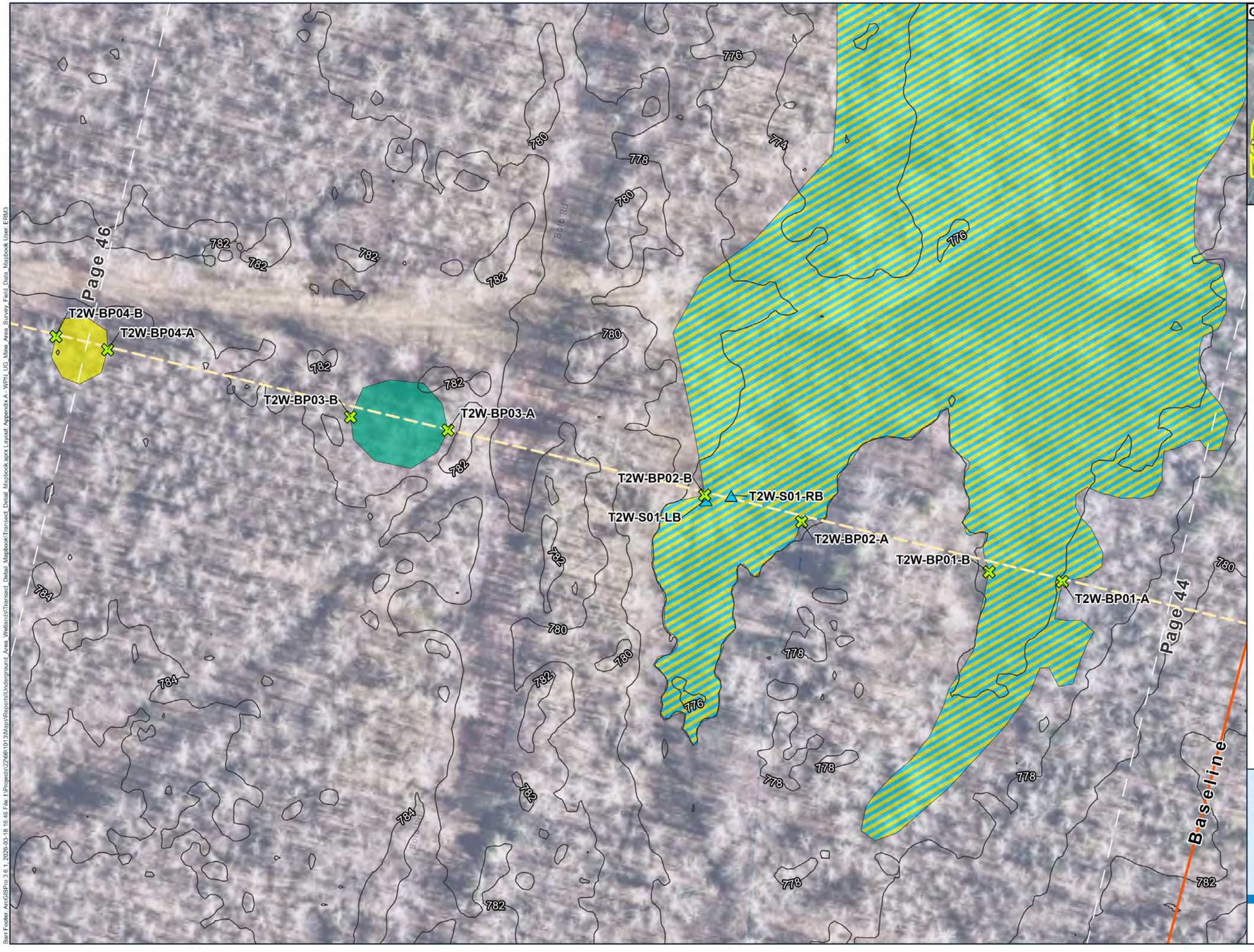
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

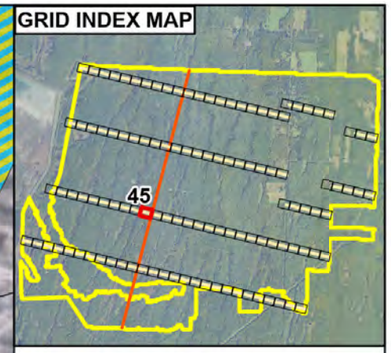
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

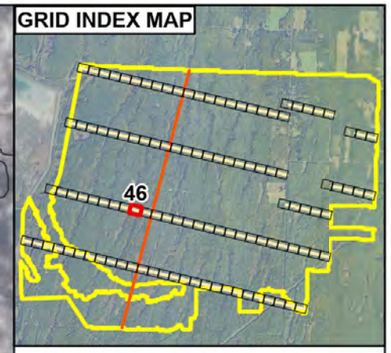
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Other - *P. tremuloides* PFO
- Northern Shrub Thicket

0 50 100
Feet

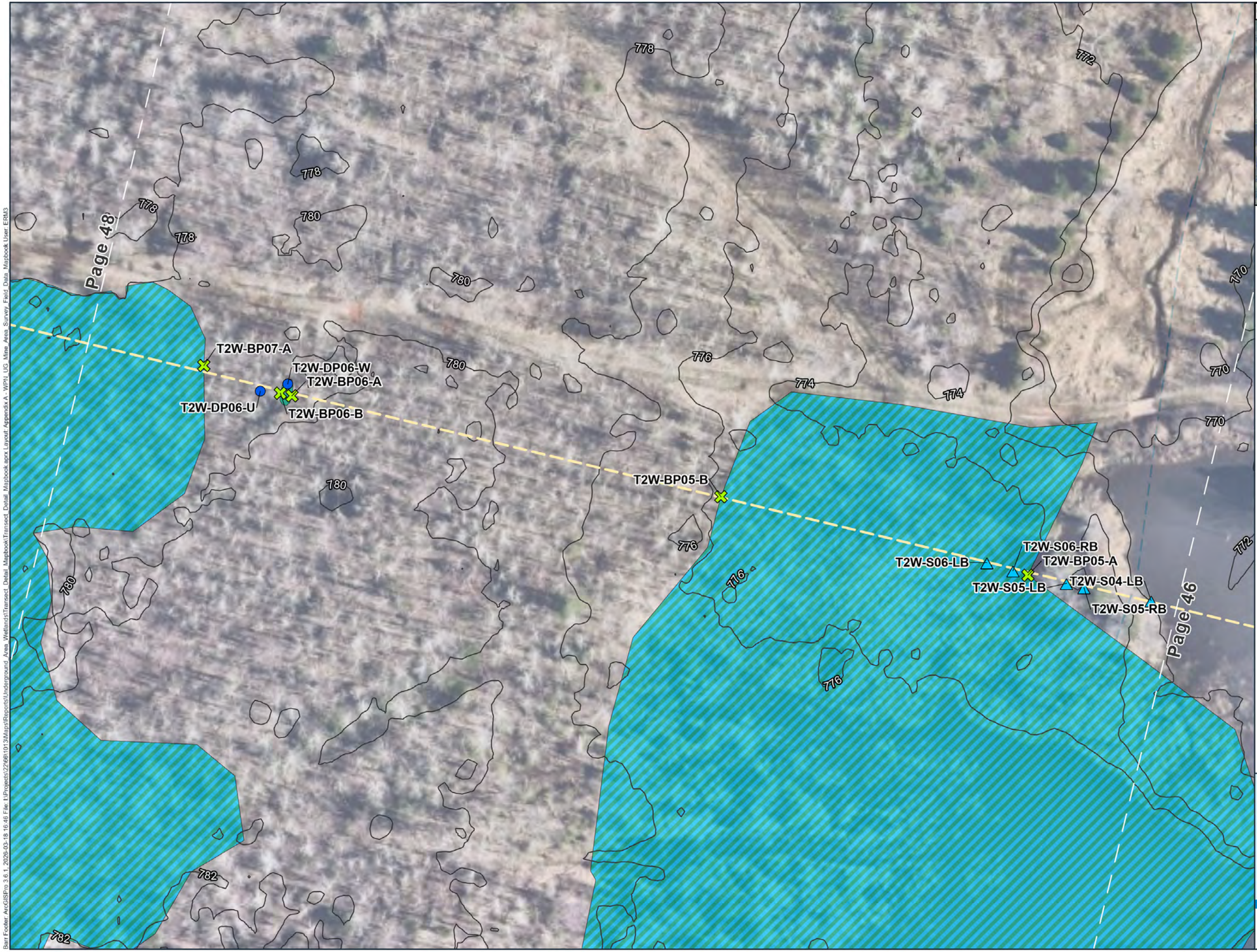
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

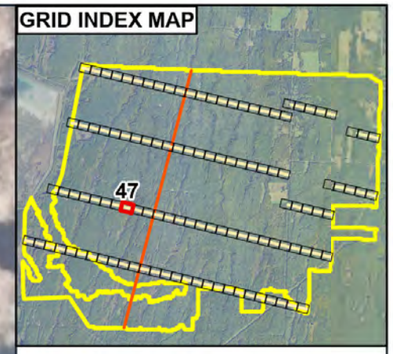
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Other - *P. tremuloides* PFO
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

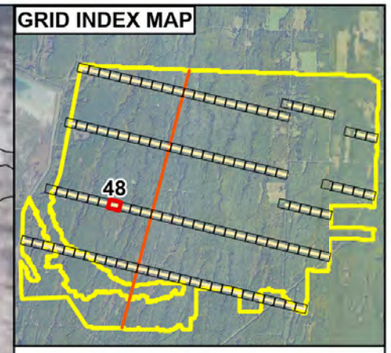
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Emergent Marsh/Other - *P. tremuloides* PFO

Northern Hardwood Swamp

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

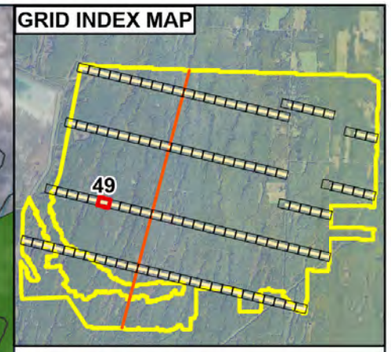
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp
- Northern Hardwood Swamp/Northern Shrub Thicket

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

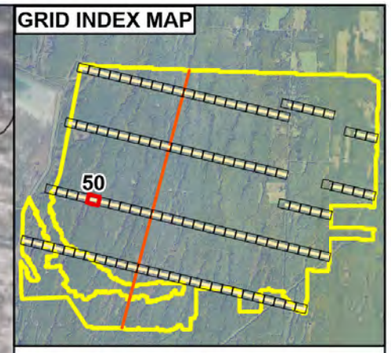
APPENDIX A - PAGE 49

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh
- Emergent Marsh/Northern Hardwood Swamp
- Northern Hardwood Swamp/Northern Shrub Thicket
- Northern Shrub Thicket

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

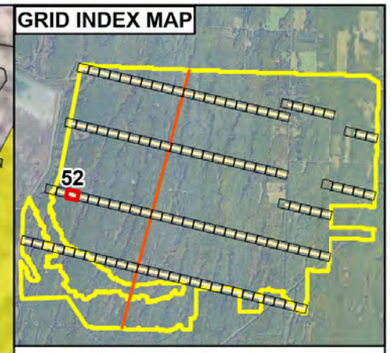
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

Stream Bank Point

**Wetlands**

Northern Hardwood Swamp

Northern Shrub Thicket

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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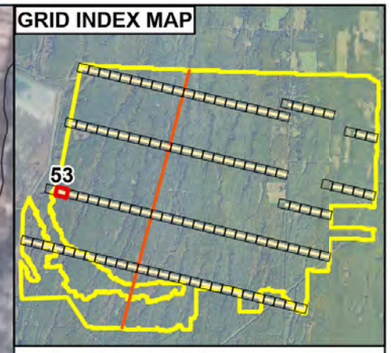
T2W-BP17-B

T2W-BP17-A

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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

Stream Bank Point

**Wetlands**

Northern Hardwood Swamp

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

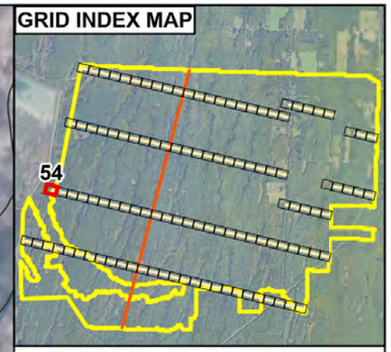
APPENDIX A - PAGE 53

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Stream Bank Point

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

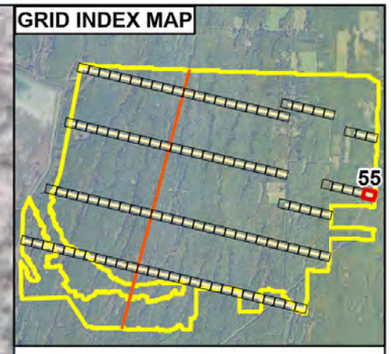
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point

**Wetlands**

- Floodplain Forest
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

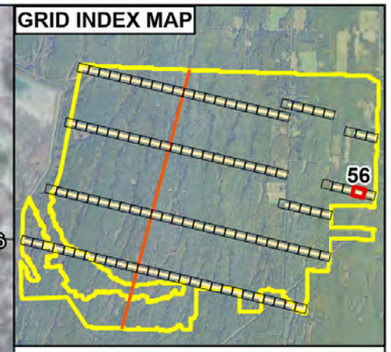
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Other - *P. tremuloides* PFO

N

0 50 100
Feet

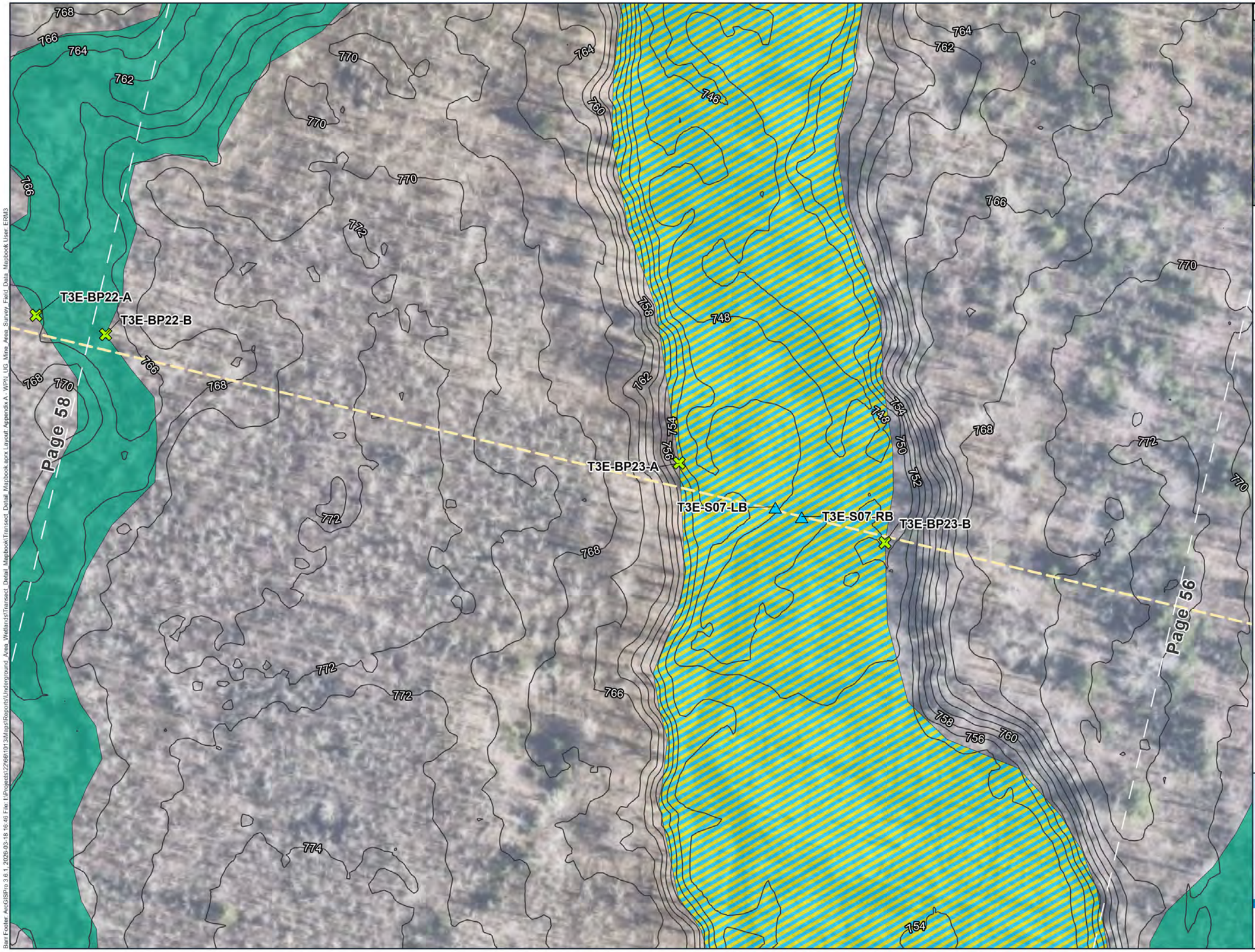
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

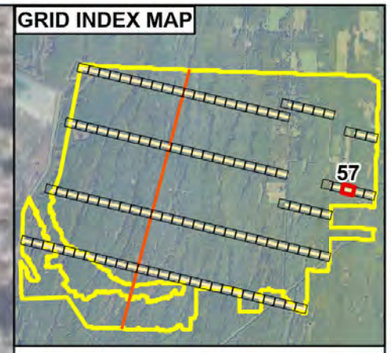
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

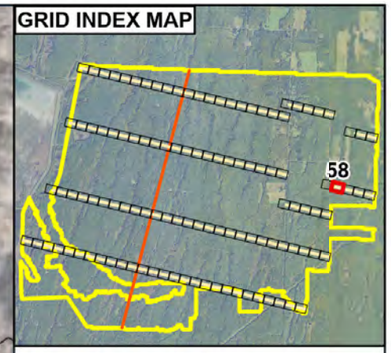
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100

Feet

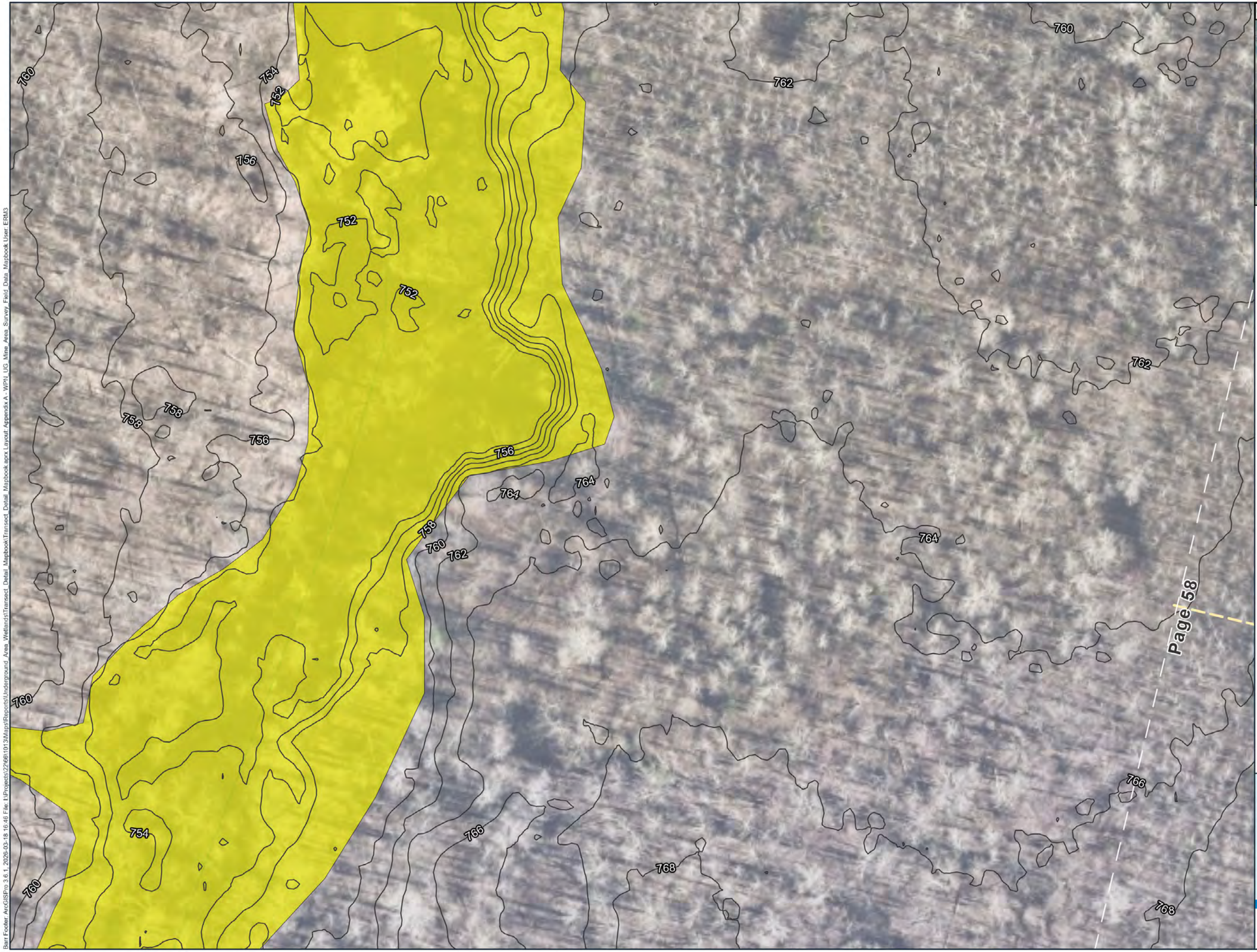
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

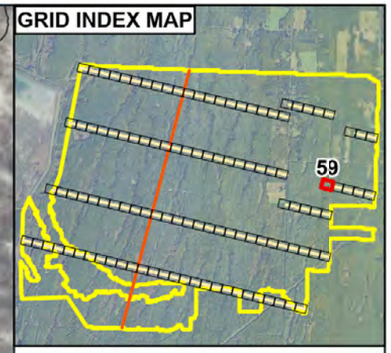
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

**Wetlands**

Northern Shrub Thicket

N

0 50 100

Feet

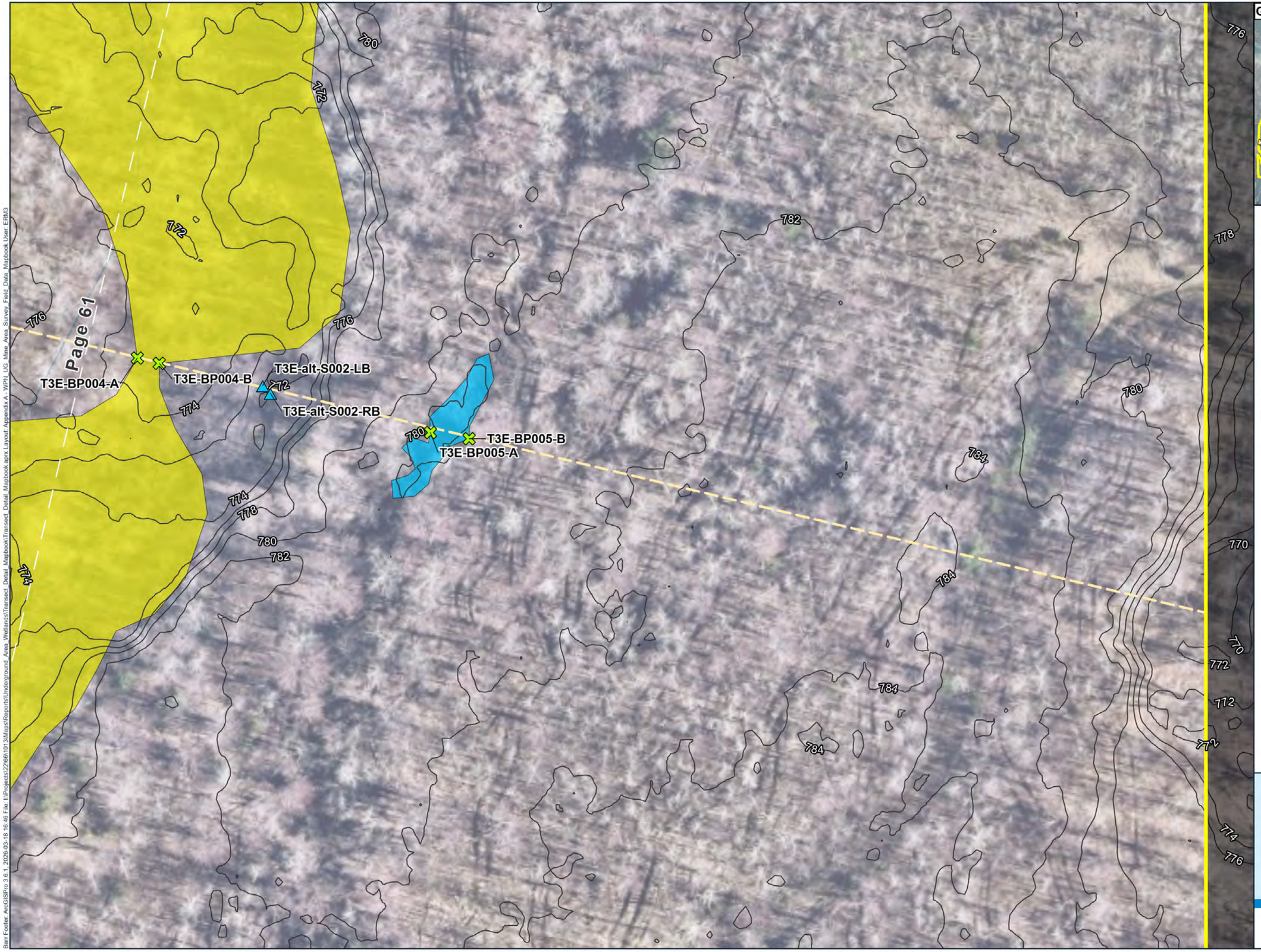
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

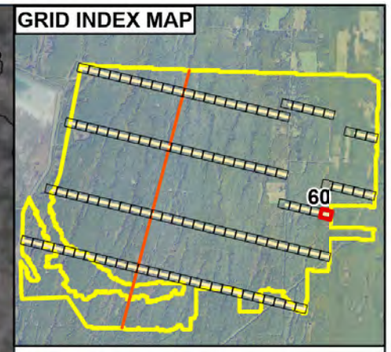
APPENDIX A - PAGE 59

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Northern Shrub Thicket

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

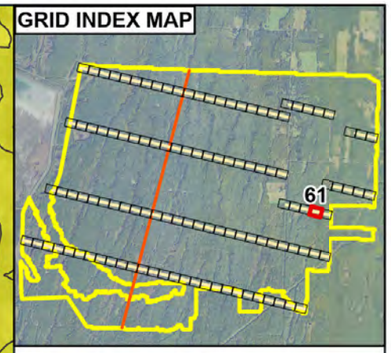
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

**Wetlands**

Northern Shrub Thicket

0 50 100
Feet

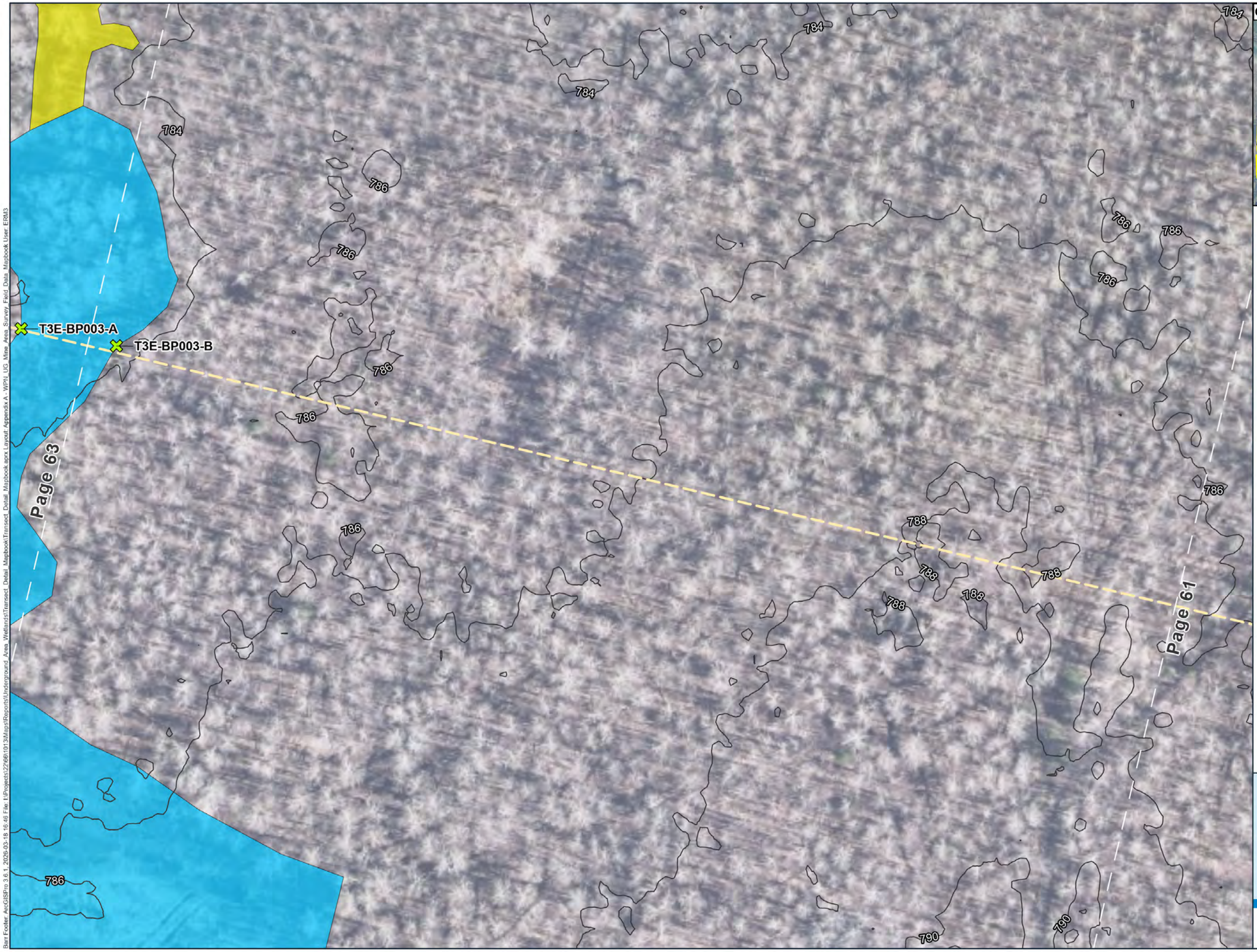
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

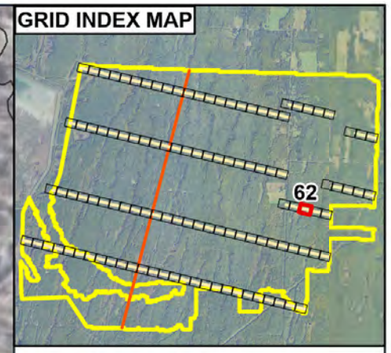
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh
- Northern Shrub Thicket

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

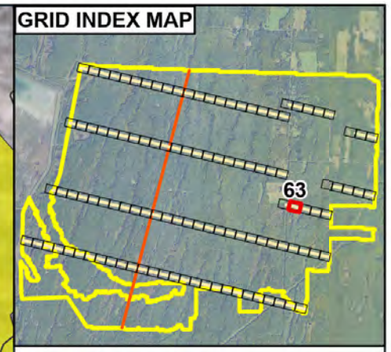
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp
- Northern Shrub Thicket

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

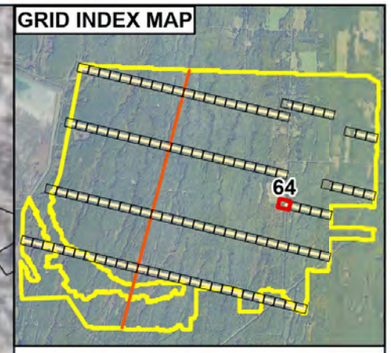
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

**Wetlands**

Emergent Marsh

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

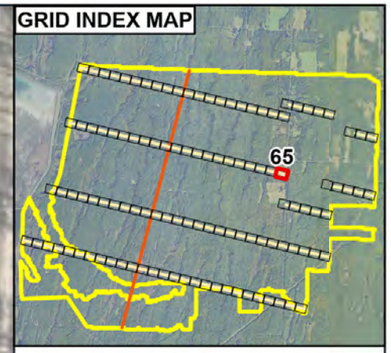
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket
- Southern Shrub Carr

0 50 100
Feet

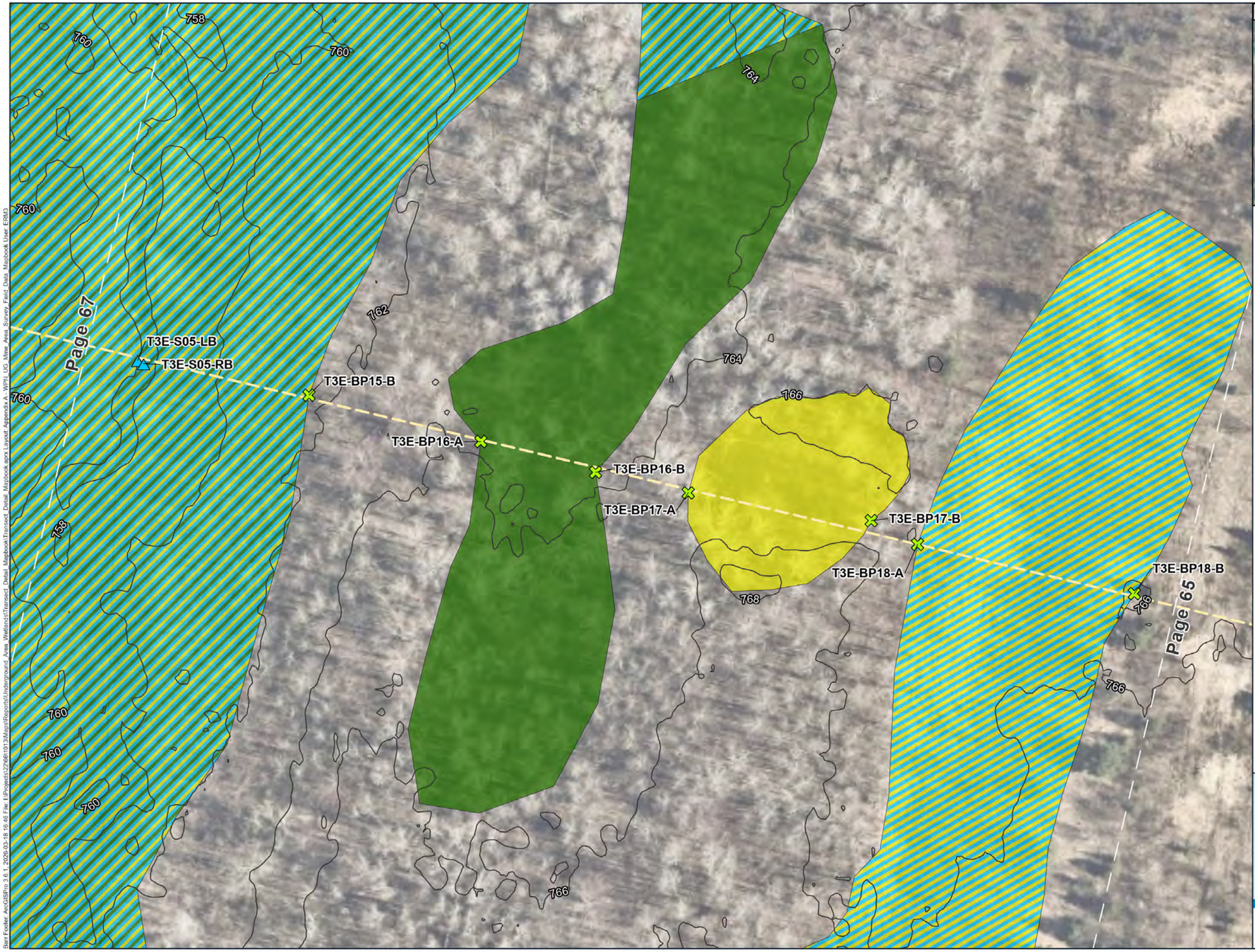
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Shrub Thicket
- Emergent Marsh/Northern Hardwood Swamp/ Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Shrub Thicket

0 50 100
Feet

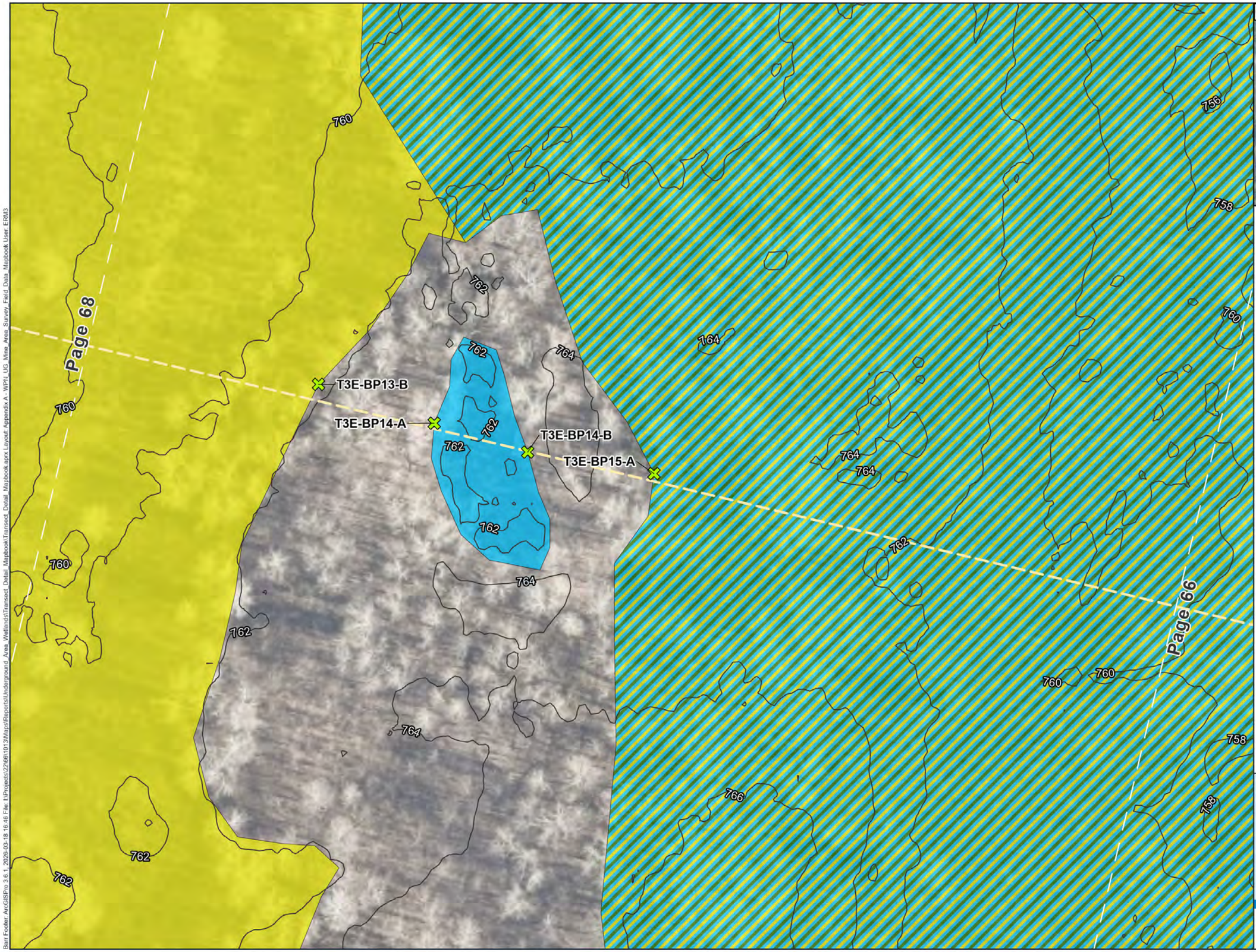
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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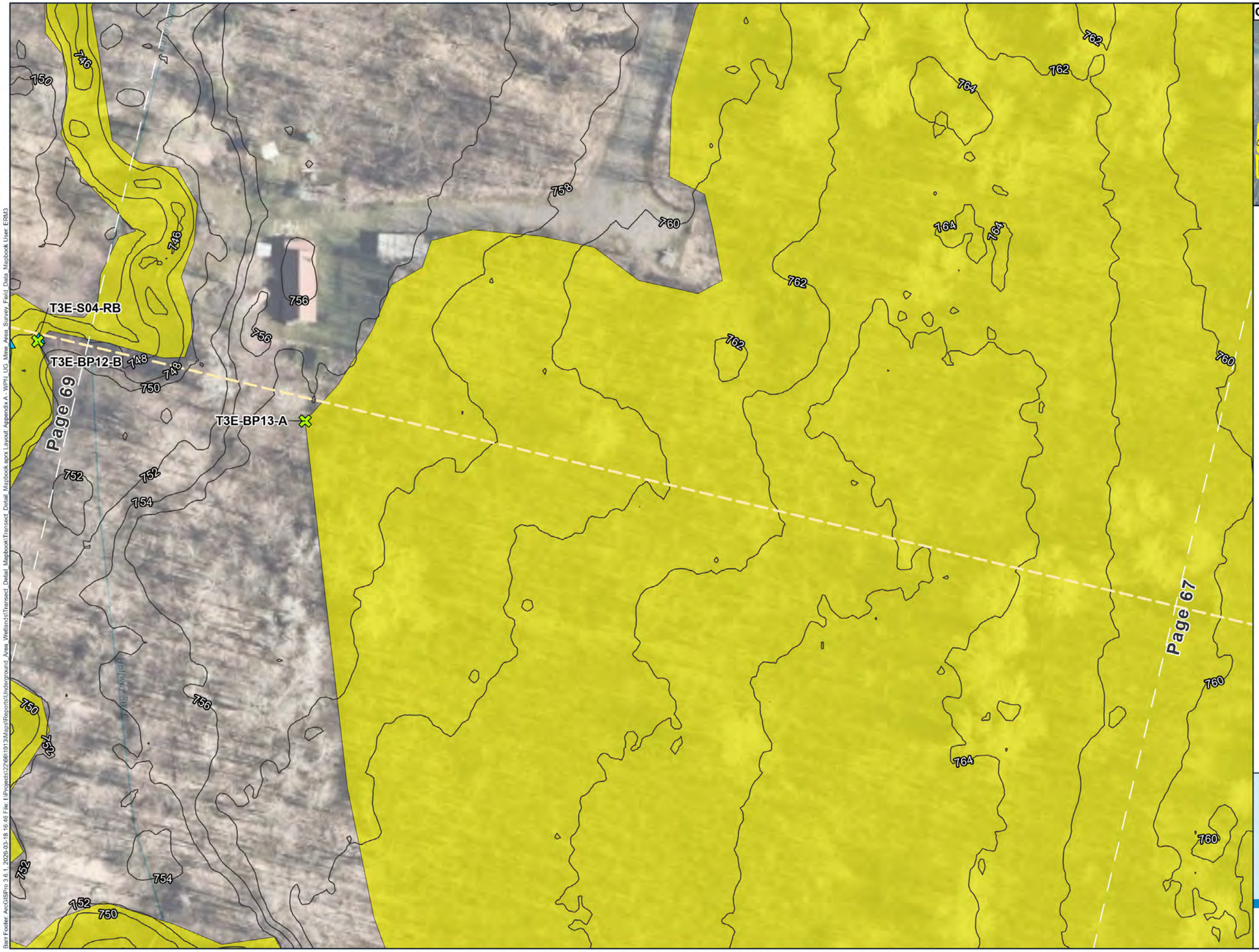



**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

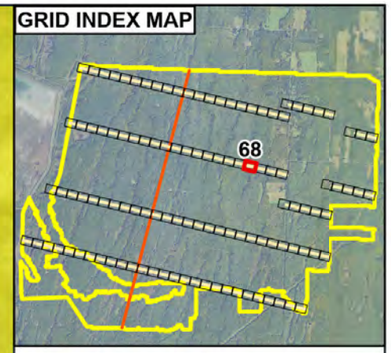
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket

0 50 100
Feet

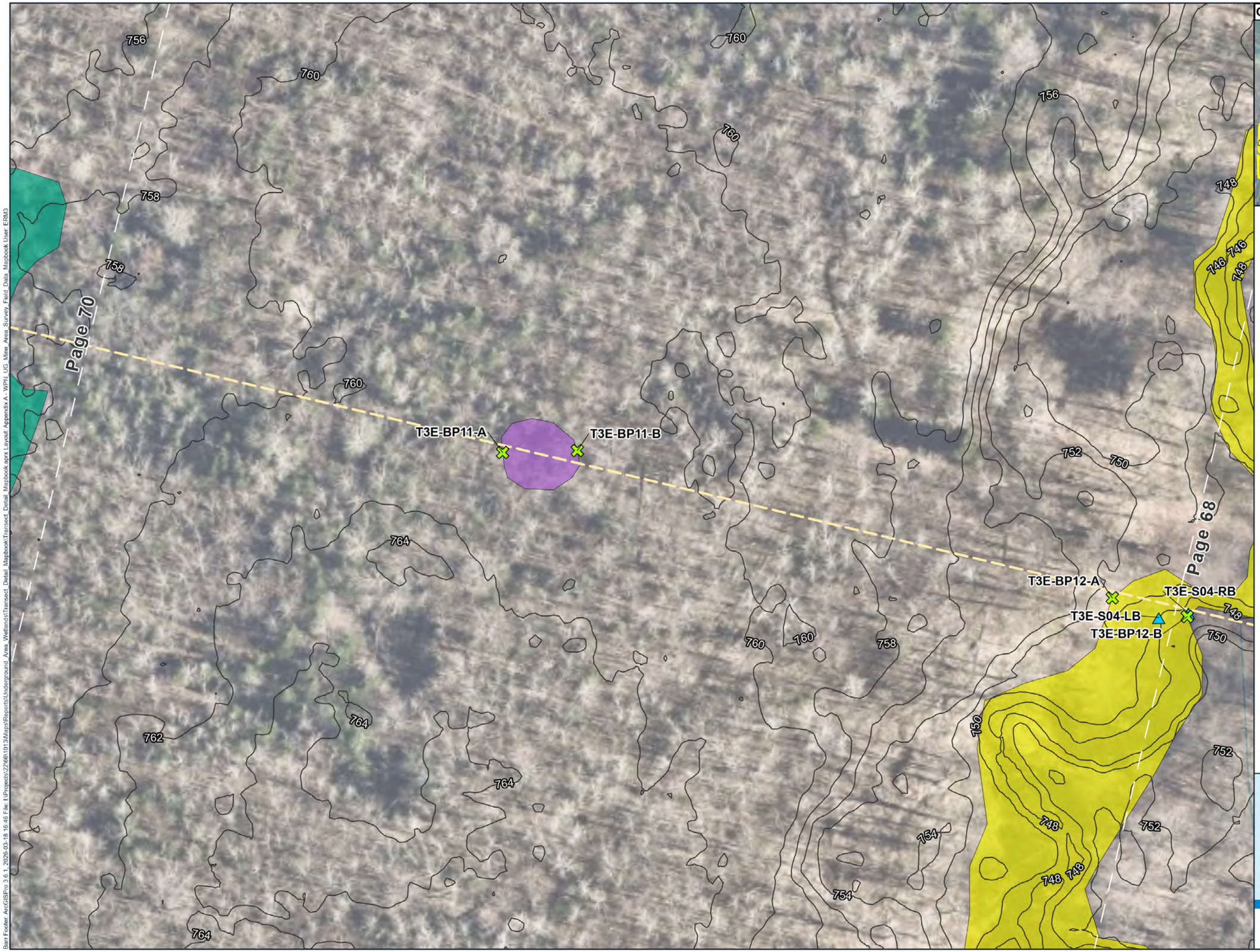
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

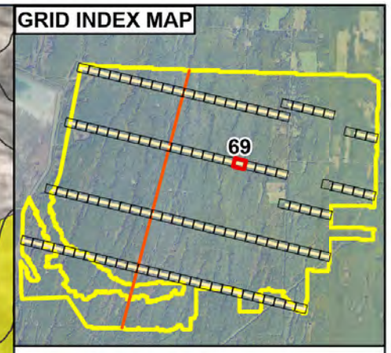
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

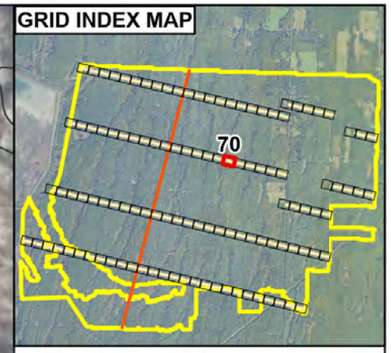
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

Stream Bank Point

**Wetlands**

Other - *P. tremuloides*
PFO

0 50 100
Feet

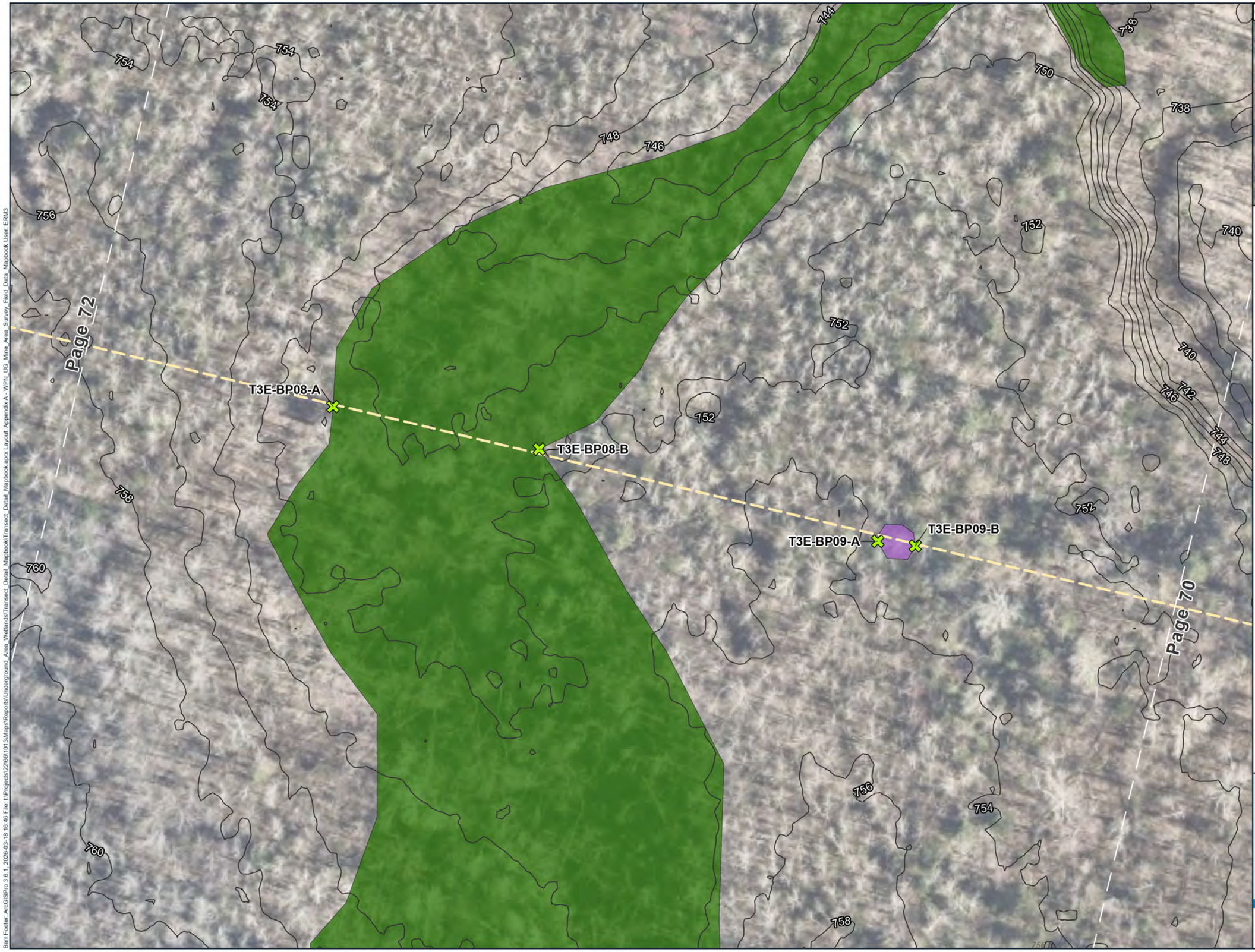
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

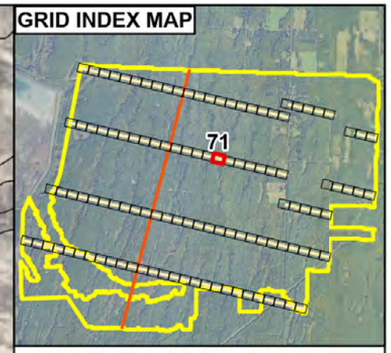
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Northern Hardwood Swamp

Other - Excavated/ Compacted

0 50 100
Feet

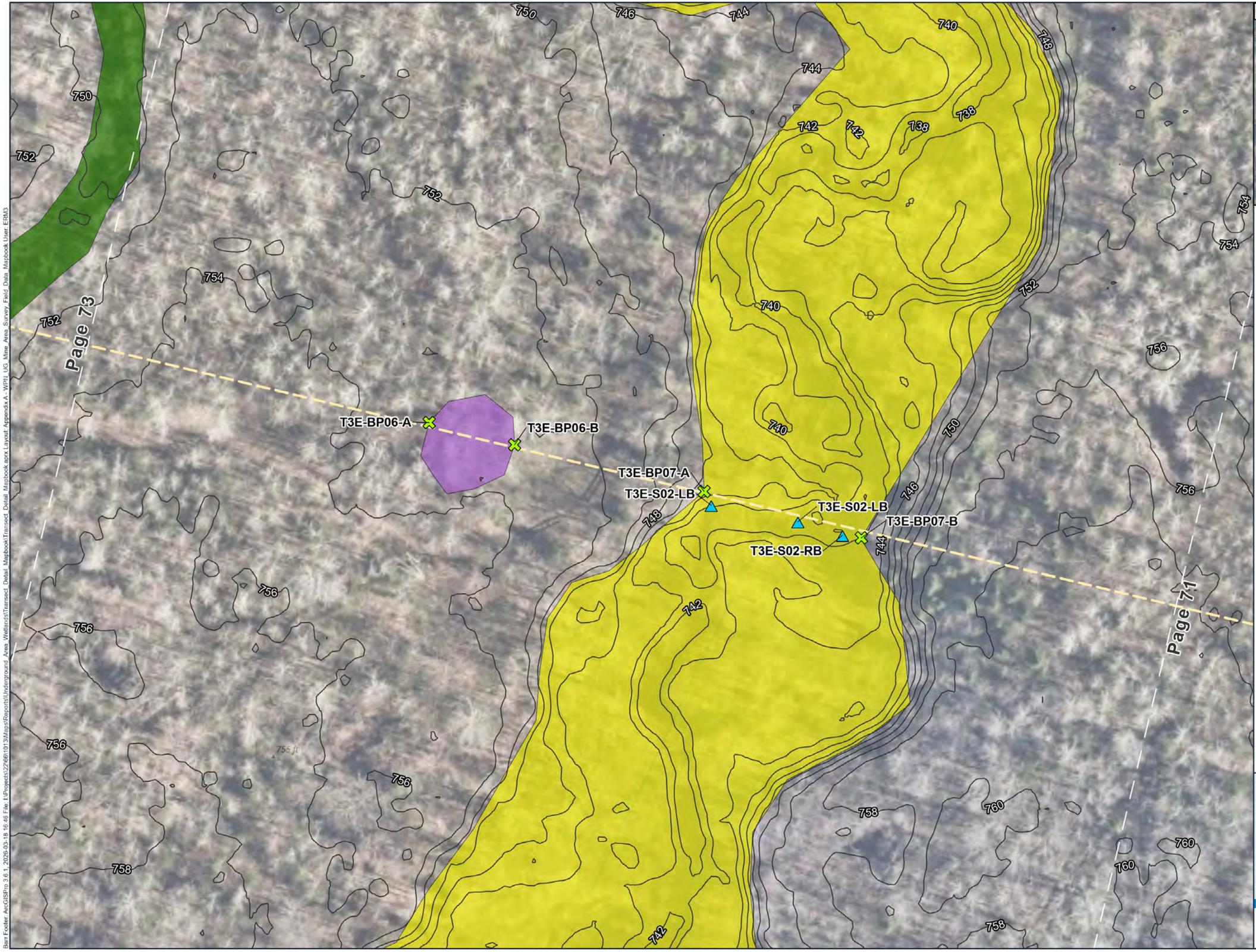
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

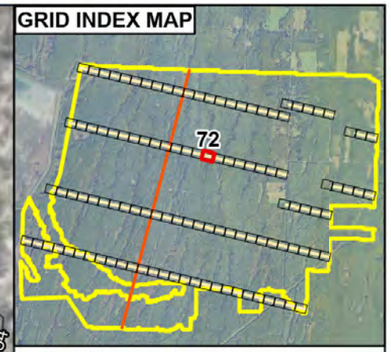
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - Excavated/ Compacted

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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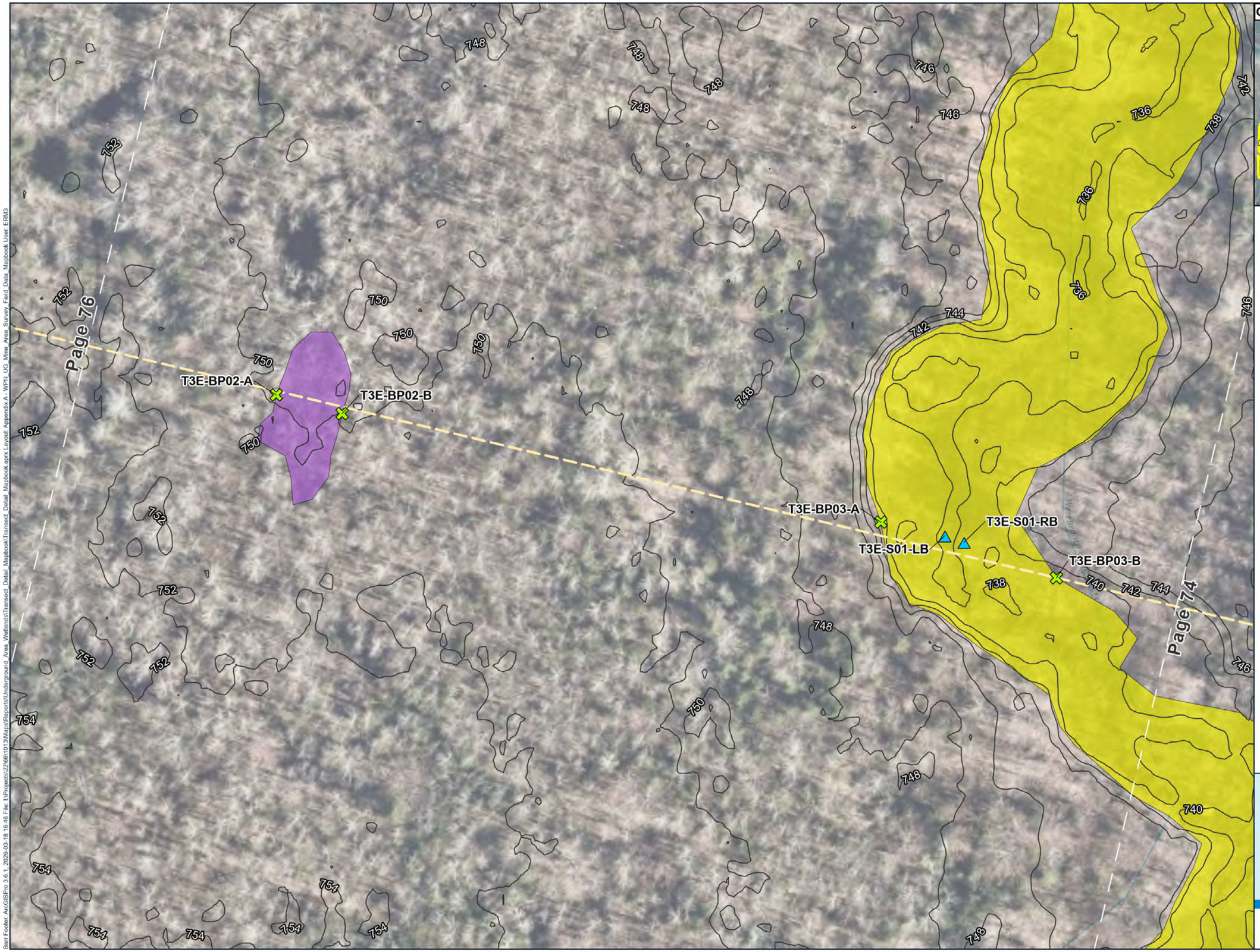

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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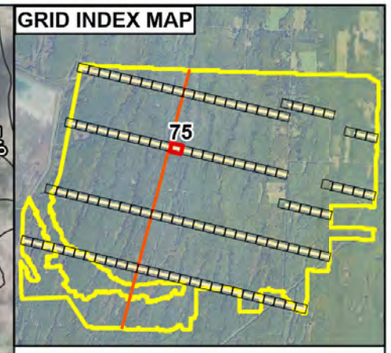
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742
744
748
748
748




GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - Excavated/ Compacted

0 50 100
Feet

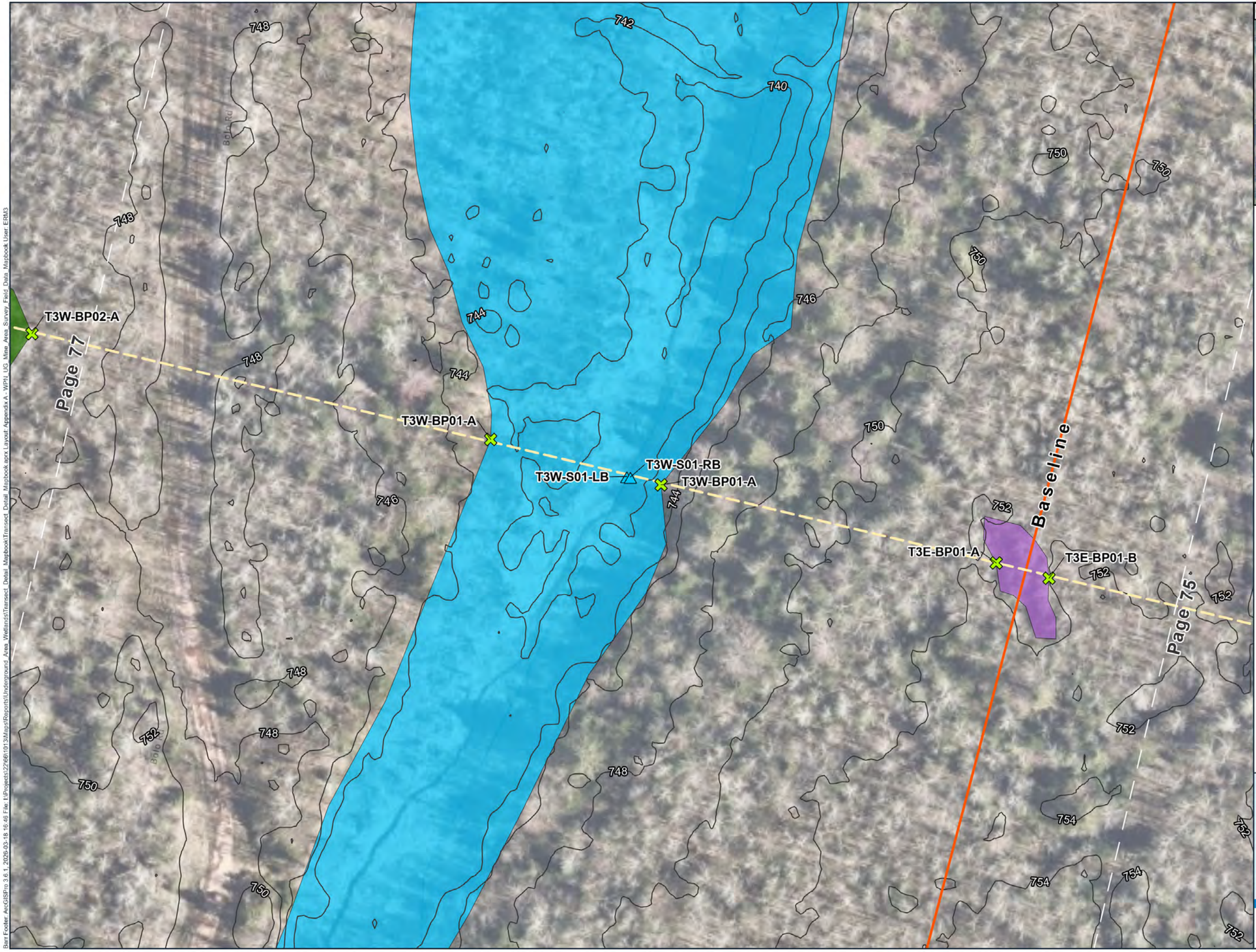
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

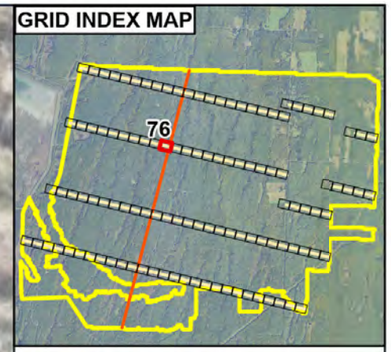
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp
- Other - Excavated/ Compacted

0 50 100
Feet

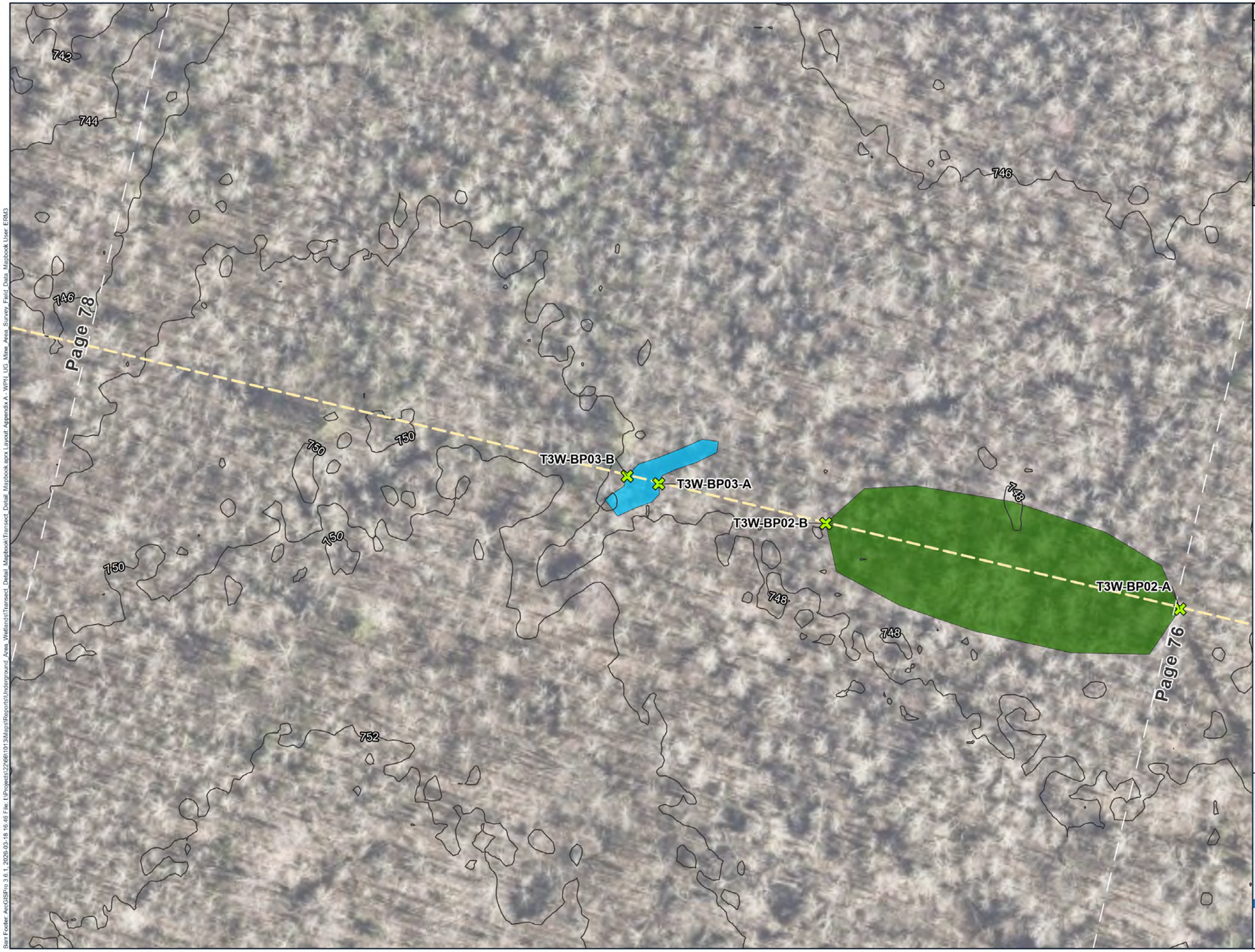
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

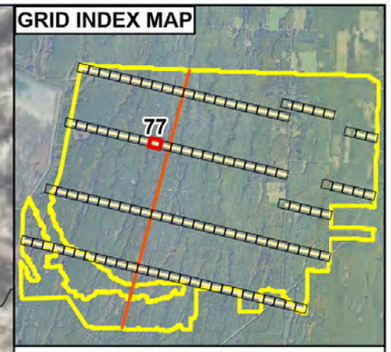
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

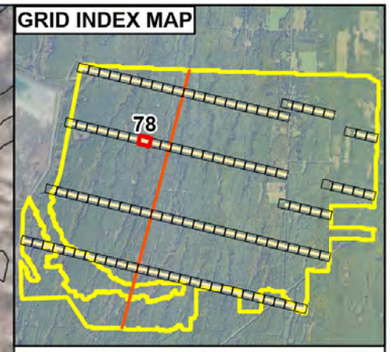
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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Stream Bank Point

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

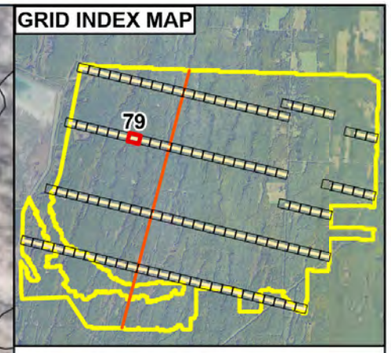
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Stream Bank Point

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

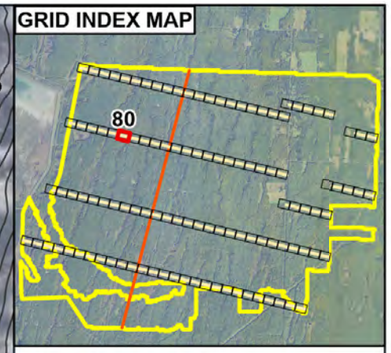
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Stream Bank Point

0 50 100
Feet

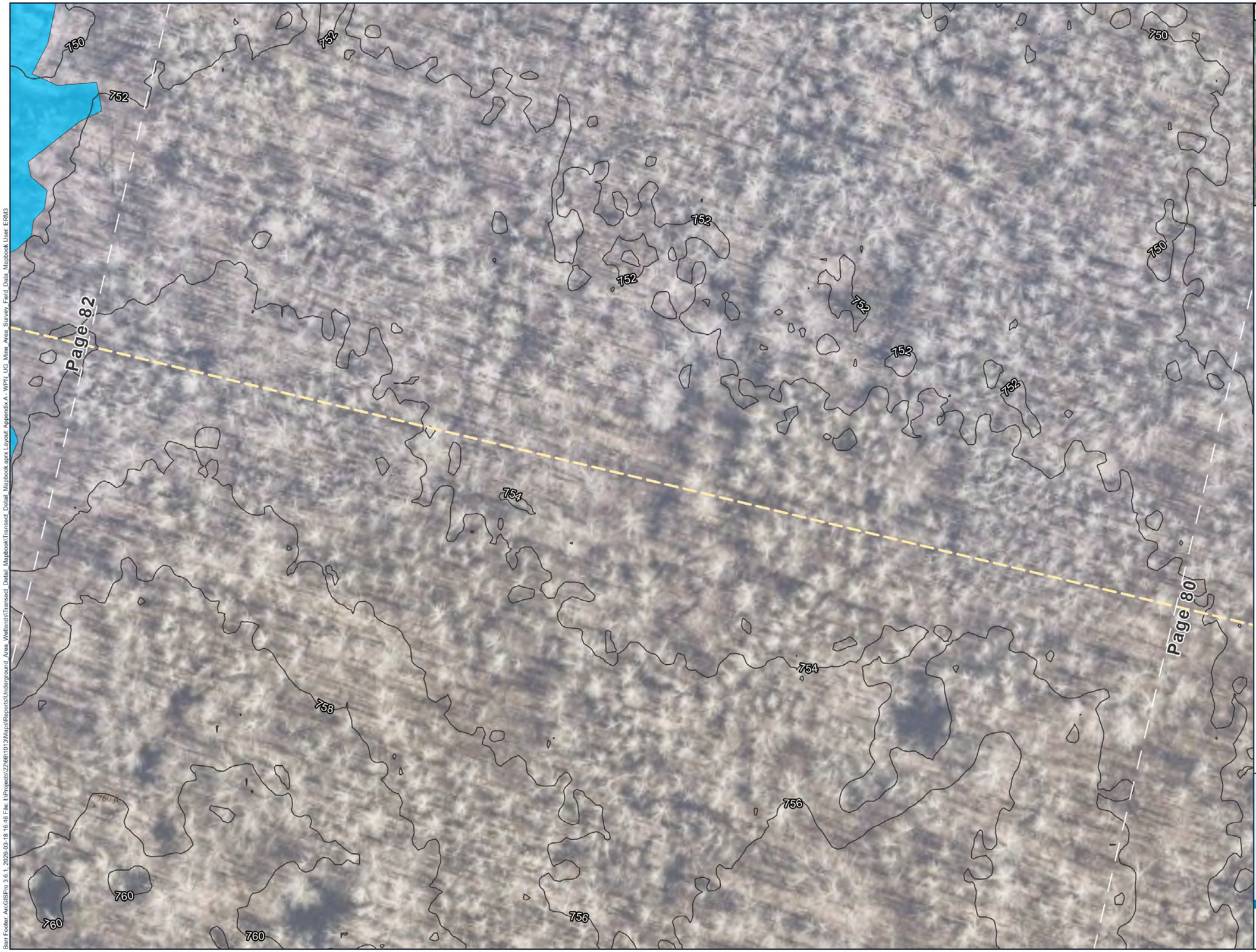
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

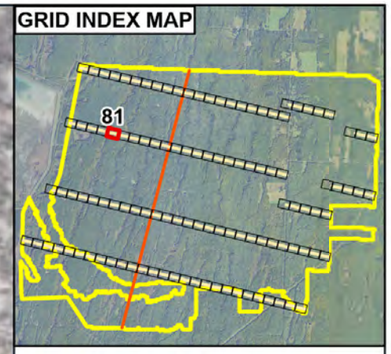
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

**Wetlands**

Emergent Marsh

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

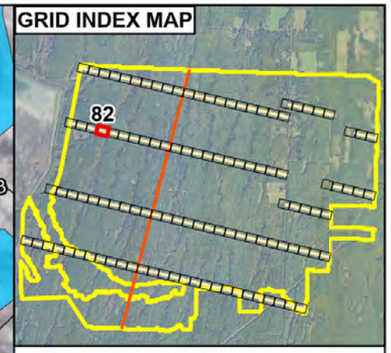
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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Boundary Point
Stream Bank Point

**Wetlands**

Emergent Marsh

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

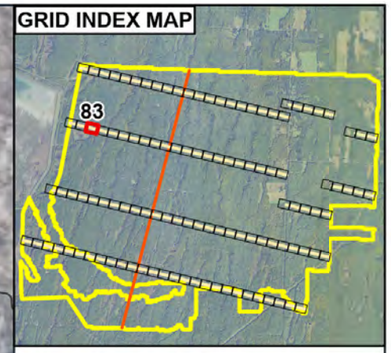
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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Wetland Boundary Point

**Wetlands**

Other - *P. tremuloides* PFO

Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

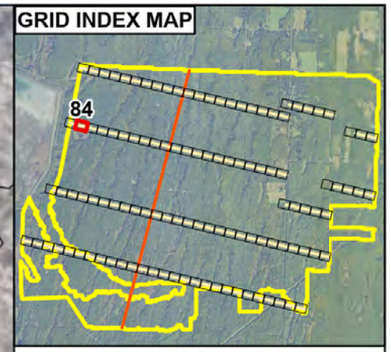
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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Outside Survey Area

T3W-S05-LB

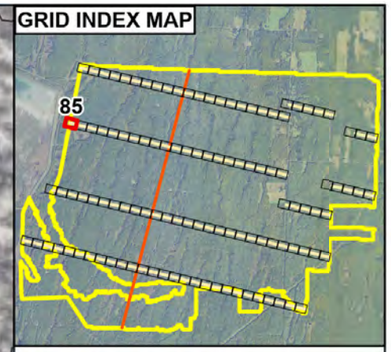
T3W-S05-RB

T3W-BP07-A

T3W-BP07-B

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Other - Excavated/ Compacted

0 50 100

Feet

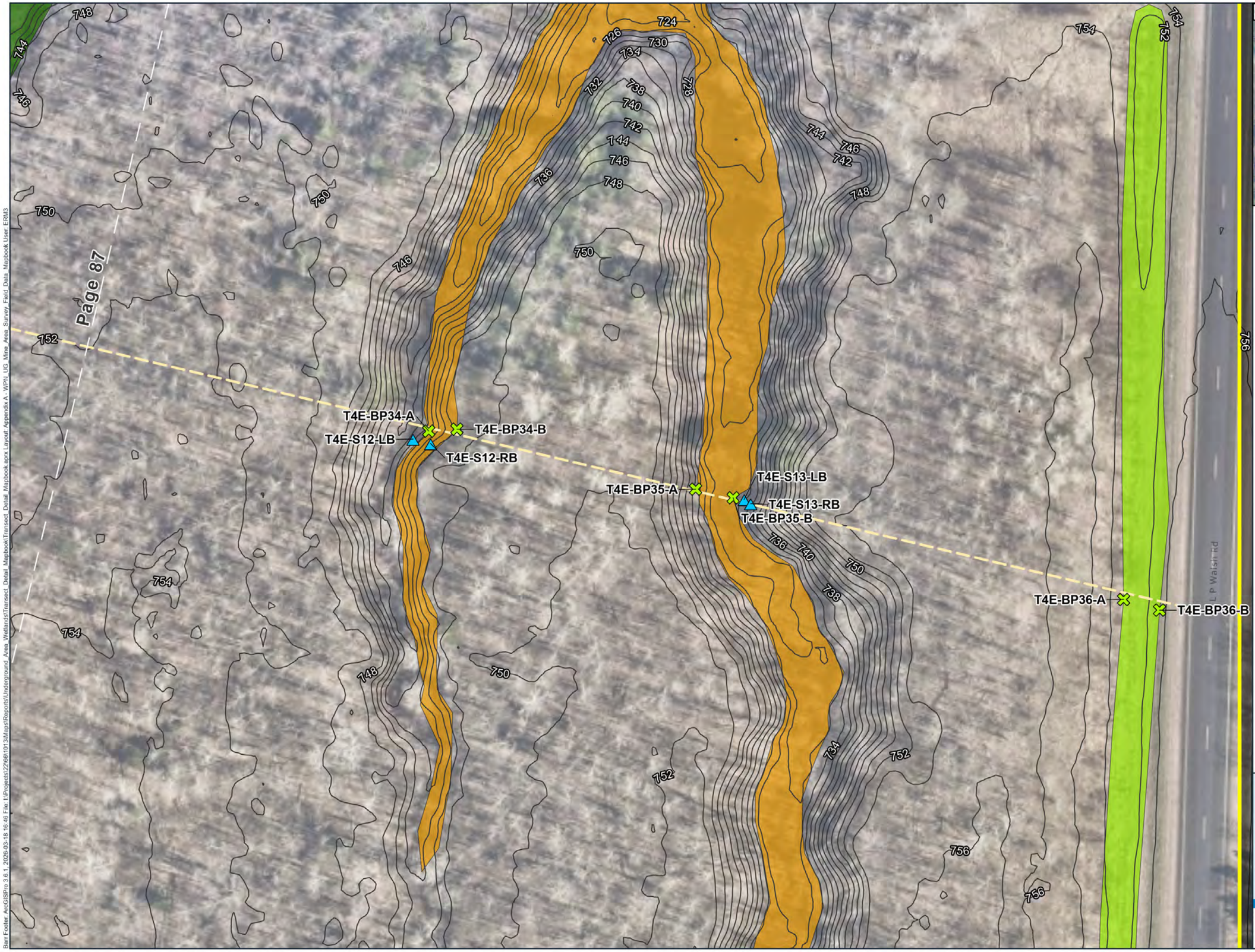
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

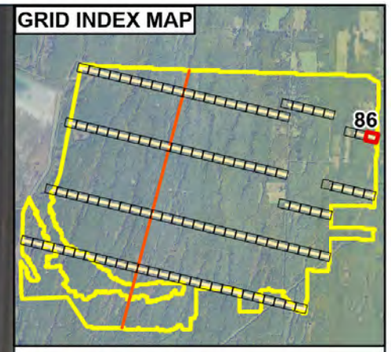
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Floodplain Forest
- Northern Wet Meadow
- Northern Hardwood Swamp

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

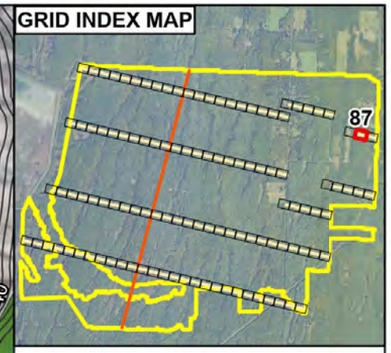
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Wet Meadow
- Northern Hardwood Swamp

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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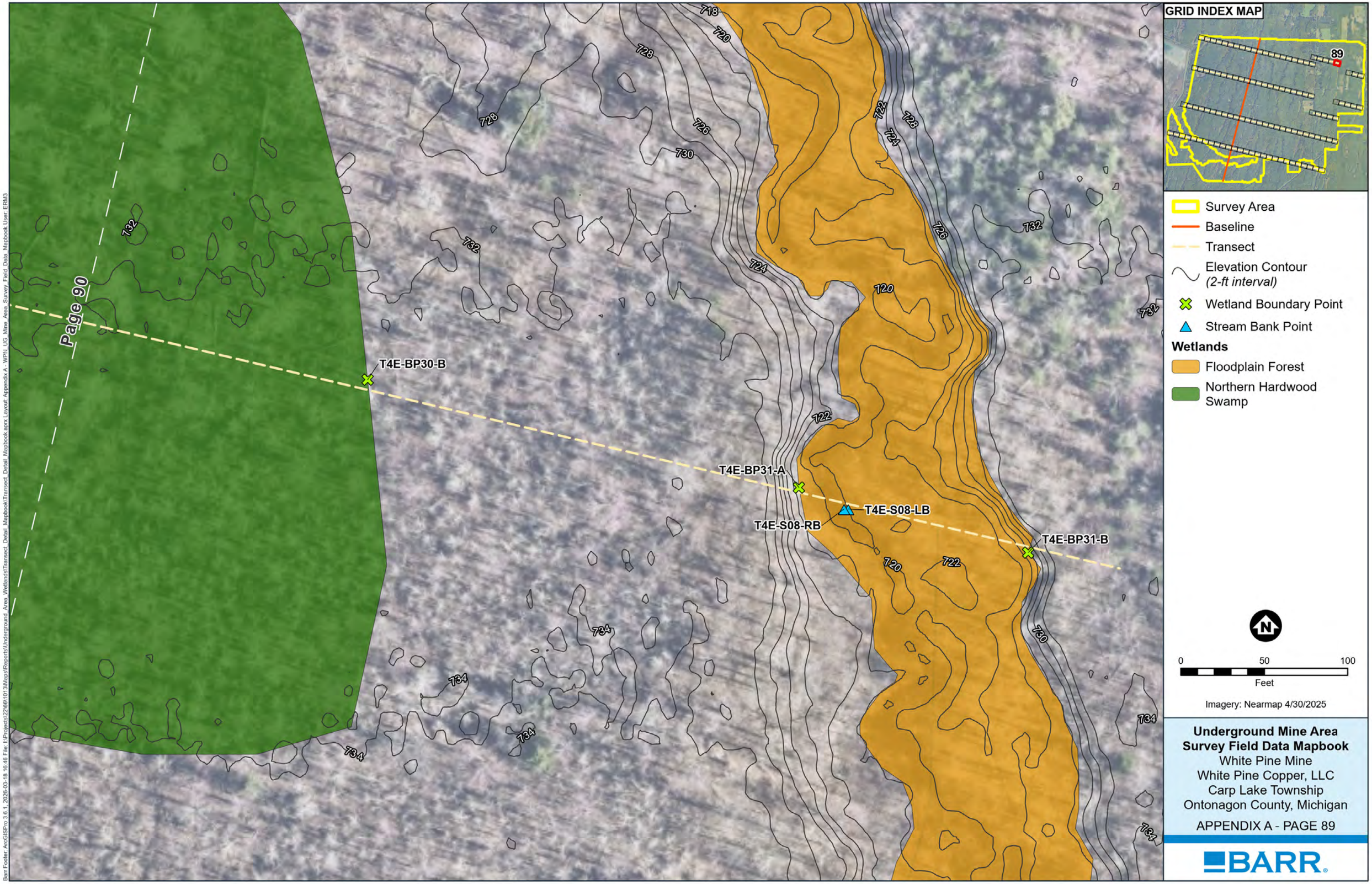



**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

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BARR

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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

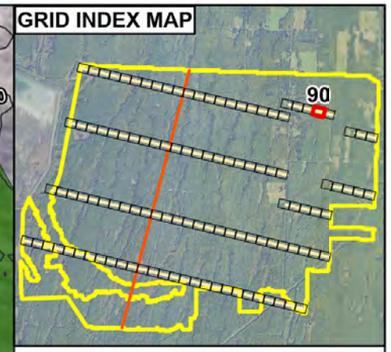
APPENDIX A - PAGE 89

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Floodplain Forest
- Northern Hardwood Swamp

N

0 50 100
Feet

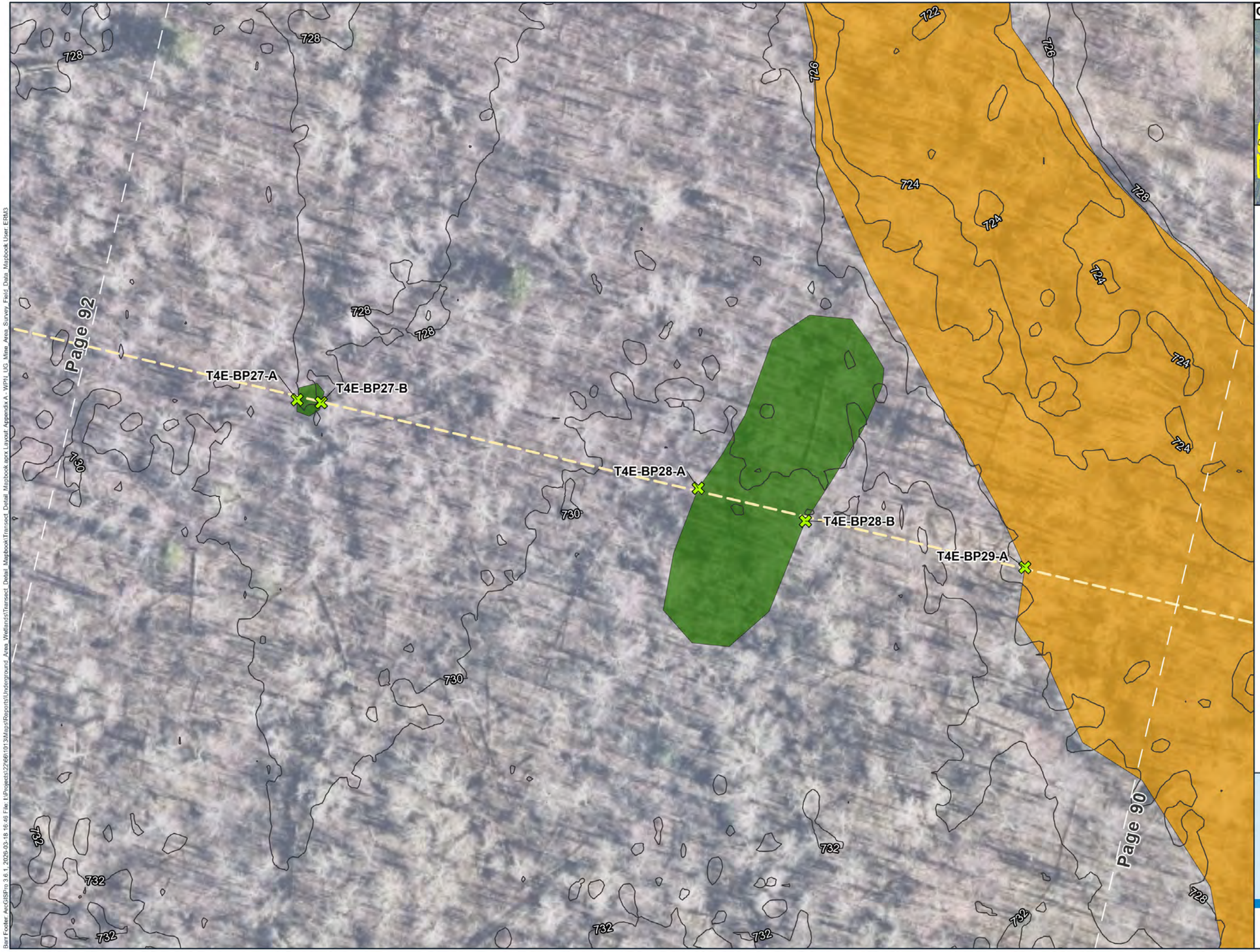
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

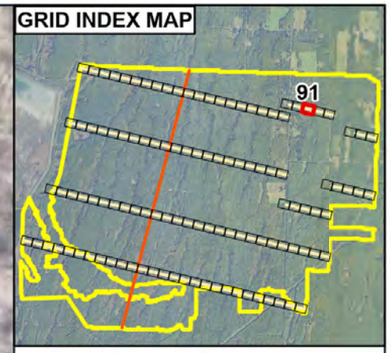
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Floodplain Forest
- Northern Hardwood Swamp

N

0 50 100

Feet

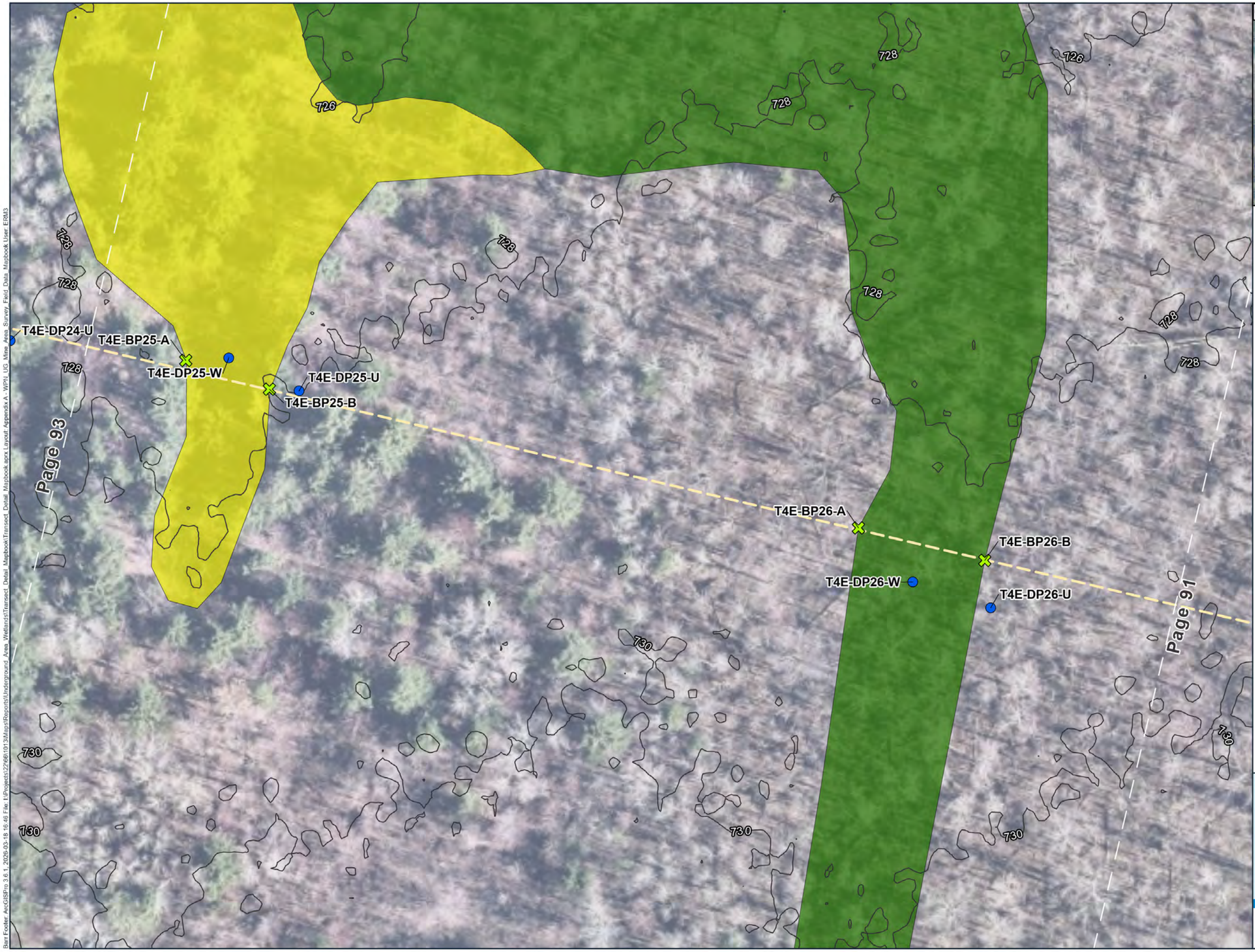
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

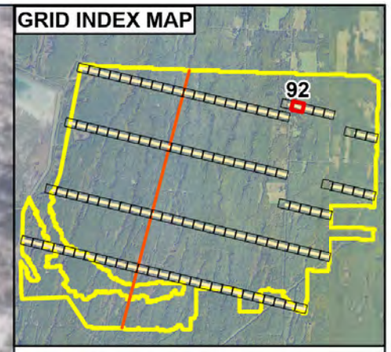
APPENDIX A - PAGE 91

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point

**Wetlands**

- Northern Hardwood Swamp
- Northern Shrub Thicket

N

0 50 100
Feet

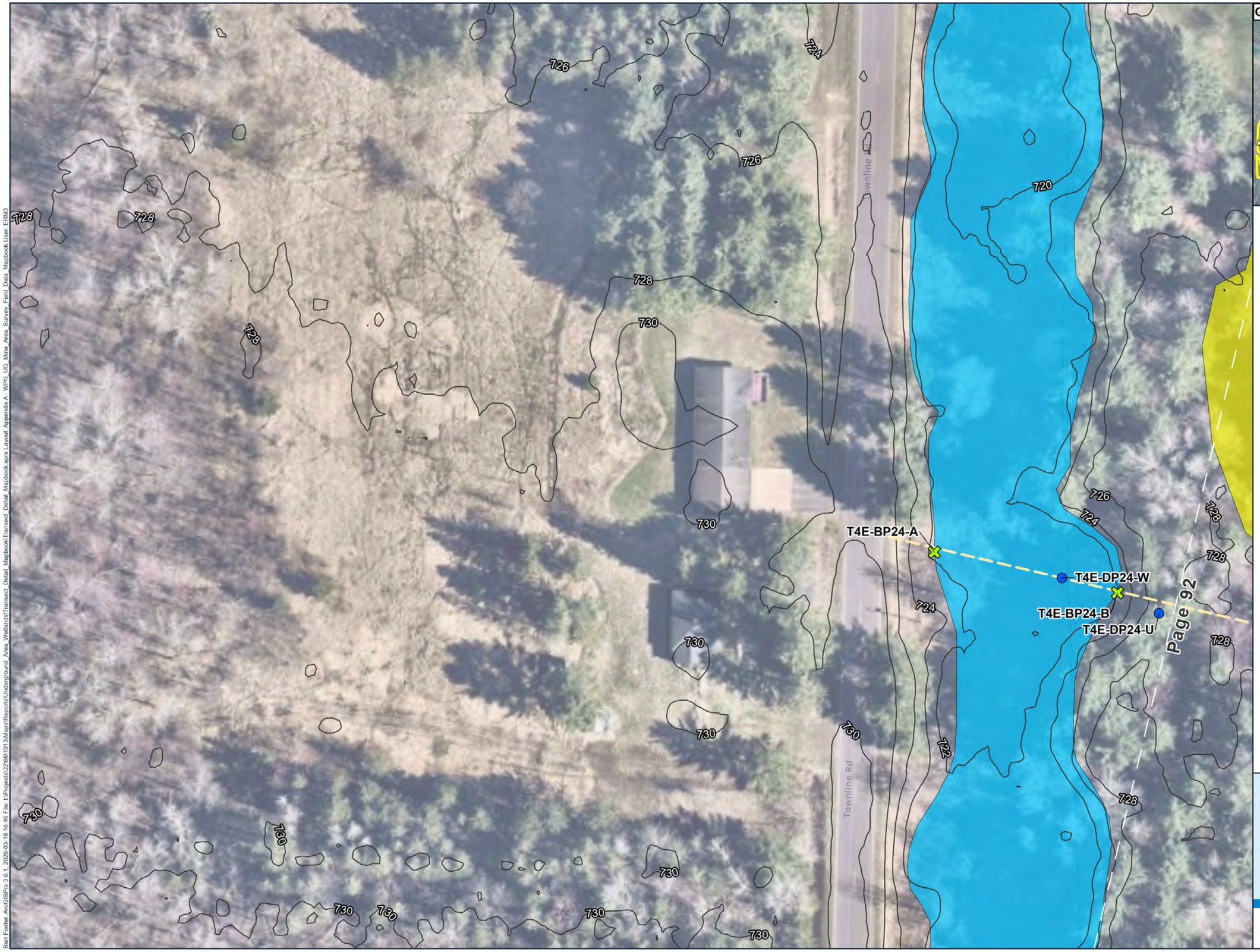
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

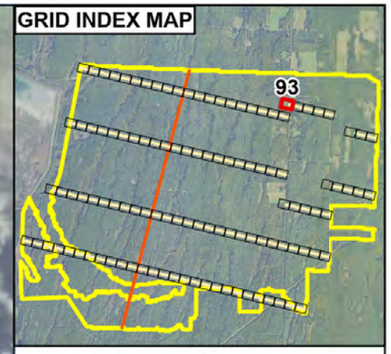
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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Data Point
Wetland Boundary Point

**Wetlands**

Emergent Marsh
Northern Shrub Thicket

N

0 50 100
Feet

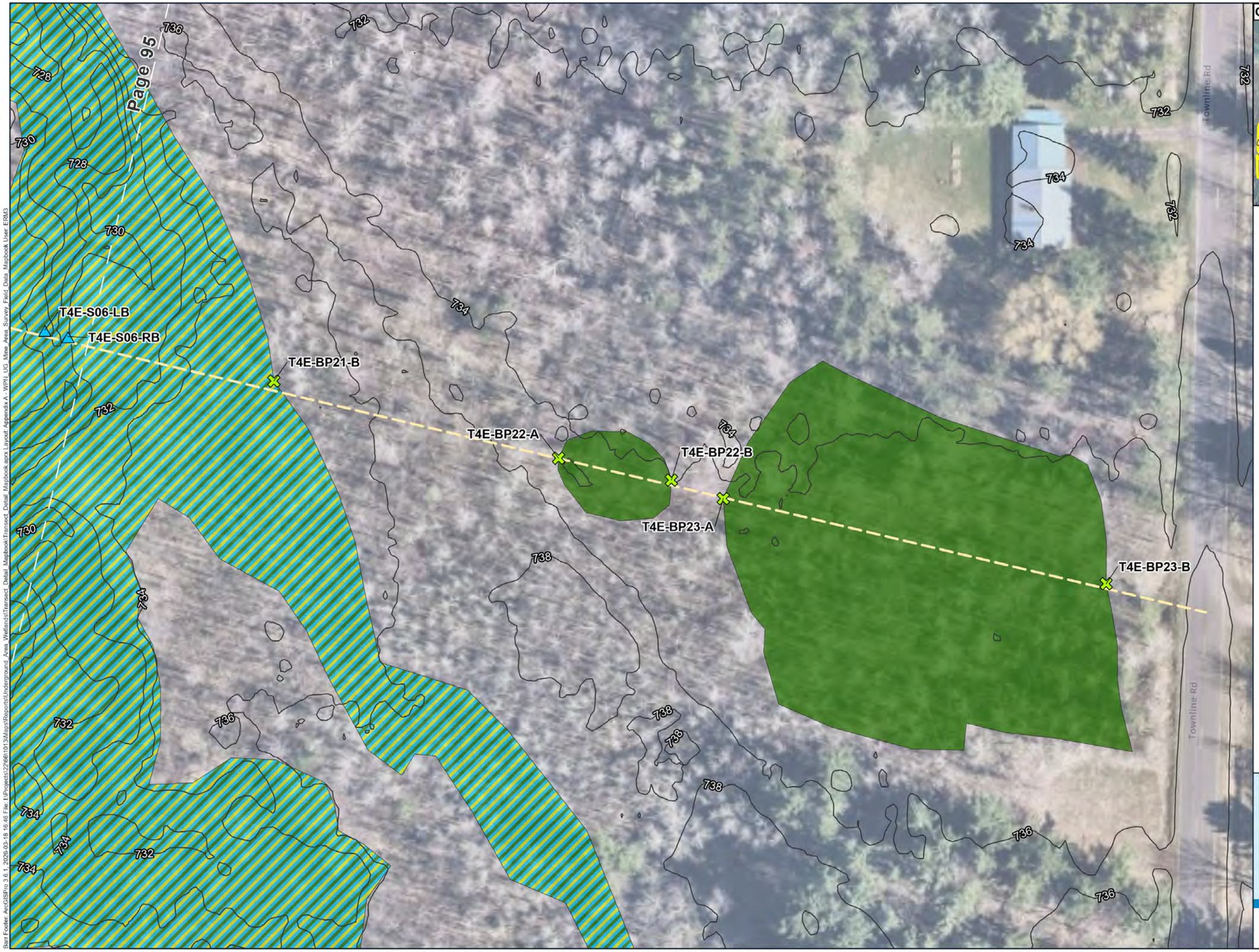
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

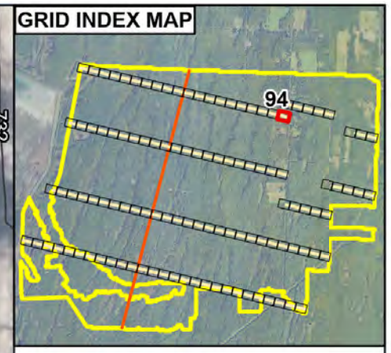
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Hardwood Swamp/ Northern Shrub Thicket
- Northern Hardwood Swamp

0 50 100
Feet

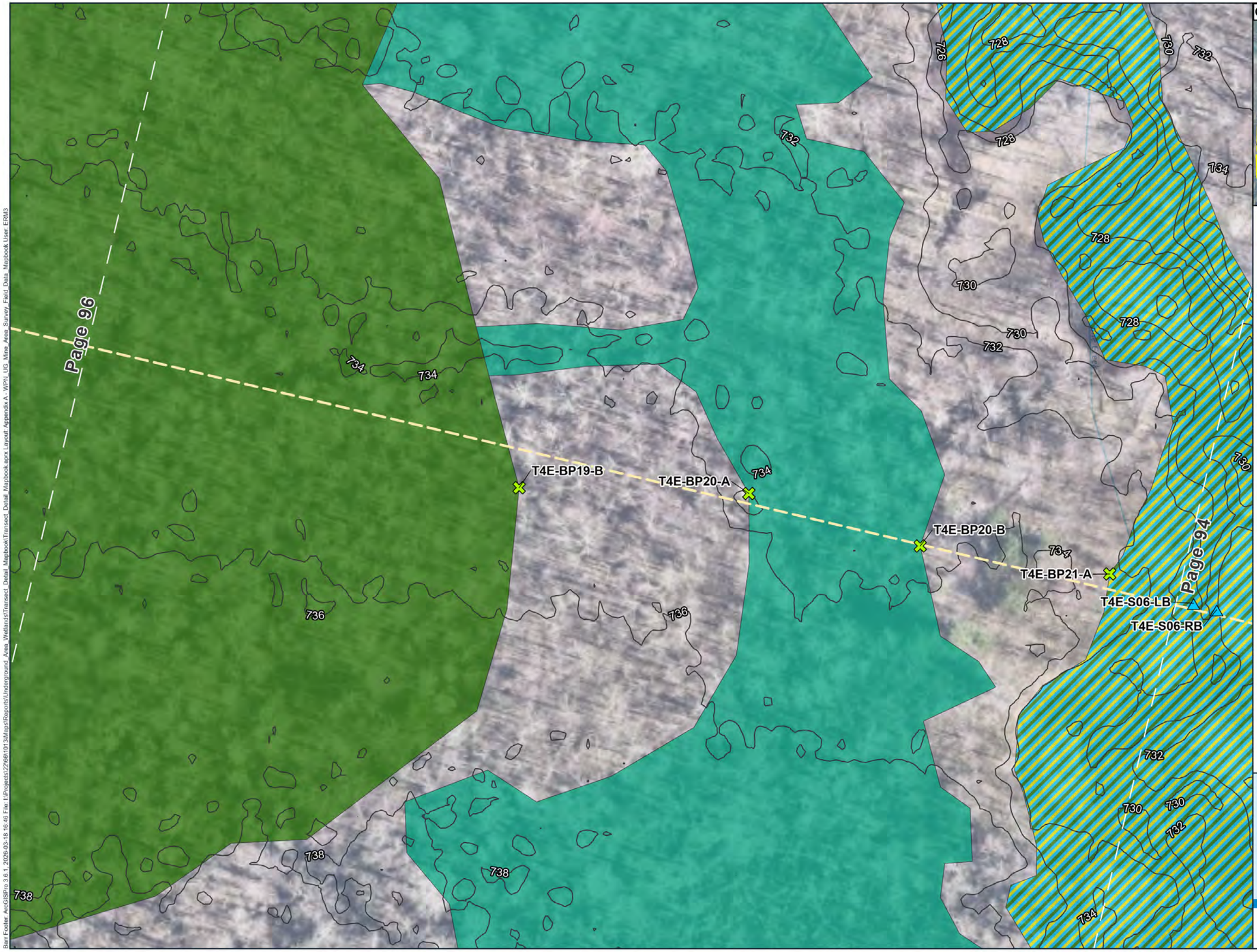
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

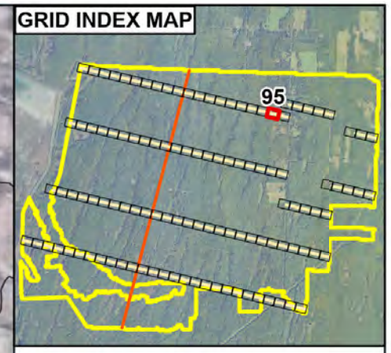
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh/Northern Hardwood Swamp/ Northern Shrub Thicket
- Northern Hardwood Swamp
- Other - *P. tremuloides* PFO

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

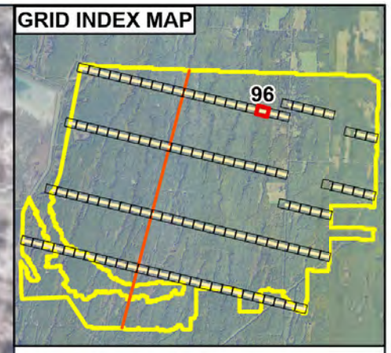
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Northern Hardwood Swamp

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

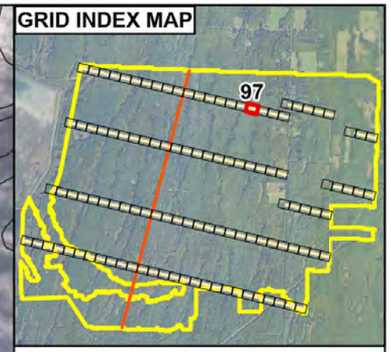
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - Excavated/ Compacted

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

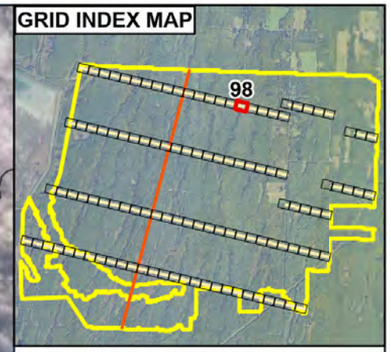
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - *P. tremuloides* PFO

0 50 100
Feet

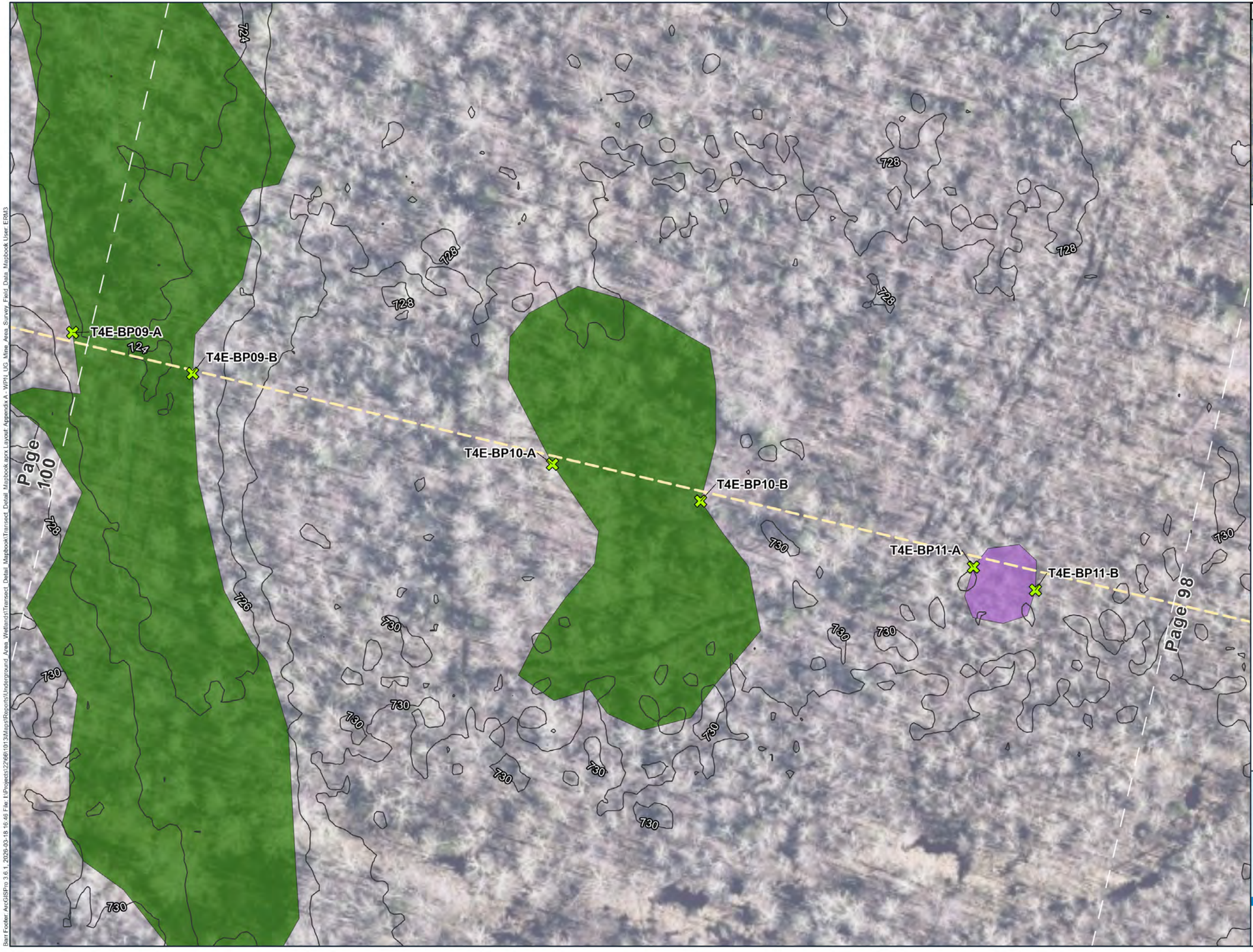
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

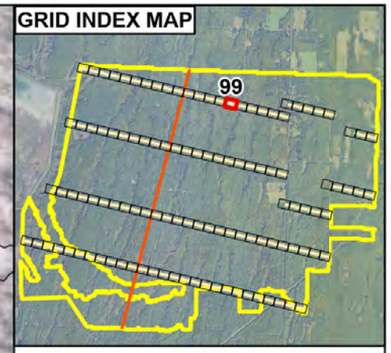
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Northern Hardwood Swamp
- Other - Excavated/ Compacted

0 50 100
Feet

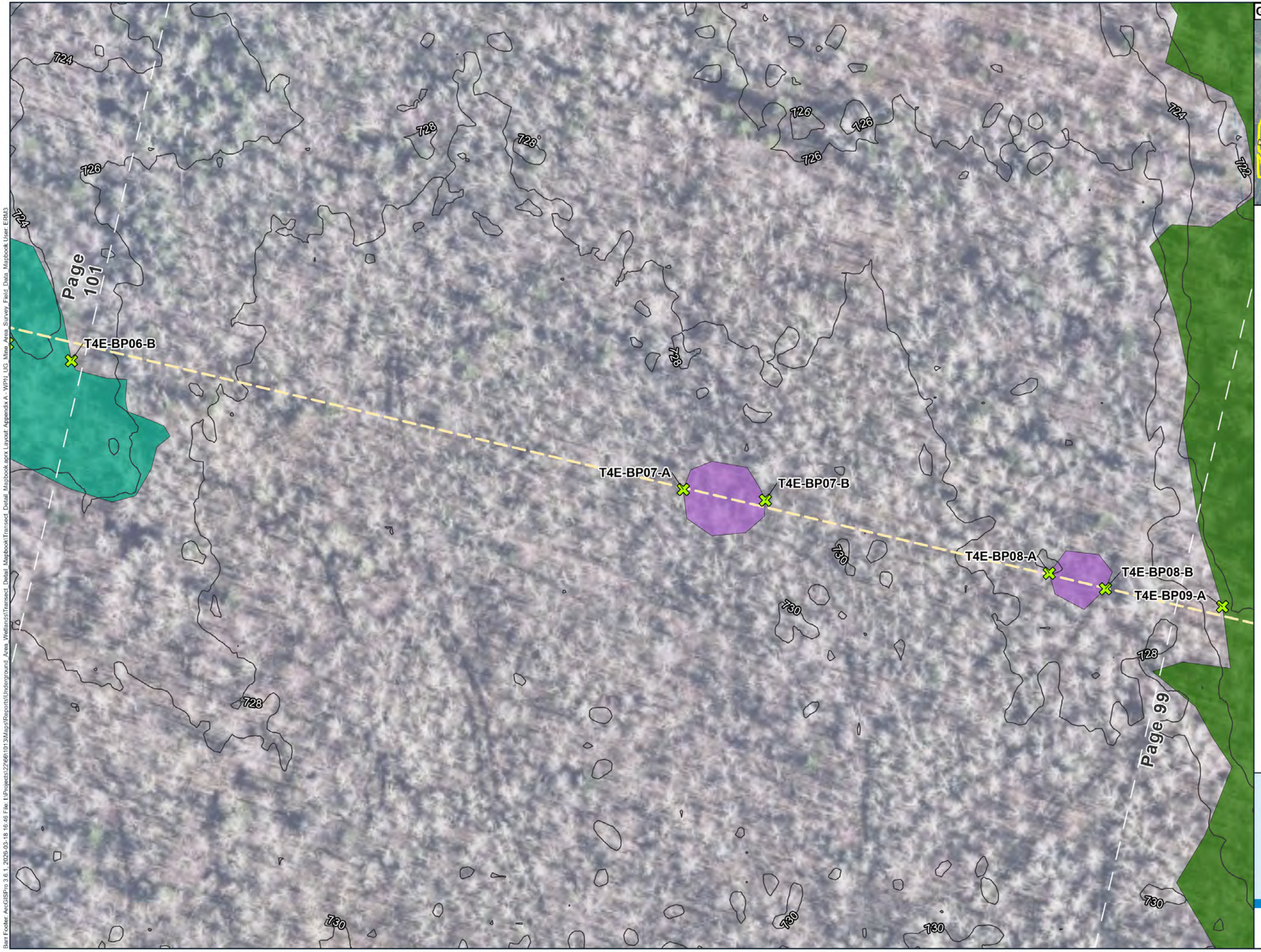
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

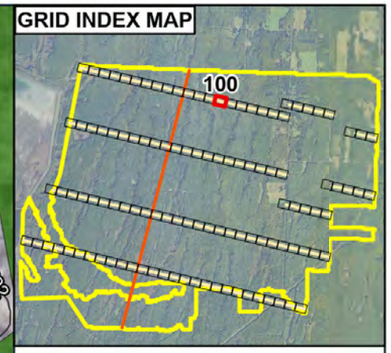
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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour *(2-ft interval)*
Wetland Boundary Point

**Wetlands**

Northern Hardwood Swamp
Other - *P. tremuloides* PFO
Other - Excavated/ Compacted

N

0 50 100
Feet

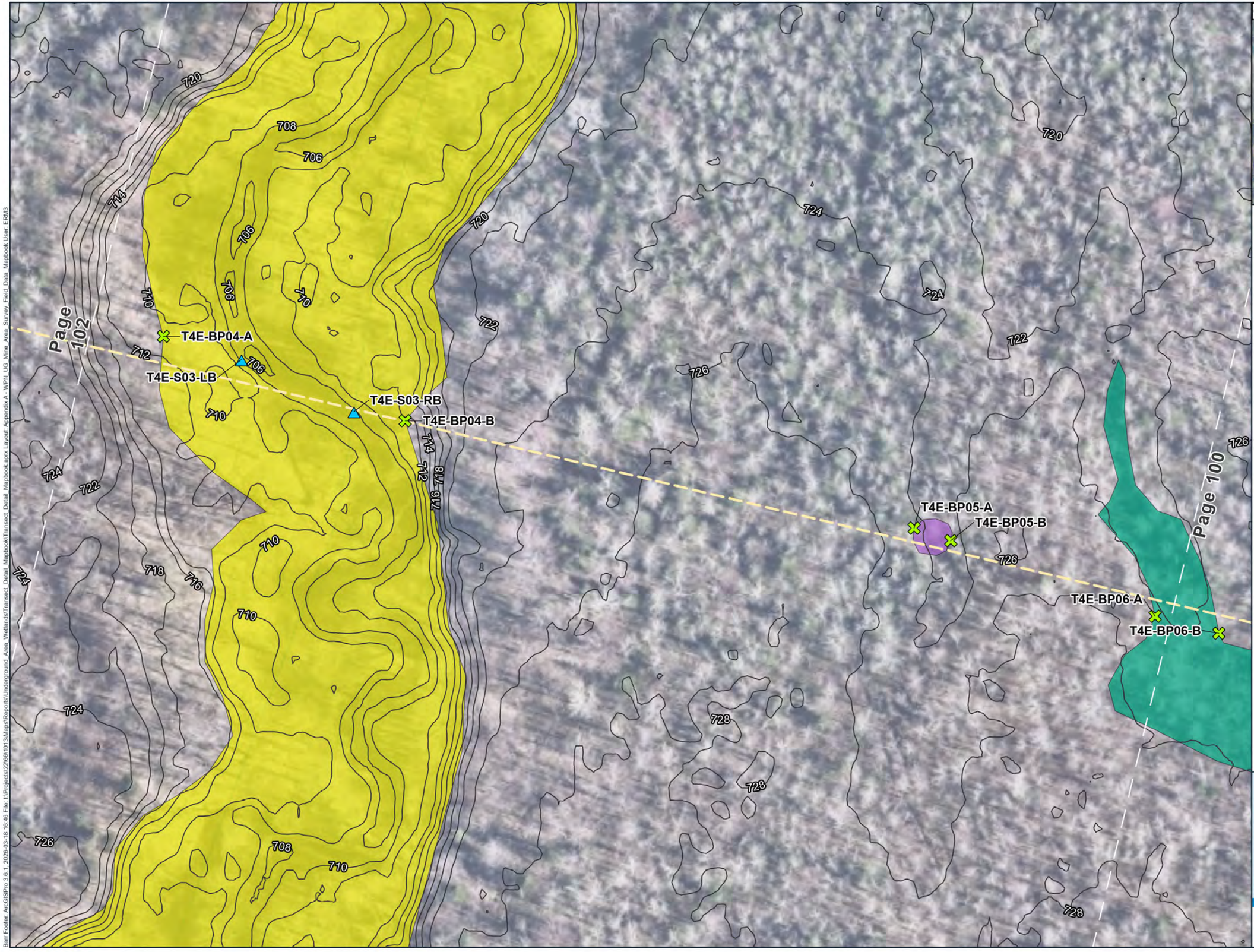
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**Underground Mine Area Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

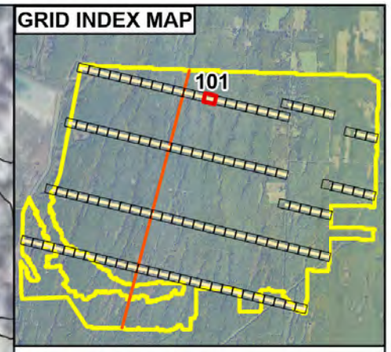
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

0 50 100
Feet

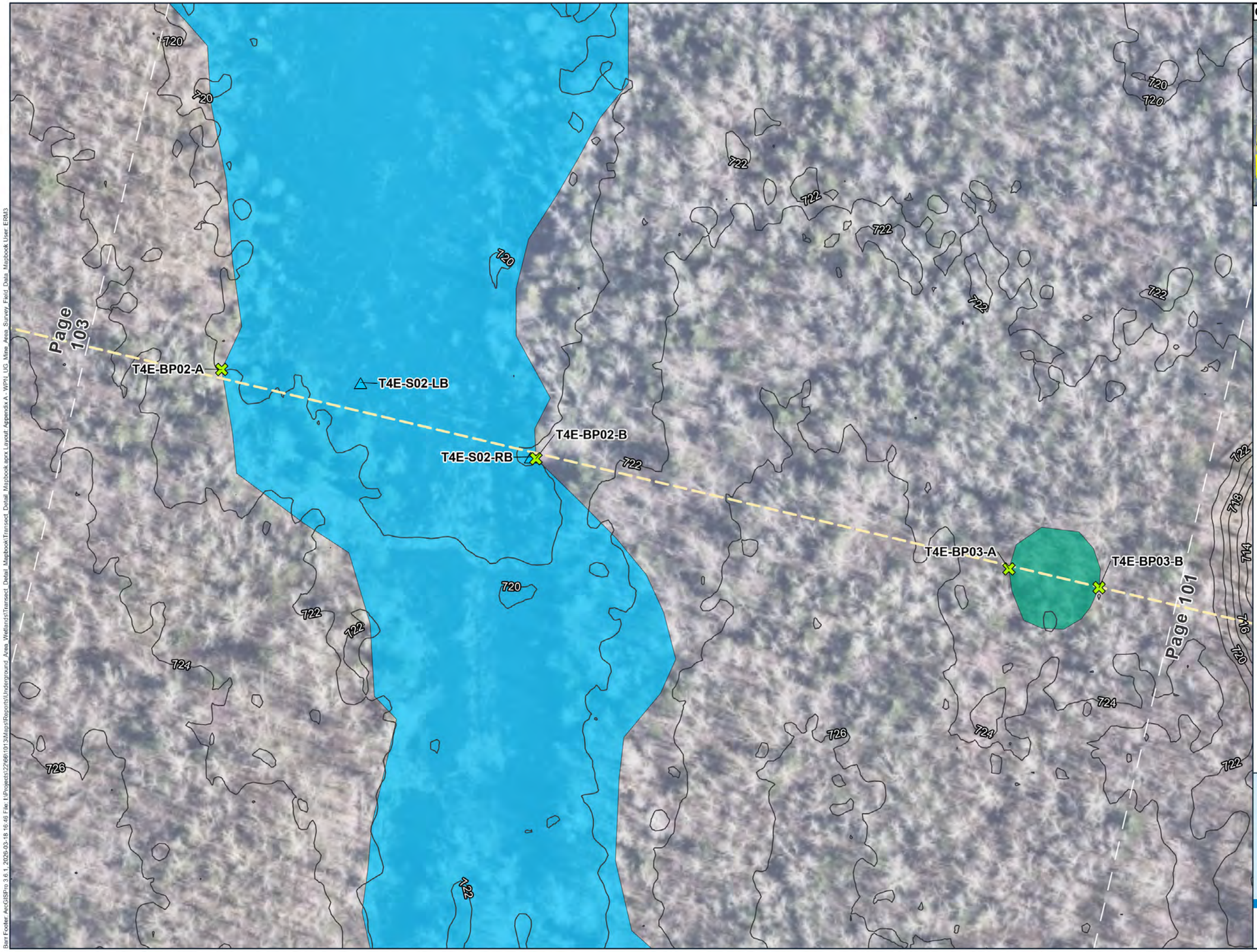
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

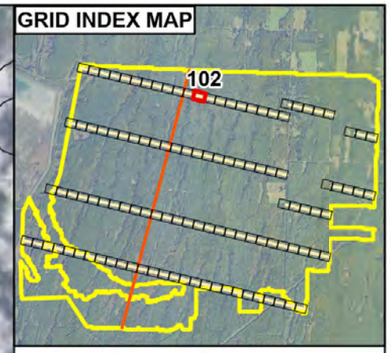
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Other - *P. tremuloides* PFO

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

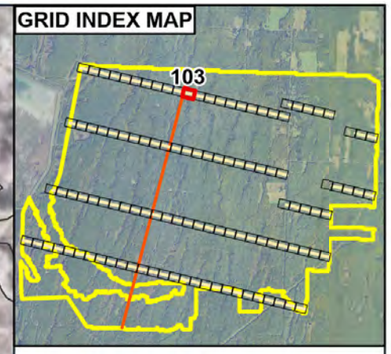
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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp

N

0 50 100
Feet

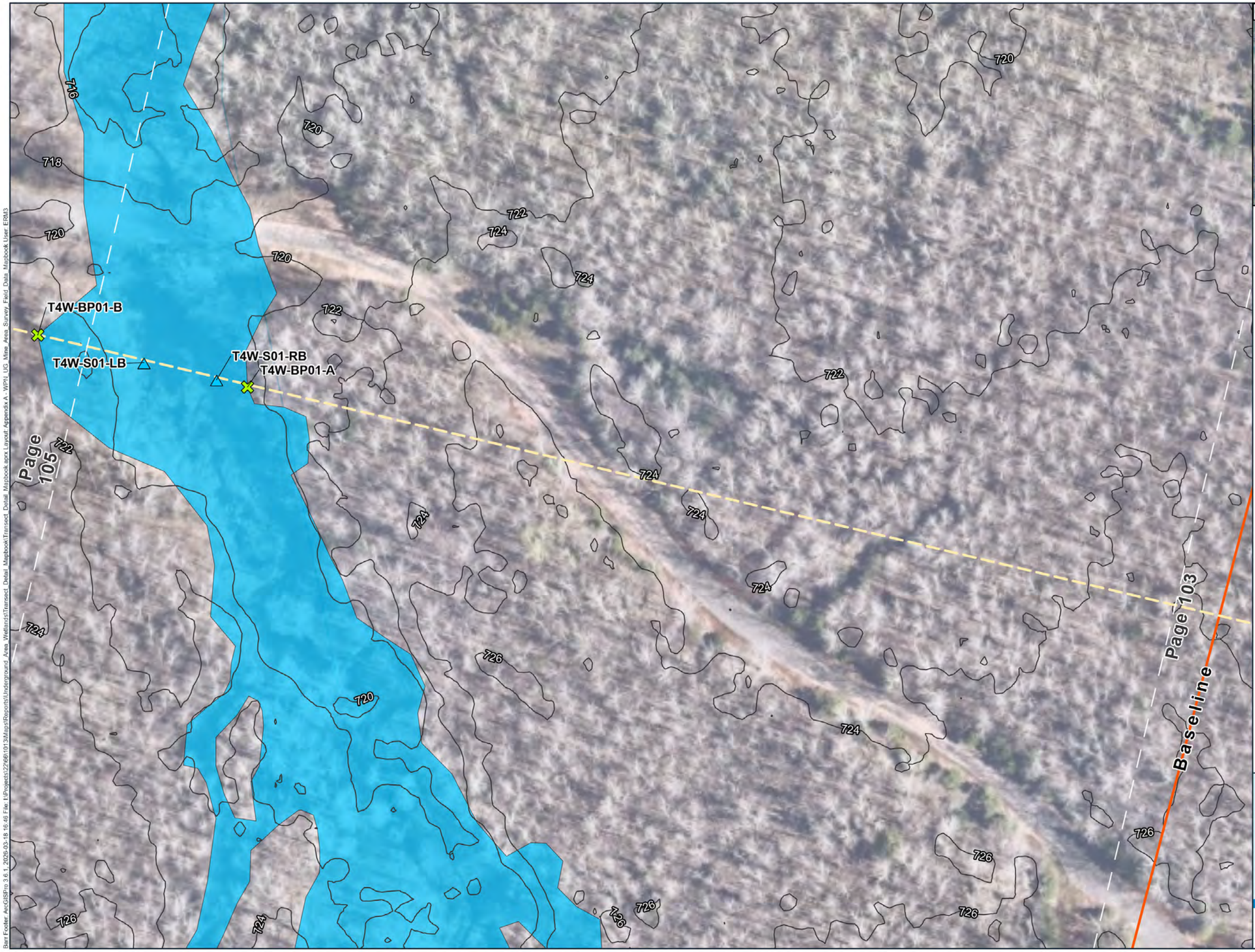
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

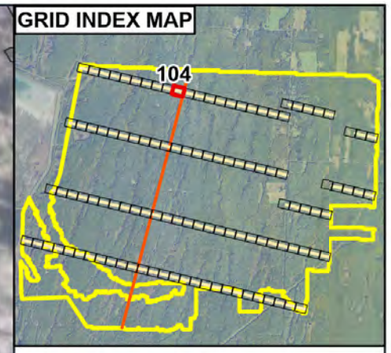
APPENDIX A - PAGE 103

BARR

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

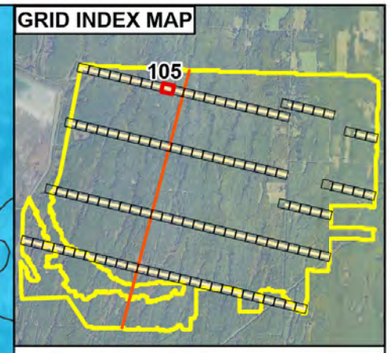
**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENDIX A - PAGE 104

BARR

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GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour
*(2-ft interval)*
Wetland Boundary Point

**Wetlands**

Emergent Marsh
Northern Hardwood Swamp

T4W-BP02-B
T4W-BP02-A
T4W-BP01-B

Page 106
Page 104

Bolo Rd

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

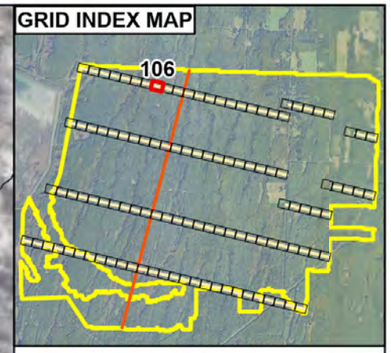
APPENDIX A - PAGE 105

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp

N

0 50 100

Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

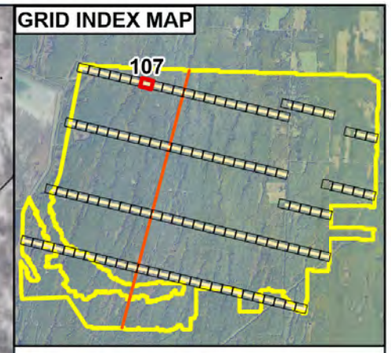
APPENDIX A - PAGE 106

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Emergent Marsh

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

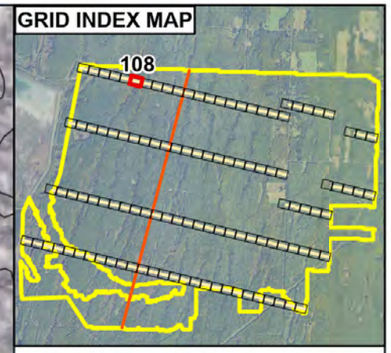
APPENDIX A - PAGE 107

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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

Stream Bank Point

**Wetlands**

Emergent Marsh

Northern Hardwood Swamp

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

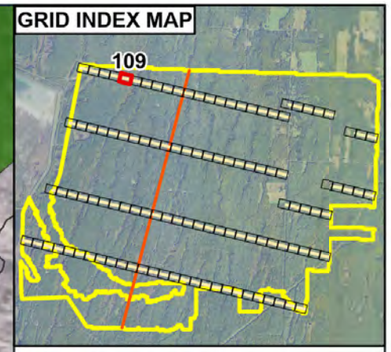
APPENDIX A - PAGE 108

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Boundary Point

**Wetlands**

- Emergent Marsh
- Northern Hardwood Swamp

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

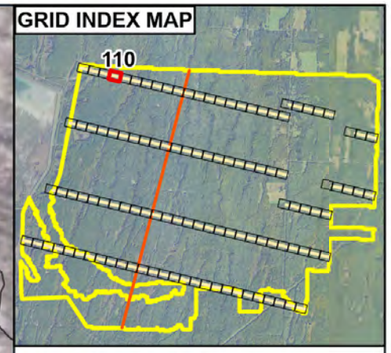
APPENDIX A - PAGE 109

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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

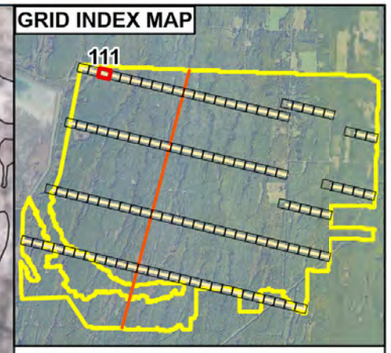
APPENDIX A - PAGE 110

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GRID INDEX MAP




Survey Area

Baseline

Transect

Elevation Contour
*(2-ft interval)*

0 50 100
Feet

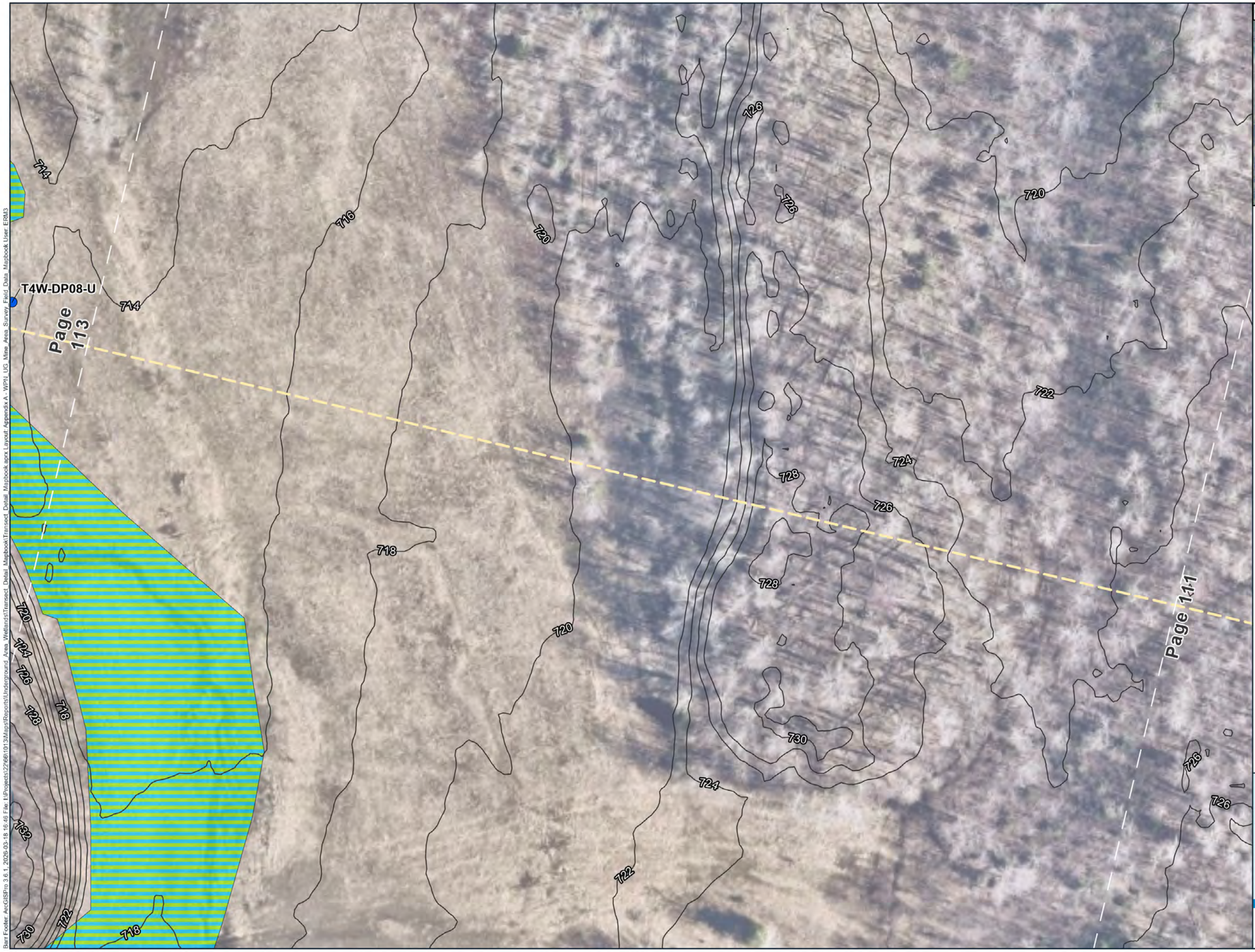
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**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

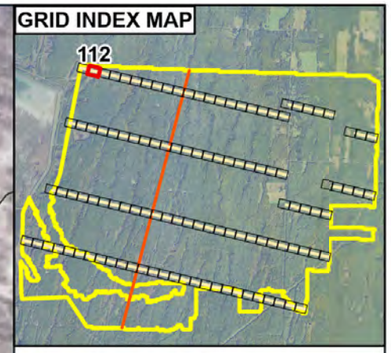
APPENDIX A - PAGE 111

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point

**Wetlands**

- Northern Wet Meadow/ Emergent Marsh

N

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENDIX A - PAGE 112

BARR

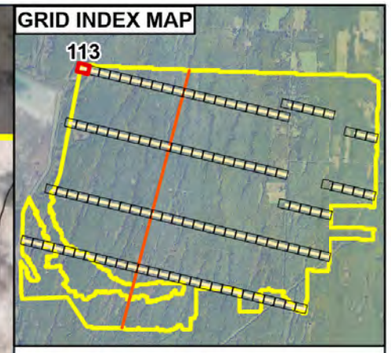
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Outside Survey Area

T4W-S04-LB
T4W-S04-RB
T4W-BP08-B
T4W-DP08-W
T4W-BP08-A
T4W-DP08-U

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(2-ft interval)*
- Wetland Data Point
- Wetland Boundary Point
- Stream Bank Point

**Wetlands**

- Northern Wet Meadow/ Emergent Marsh

0 50 100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Survey Field Data Mapbook**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

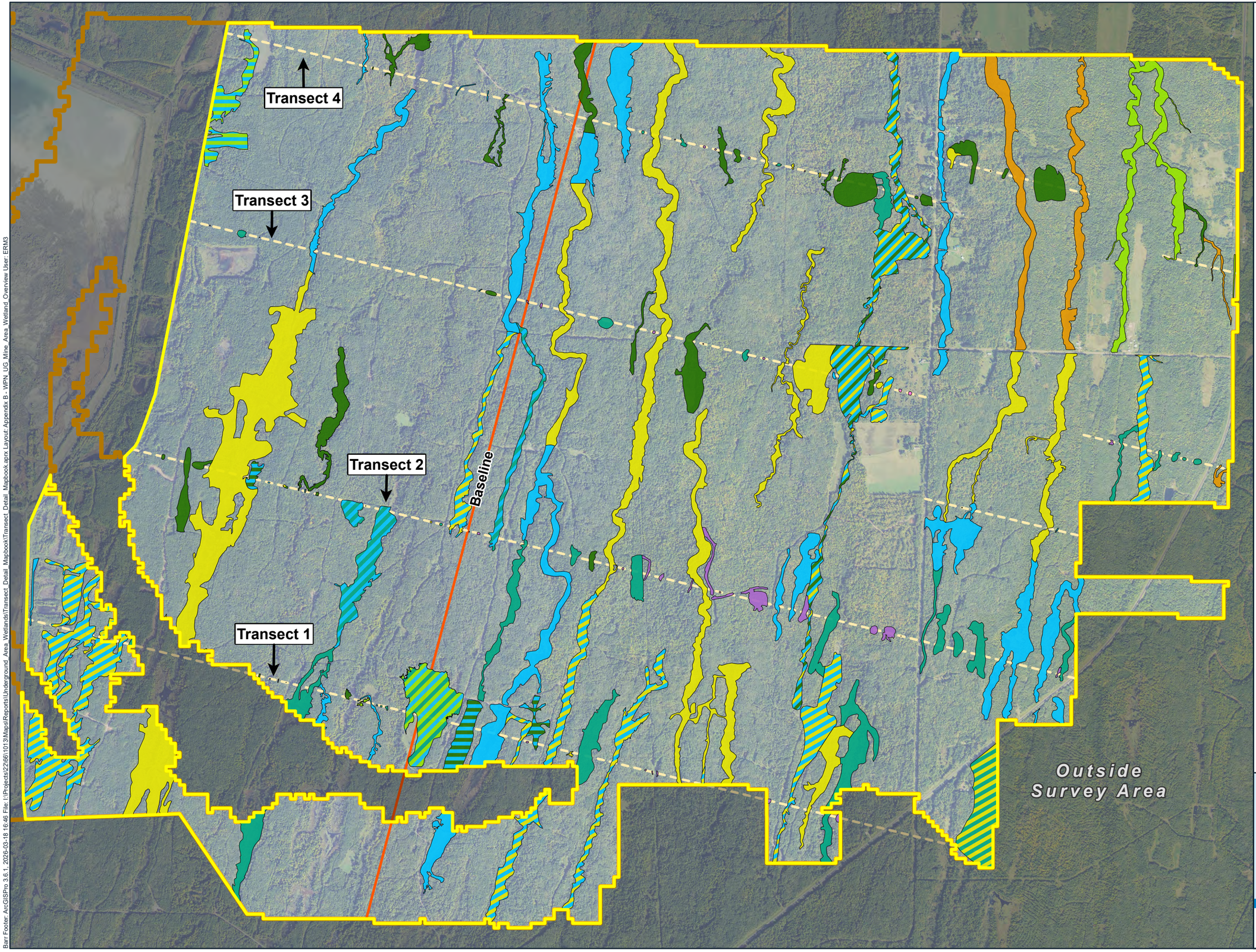
APPENDIX A - PAGE 113

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# Appendix B

## Wetland Maps




Apx. Limit of Underground Mine Area
Survey Area
Baseline
Transect

**Wetlands**

- Floodplain Forest
- Northern Wet Meadow
- Northern Wet Meadow/Other - *P. tremuloides* PFO/Emergent Marsh
- Northern Wet Meadow/ Emergent Marsh
- Emergent Marsh
- Emergent Marsh//Other - *P. tremuloides* PFO
- Emergent Marsh/Northern Hardwood Swamp
- Emergent Marsh/Northern Shrub Thicket
- Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Hardwood Swamp/ Northern Shrub Thicket
- Northern Shrub Thicket
- Northern Shrub Thicket/Other - *P. tremuloides* PFO
- Other - *P. tremuloides* PFO
- Other - Excavated/Compacted
- Southern Shrub Carr

N

0 1,600 3,200
Feet

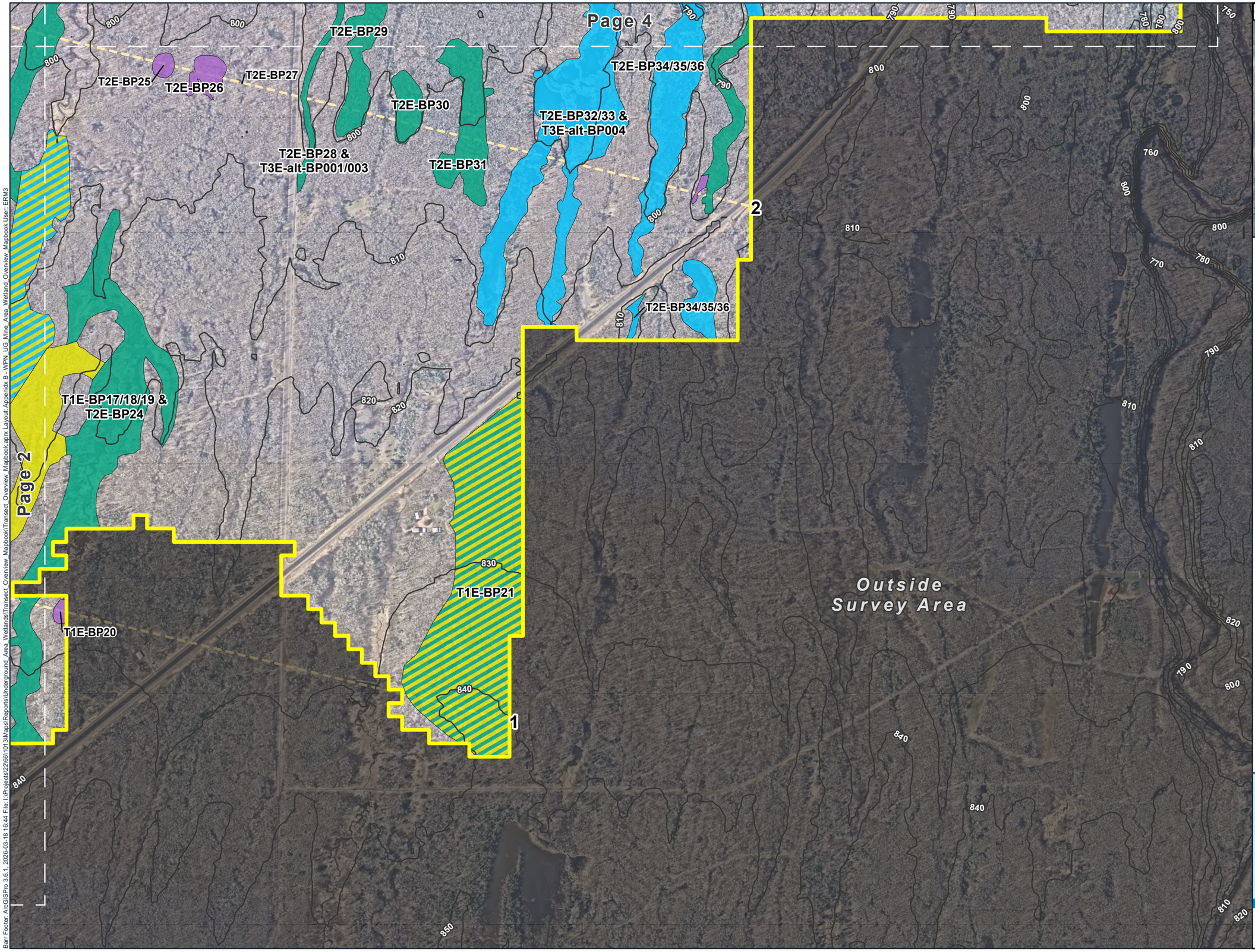
Imagery: USDA NAIP 2024

**Underground Mine Area Wetland Overview**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

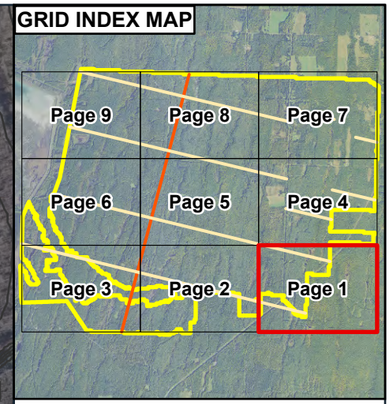
APPENDIX B

BARR

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(10-ft interval)*

**Wetlands**

- Emergent Marsh
- Emergent Marsh/Northern Shrub Thicket
- Northern Shrub Thicket
- Northern Shrub Thicket/ Other - *P. tremuloides* PFO
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 550 1,100
Feet

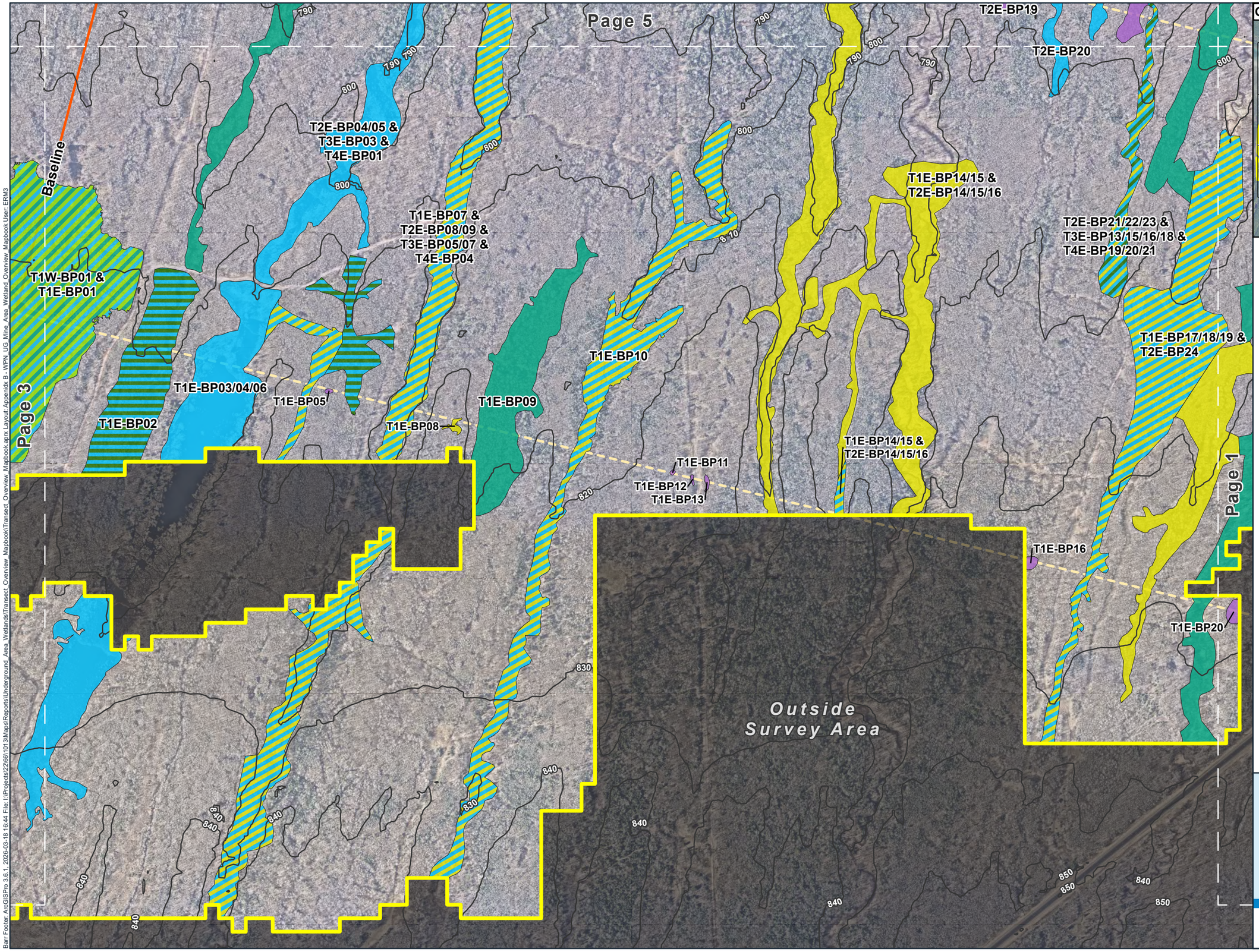
Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 1

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-03-18 16:44, File: I:\Projects\23266\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Overview_Mapbook\Transect_Overview_Mapbook.aprx, Layout: Appenidx B - WPN_UG_Mine_Area_Wetland_Overview_Mapbook, User: ERM3






- Survey Area
- Baseline
- Transect
- Elevation Contour *(10-ft interval)*

**Wetlands**

- Northern Wet Meadow/Other - *P. tremuloides* PFO/ Emergent Marsh
- Emergent Marsh
- Emergent Marsh/Northern Hardwood Swamp
- Emergent Marsh/Northern Shrub Thicket
- Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 550 1,100
Feet

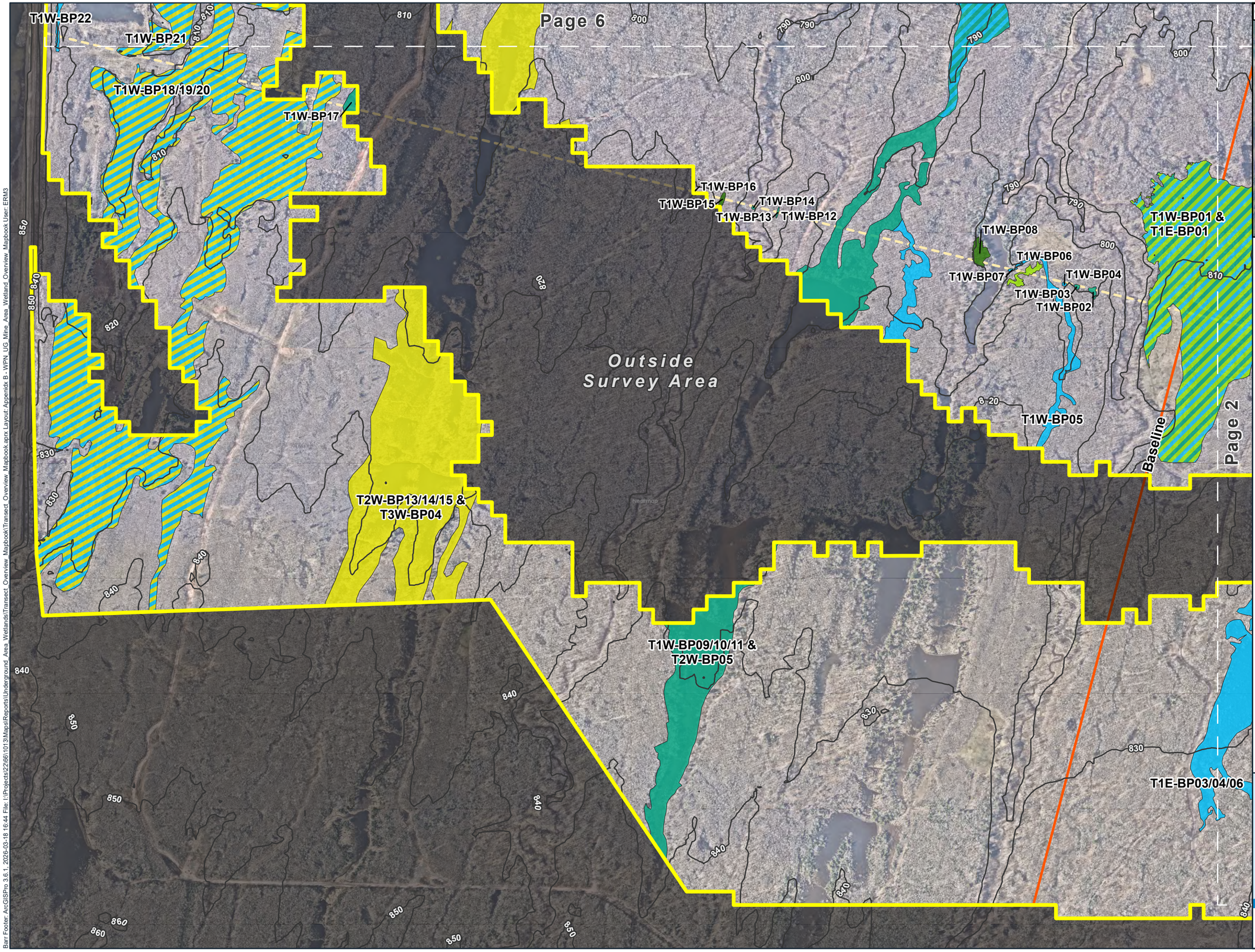
Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 2

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-03-18 16:44 File: I:\Projects\23\666\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Overview_Mapbook\Transect_Overview_Mapbook.aprx Layout: Appendix B - WPN_UG_Mine_Area_Wetland_Overview_Mapbook User: ERM3






- Survey Area
- Baseline
- Transect
- Elevation Contour *(10-ft interval)*

**Wetlands**

- Northern Wet Meadow
- Northern Wet Meadow/Other - *P. tremuloides* PFO/ Emergent Marsh
- Emergent Marsh
- Emergent Marsh//Other - *P. tremuloides* PFO
- Emergent Marsh/Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

N

0 550 1,100
Feet

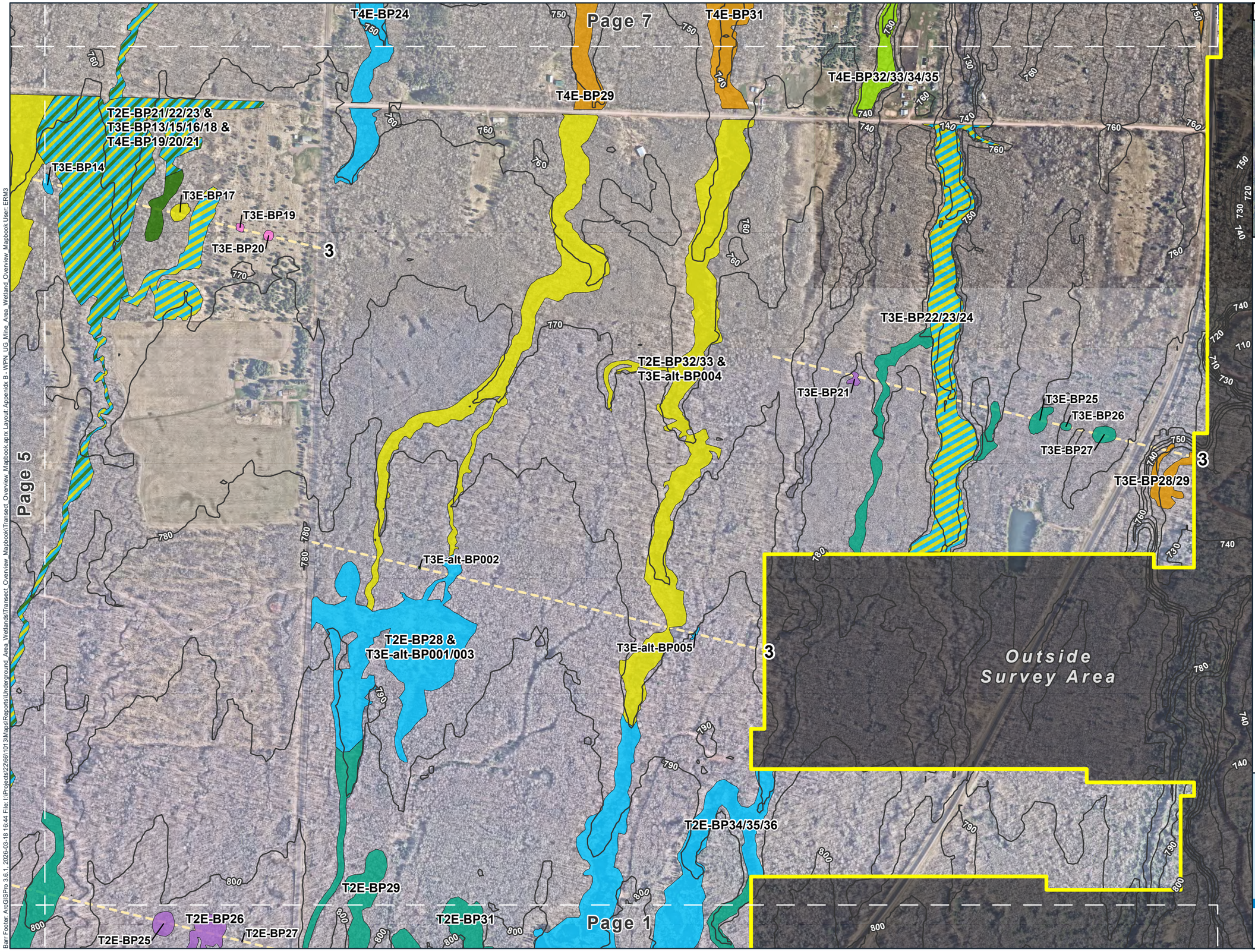
Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 3

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-03-18 16:44 File: I:\Projects\23266\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Overview_Mapbook\Transect_Overview_Mapbook.aprx Layout: Appenidx B - WPN_UG_Mine_Area_Wetland_Overview_Mapbook User: ERM3






- Survey Area
- Baseline
- Transect
- Elevation Contour *(10-ft interval)*

**Wetlands**

- Floodplain Forest
- Northern Wet Meadow
- Emergent Marsh
- Emergent Marsh/Northern Shrub Thicket
- Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted
- Southern Shrub Carr

0 550 1,100
Feet

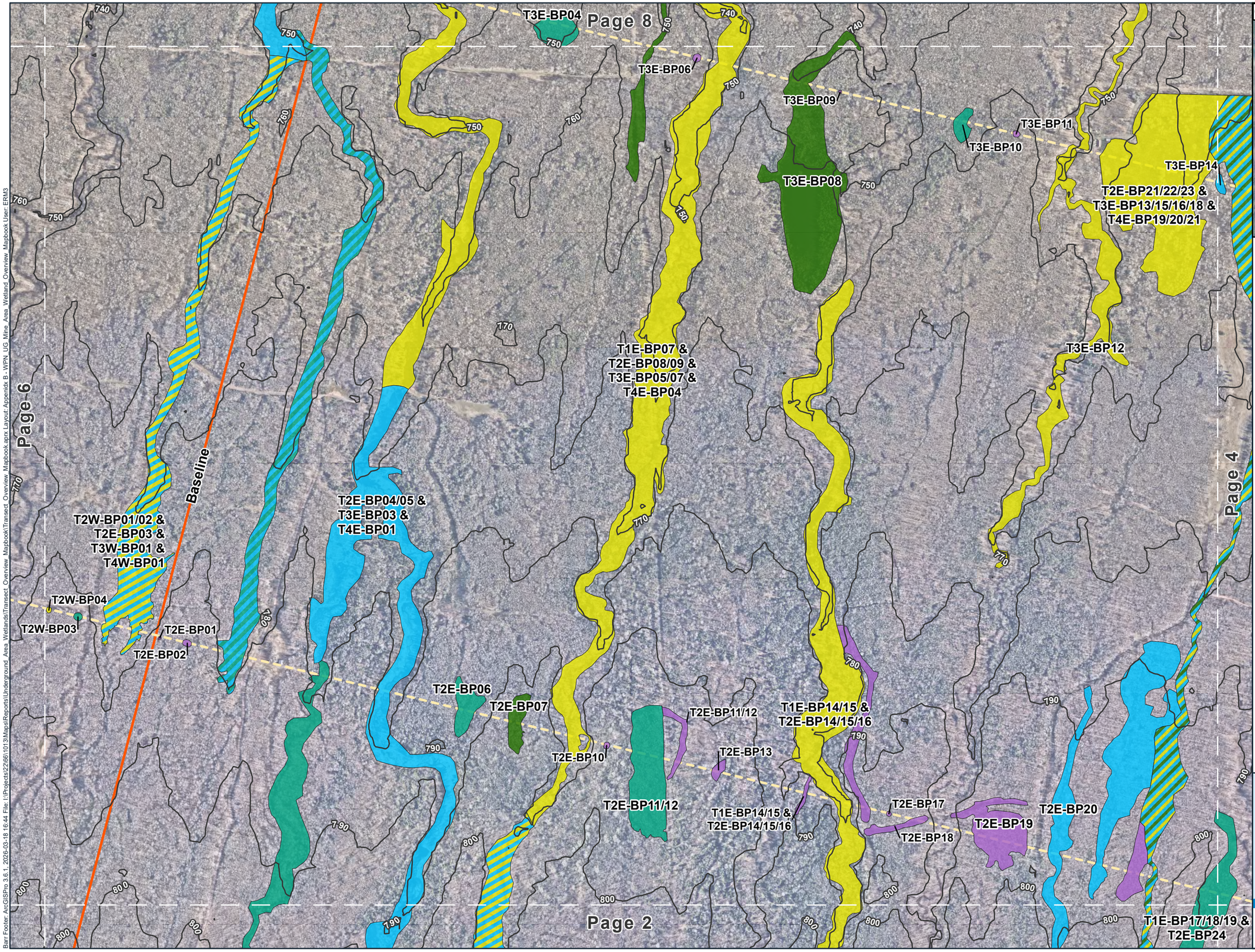
Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 4

BARR

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Survey Area
Baseline
Transect
Elevation Contour
*(10-ft interval)*

**Wetlands**

- Emergent Marsh
- Emergent Marsh//Other - *P. tremuloides* PFO
- Emergent Marsh/Northern Shrub Thicket
- Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO
- Other - Excavated/ Compacted

0 550 1,100
Feet

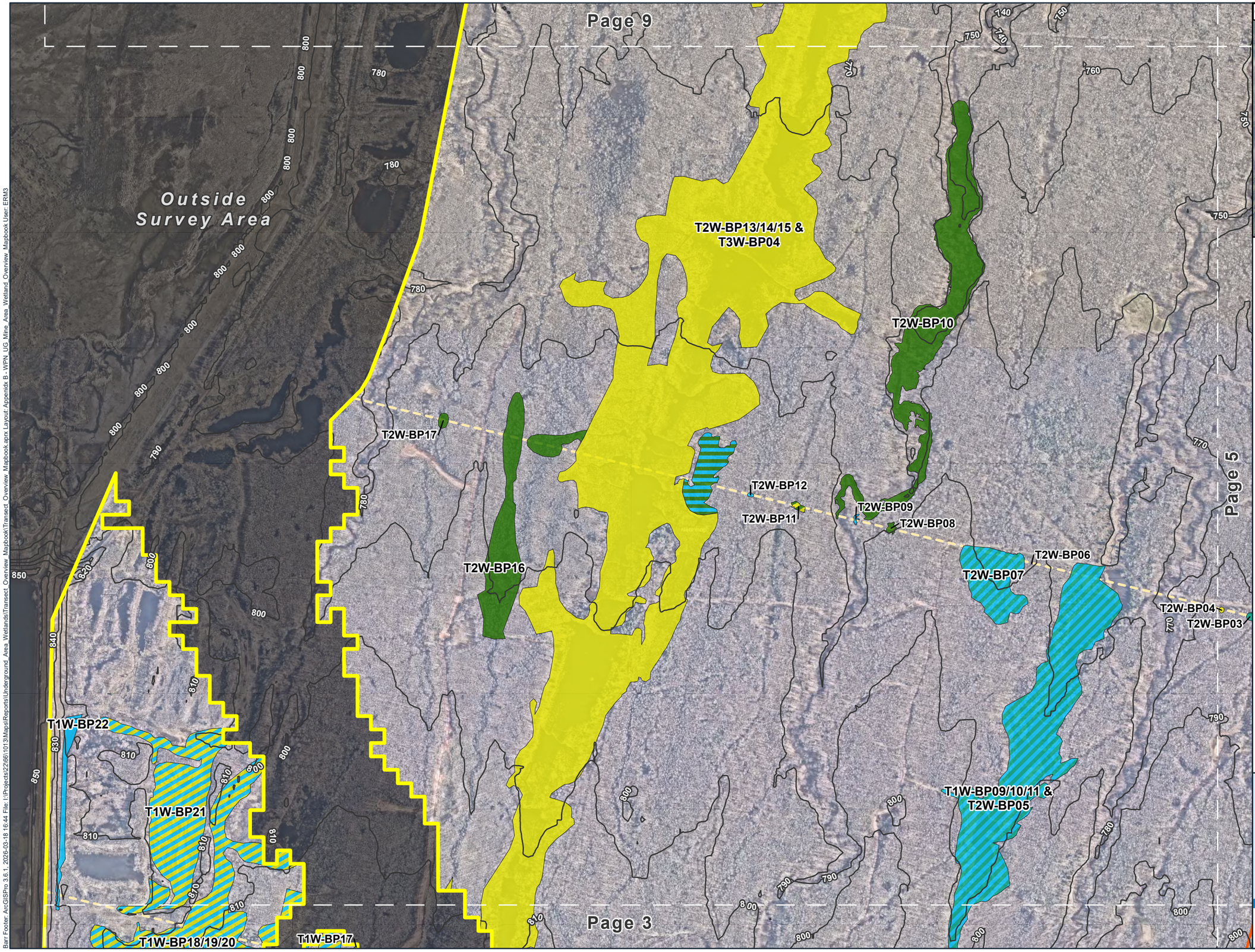
Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

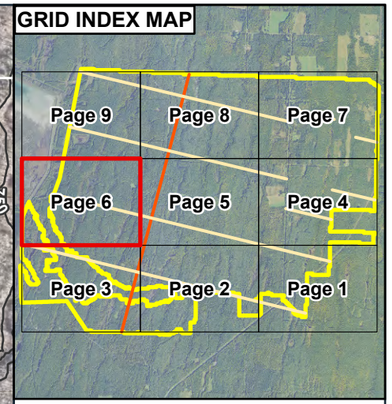
APPENIDX B - PAGE 5

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GRID INDEX MAP




- Survey Area
- Baseline
- Transect
- Elevation Contour *(10-ft interval)*

**Wetlands**

- Emergent Marsh
- Emergent Marsh//Other - *P. tremuloides* PFO
- Emergent Marsh/Northern Hardwood Swamp
- Emergent Marsh/Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Hardwood Swamp/ Northern Shrub Thicket
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO

0 550 1,100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 6

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-03-18 16:44 File: I:\Projects\23266\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Overview_Mapbook\Transect_Overview_Mapbook.aprx Layout: Appendix B - WPN_UG_Mine_Area_Wetland_Overview_Mapbook User: ERM3

Outside Survey Area

T4E-BP29

T4E-BP25/26

T4E-BP18

T4E-BP17

T4E-BP28

T4E-BP27

T4E-BP30

T4E-BP22

T4E-BP23

T2E-BP21/22/23 &
T3E-BP13/15/16/18 &
T4E-BP19/20/21

T4E-BP24

T4E-BP31

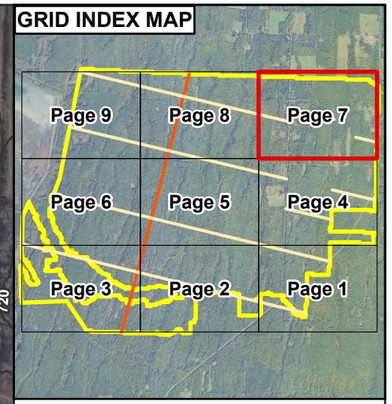
T4E-BP32/33/34/35

T4E-BP36

Page 8

Page 4

4




Survey Area
Baseline
Transect
Elevation Contour
*(10-ft interval)*

**Wetlands**

- Floodplain Forest
- Northern Wet Meadow
- Emergent Marsh
- Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket
- Northern Hardwood Swamp
- Northern Shrub Thicket
- Other - *P. tremuloides* PFO

N

0 550 1,100
Feet

Imagery: Nearmap 4/30/2025

**Underground Mine Area**
**Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 7

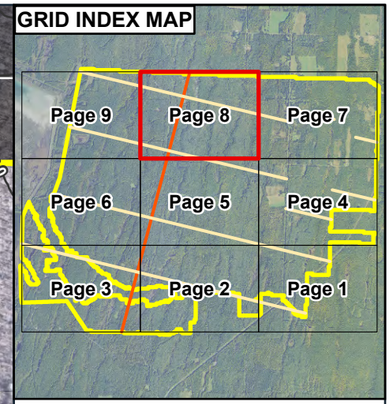
BARR

Barr Footer: ArcGISPro 3.6.1 2026-03-18 16:44 File: I:\Projects\22\66\i013\Maps\Reports\Underground_Area_Wetlands\Transect_Overview_Mapbook\Transect_Overview_Mapbook.aprx Layout: Appendix B - WPN_UG_Mine_Area_Wetland_Overview_Mapbook User: ERM3

Outside Survey Area

T4W-BP05
T4W-BP04
T4W-BP03
T4W-BP02
T4E-BP02
T4E-BP03
T4E-BP05
T4E-BP06
T4E-BP07
T4E-BP08
T4E-BP09
T4E-BP10
T4E-BP11
T4E-BP12
T4E-BP13
T4E-BP14
T4E-BP15
T4E-BP16
T4E-BP17
T4E-BP18
T1E-BP07 & T2E-BP08/09 & T3E-BP05/07 & T4E-BP04
T2W-BP01/02 & T2E-BP03 & T3W-BP01 & T4W-BP01
T2E-BP04/05 & T3E-BP03 & T4E-BP01
T3W-BP03
T3W-BP02
T3E-BP01
T3E-BP02
T3E-BP04
T3E-BP06
T3E-BP08
T3E-BP12
Baseline
Page 9
Page 5
Page 7

GRID INDEX MAP




Survey Area
Baseline
Transect
Elevation Contour *(10-ft interval)*

**Wetlands**

Emergent Marsh
Emergent Marsh//Other - *P. tremuloides* PFO
Emergent Marsh/Northern Shrub Thicket
Northern Hardwood Swamp
Northern Shrub Thicket
Other - *P. tremuloides* PFO
Other - Excavated/ Compacted

0 550 1,100
Feet

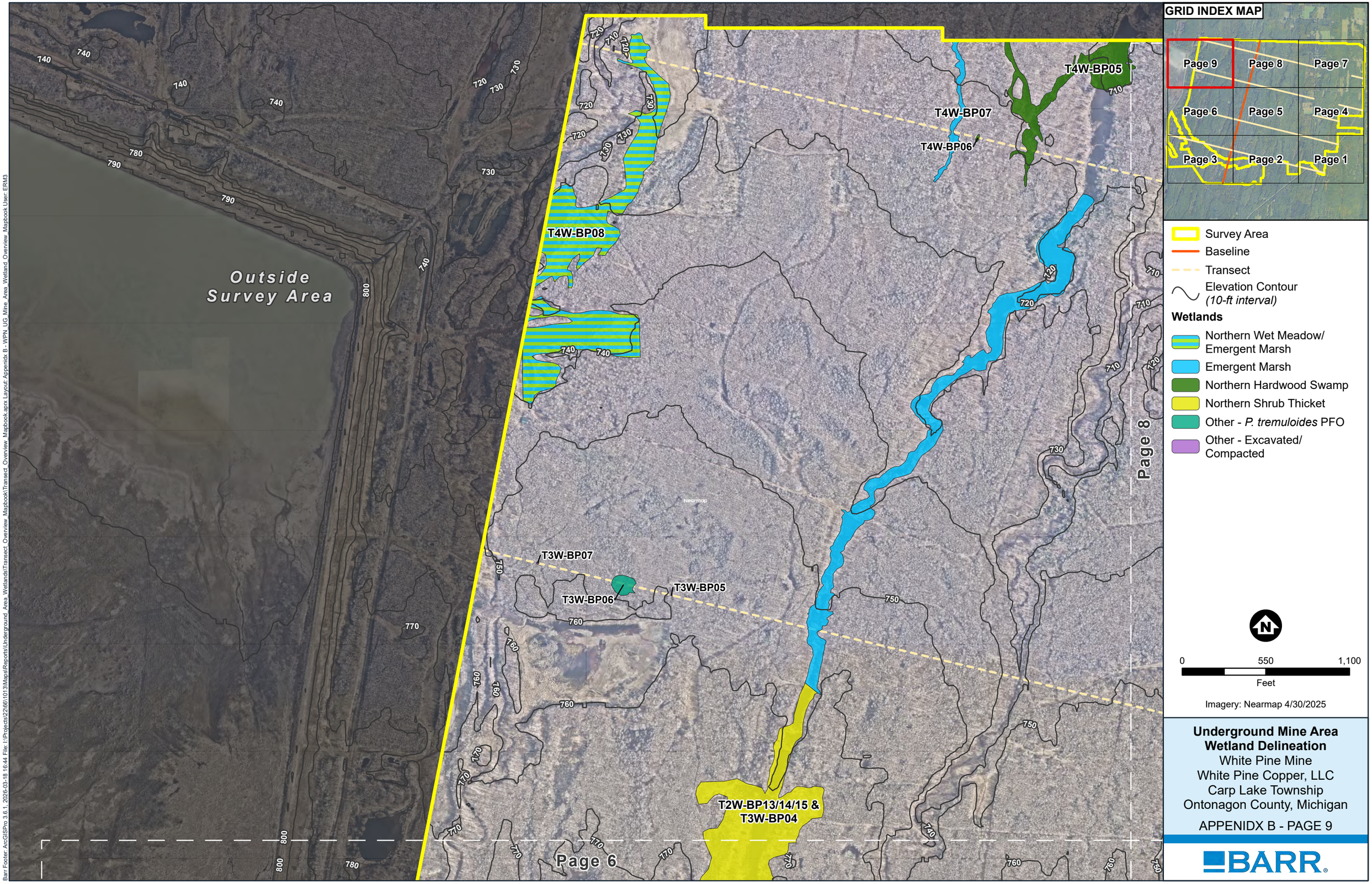
Imagery: Nearmap 4/30/2025

**Underground Mine Area Wetland Delineation**
White Pine Mine
White Pine Copper, LLC
Carp Lake Township
Ontonagon County, Michigan

APPENIDX B - PAGE 8

BARR

Barr Footer: ArcGISPro 3.6.1, 2026-03-18 16:44 File: I:\Projects\22\66\1013\Maps\Reports\Underground_Area_Wetlands\Transect_Overview_Mapbook\Transect_Overview_Mapbook.aprx Layout: Appendix B - WPN_UG_Mine_Area_Wetland_Overview_Mapbook User: ERM3



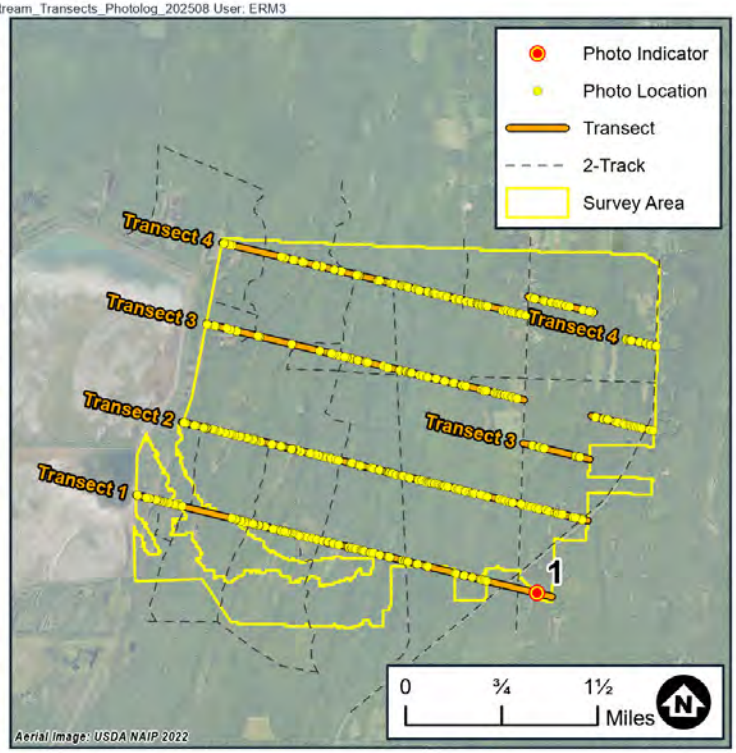

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# Appendix C

## Transect Photo Log

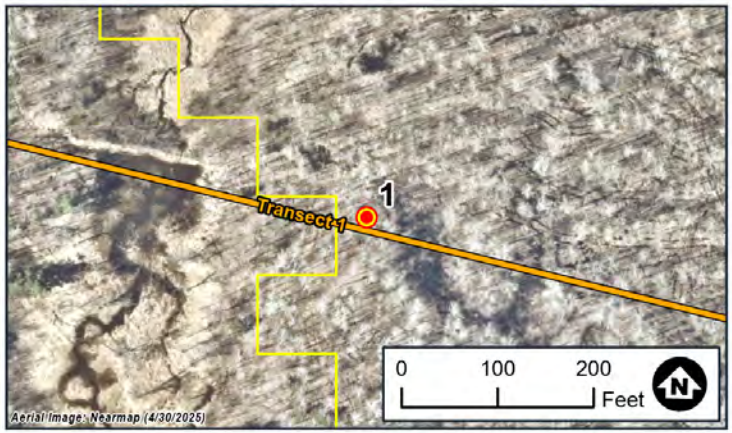
## Photo 1-1






## Photo 1-2







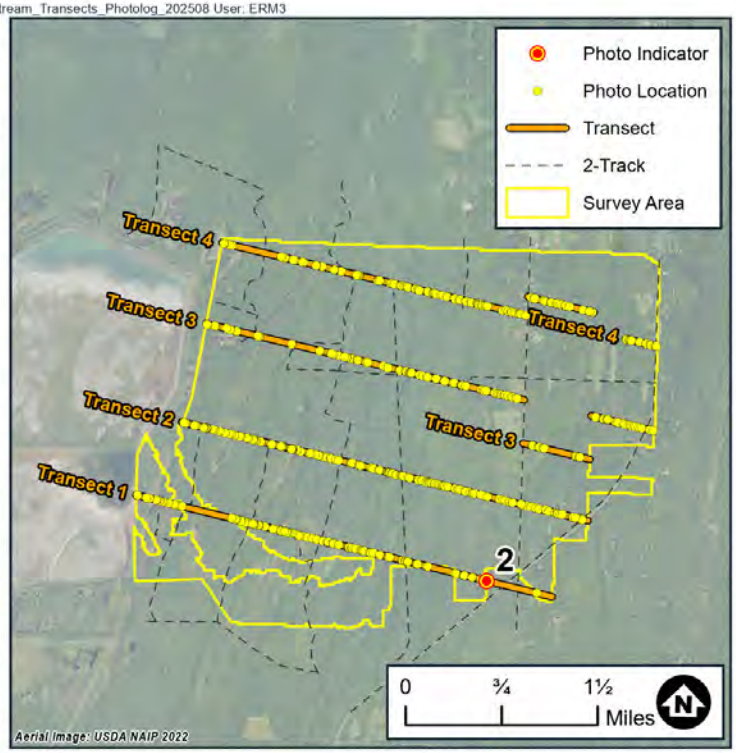

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP21-A, Wetland
**Photo 2 Caption:** T1E-BP21-A, Upland

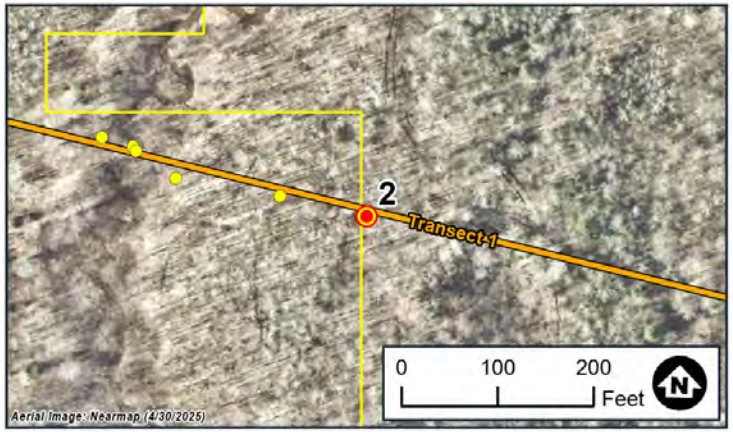
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

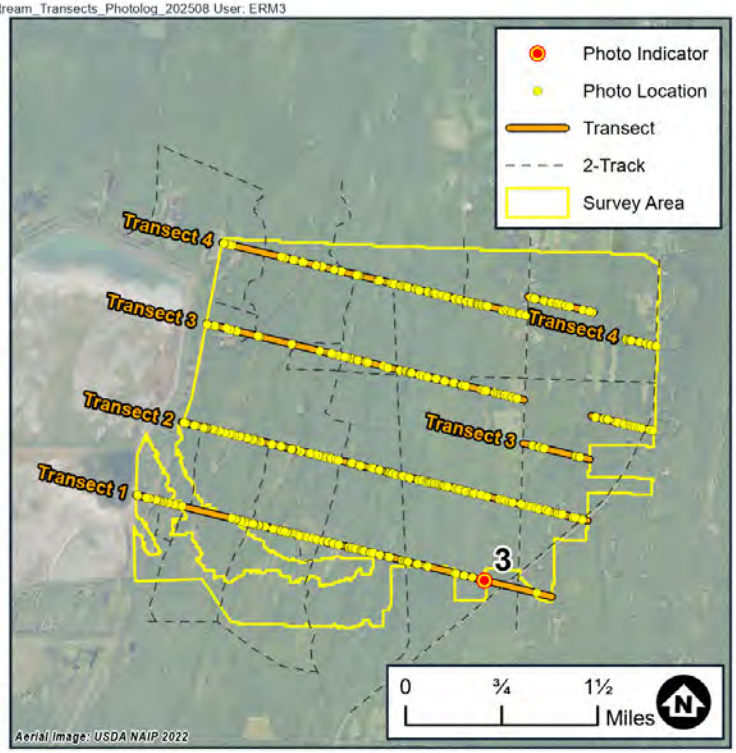
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP20-B Wetland
**Photo 2 Caption:** T1E-BP20-B, Upland

*Note: Photo locations are approximate*

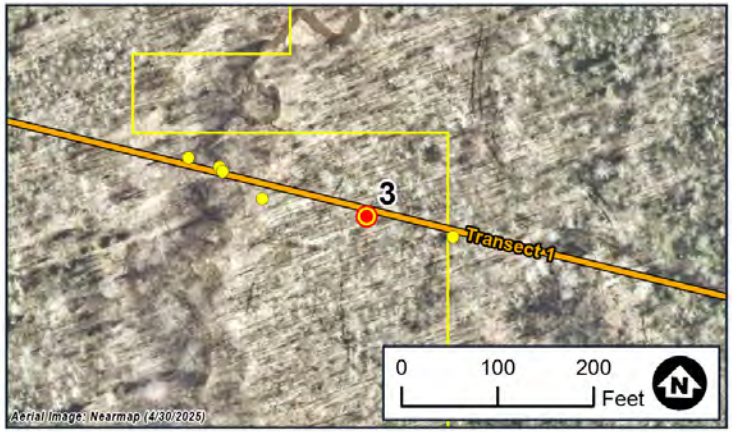
## Photo 3-1






## Photo 3-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

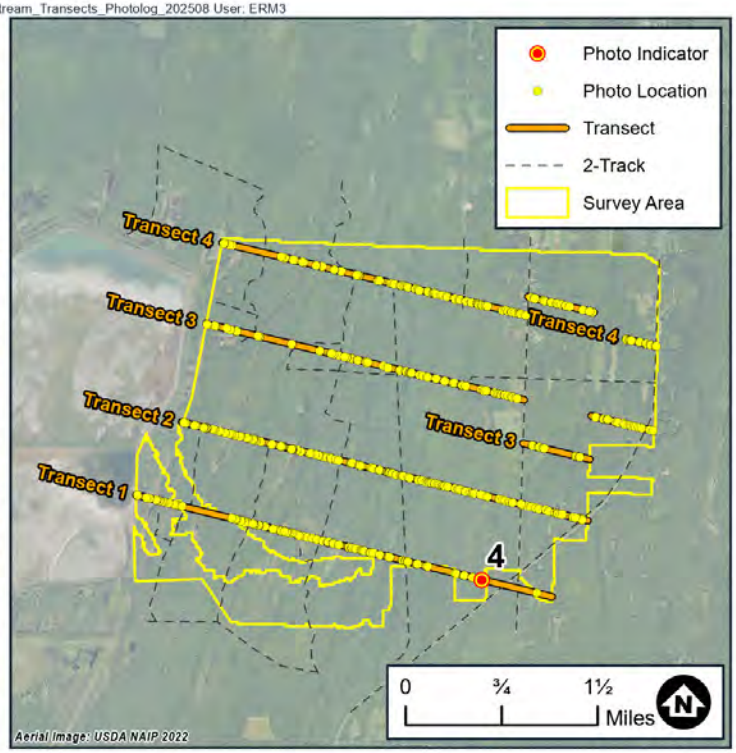
**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP20-A, Wetland
**Photo 2 Caption:** T1E-BP20-A, Upland

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3

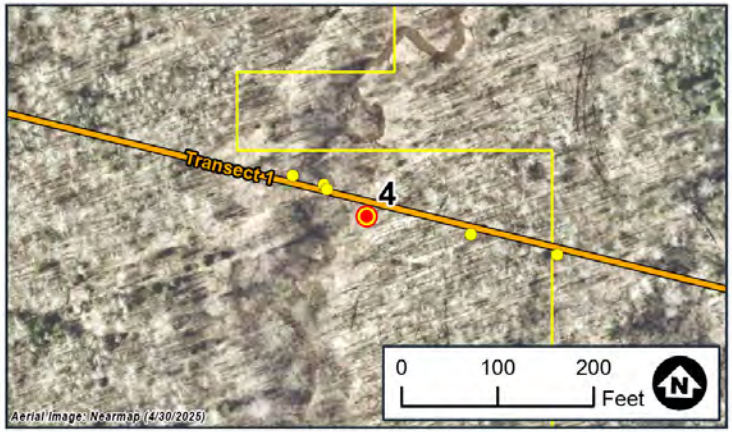
## Photo 4-1






## Photo 4-2







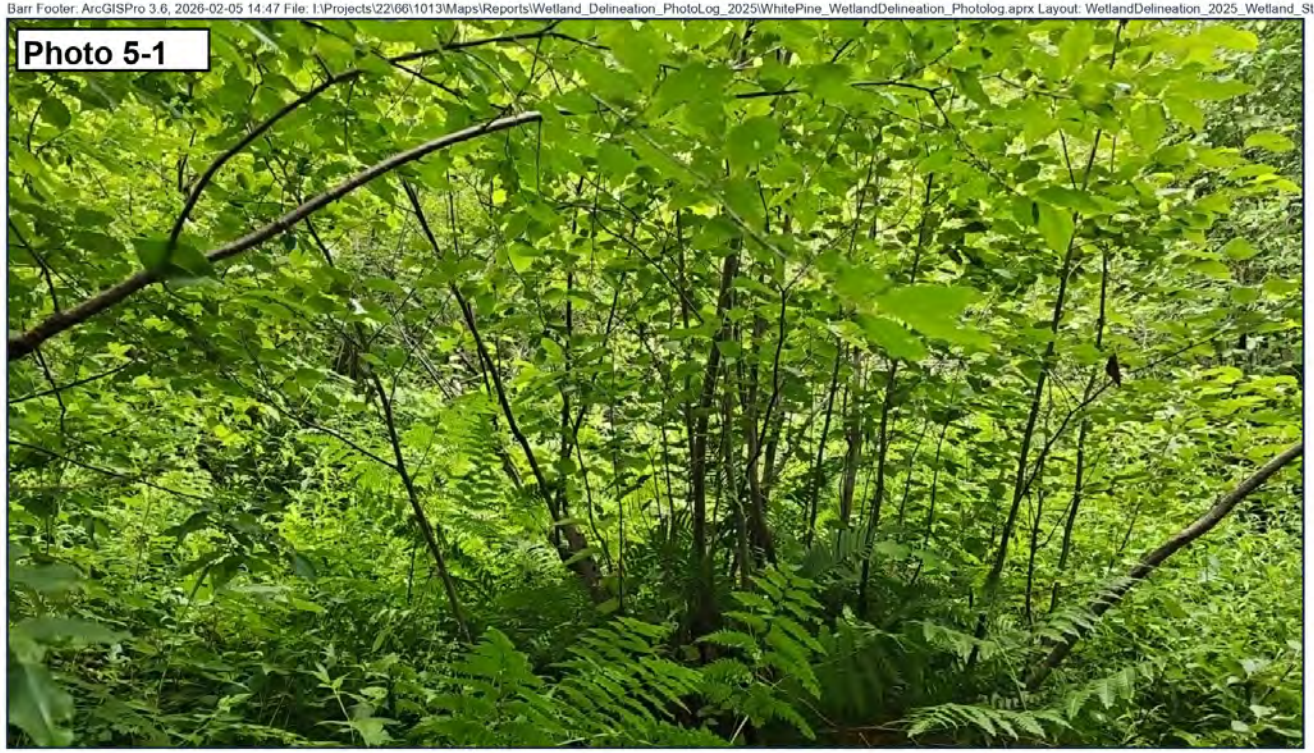

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP19-B, Wetland
**Photo 2 Caption:** T1E-BP19-B Upland

*Note: Photo locations are approximate*

**Photo 5-1**



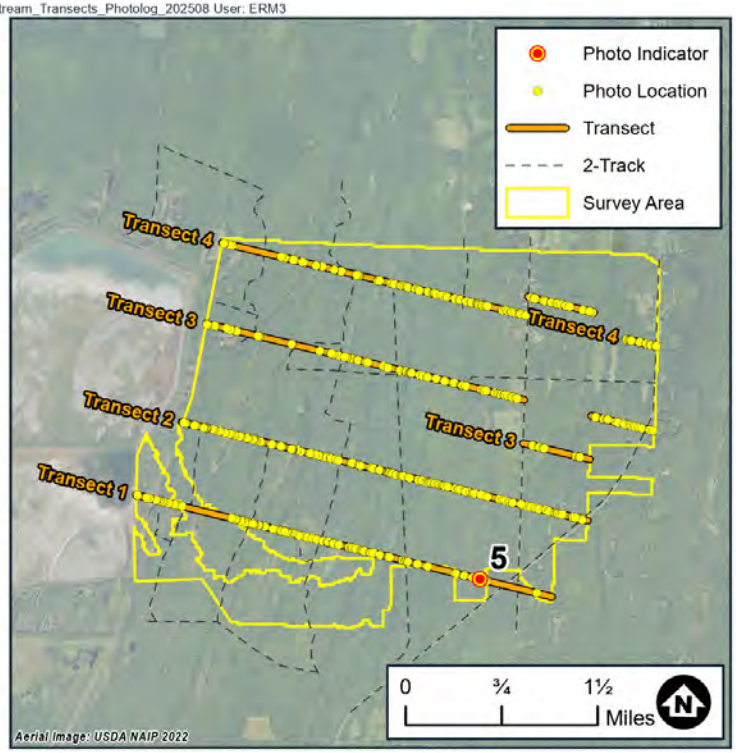
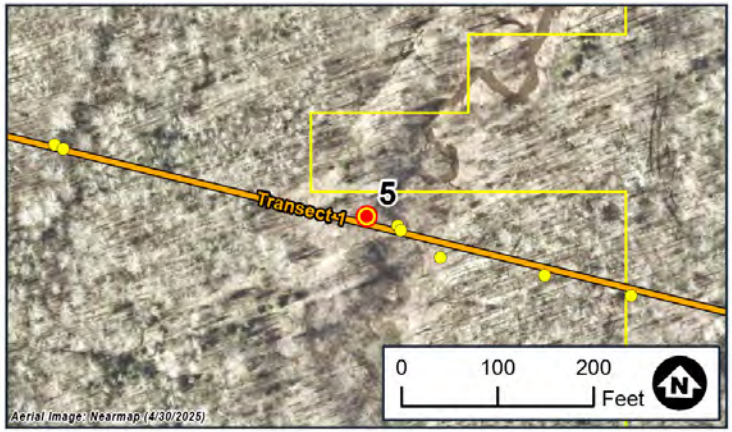



**Photo 5-2**







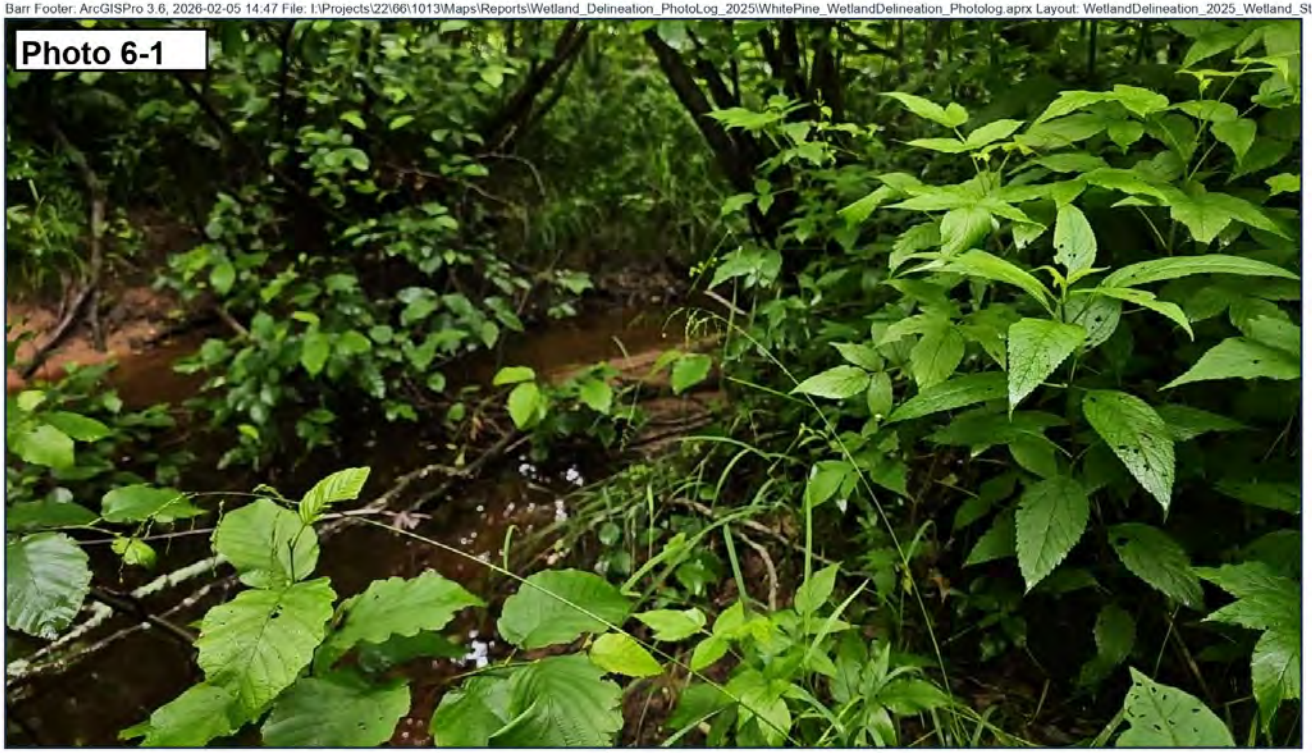

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP19-A, Wetland
**Photo 2 Caption:** T1E-BP19-A, Upland

*Note: Photo locations are approximate*

**Photo 6-1**



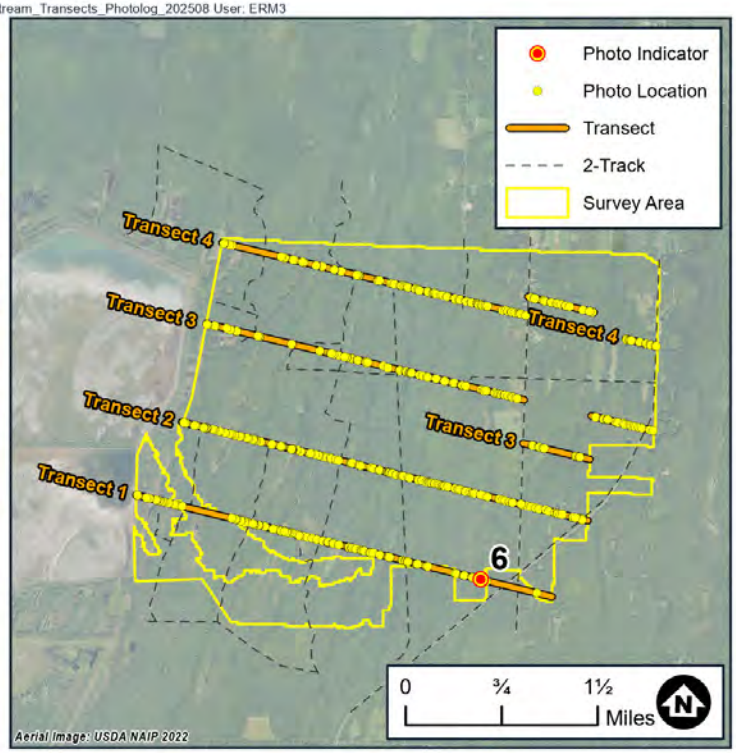
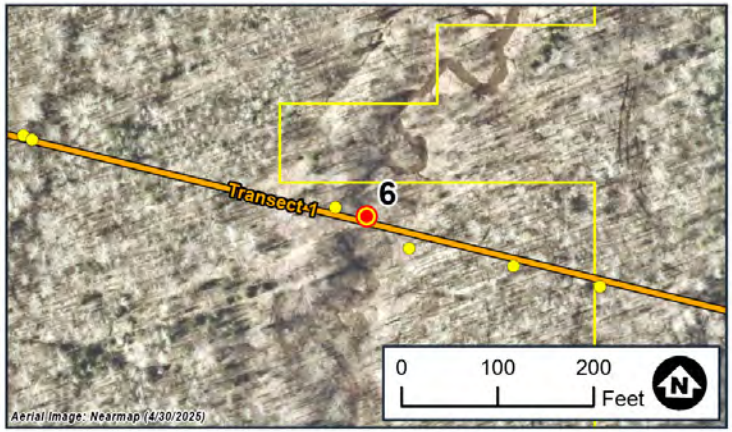



**Photo 6-2**








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

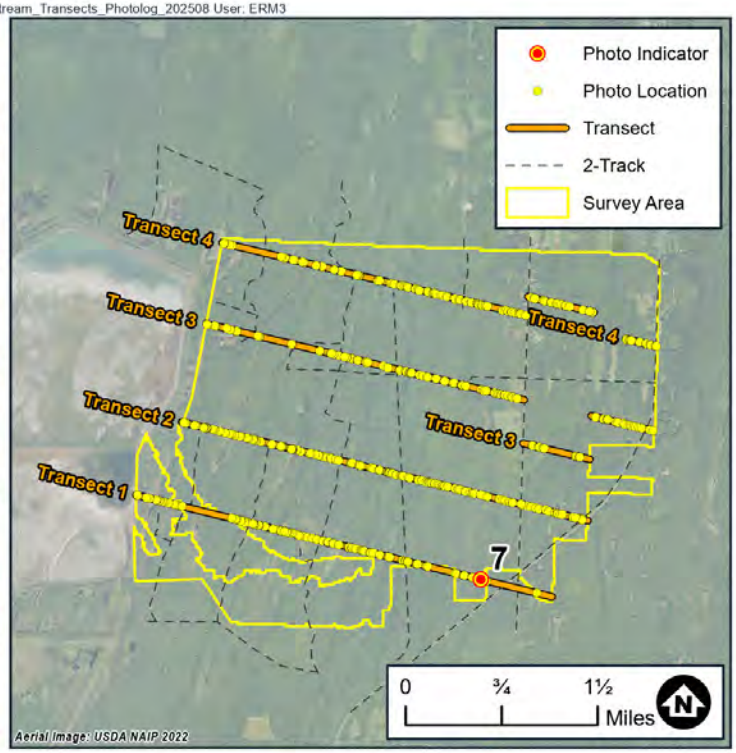
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-S09-LB, Upstream
**Photo 2 Caption:** T1E-S09-LB, Downstream

*Note: Photo locations are approximate*

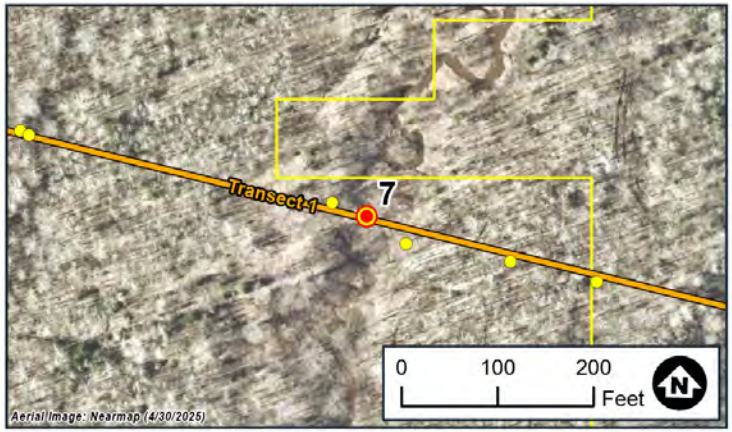
## Photo 7-1






## Photo 7-2





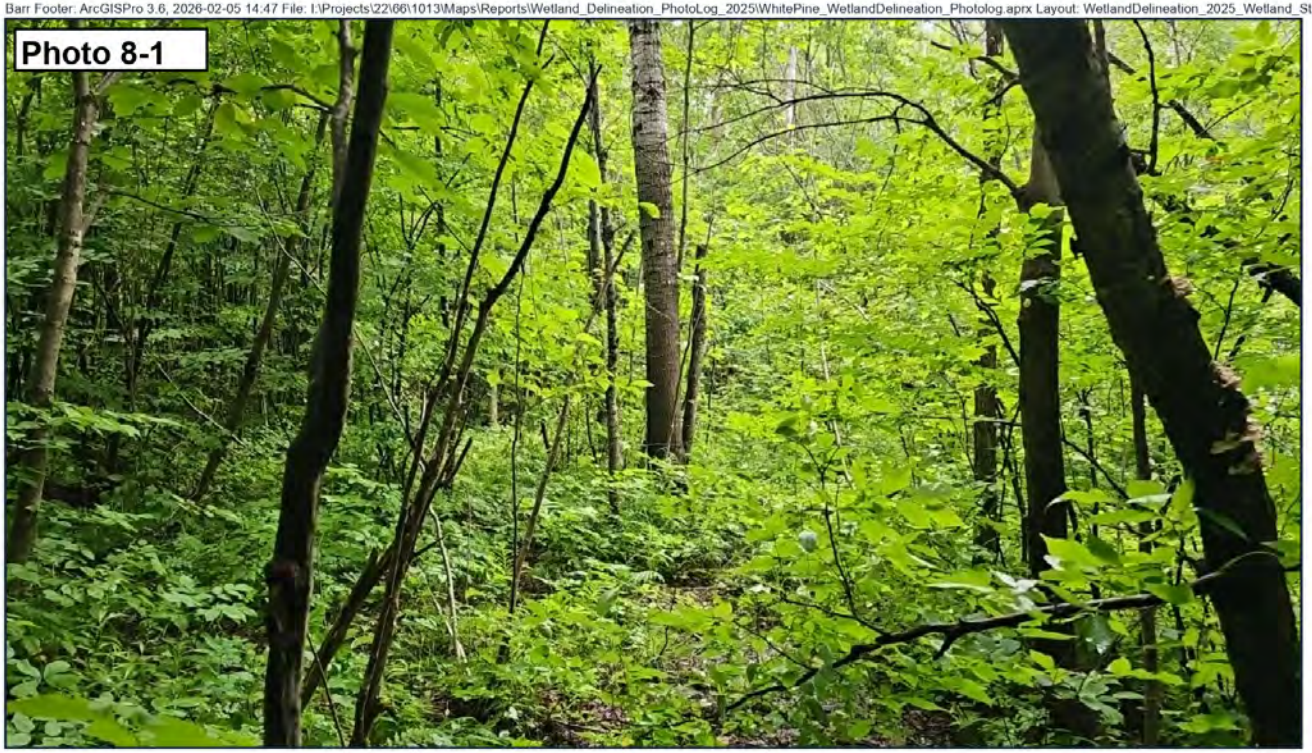


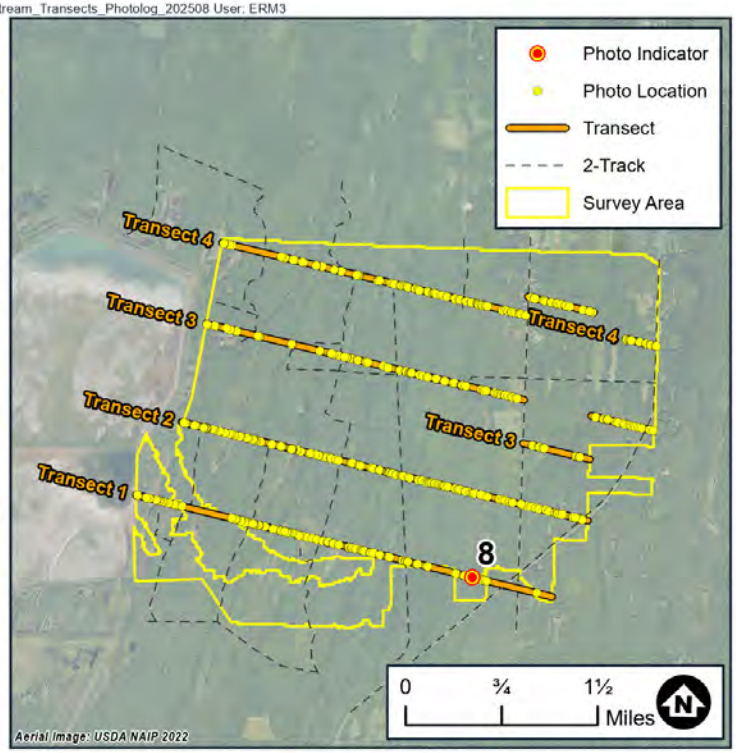

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-S09-RB, Upstream
**Photo 2 Caption:** T1E-S09-RB, Downstream

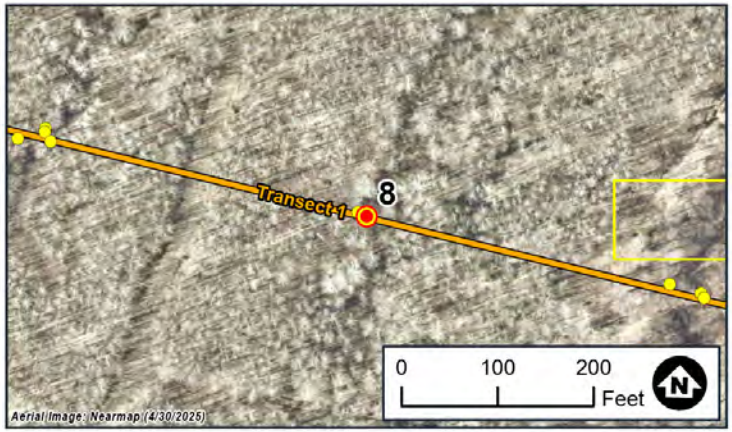
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP18-B, Wetland
**Photo 2 Caption:** T1E-BP18-B, Upland

*Note: Photo locations are approximate*

**Photo 9-1**



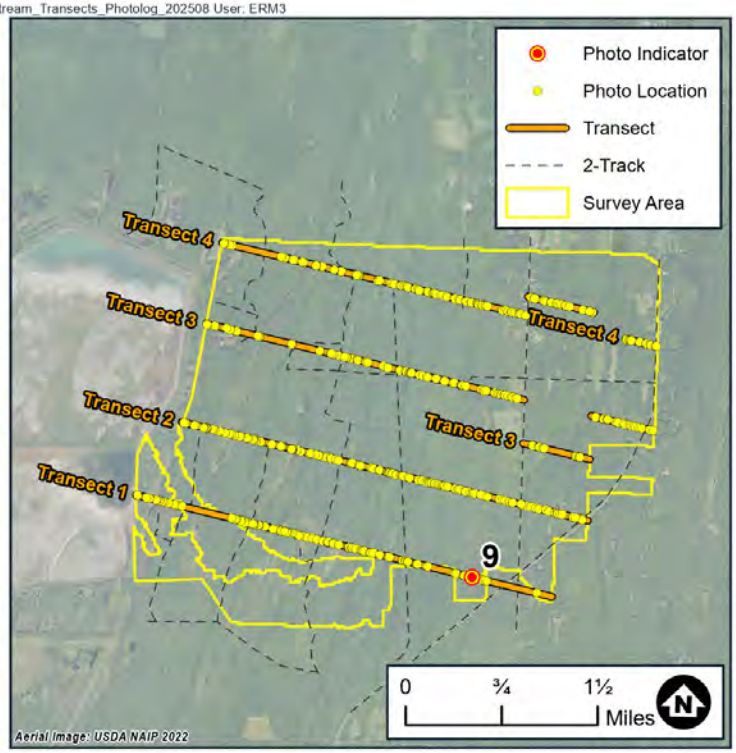
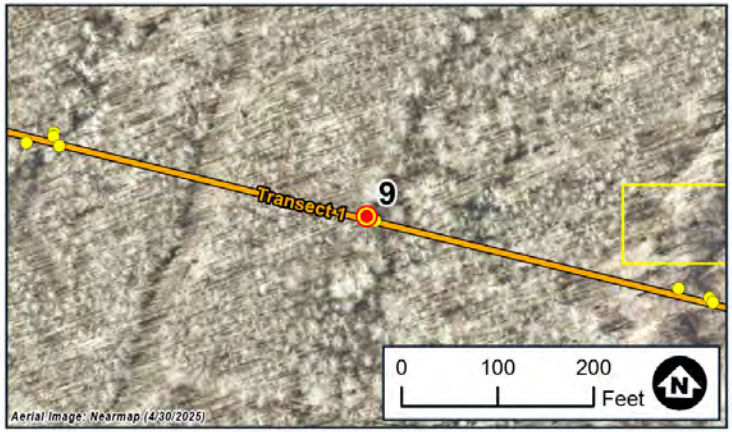



**Photo 9-2**







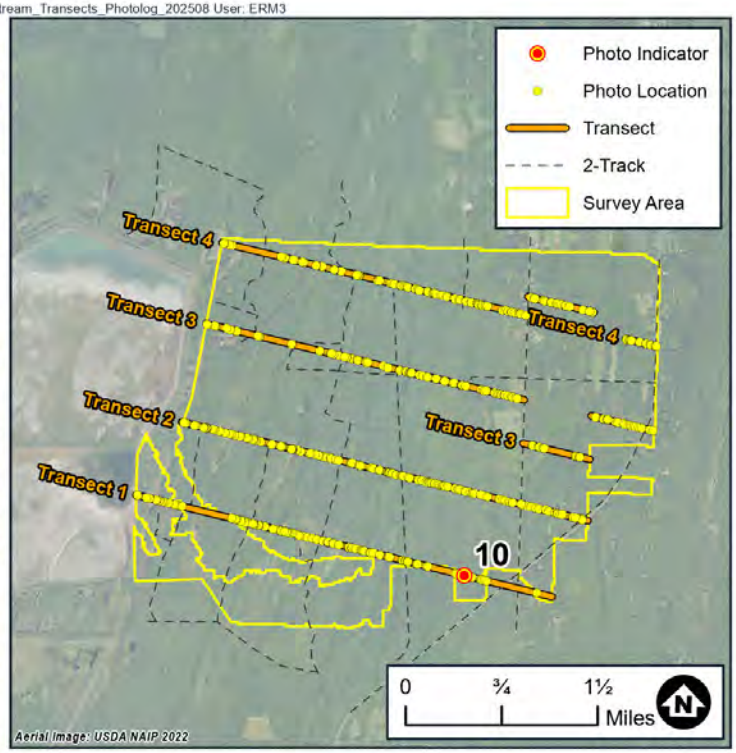

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP18-A, Wetland
**Photo 2 Caption:** T1E-BP18-A, Upland

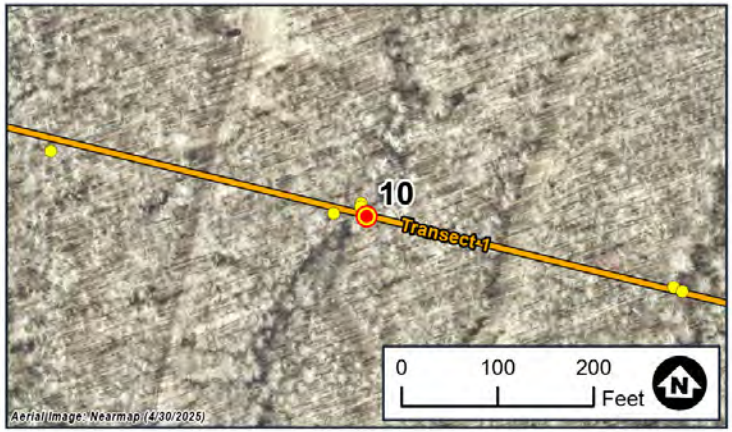
*Note: Photo locations are approximate*











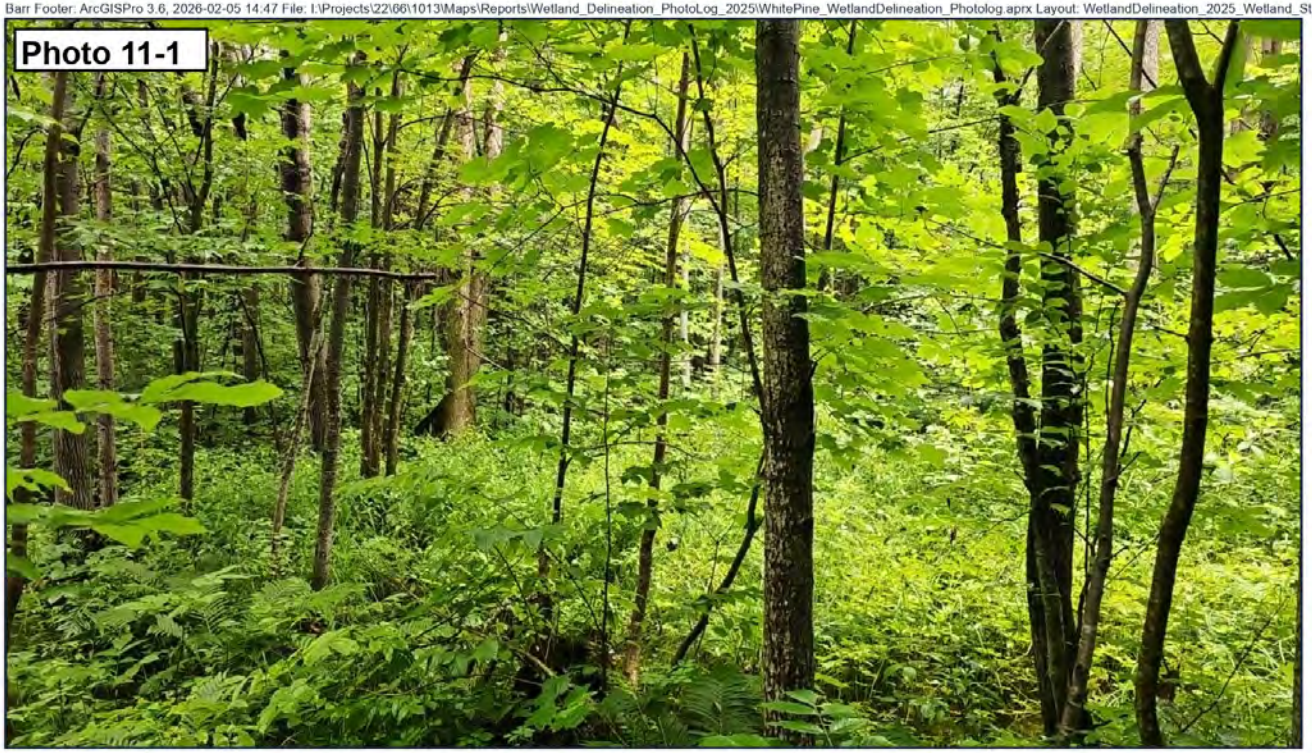

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

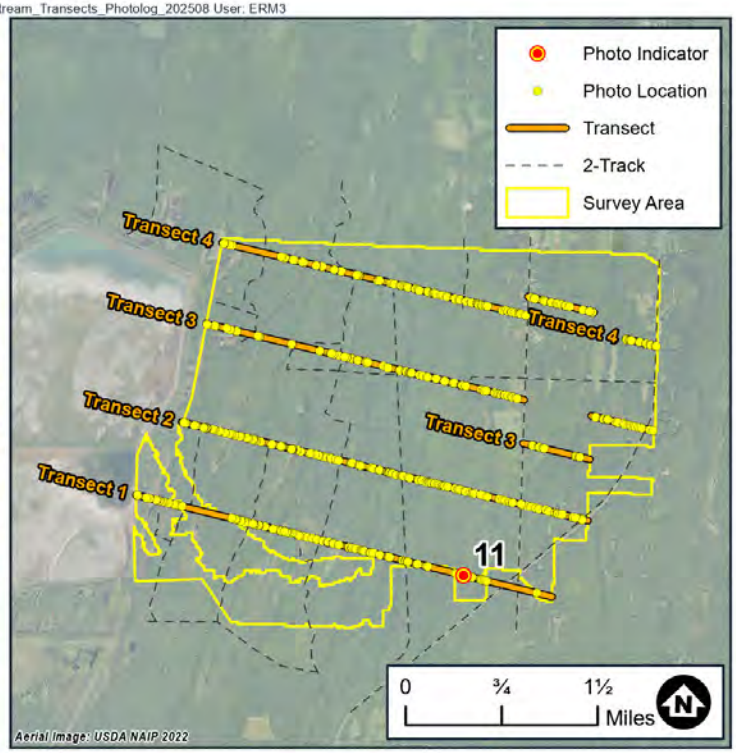
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP17-B, Wetland
**Photo 2 Caption:** T1E-BP17-B, Upland

*Note: Photo locations are approximate*

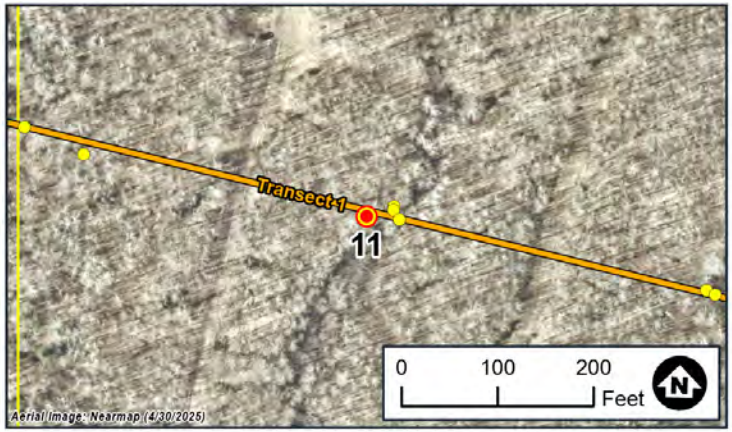
## Photo 11-1






## Photo 11-2







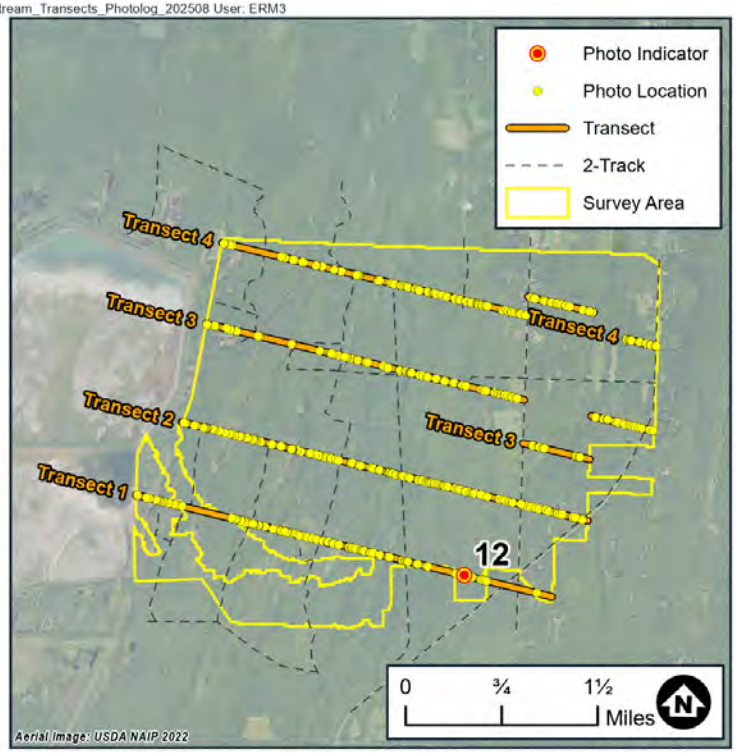

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP17-A, Wetland
**Photo 2 Caption:** T1E-BP17-A, Upland

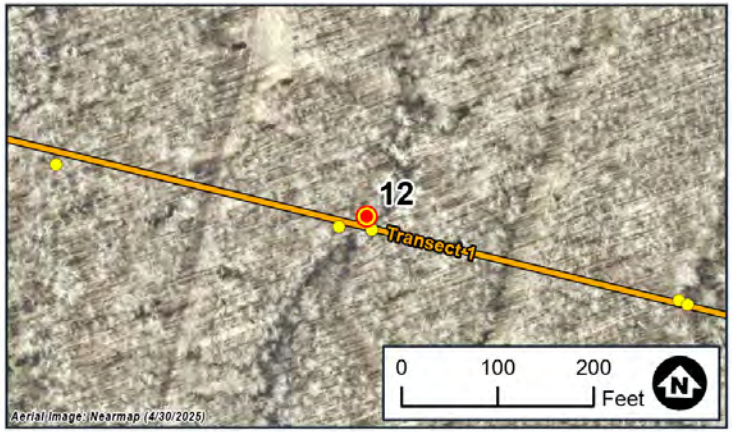
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-S08-LB, Upstream
**Photo 2 Caption:** T1E-S08-LB, Downstream

*Note: Photo locations are approximate*

**Photo 13-1**



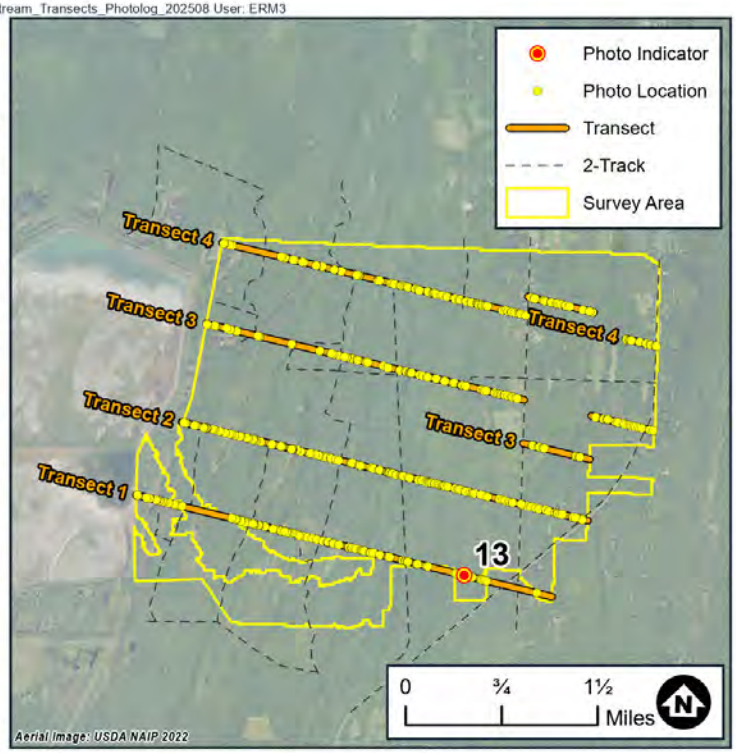
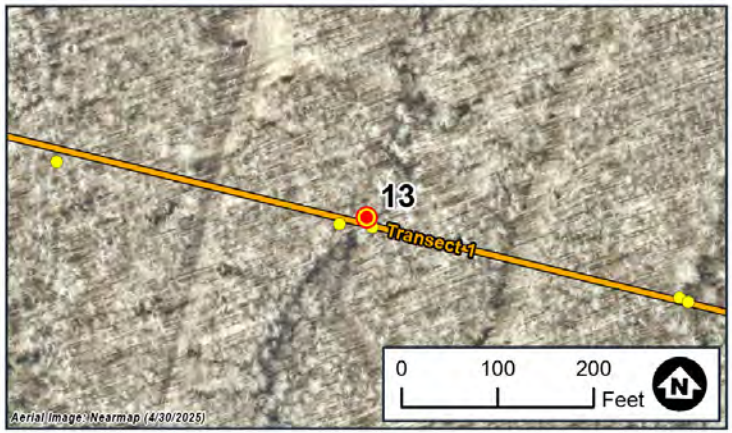



**Photo 13-2**








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

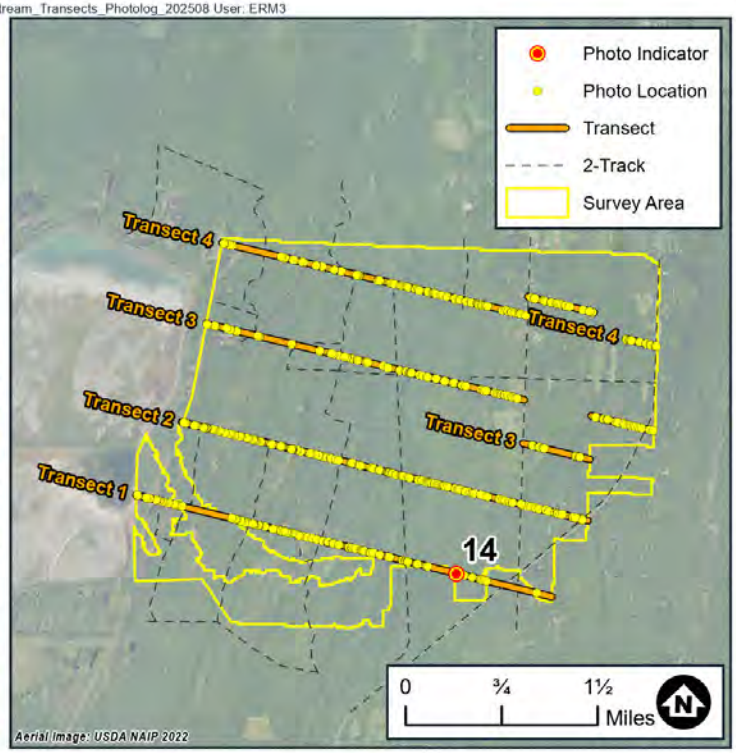
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-S08-RB, Upstream
**Photo 2 Caption:** T1E-S08-RB, Downstream

*Note: Photo locations are approximate*

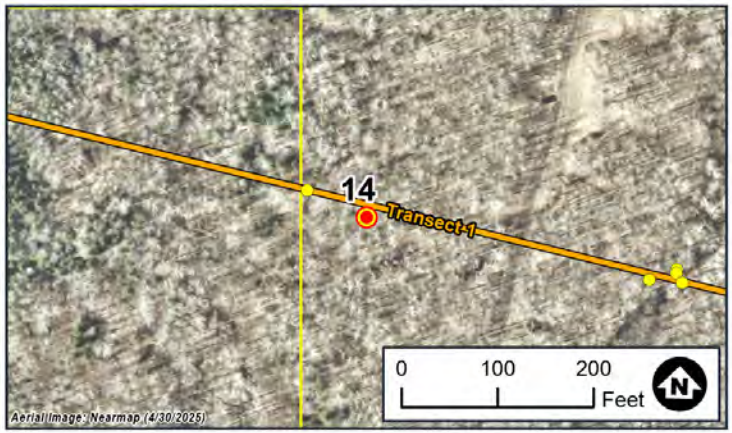
## Photo 14-1






## Photo 14-2







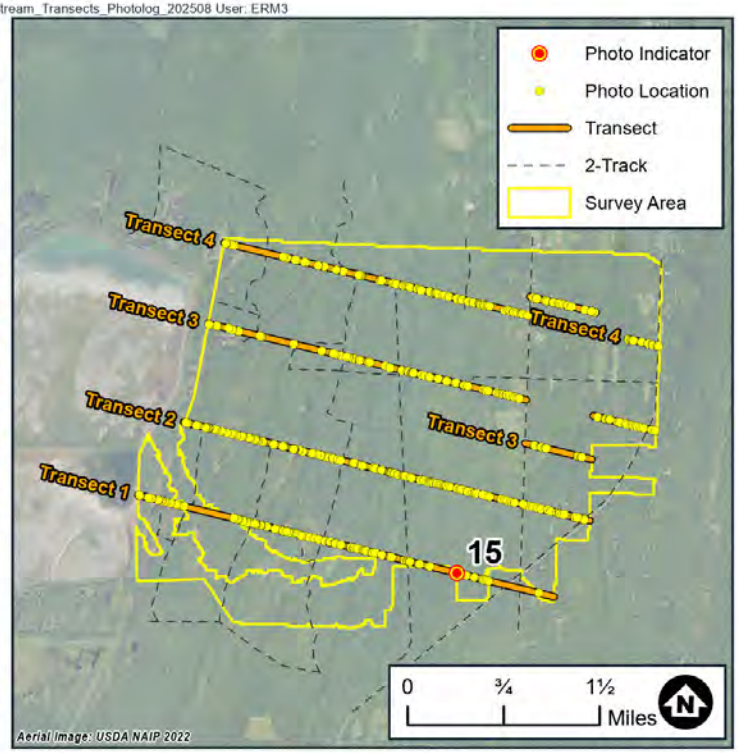

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP16-B, Wetland
**Photo 2 Caption:** T1E-BP16-B, Upland

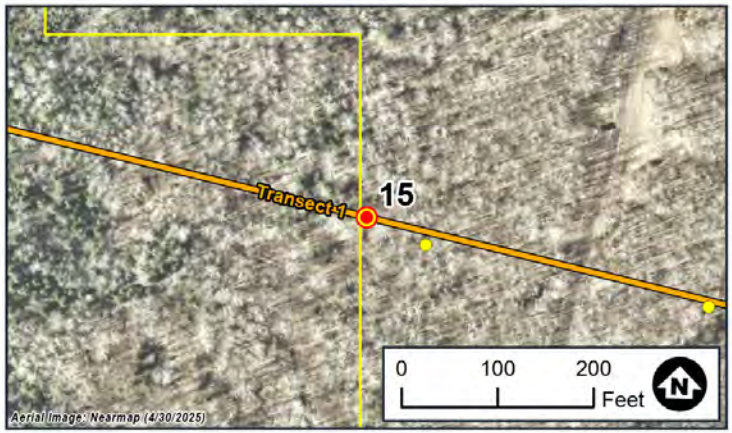
*Note: Photo locations are approximate*











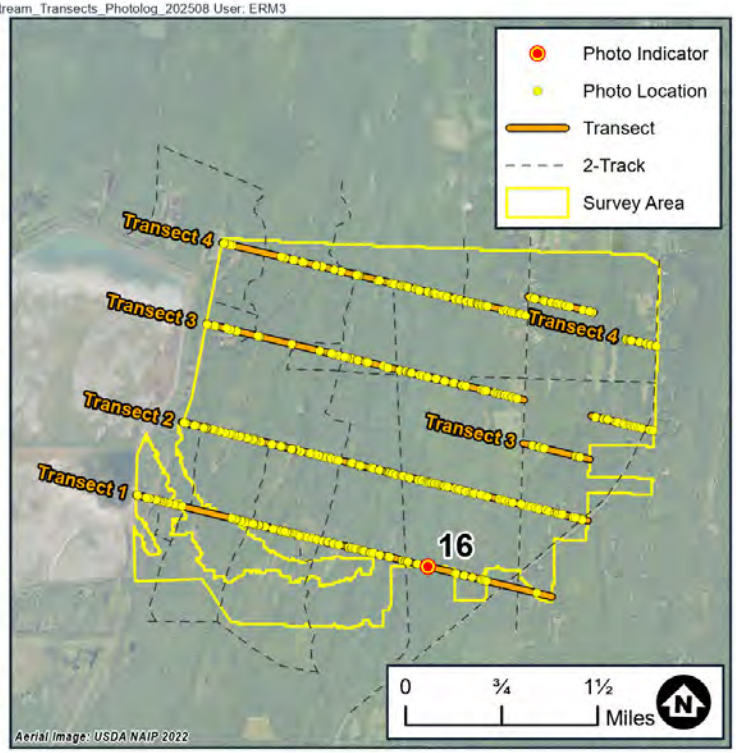

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP16-A, Wetland
**Photo 2 Caption:** T1E-BP16-A, Upland

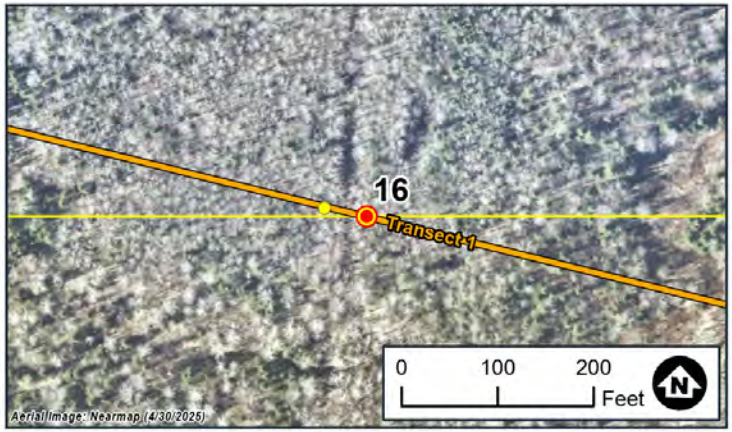
*Note: Photo locations are approximate*











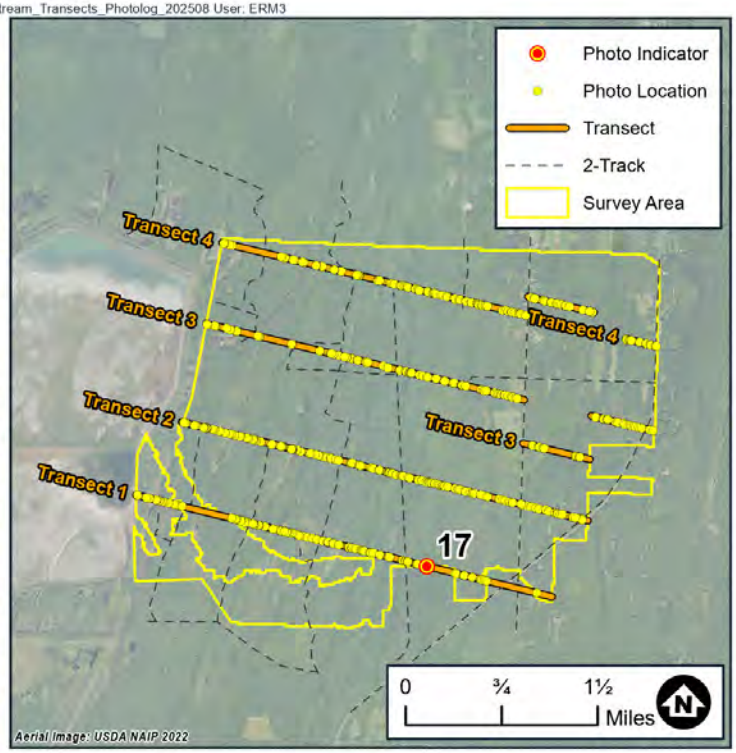

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP15-B, Wetland
**Photo 2 Caption:** T1E-BP15-B, Upland

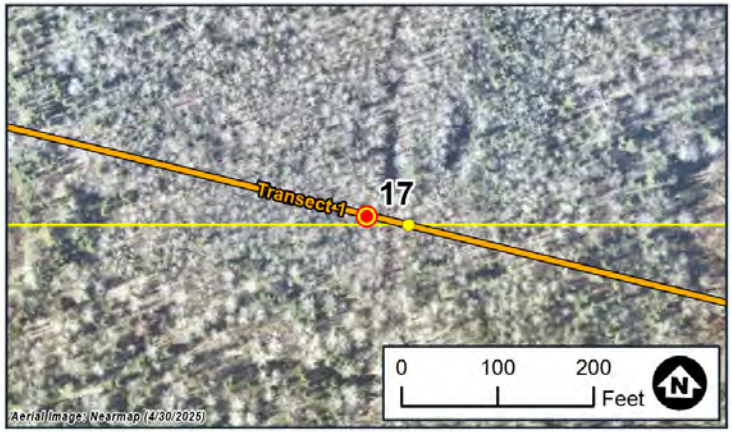
*Note: Photo locations are approximate*











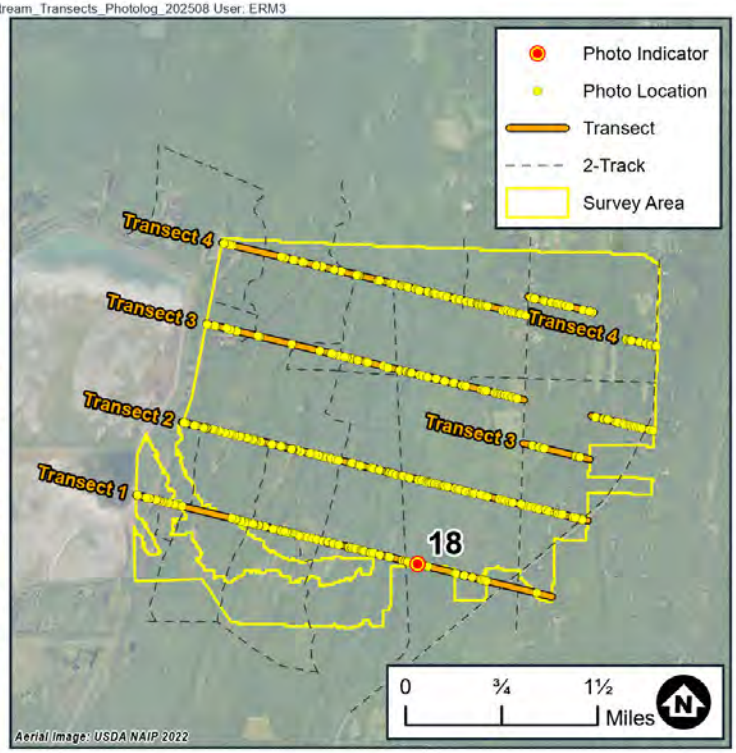

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP15-A, Wetland
**Photo 2 Caption:** T1E-BP15-A, Upland

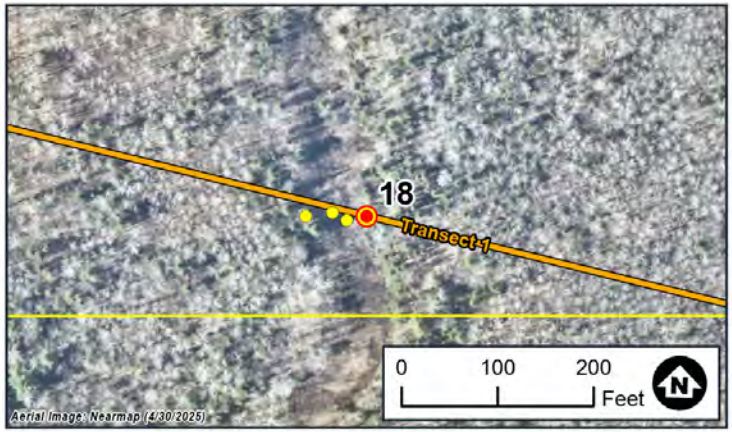
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

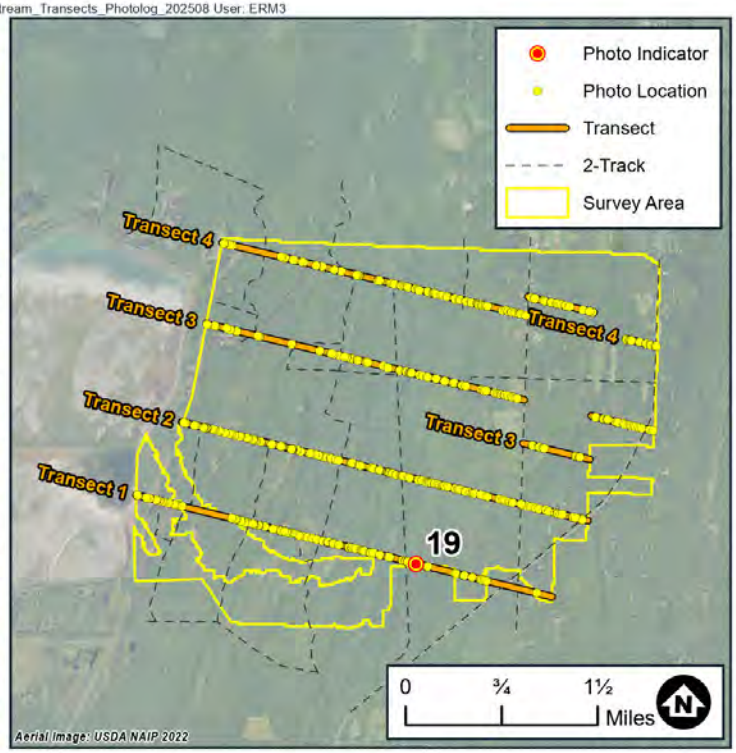
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP14-B, Wetland
**Photo 2 Caption:** T1E-BP14-B, Upland

*Note: Photo locations are approximate*

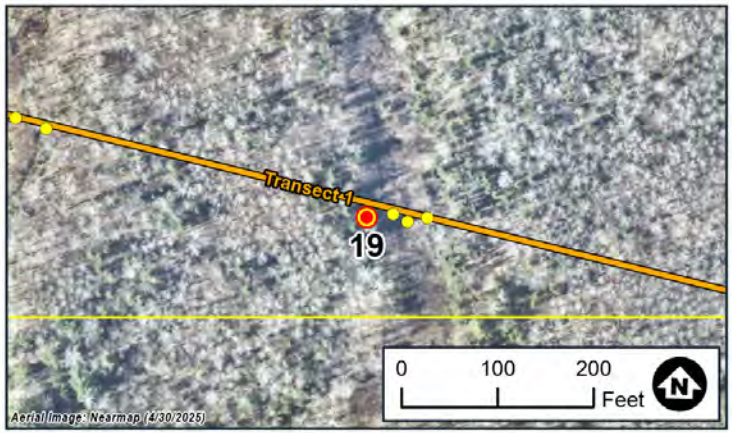
## Photo 19-1






## Photo 19-2







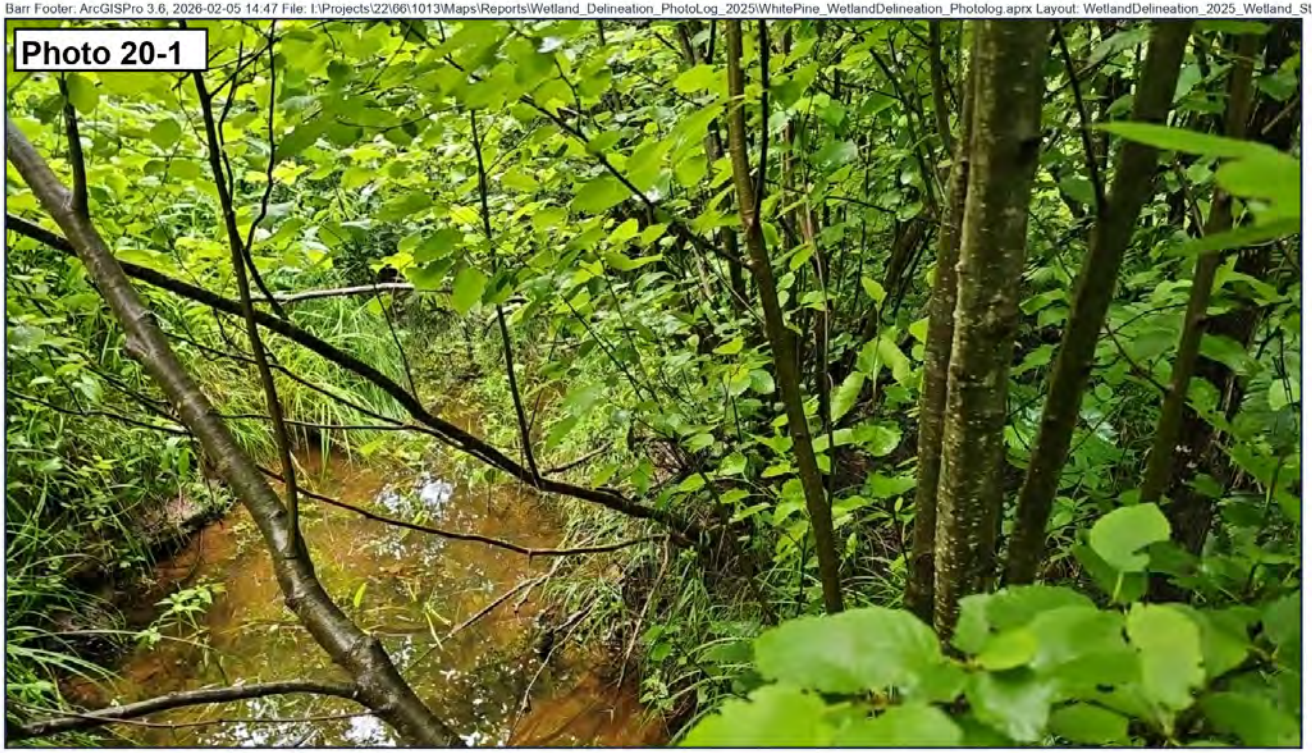

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

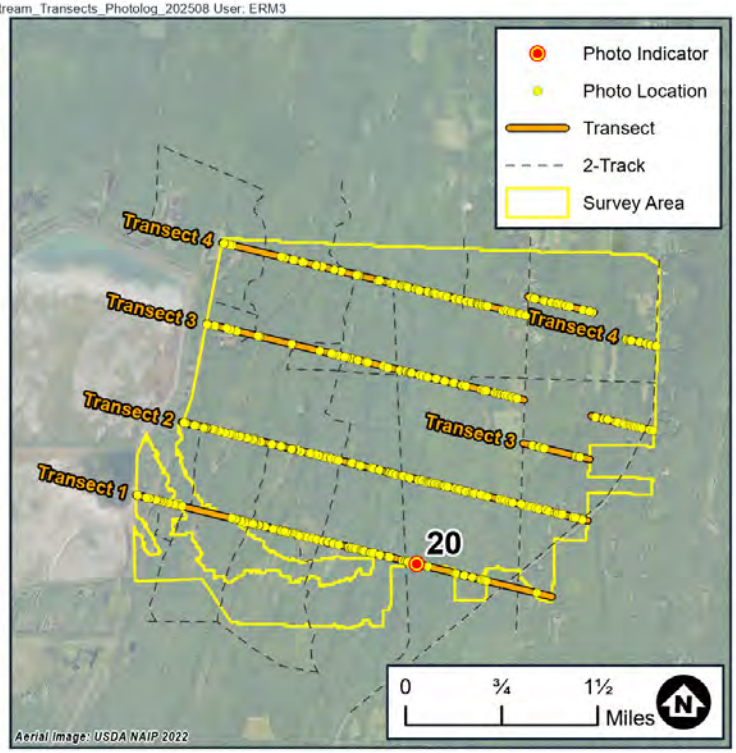
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-BP14-A, Wetland
**Photo 2 Caption:** T1E-BP14-A, Upland

*Note: Photo locations are approximate*

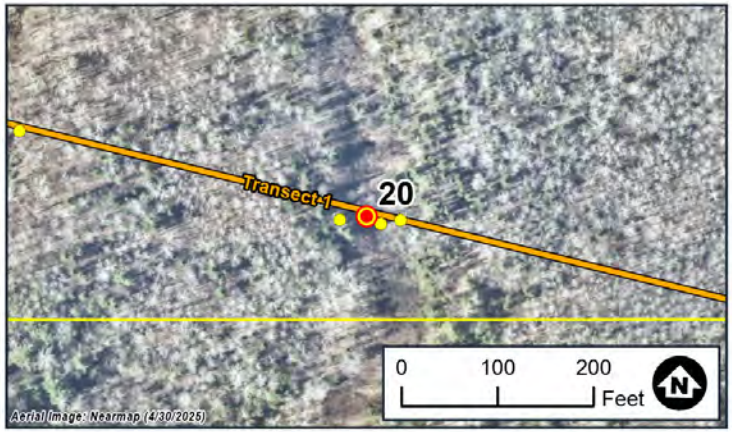
## Photo 20-1






## Photo 20-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

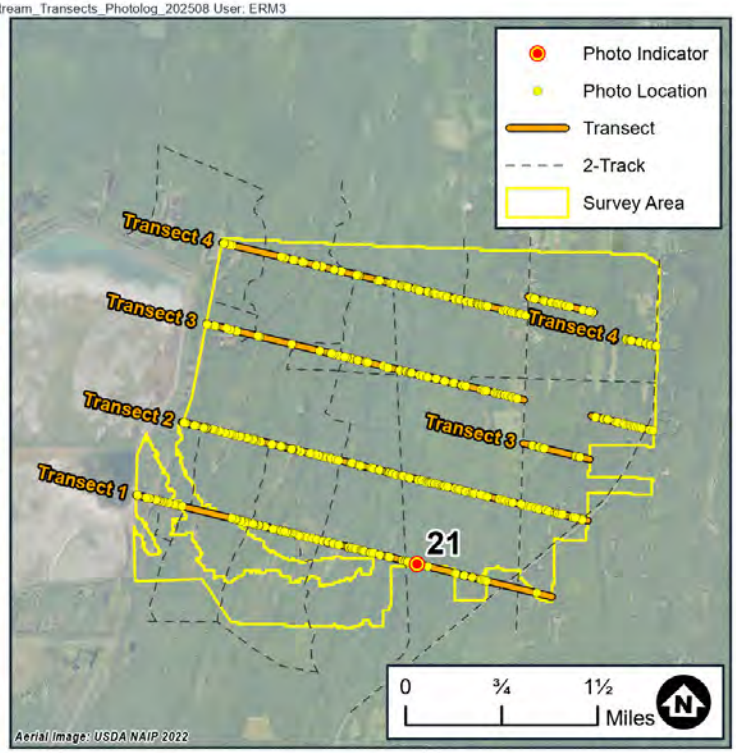
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-S07-LB, Upstream
**Photo 2 Caption:** T1E-S07-LB, Downstream

*Note: Photo locations are approximate*

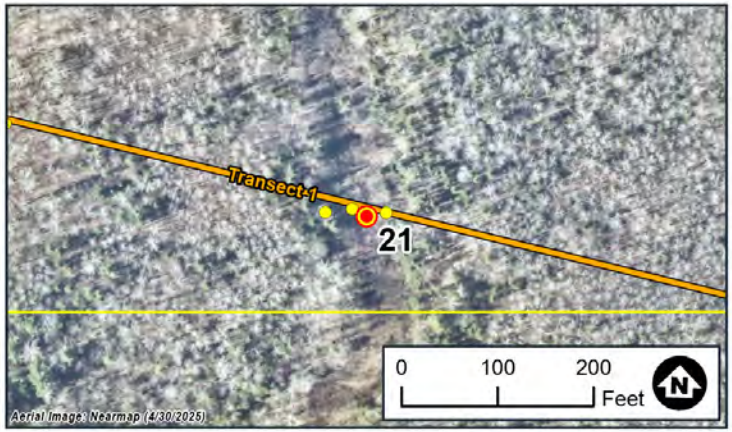
## Photo 21-1






## Photo 21-2







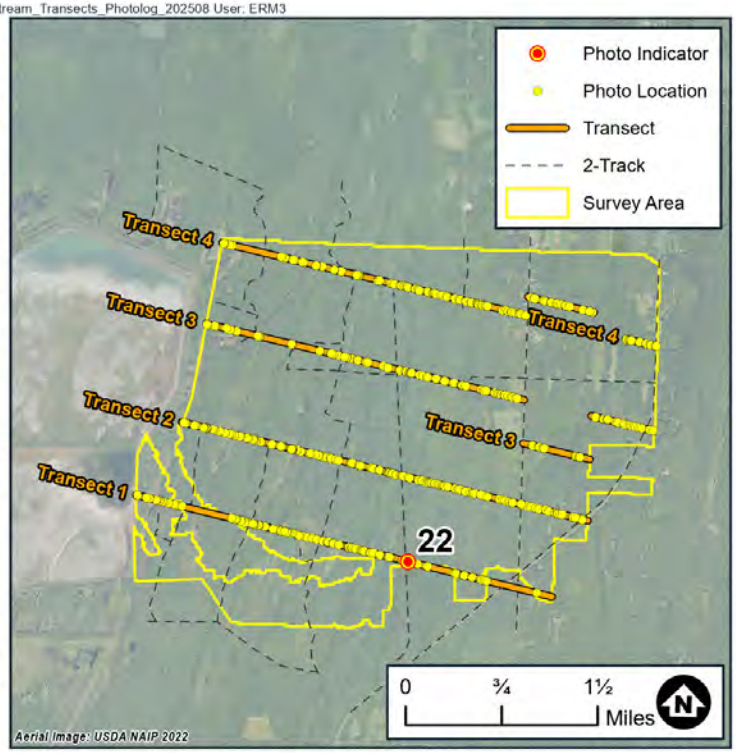

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1E-S07-RB, Upstream
**Photo 2 Caption:** T1E-S07-RB, Downstream

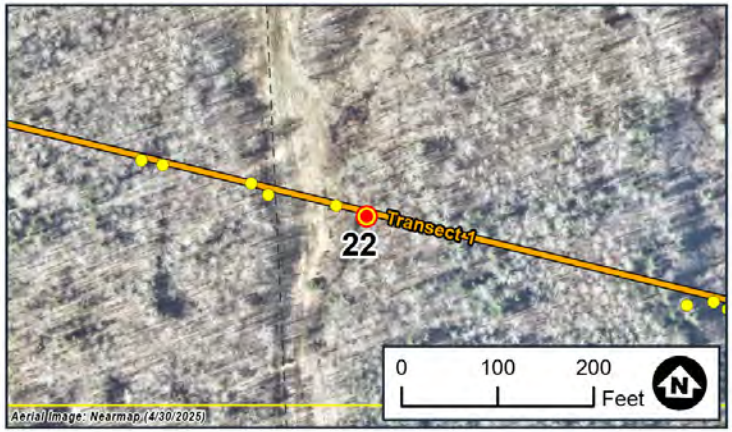
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

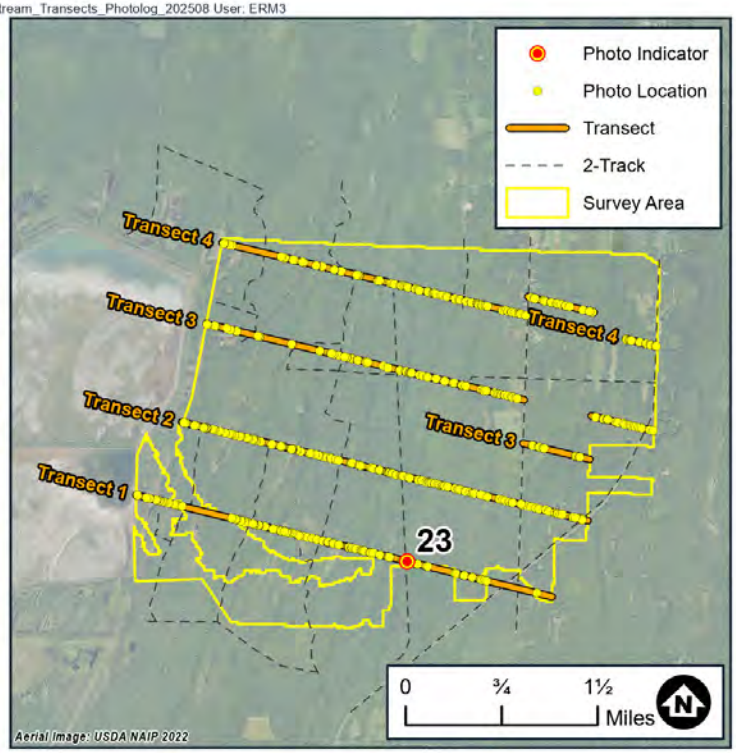
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP13-B, Wetland
**Photo 2 Caption:** T1E-BP13-B, Upland

*Note: Photo locations are approximate*

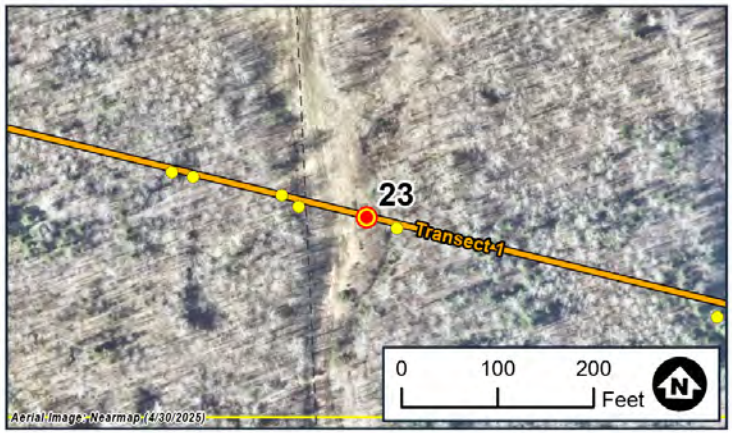
## Photo 23-1






## Photo 23-2







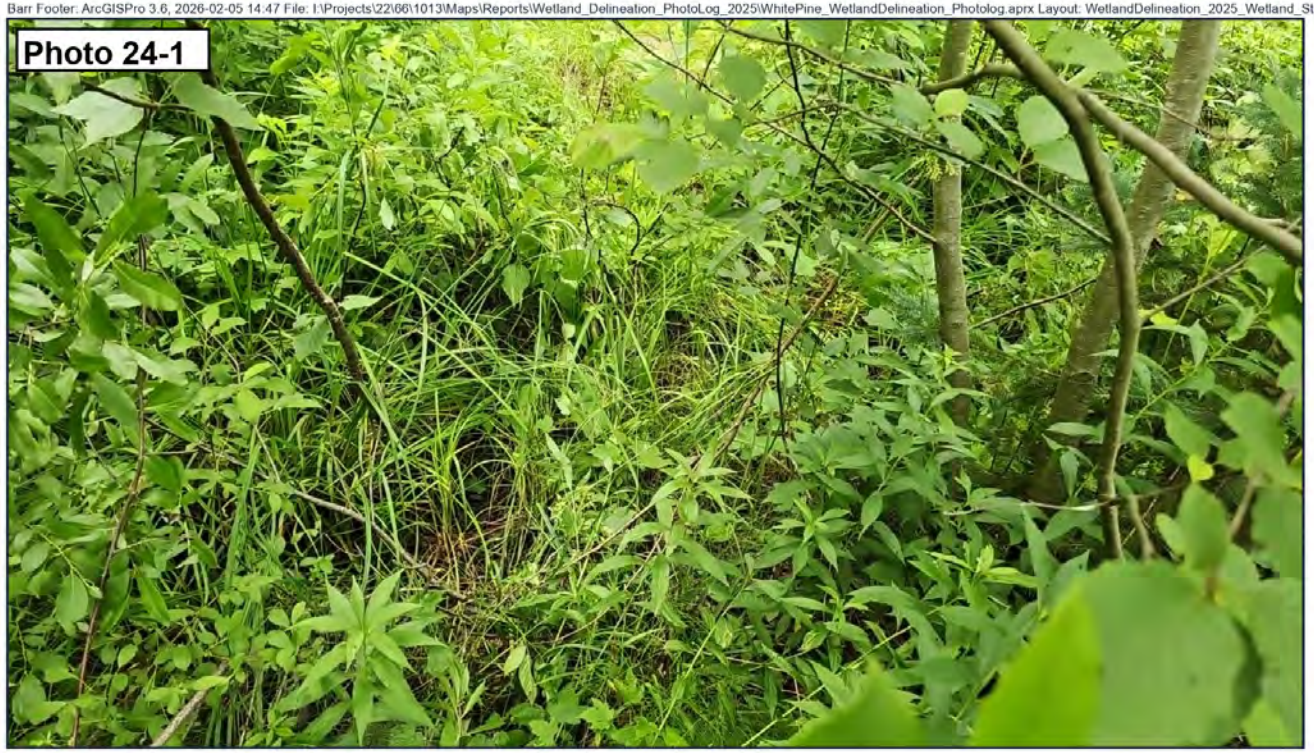

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP13-A, Wetland
**Photo 2 Caption:** T1E-BP13-A, Upland

*Note: Photo locations are approximate*

**Photo 24-1**



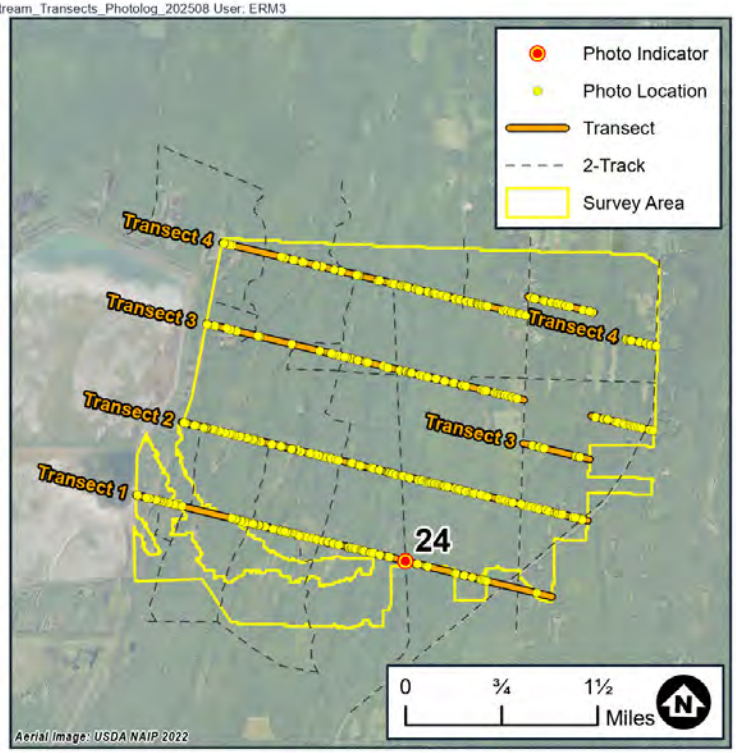



**Photo 24-2**








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

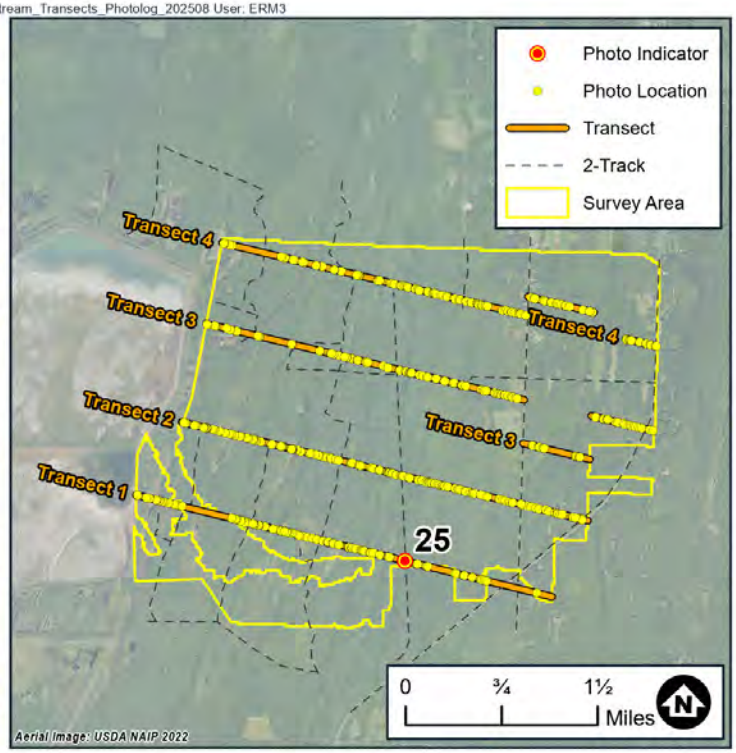
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP12-B, Wetland
**Photo 2 Caption:** T1E-BP12-B, Upland

*Note: Photo locations are approximate*

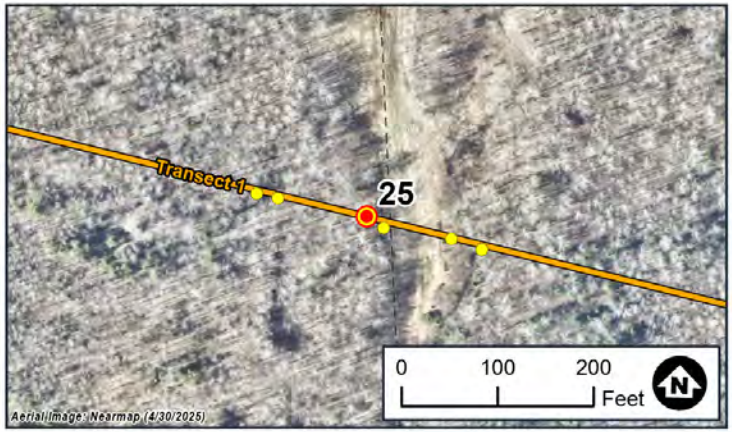
## Photo 25-1






## Photo 25-2





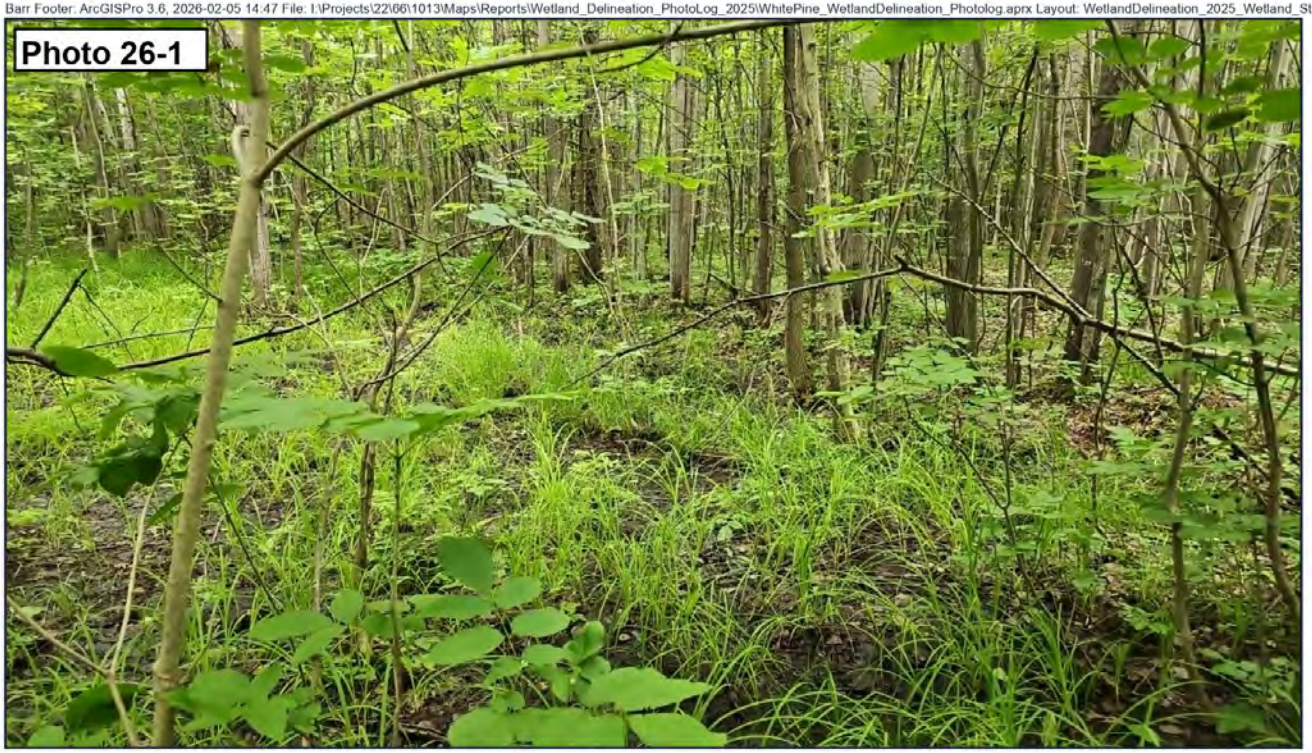


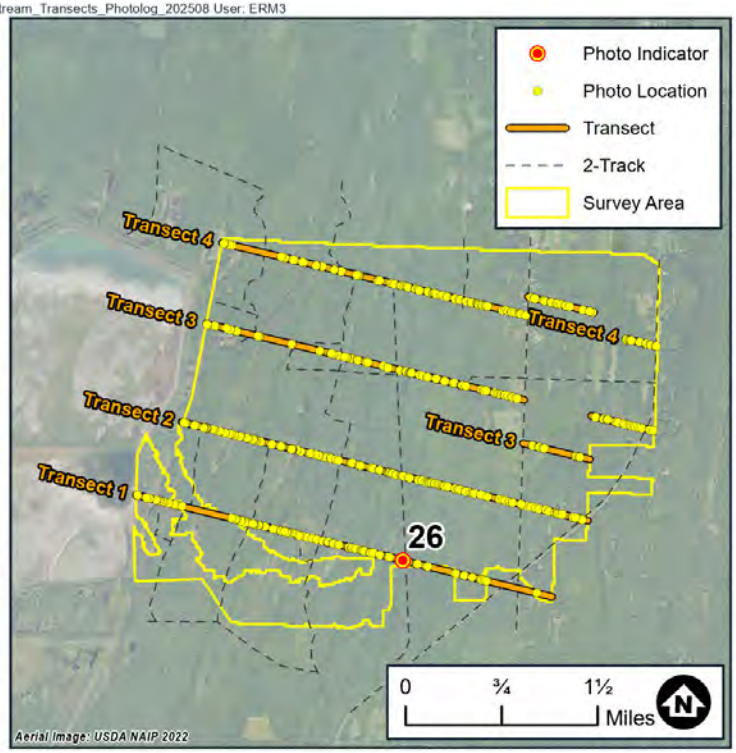

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP12-A, Wetland
**Photo 2 Caption:** T1E-BP12-A, Upland

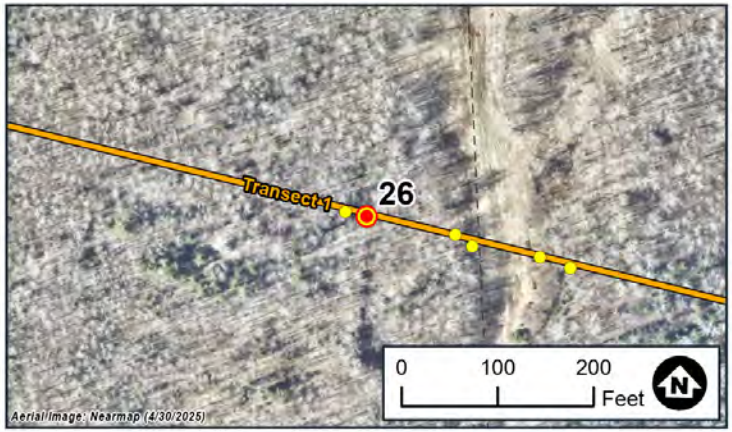
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

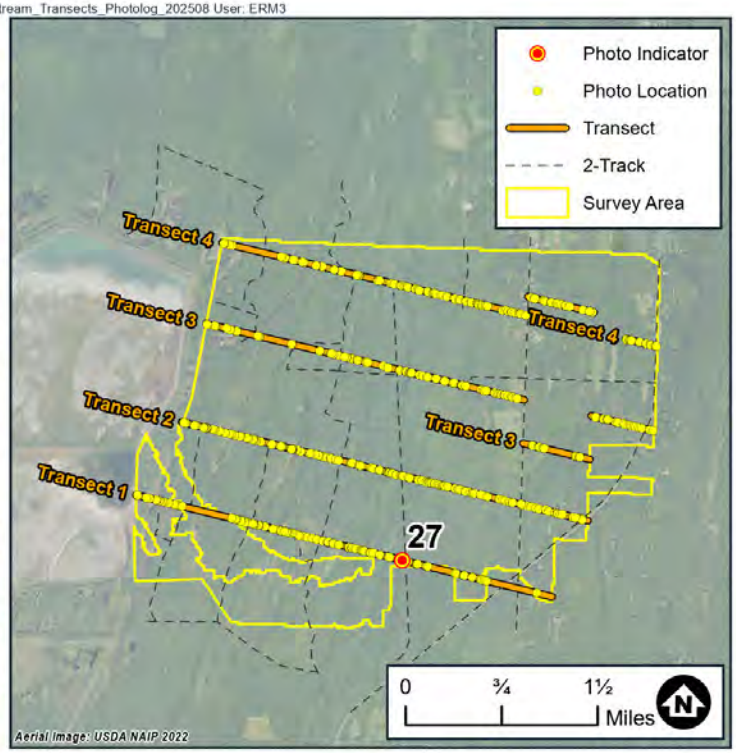
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP11-B, Wetland
**Photo 2 Caption:** T1E-BP11-B, Upland

*Note: Photo locations are approximate*

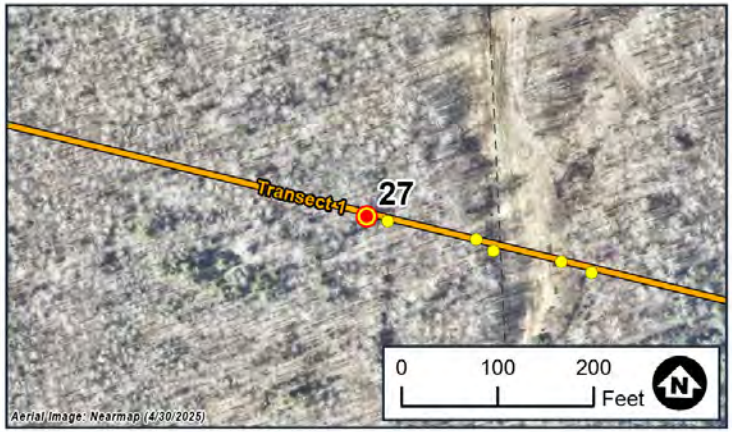
## Photo 27-1






## Photo 27-2







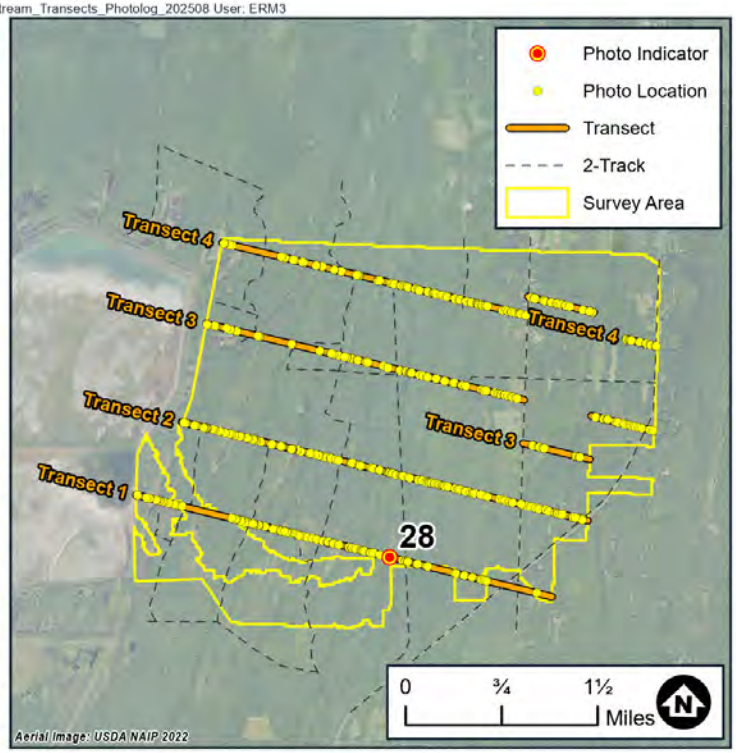

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP11-A, Wetland
**Photo 2 Caption:** T1E-BP11-A, Upland

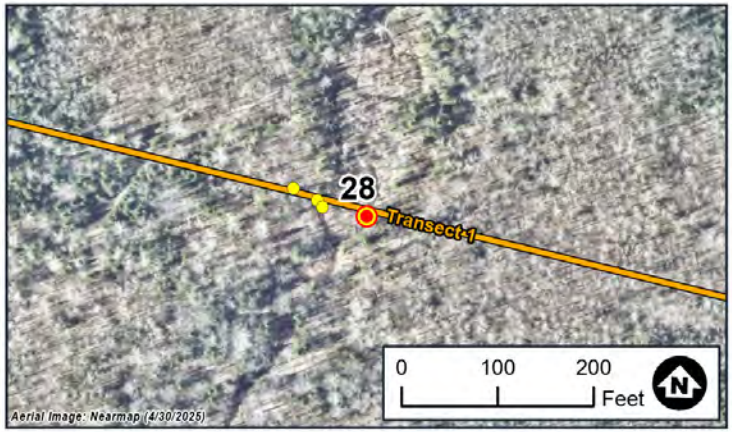
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

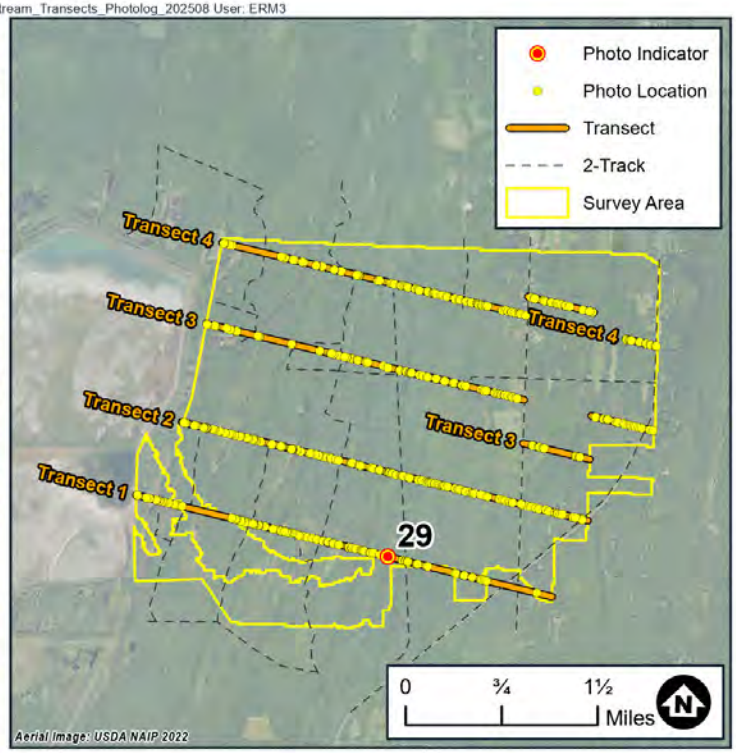
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP10-B, Wetland
**Photo 2 Caption:** T1E-BP10-B, Upland

*Note: Photo locations are approximate*

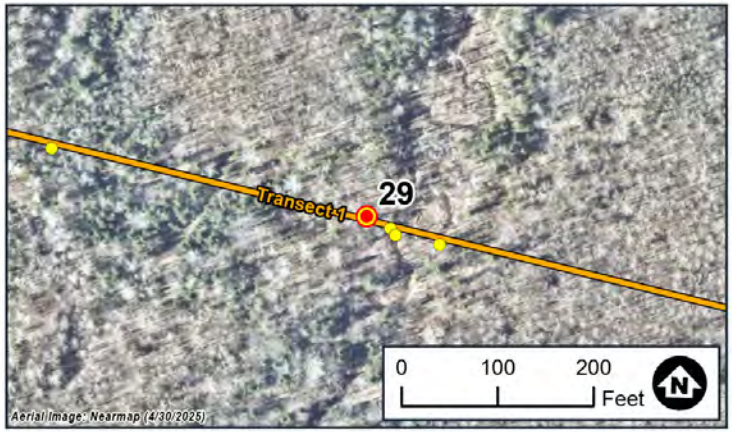
## Photo 29-1






## Photo 29-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP10-A, Wetland
**Photo 2 Caption:** T1E-BP10-A, Upland

*Note: Photo locations are approximate*

**Photo 30-1**



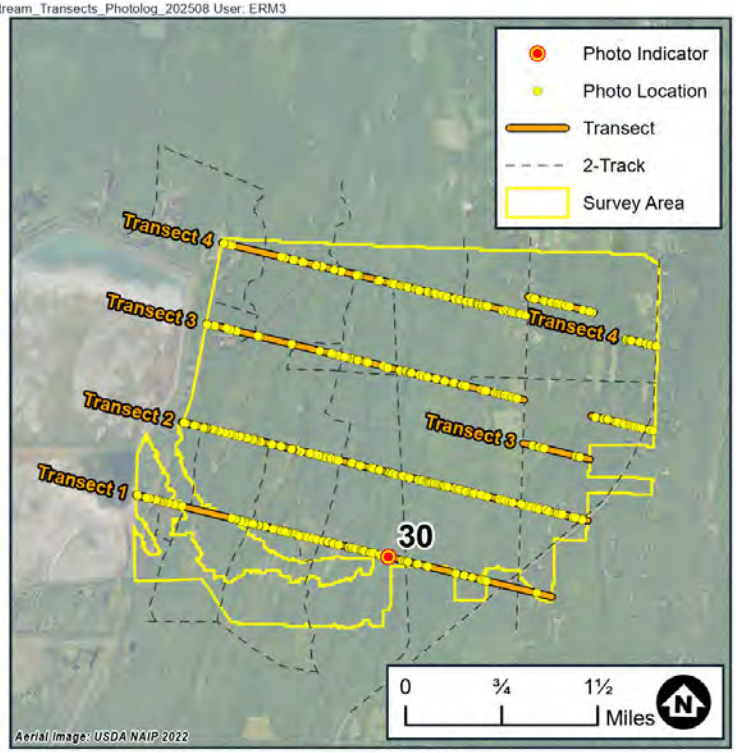
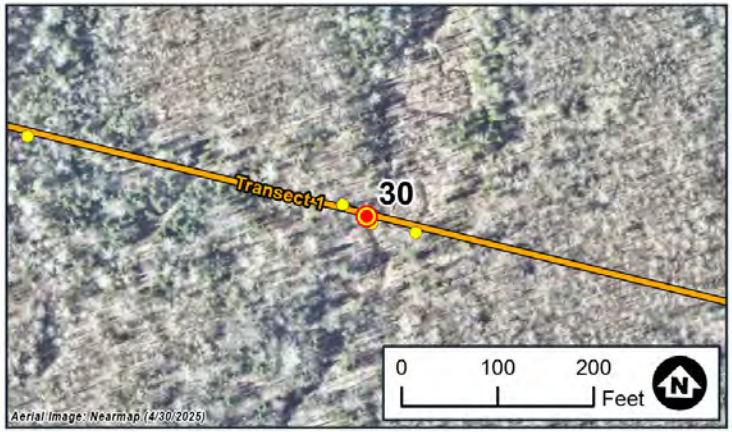



**Photo 30-2**







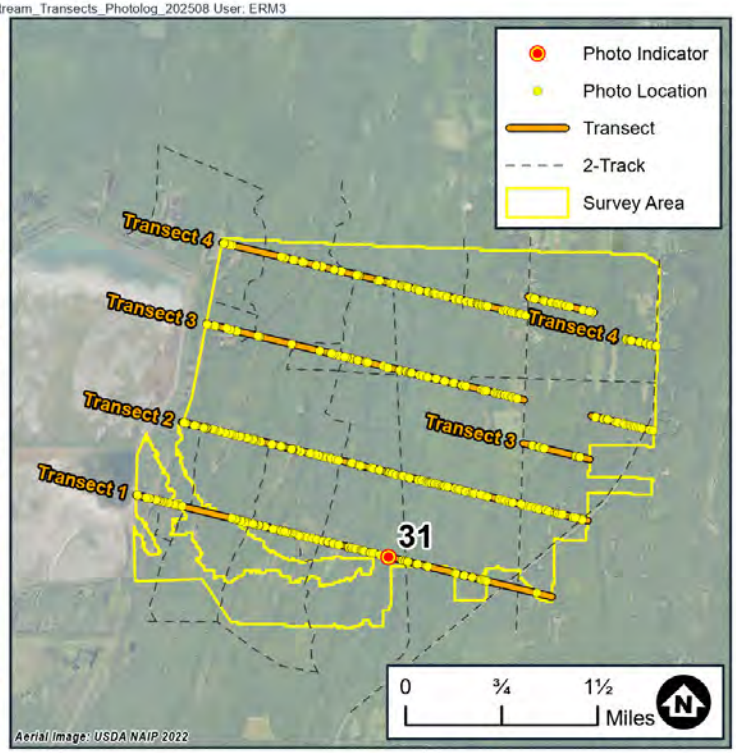

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S06-LB, Upstream
**Photo 2 Caption:** T1E-S06-LB, Downstream

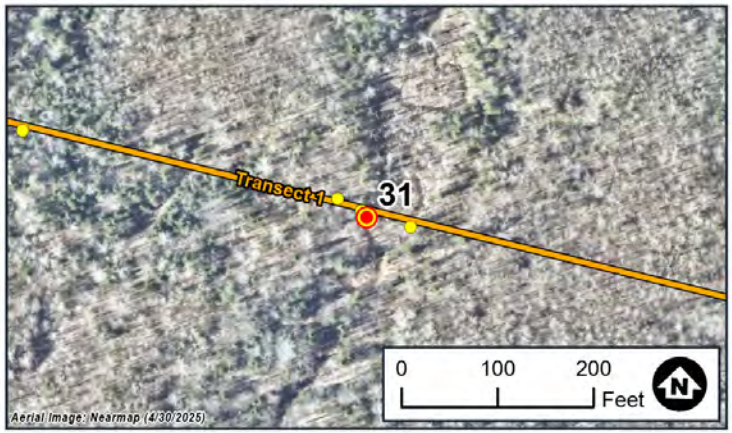
*Note: Photo locations are approximate*











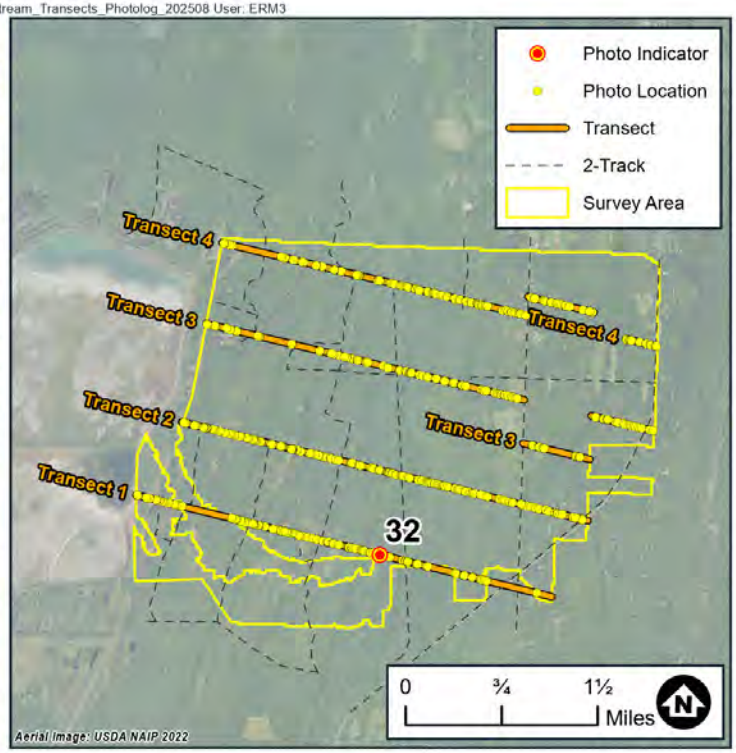

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S06-RB, Upstream
**Photo 2 Caption:** T1E-S06-RB, Upstream

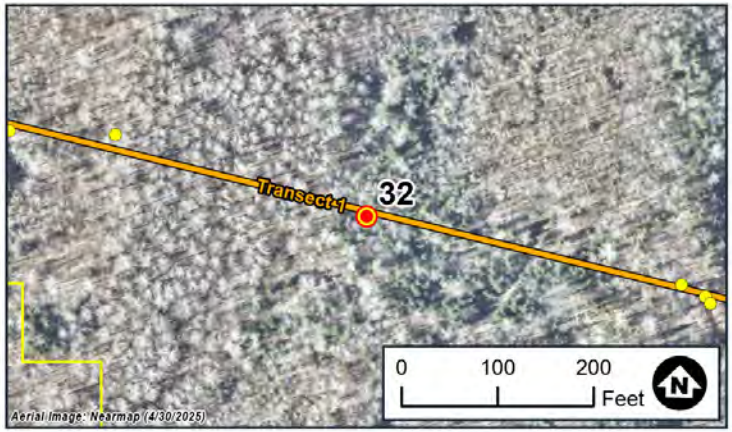
*Note: Photo locations are approximate*











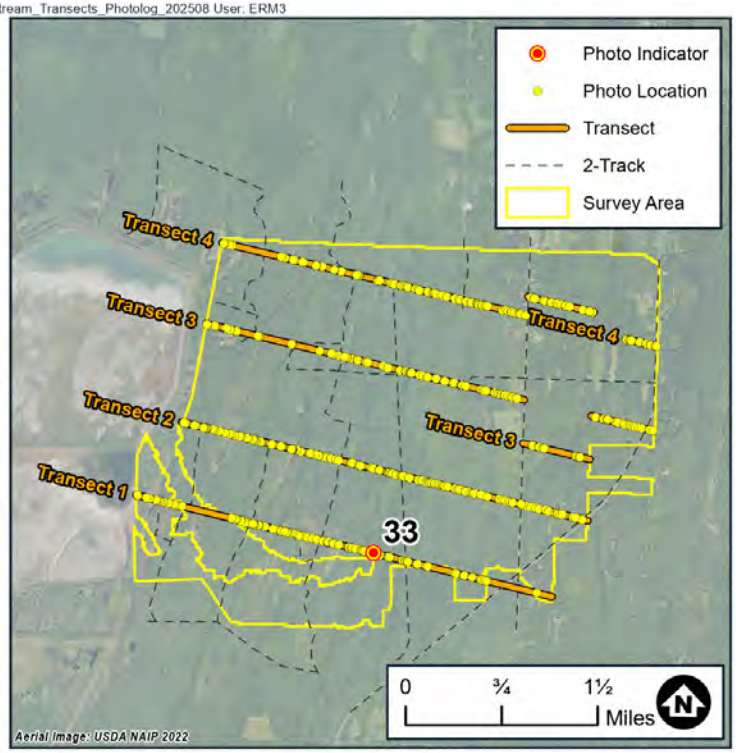

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP09-B, Wetland
**Photo 2 Caption:** T1E-BP09-B, Upland

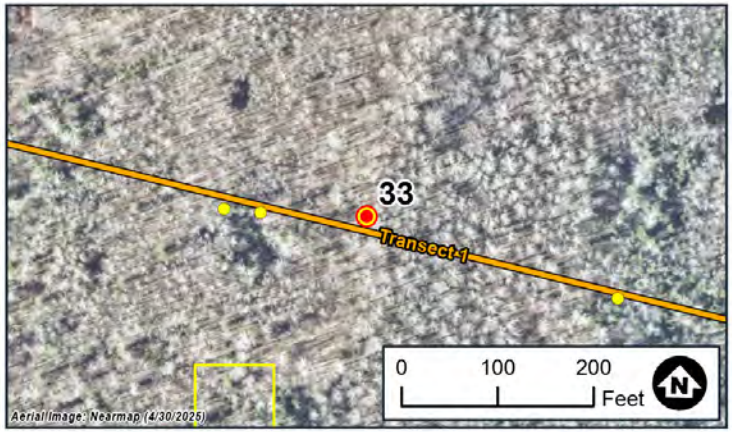
*Note: Photo locations are approximate*











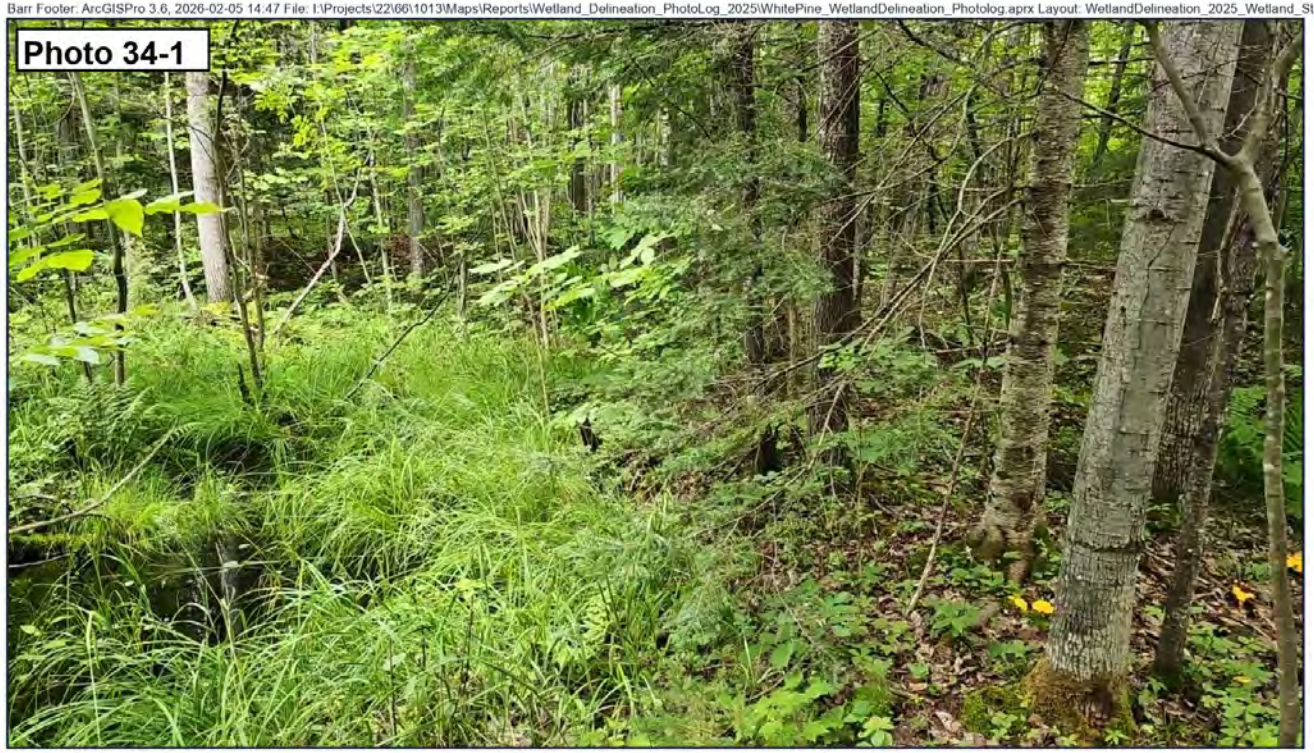

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

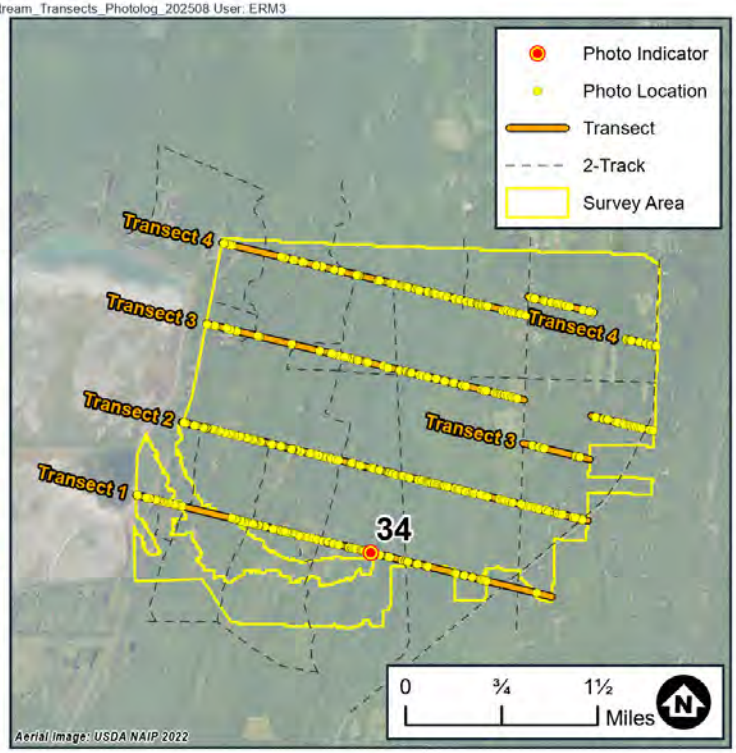
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP09-A, Wetland
**Photo 2 Caption:** T1E-BP09-A, Upland

*Note: Photo locations are approximate*

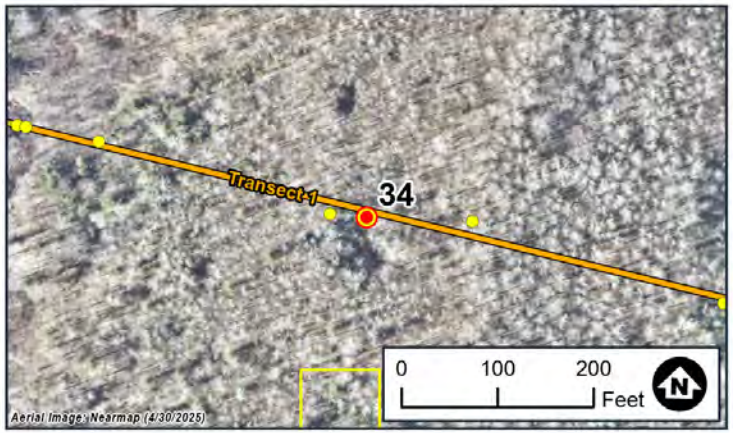
## Photo 34-1






## Photo 34-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

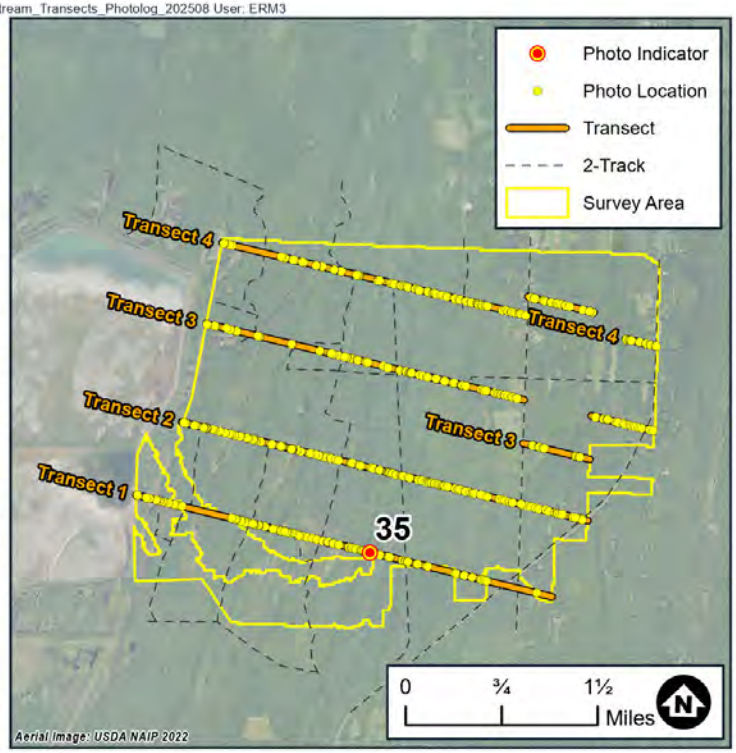
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP08-B, Wetland
**Photo 2 Caption:** T1E-BP08-B, Upland

*Note: Photo locations are approximate*

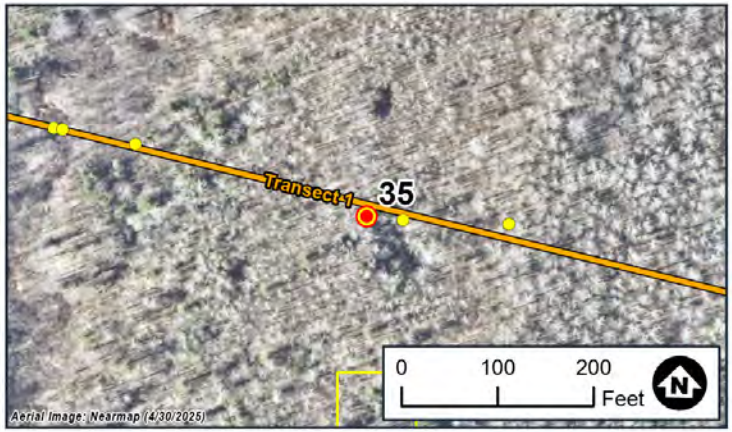
## Photo 35-1






## Photo 35-2





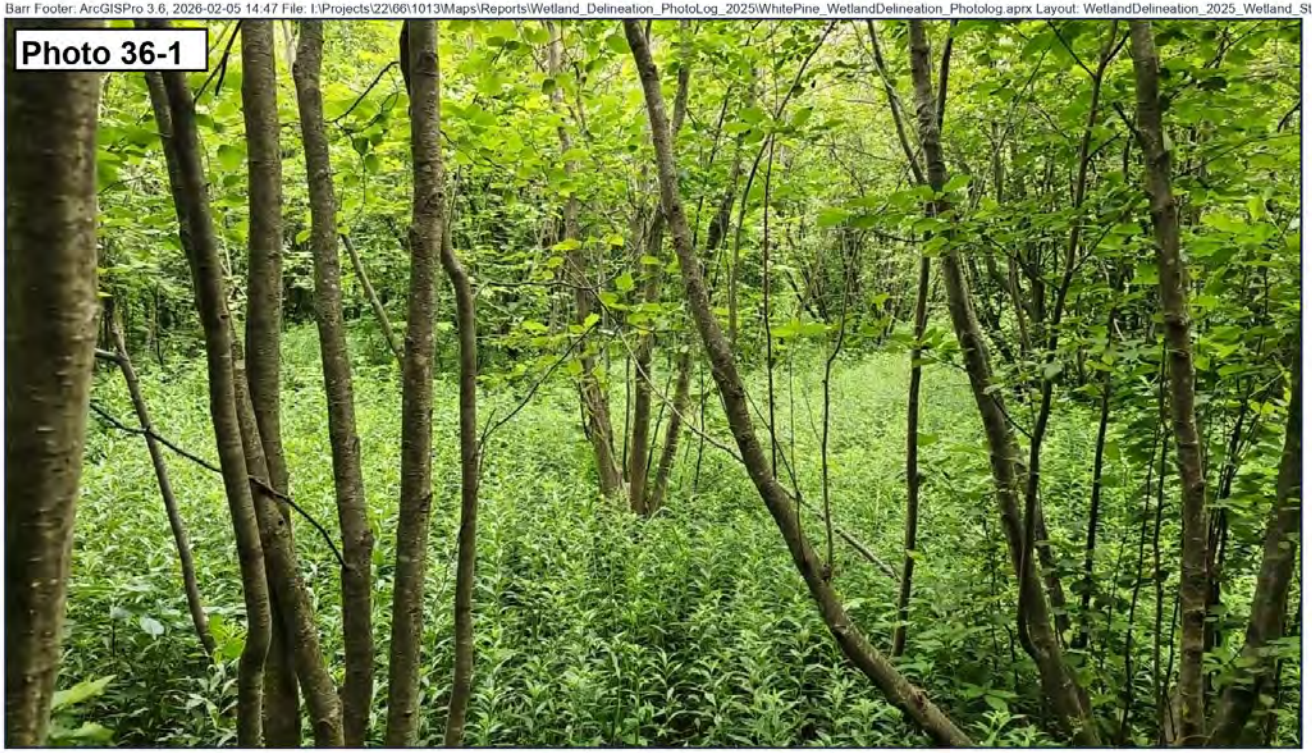


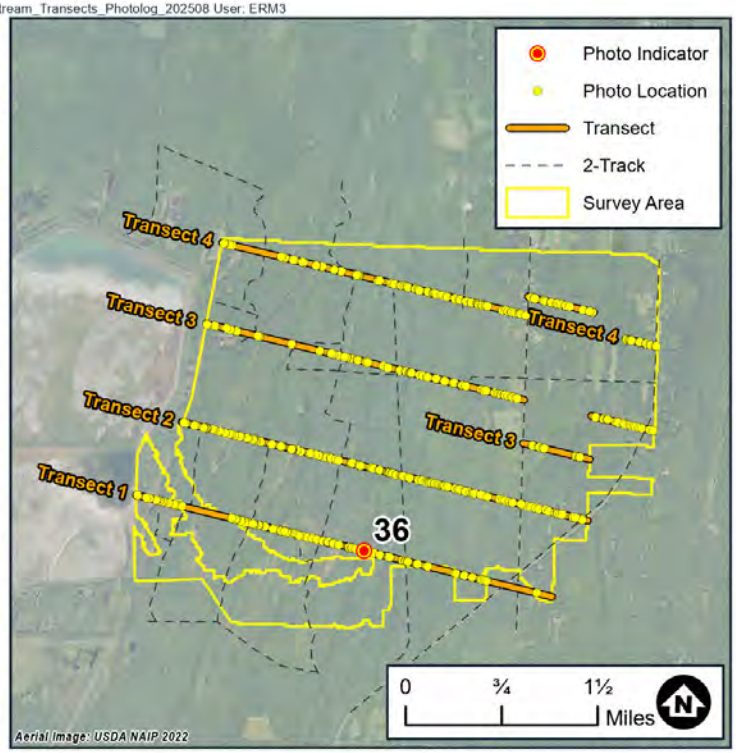

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP08-A, Wetland
**Photo 2 Caption:** T1E-BP08-A, Upland

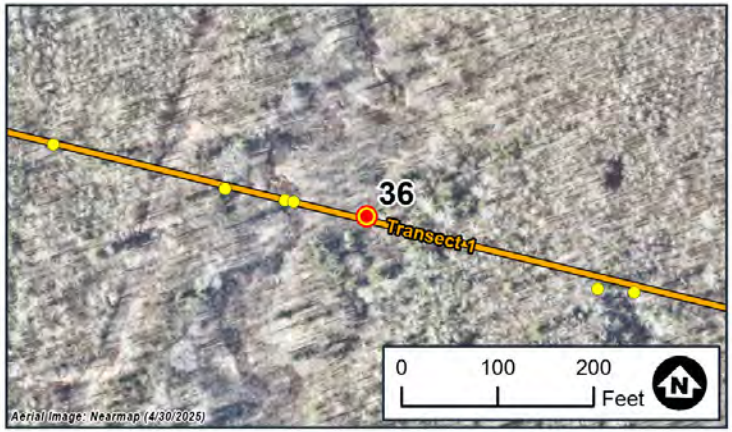
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

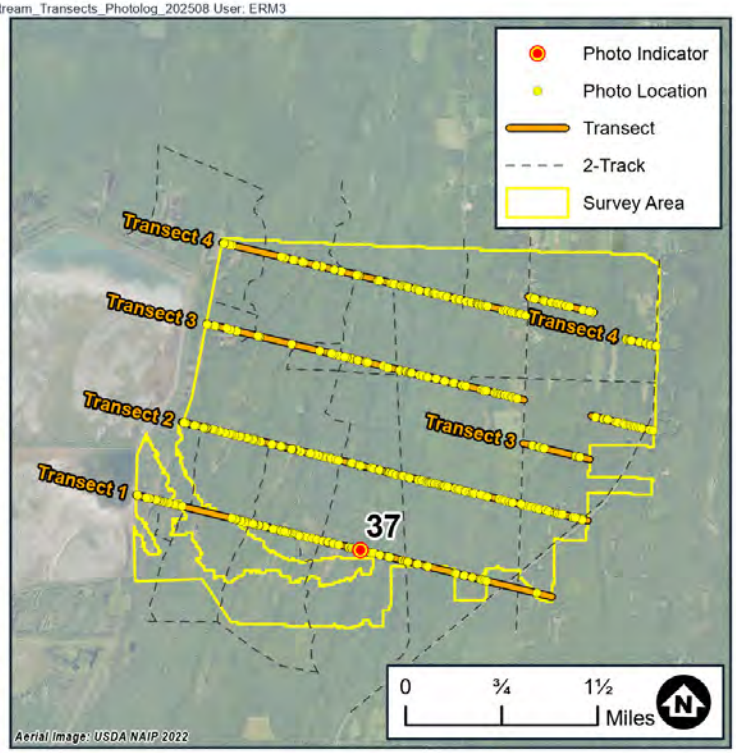
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP07-B, Wetland
**Photo 2 Caption:** T1E-BP07-B, Upland

*Note: Photo locations are approximate*

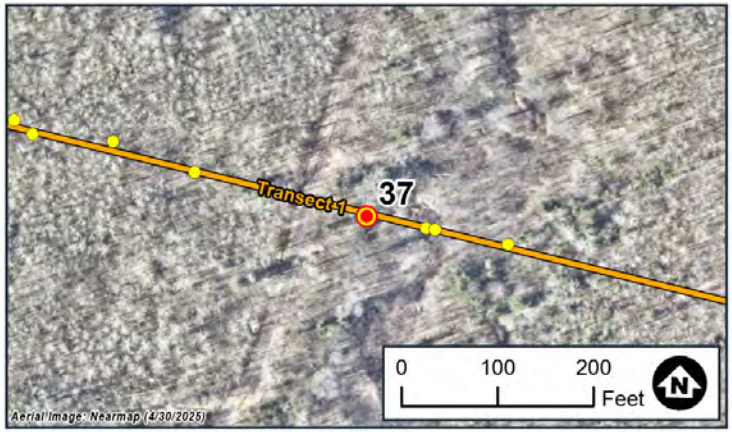
## Photo 37-1






## Photo 37-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

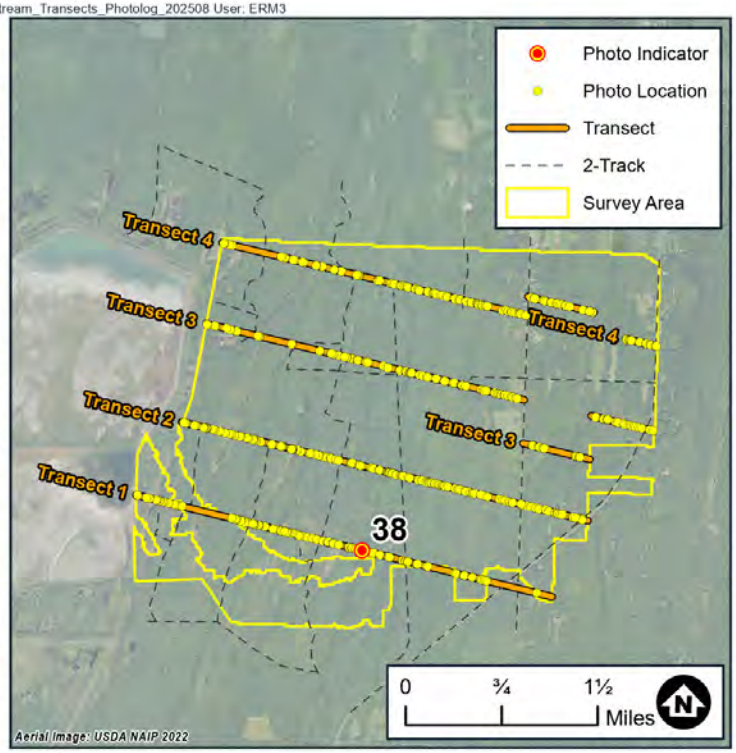
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP07-A, Wetland
**Photo 2 Caption:** T1E-BP07-A, Upland

*Note: Photo locations are approximate*

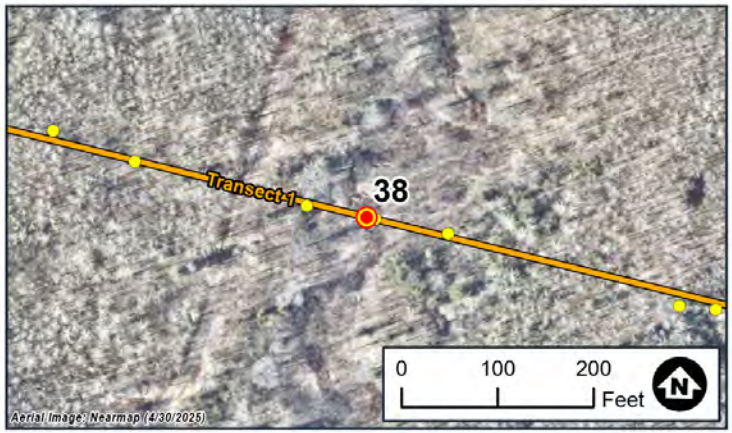
## Photo 38-1






## Photo 38-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

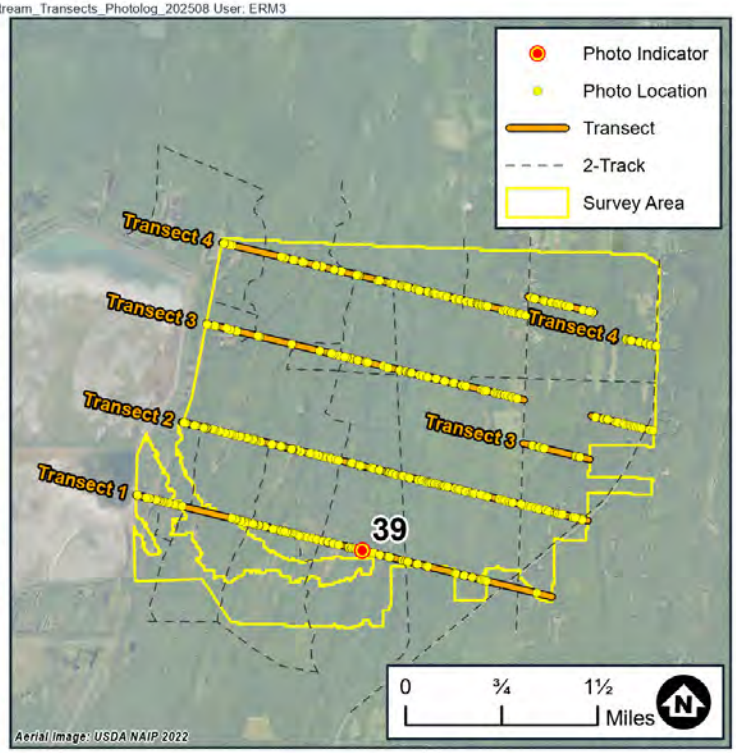
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S05-LB, Upstream
**Photo 2 Caption:** T1E-S05-LB, Downstream

*Note: Photo locations are approximate*

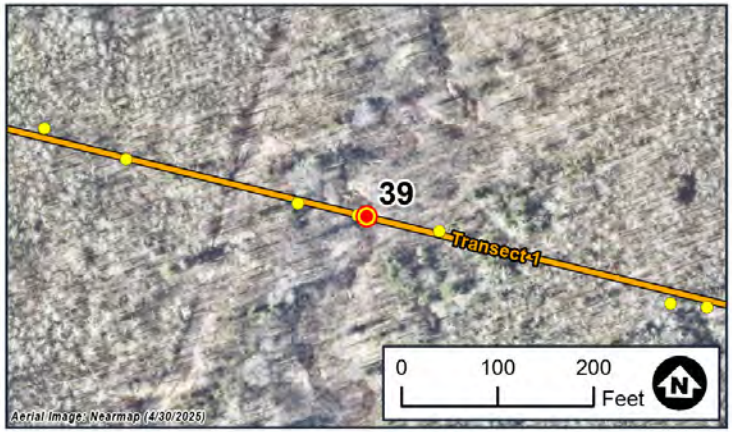
## Photo 39-1






## Photo 39-2







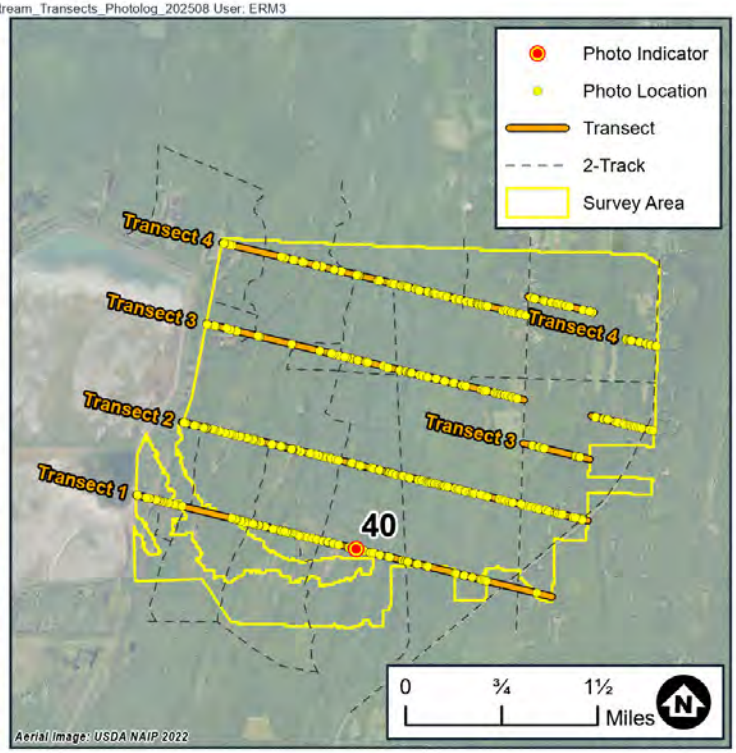

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S05-RB, Upstream
**Photo 2 Caption:** T1E-S05-RB, Downstream

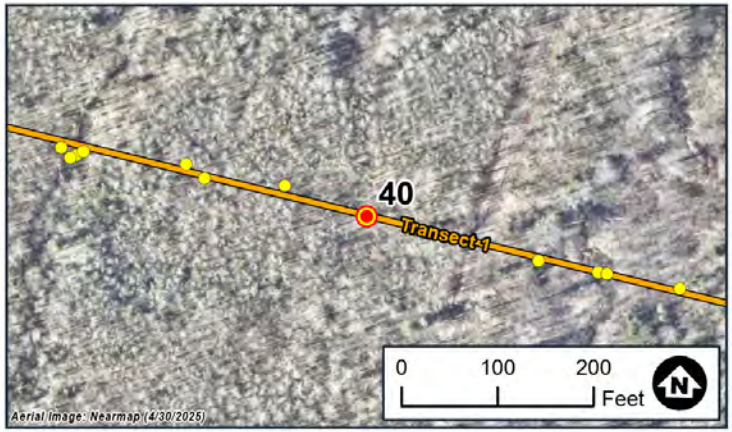
*Note: Photo locations are approximate*









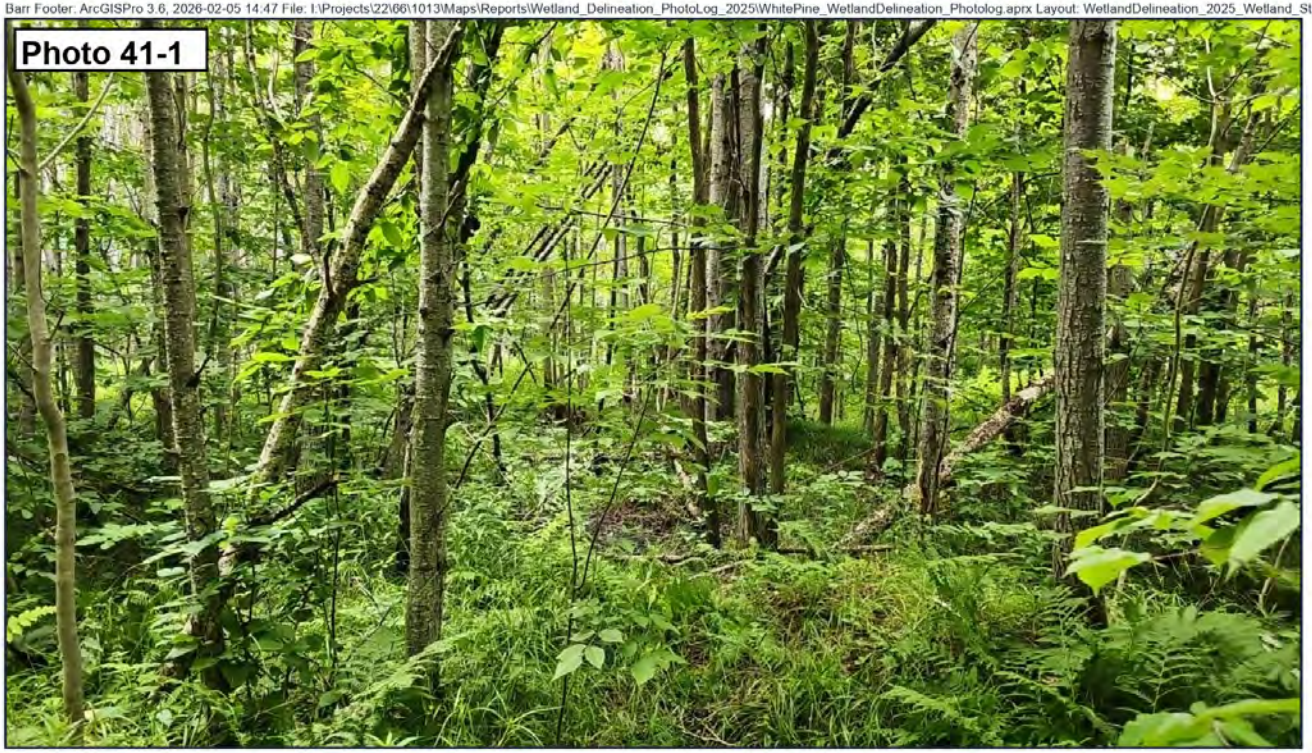


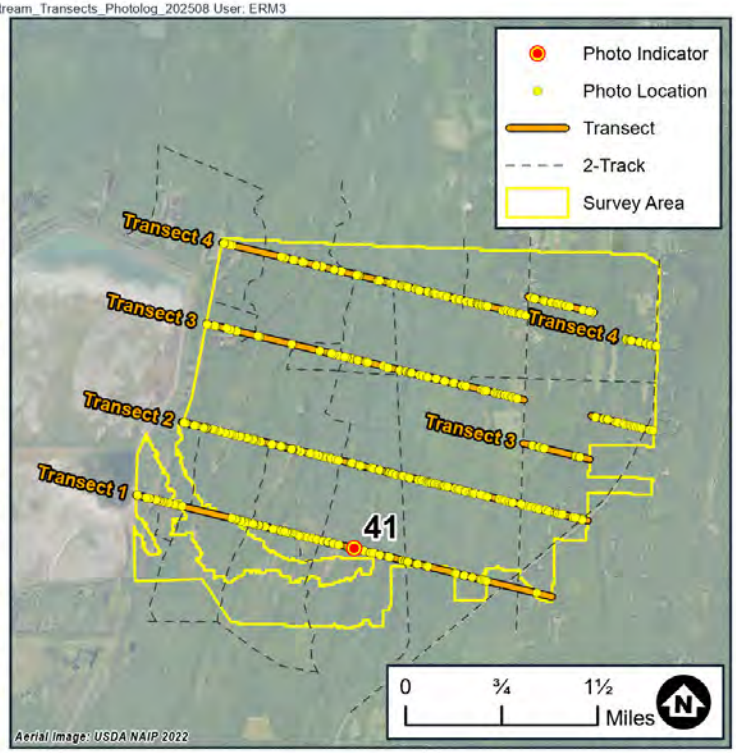

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP06-B, Wetland
**Photo 2 Caption:** T1E-BP06-B, Upland

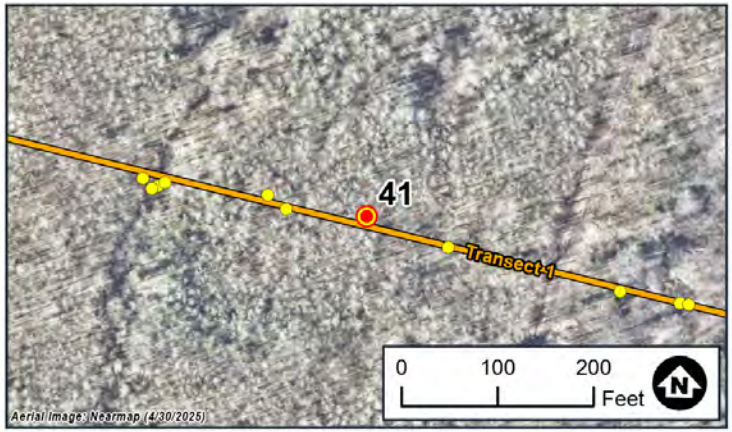
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

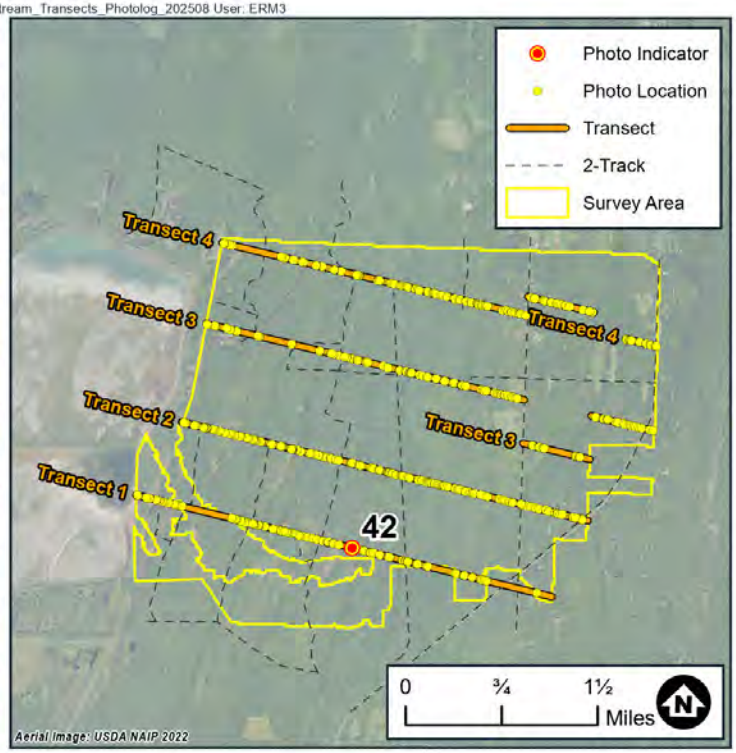
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP06-A, Wetland
**Photo 2 Caption:** T1E-BP06-A, Upland

*Note: Photo locations are approximate*

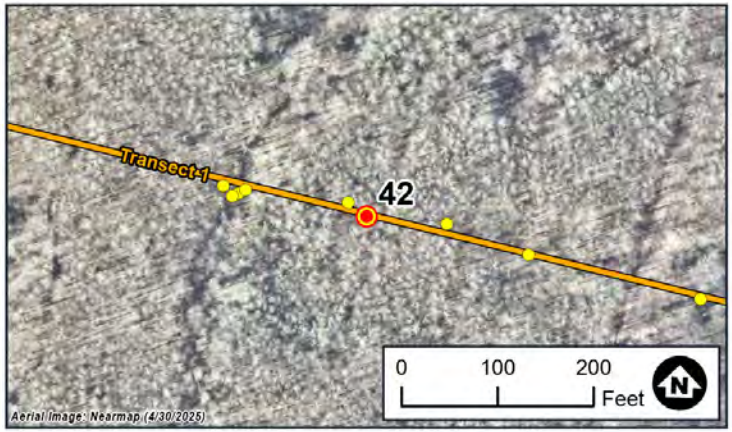
## Photo 42-1






## Photo 42-2







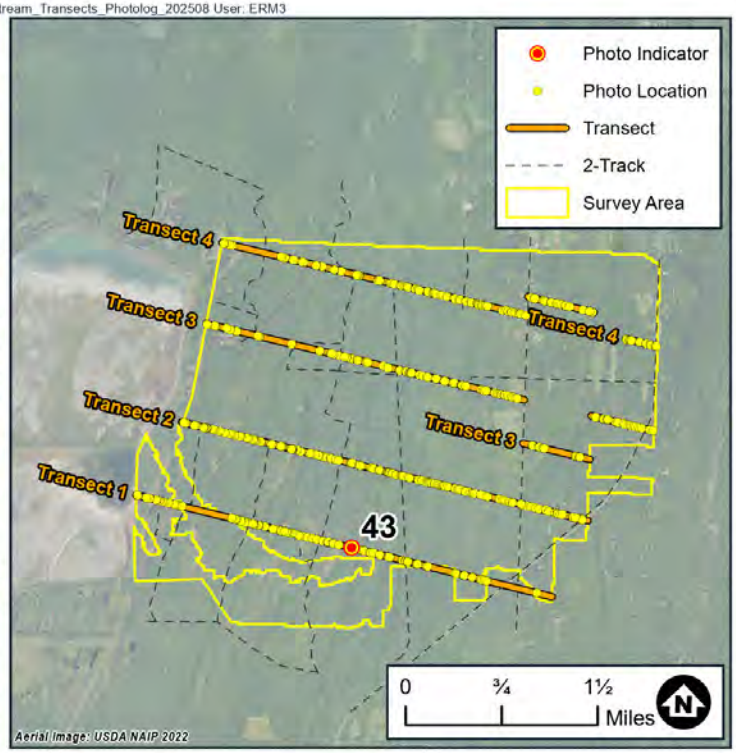

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP05-B, Wetland
**Photo 2 Caption:** T1E-BP05-B, Upland

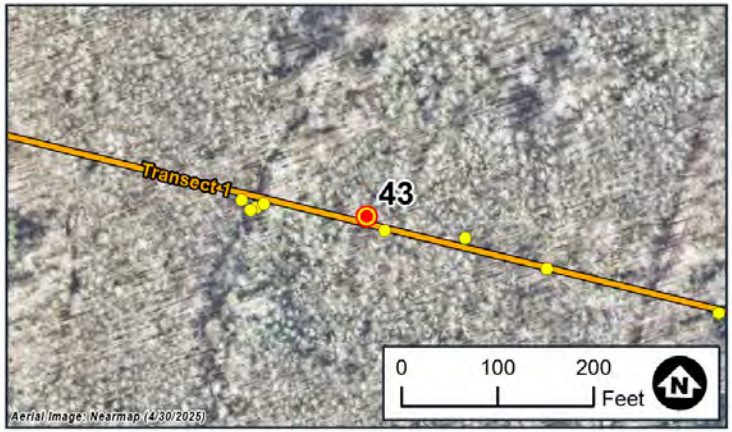
*Note: Photo locations are approximate*









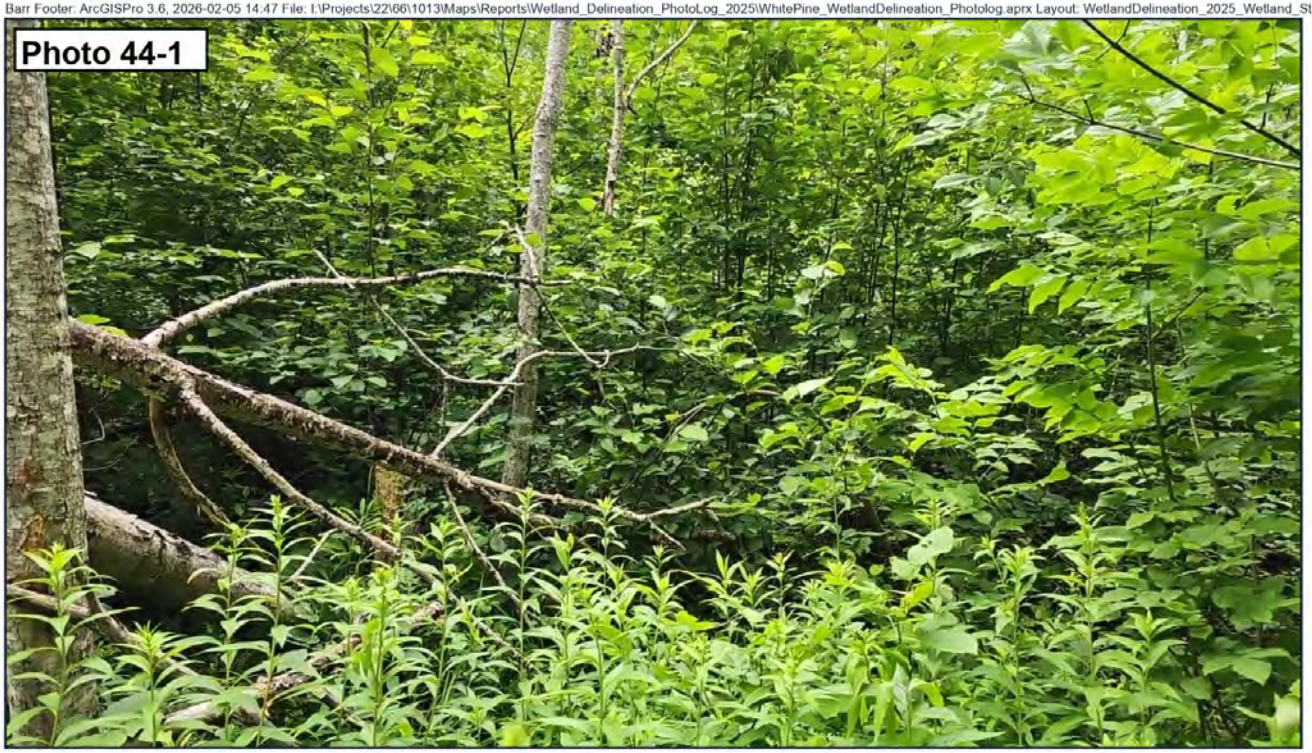


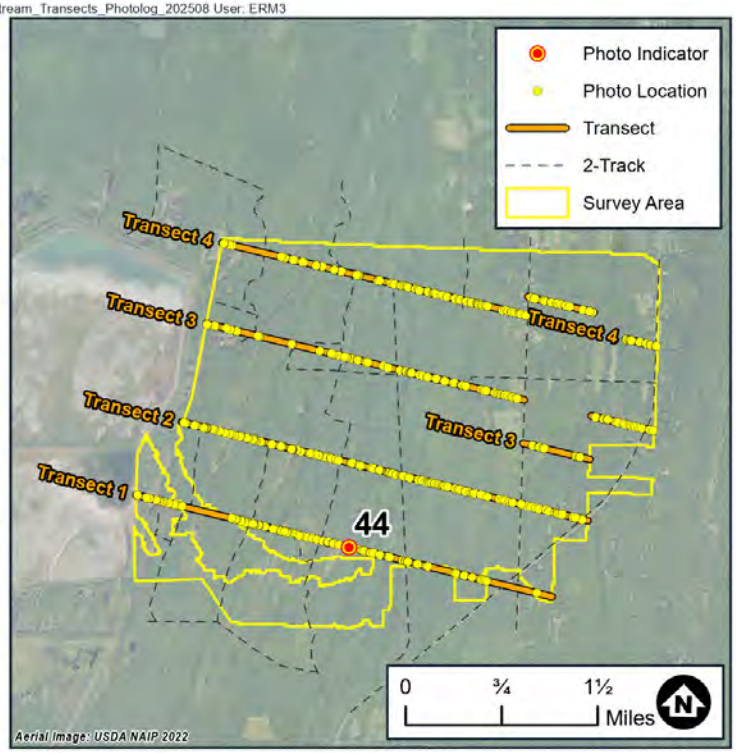

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP05-A, Wetland
**Photo 2 Caption:** T1E-BP05-A, Upland

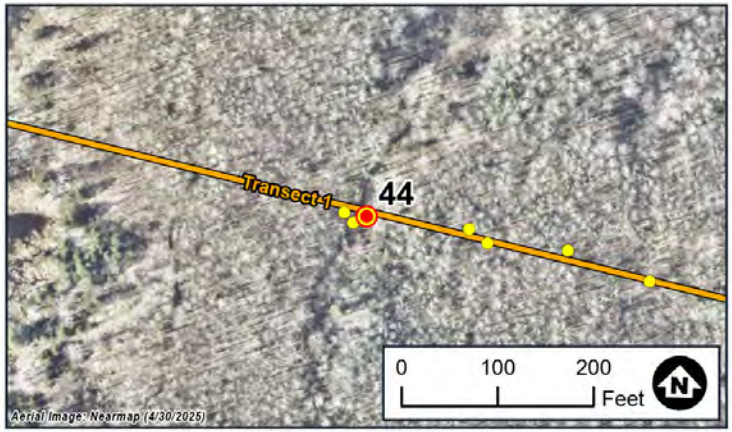
*Note: Photo locations are approximate*









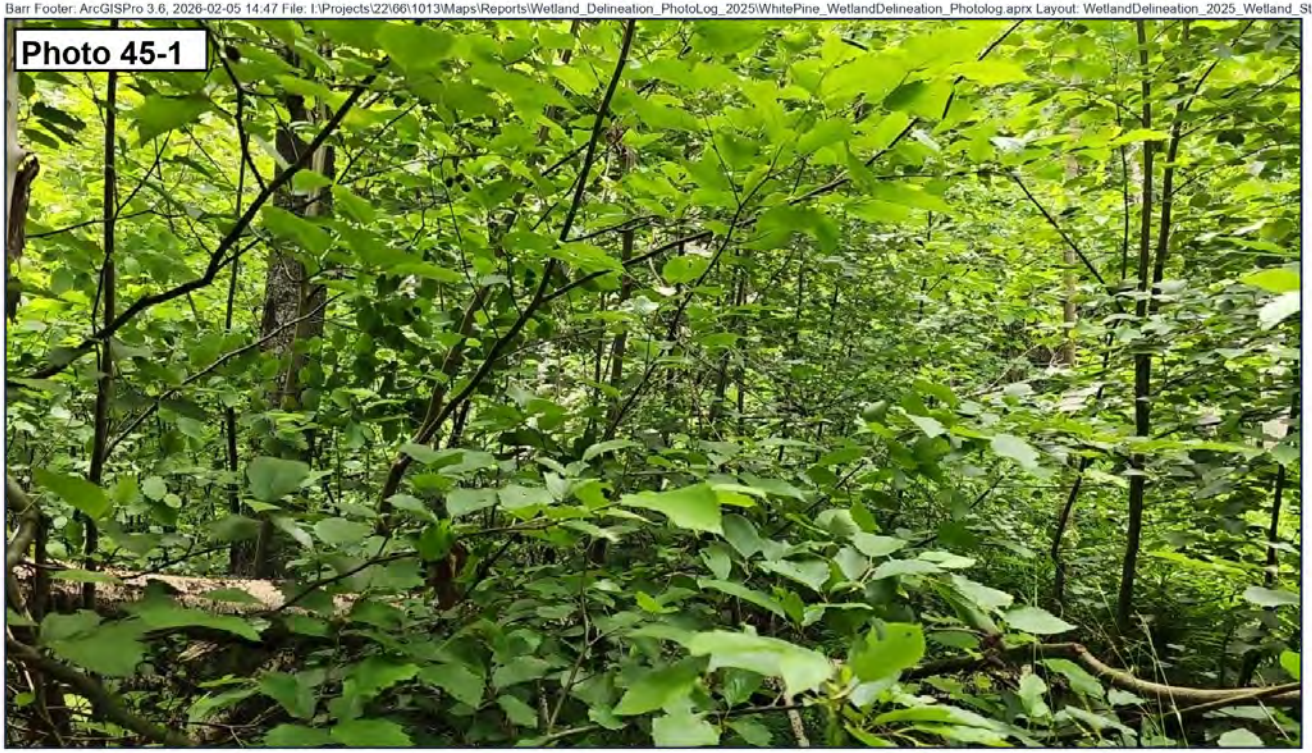


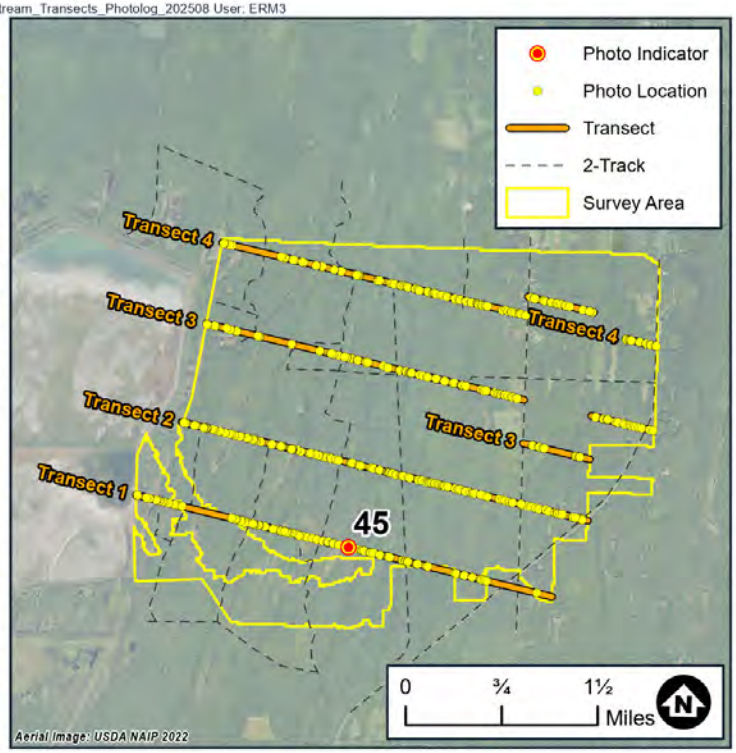

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP04-B, Wetland
**Photo 2 Caption:** T1E-BP04-B, Upland

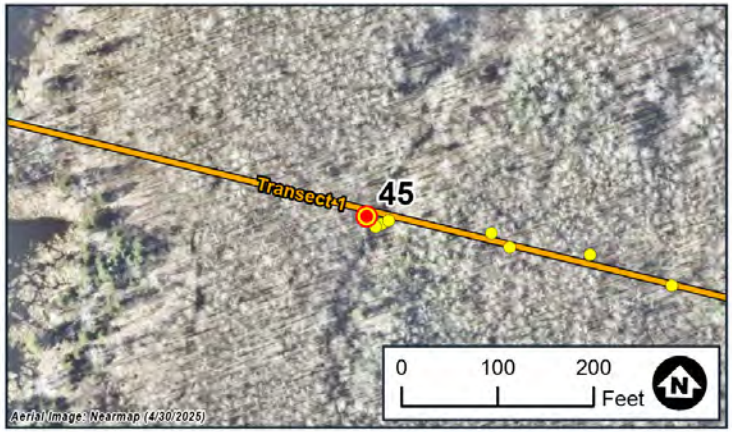
*Note: Photo locations are approximate*











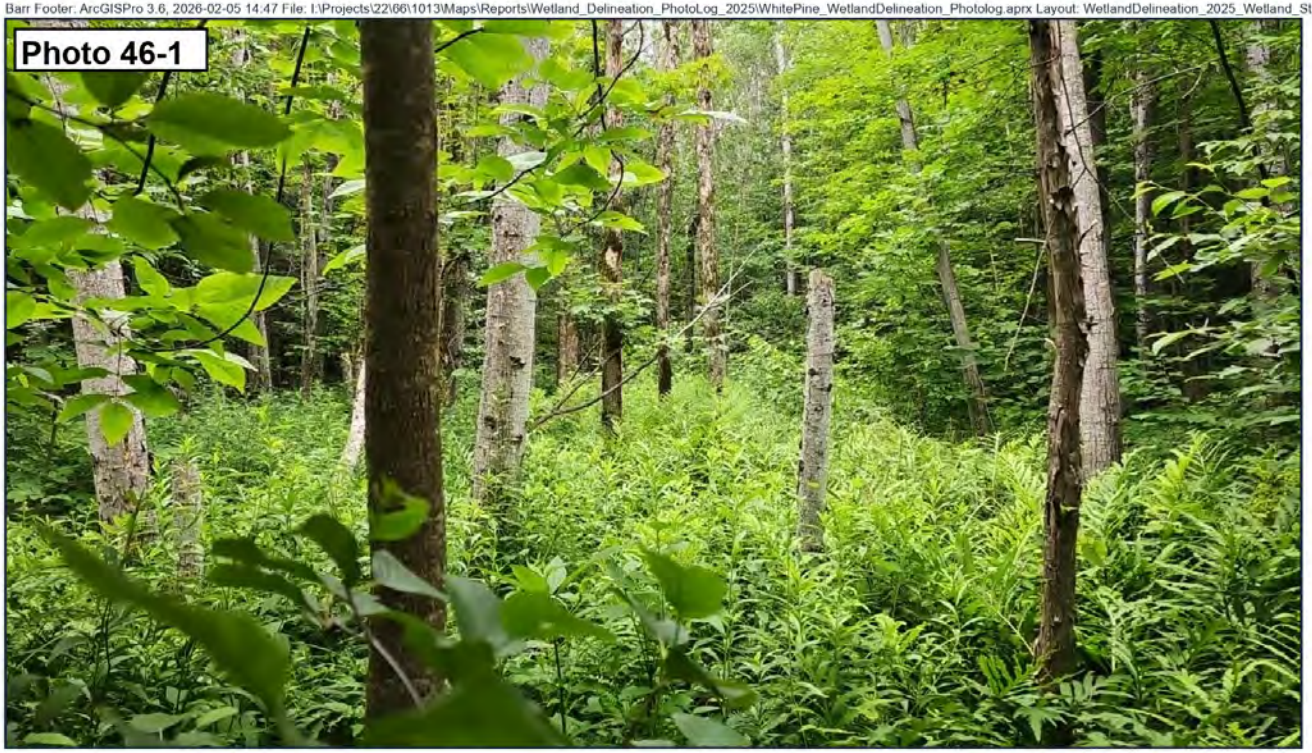

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

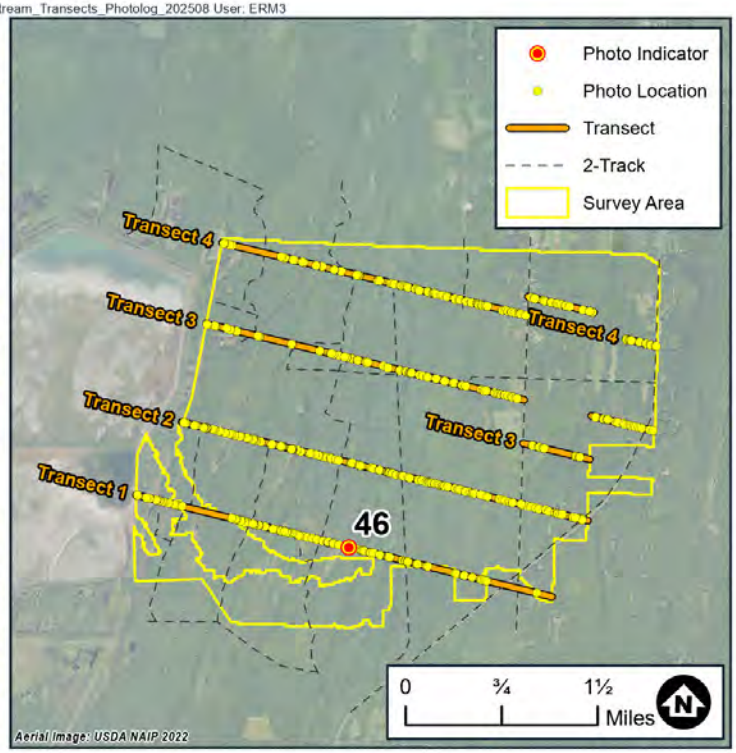
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP04-A, Wetland
**Photo 2 Caption:** T1E-BP04-A, Upland

*Note: Photo locations are approximate*

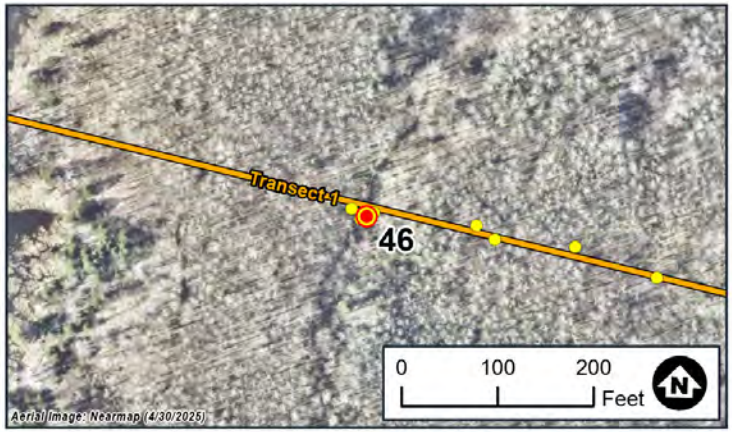
## Photo 46-1






## Photo 46-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

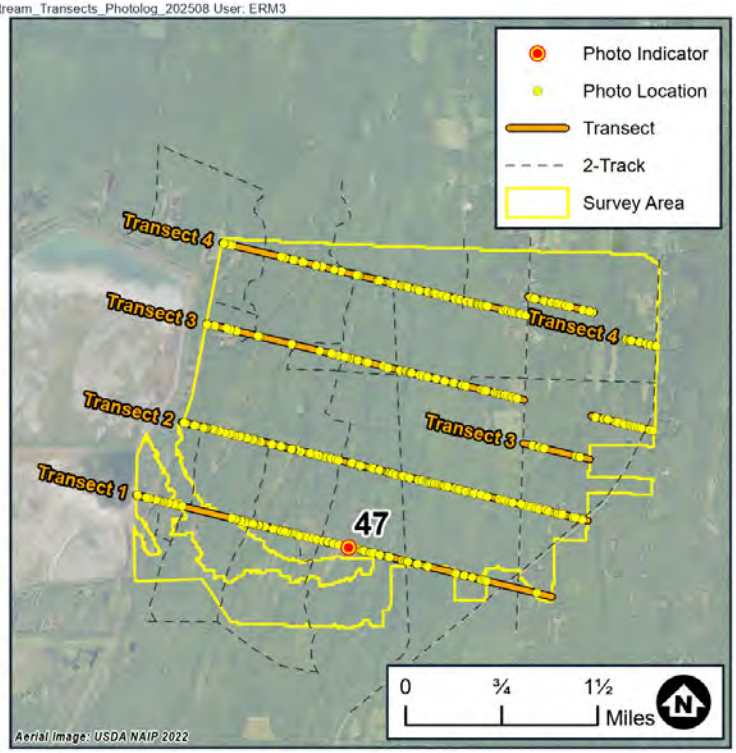
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S04-LB, Upstream
**Photo 2 Caption:** T1E-S04-LB, Downstream

*Note: Photo locations are approximate*

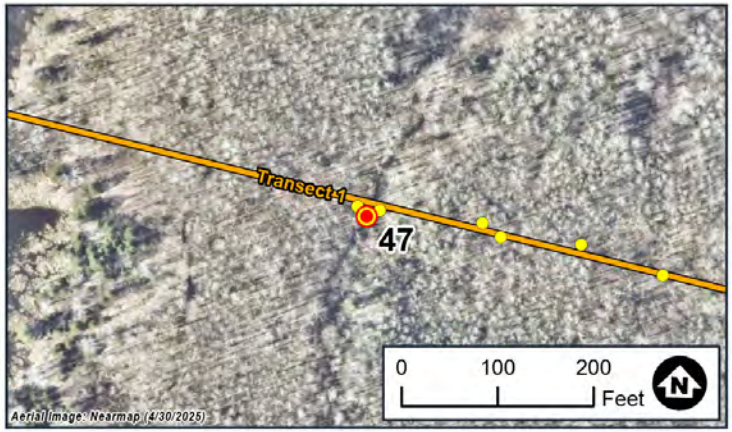
## Photo 47-1






## Photo 47-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S04-RB, Upstream
**Photo 2 Caption:** T1E-S04-RB, Downstream

*Note: Photo locations are approximate*

**Photo 48-1**



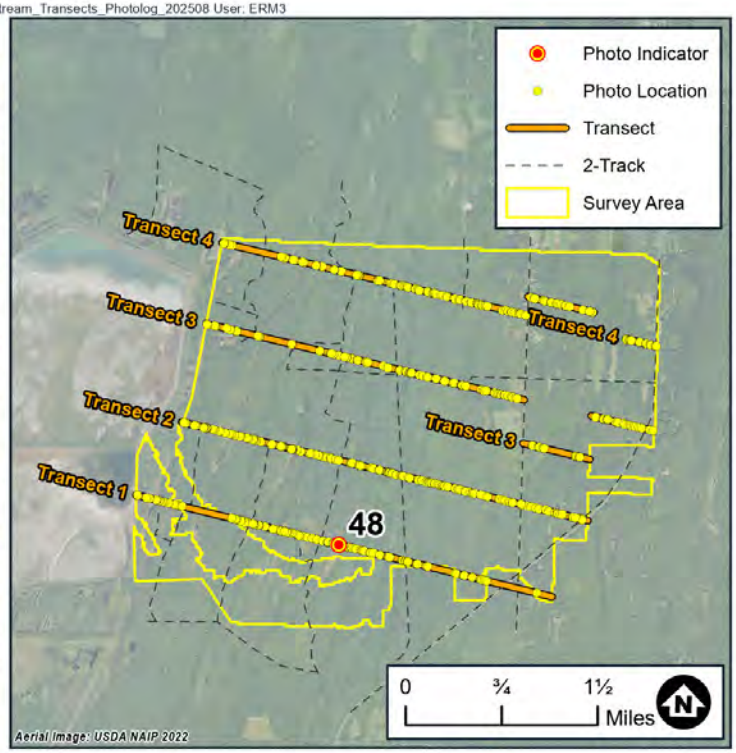
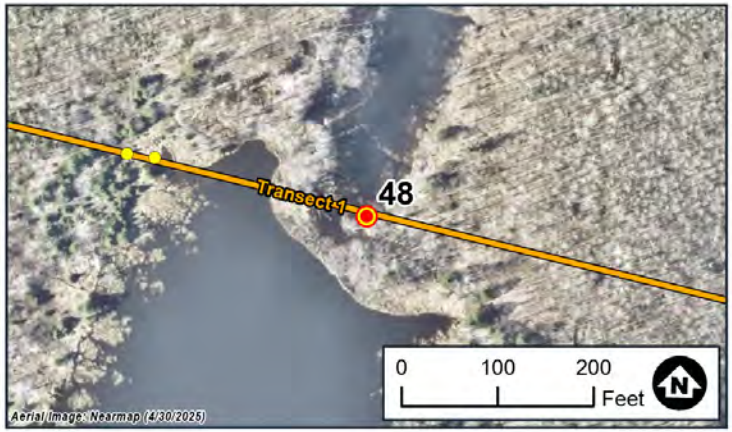



**Photo 48-2**






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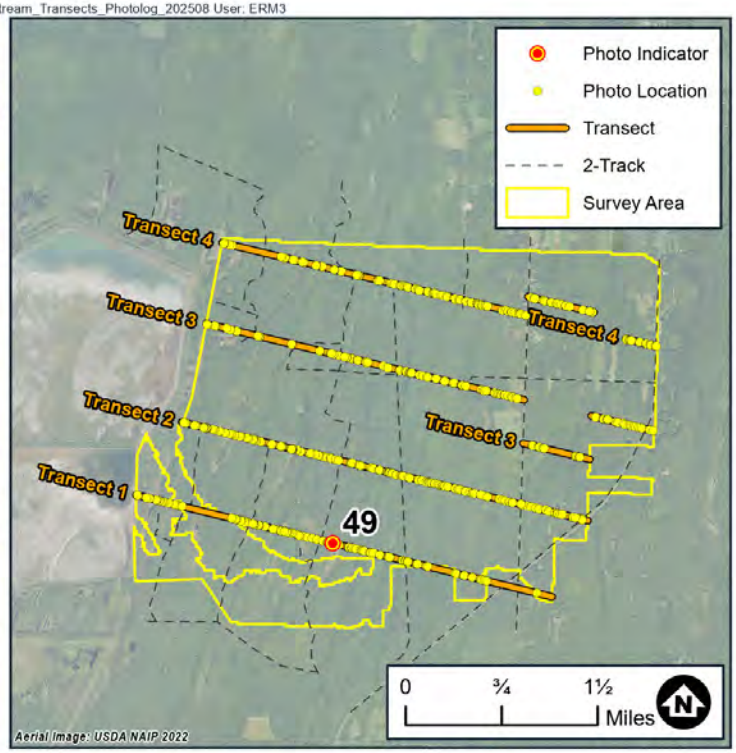
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP03-B, Wetland
**Photo 2 Caption:** T1E-BP03-B, Upland

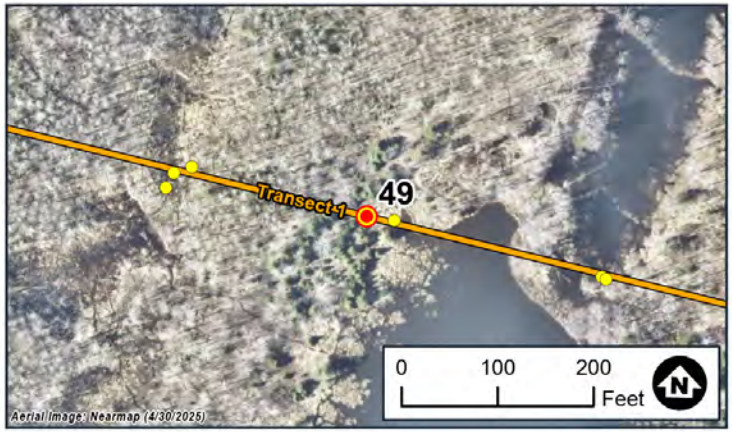
*Note: Photo locations are approximate*











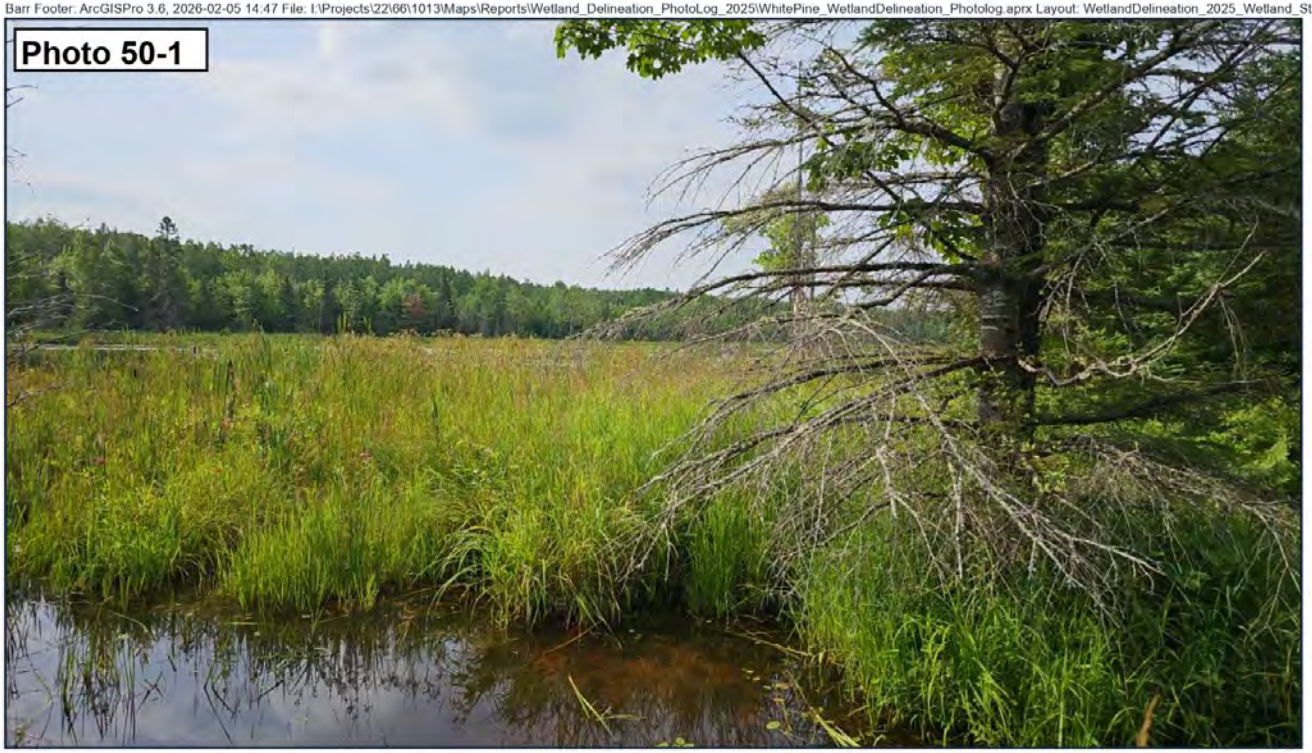

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

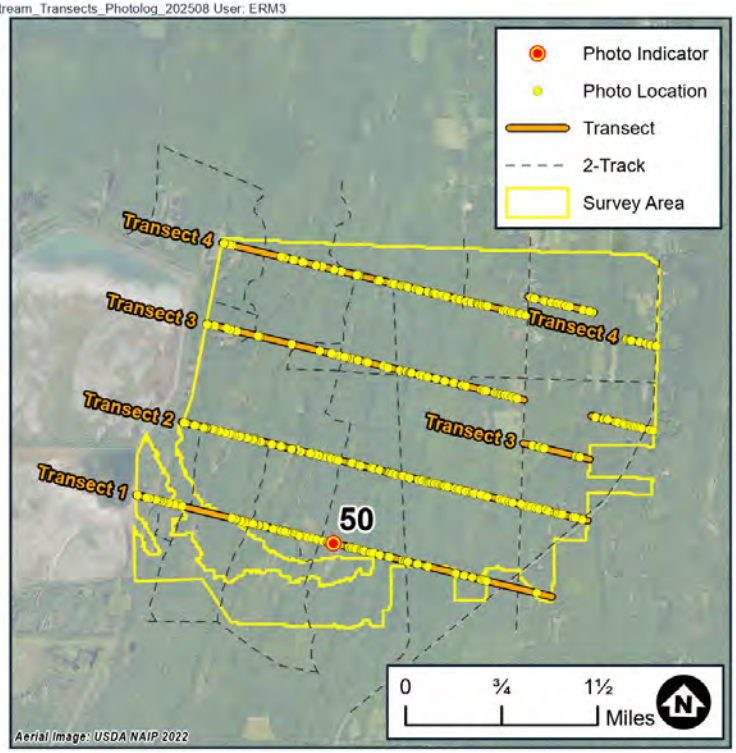
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP03-A, Wetland
**Photo 2 Caption:** T1E-BP03-A, Upland

*Note: Photo locations are approximate*

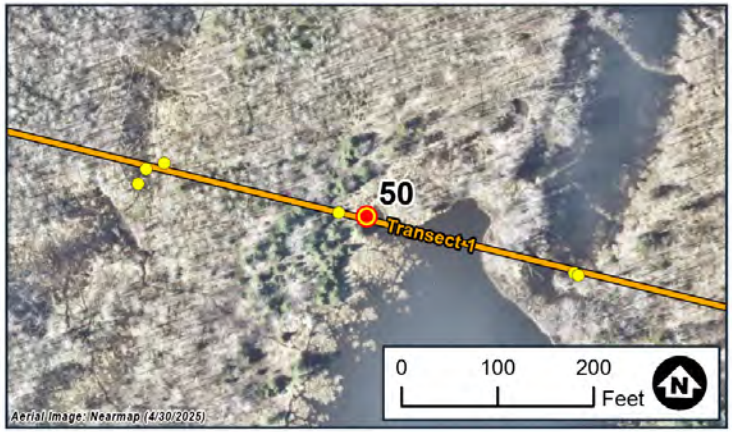
## Photo 50-1






## Photo 50-2






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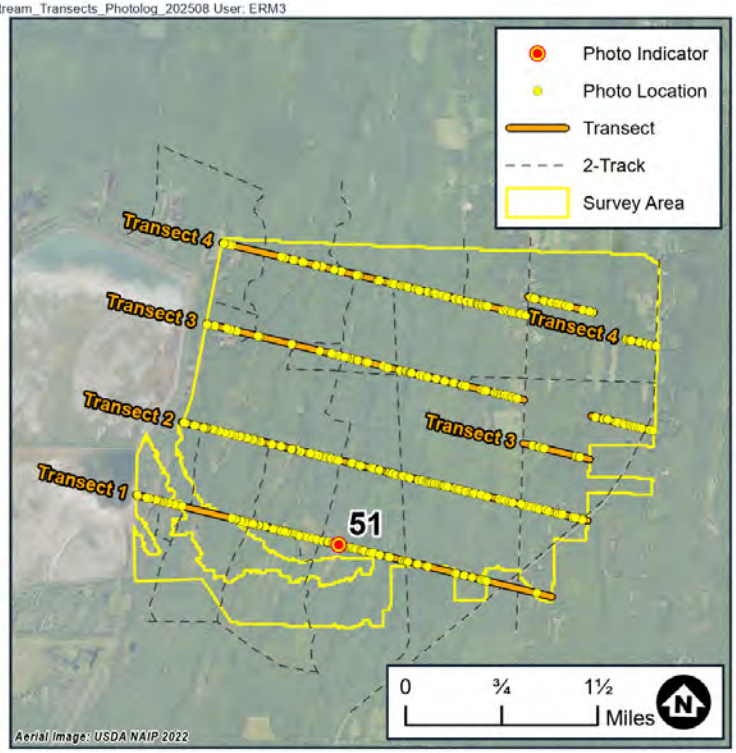
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S03-LB, Upstream
**Photo 2 Caption:** T1E-S03-LB, Downstream

*Note: Photo locations are approximate*











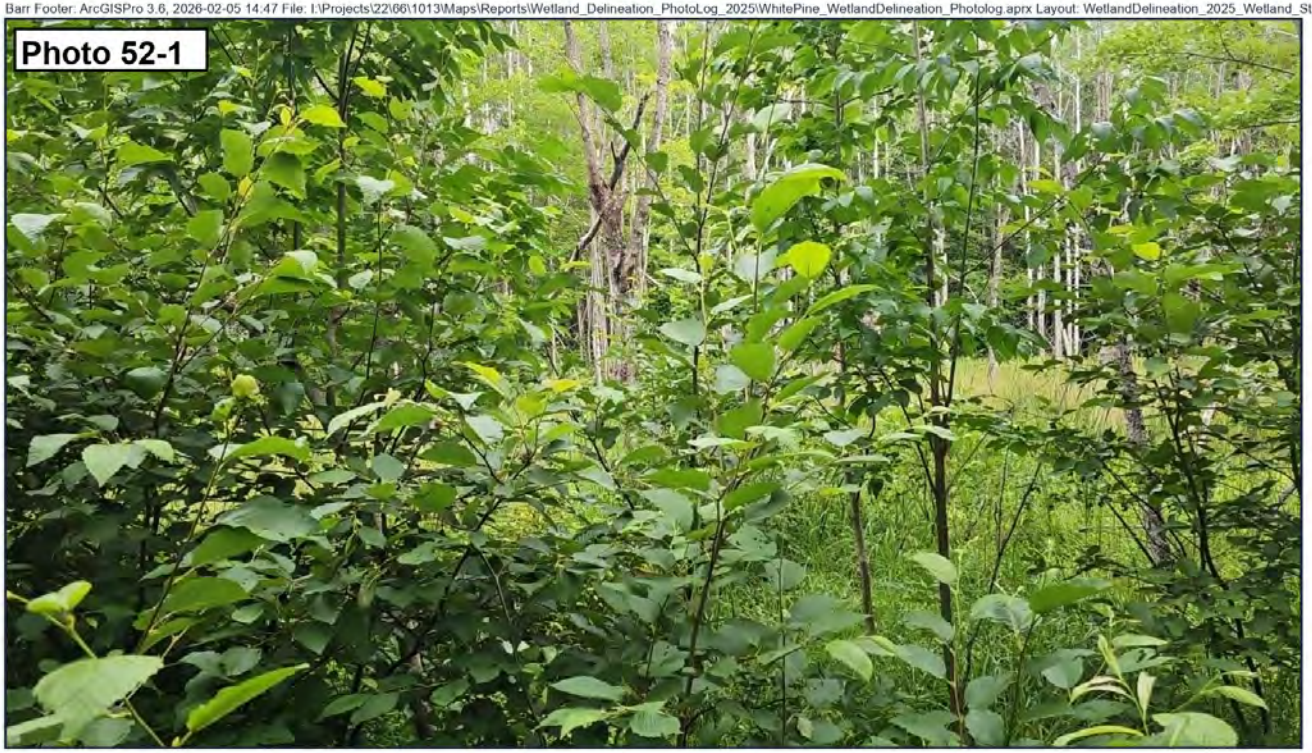

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

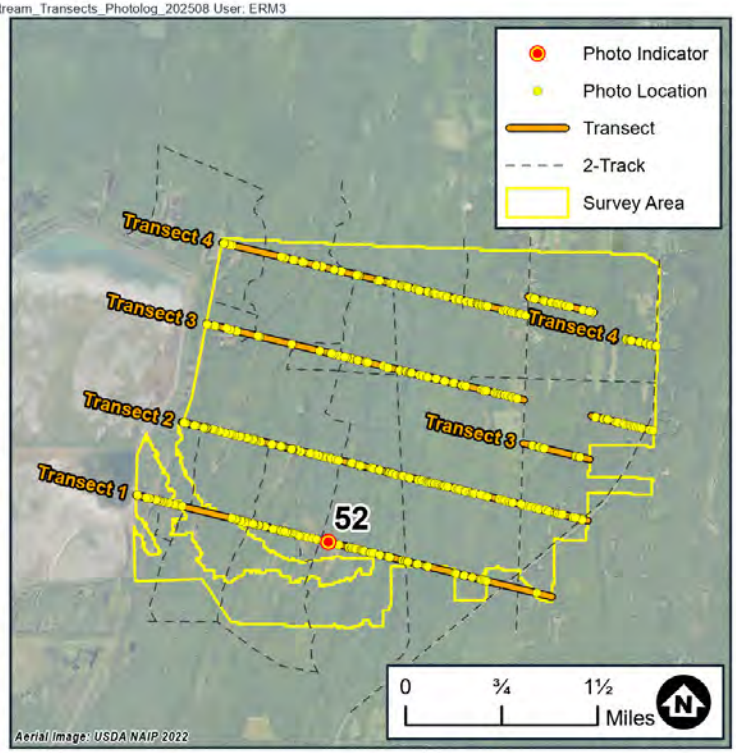
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S03-RB, Upstream
**Photo 2 Caption:** T1E-S03-RB, Downstream

*Note: Photo locations are approximate*

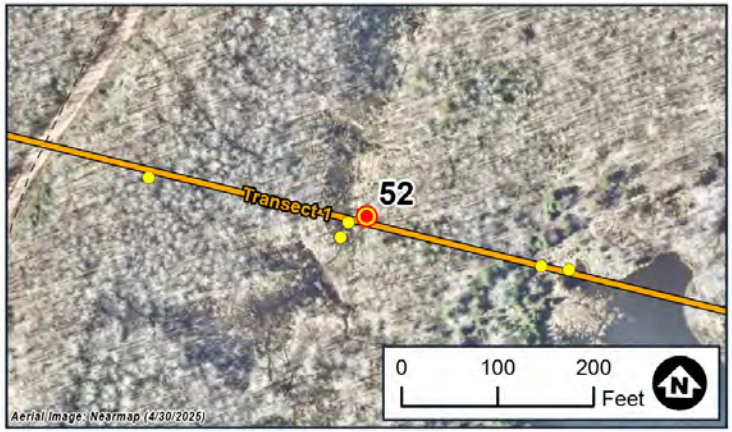
## Photo 52-1






## Photo 52-2







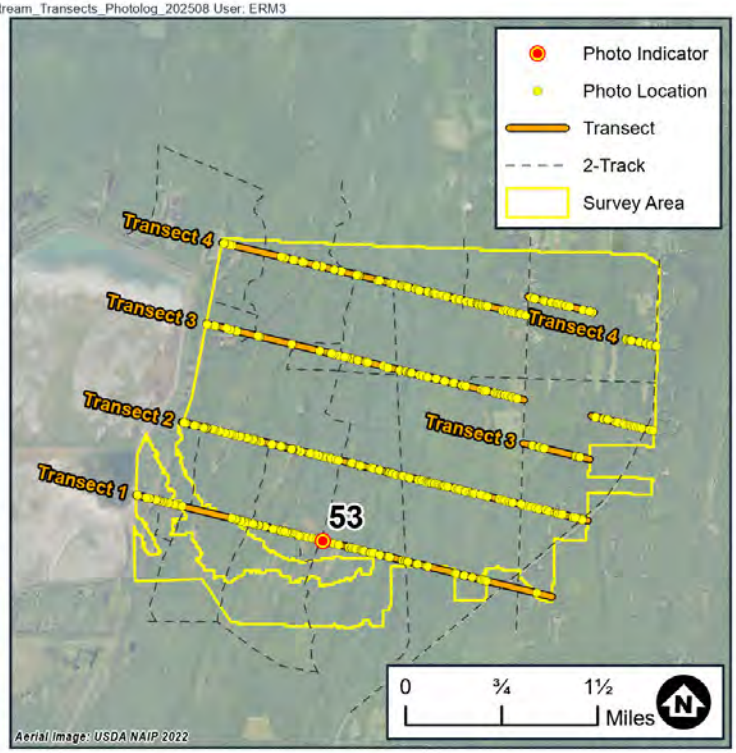

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP02-B, Wetland
**Photo 2 Caption:** T1E-BP02-B, Upland

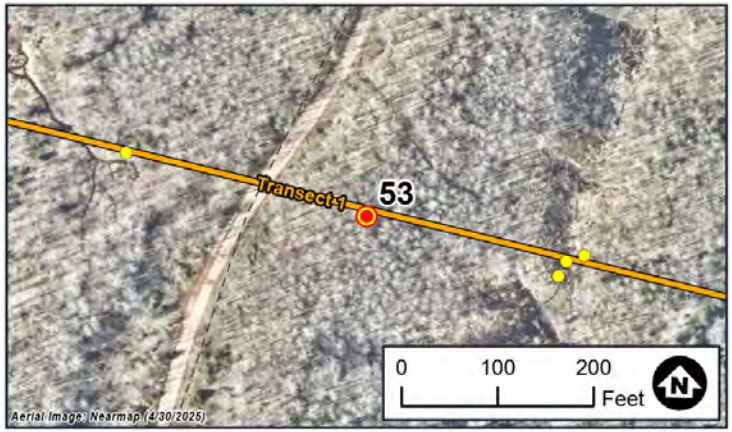
*Note: Photo locations are approximate*











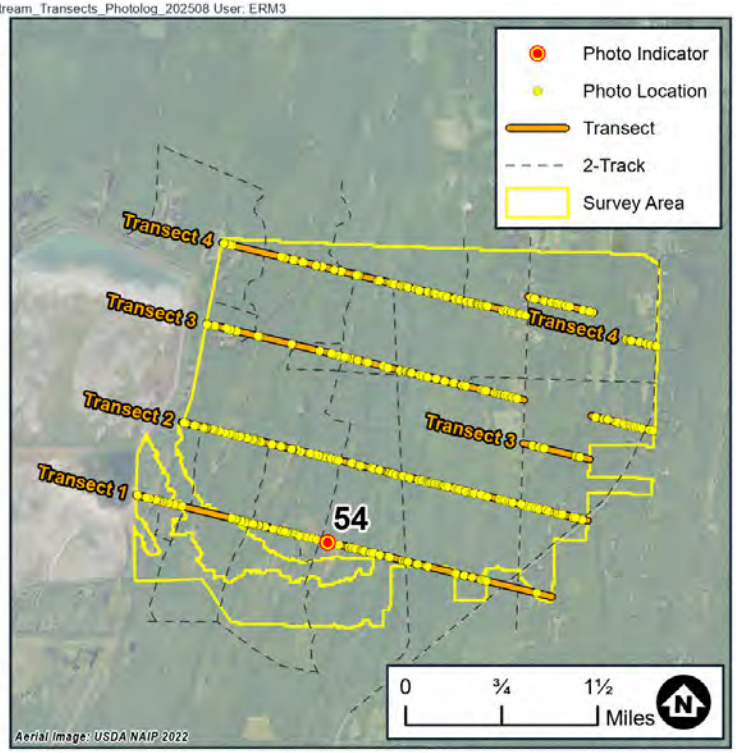

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-BP02-A, Wetland
**Photo 2 Caption:** T1E-BP02-A, Upland

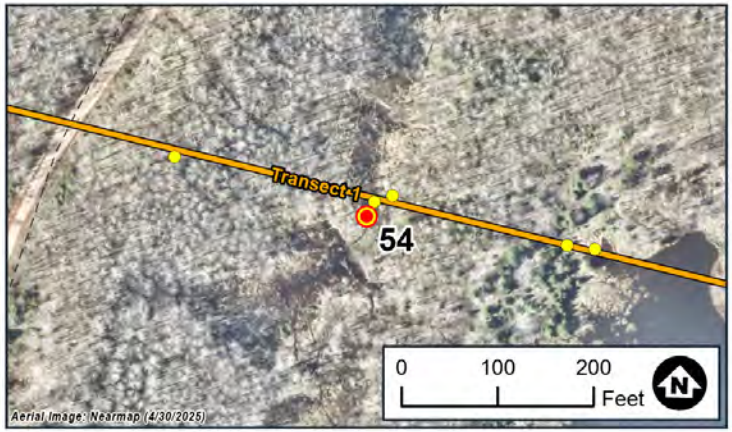
*Note: Photo locations are approximate*











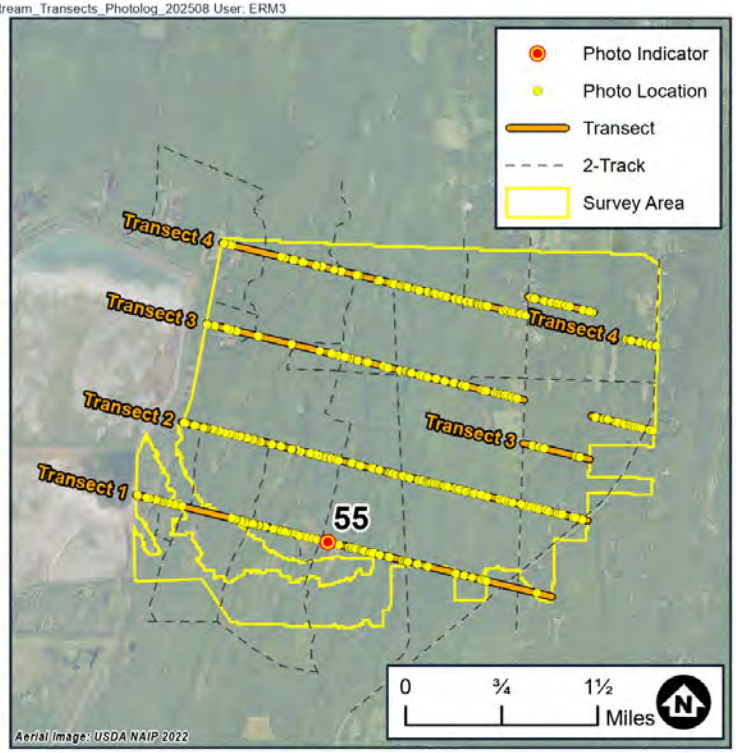

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S02-LB, Upstream
**Photo 2 Caption:** T1E-S02-LB, Downstream

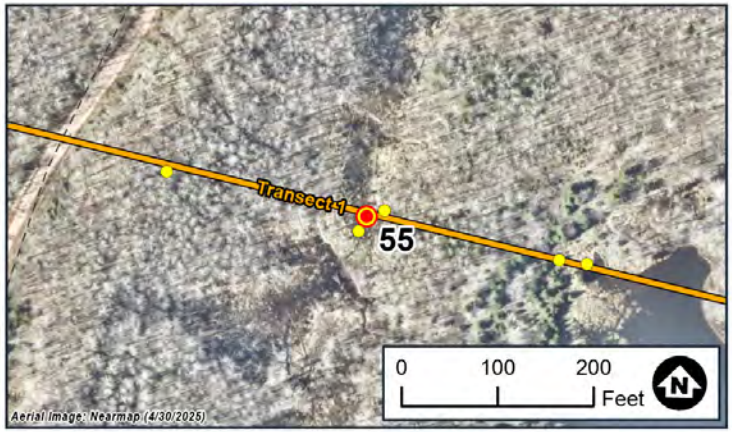
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

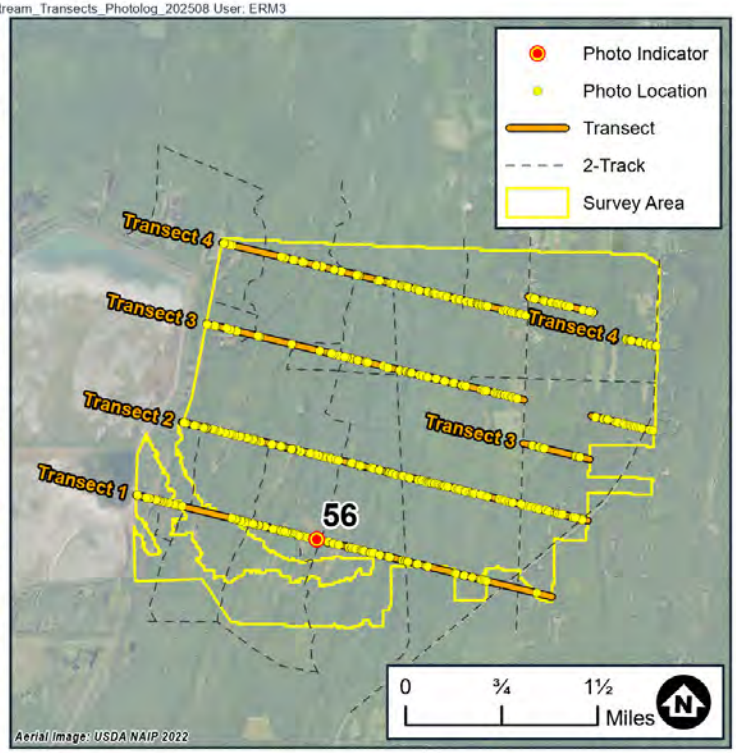
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1E-S02-RB, Upstream
**Photo 2 Caption:** T1E-S02-RB, Downstream

*Note: Photo locations are approximate*

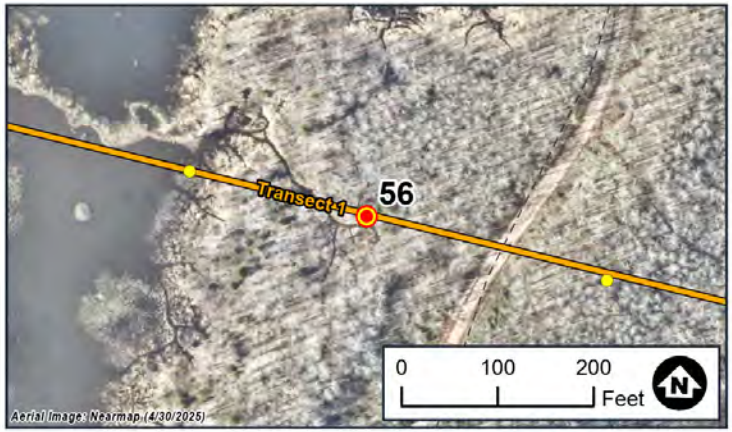
## Photo 56-1






## Photo 56-2







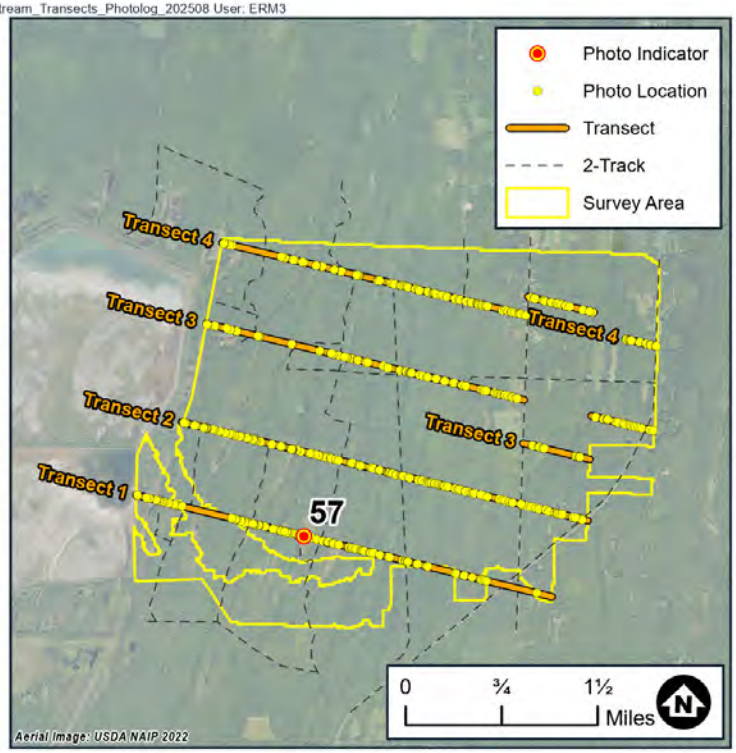

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1E-BP01-B, Wetland
**Photo 2 Caption:** T1E-BP01-B, Upland

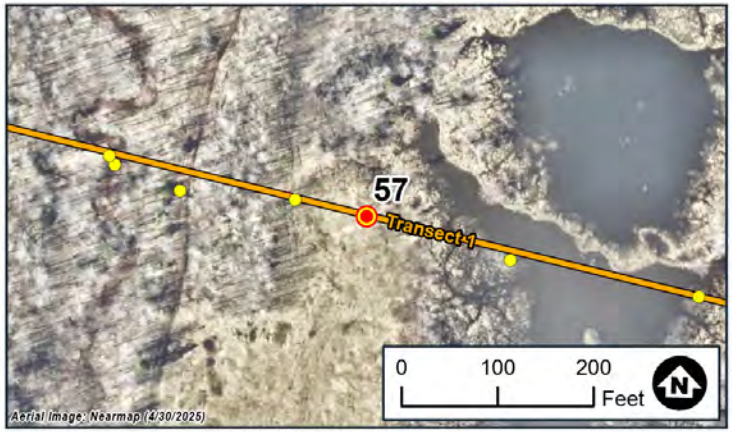
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1E-BP01-A, Wetland
**Photo 2 Caption:** T1E-BP01-A, Upland

*Note: Photo locations are approximate*

**Photo 58-1**



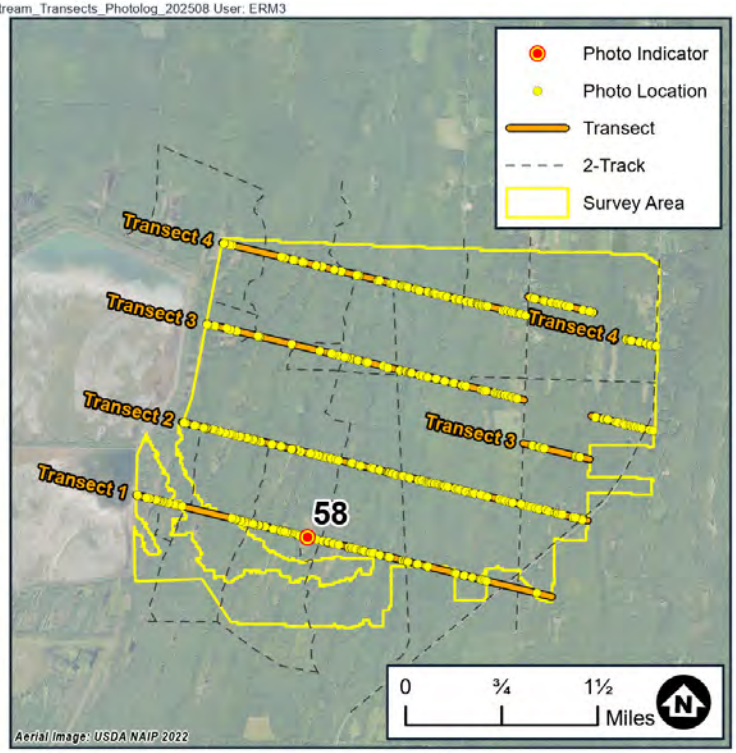
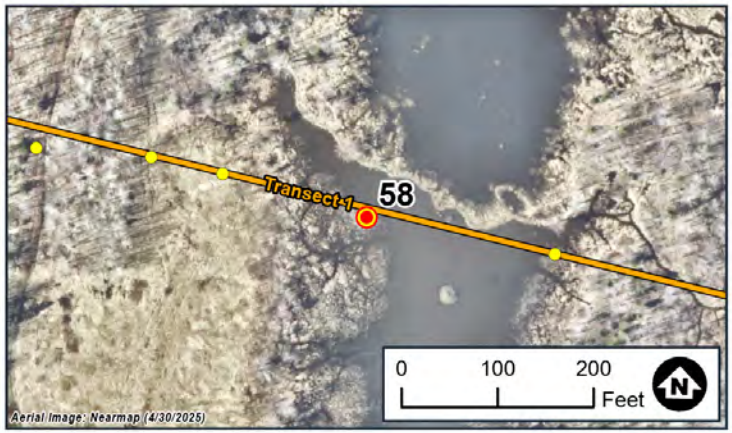



**Photo 58-2**








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

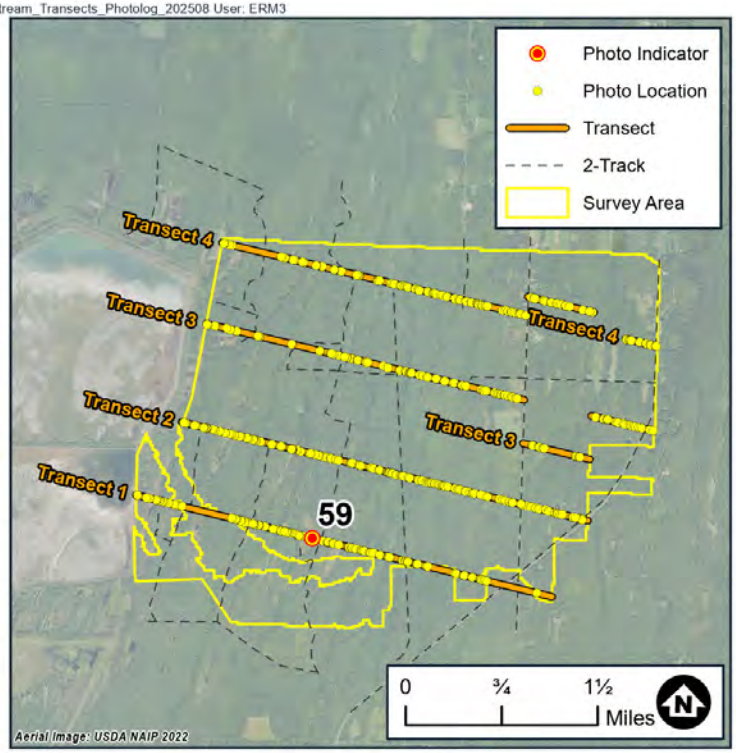
BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1E-S01-LB, Upstream
**Photo 2 Caption:** T1E-S01-LB, Downstream

*Note: Photo locations are approximate*

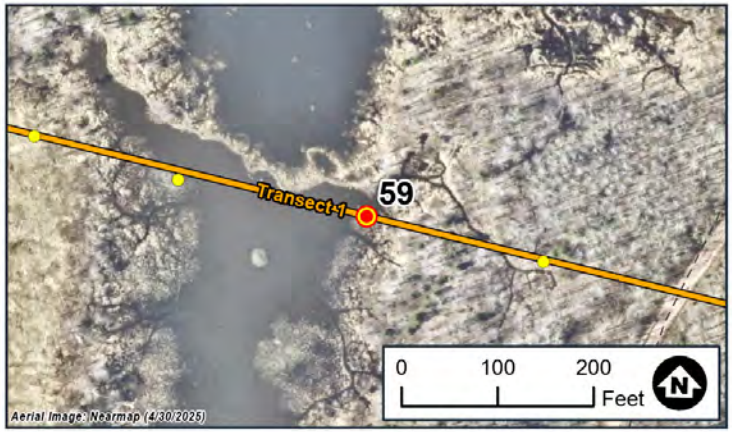
## Photo 59-1






## Photo 59-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

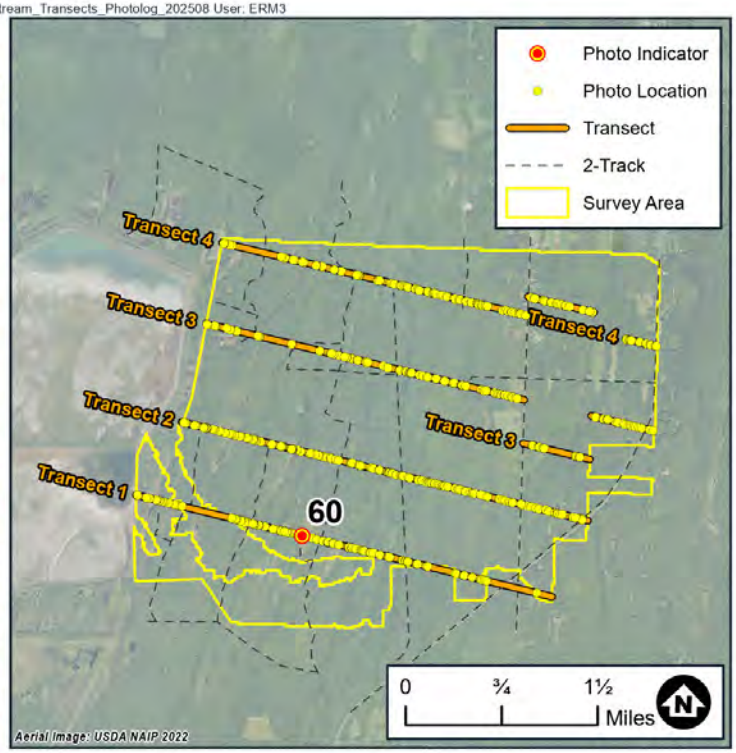
BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1E-S01-RB, Upstream
**Photo 2 Caption:** T1E-S01-RB, Downstream

*Note: Photo locations are approximate*

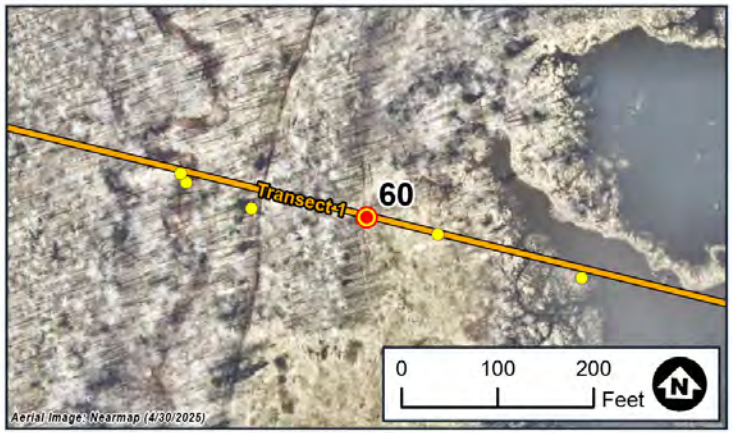
## Photo 60-1






## Photo 60-2







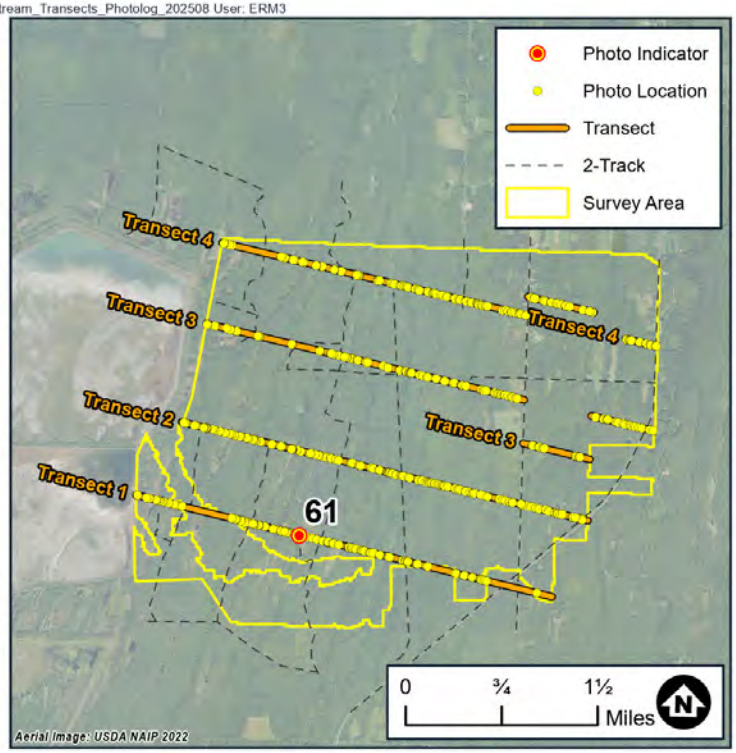

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1W-BP01-A, Wetland
**Photo 2 Caption:** T1W-BP01-A, Upland

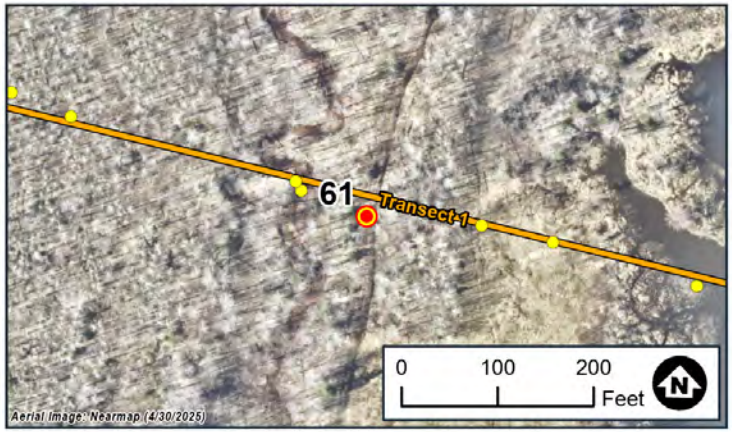
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

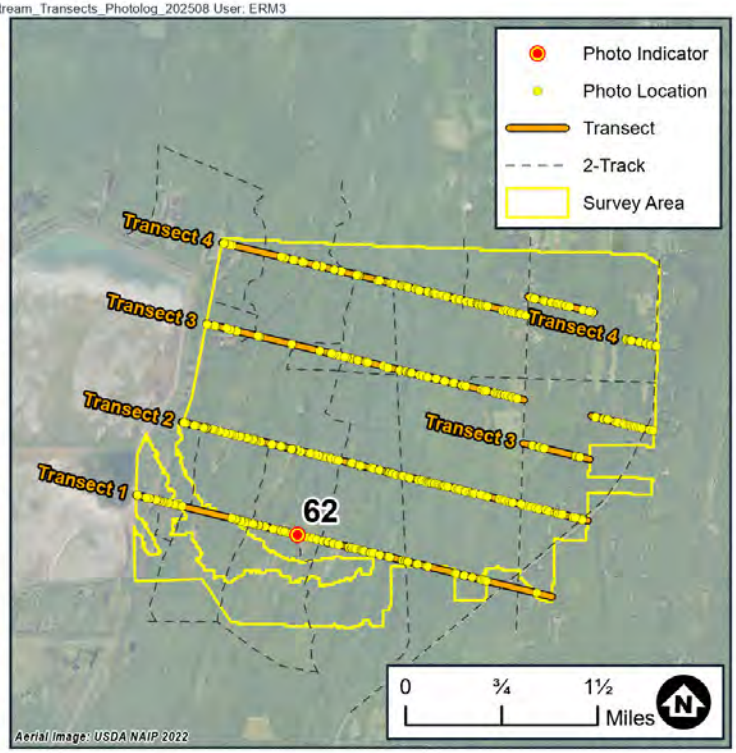
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP01-B, Wetland
**Photo 2 Caption:** T1W-BP01-B, Upland

*Note: Photo locations are approximate*

## Photo 62-1






## Photo 62-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

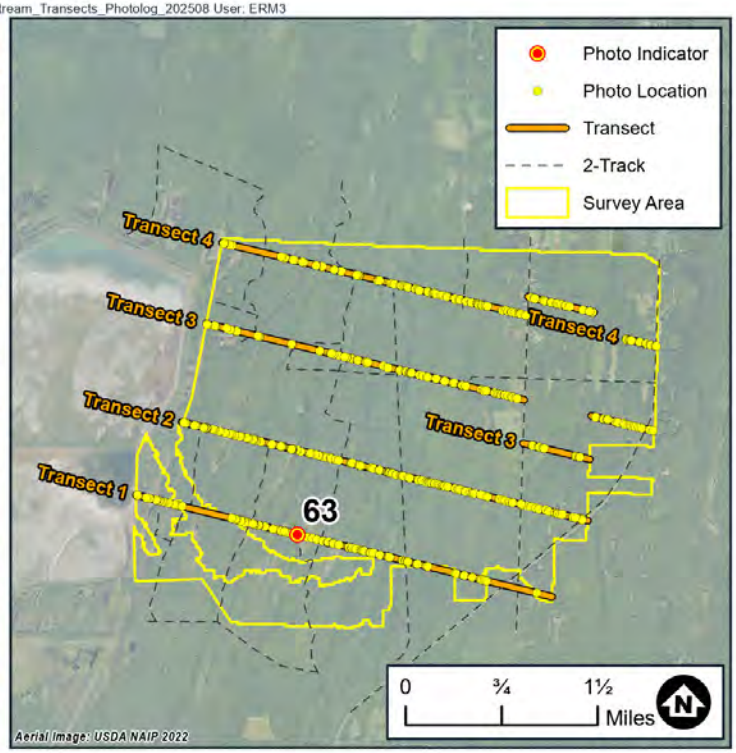
BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1W-S01-RB, Upstream
**Photo 2 Caption:** T1W-S01-RB, Downstream

*Note: Photo locations are approximate*

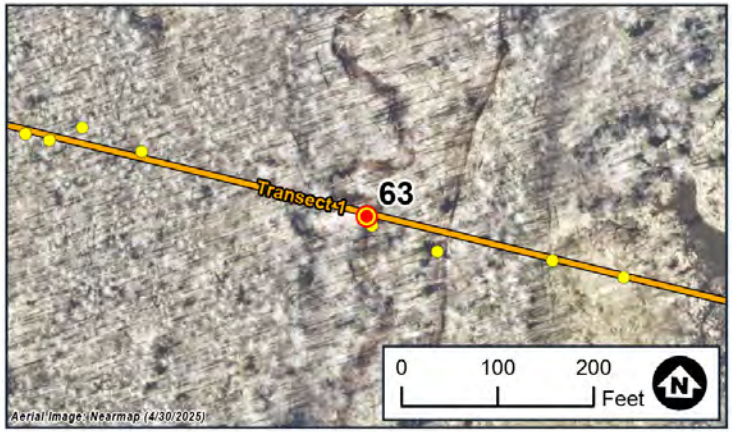
## Photo 63-1






## Photo 63-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

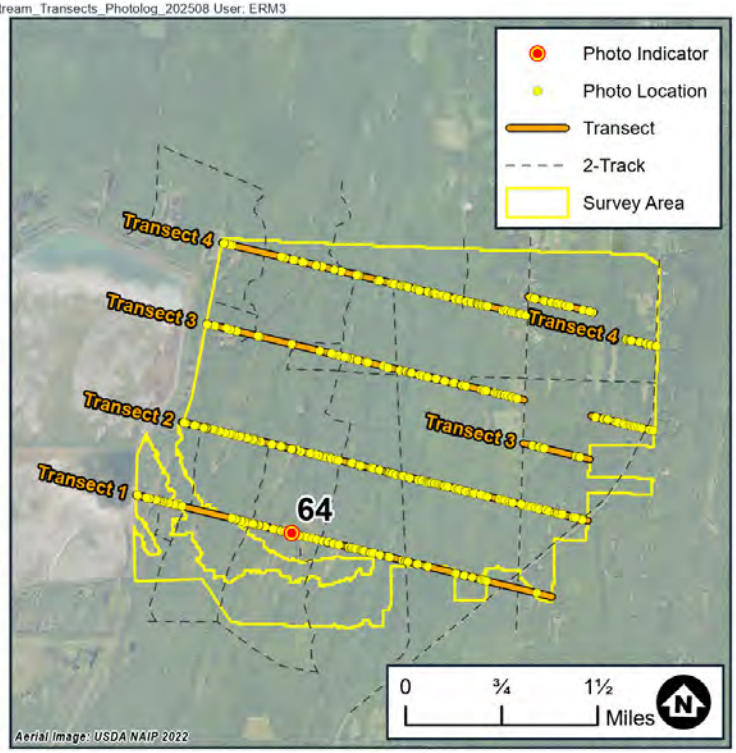
BARR

**Date:** 7/21/2025
**Photo 1 Caption:** T1W-S01-LB, Upstream
**Photo 2 Caption:** T1W-S01-LB, Downstream

*Note: Photo locations are approximate*

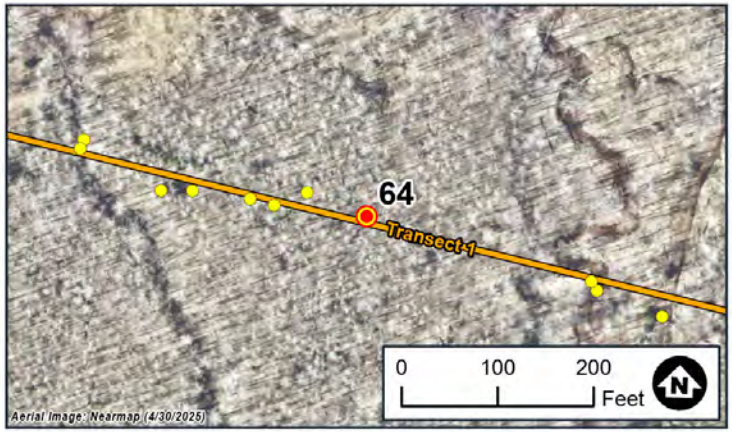
## Photo 64-1






## Photo 64-2







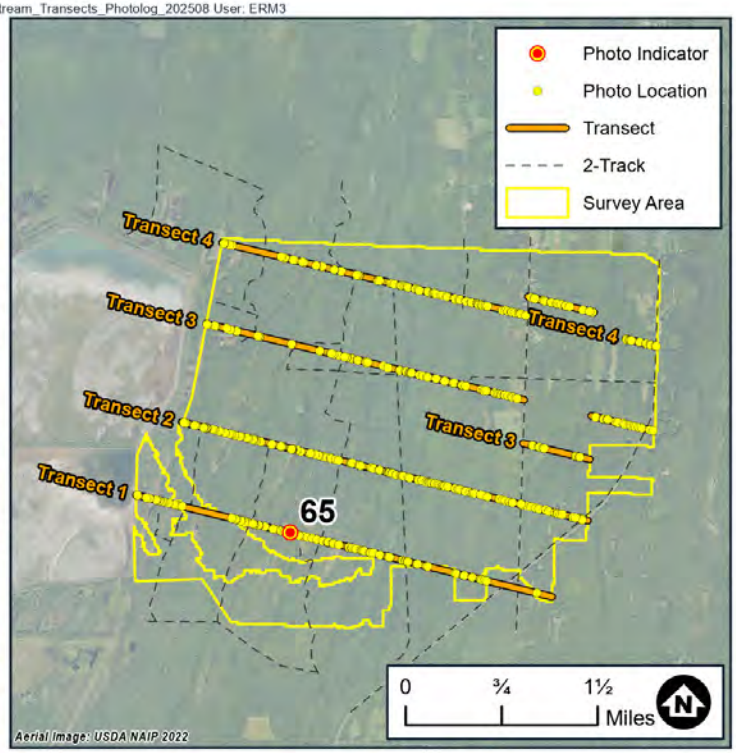

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP02-A, Wetland
**Photo 2 Caption:** T1W-BP02-A, Upland

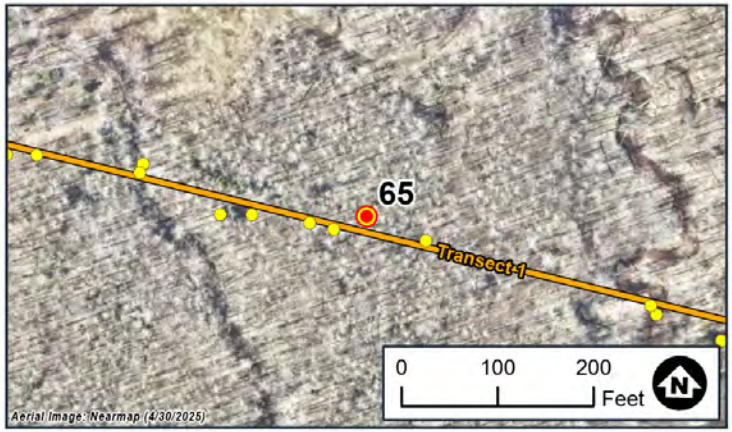
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP02-B, Wetland
**Photo 2 Caption:** T1W-BP02-B, Upland

*Note: Photo locations are approximate*

**Photo 66-1**



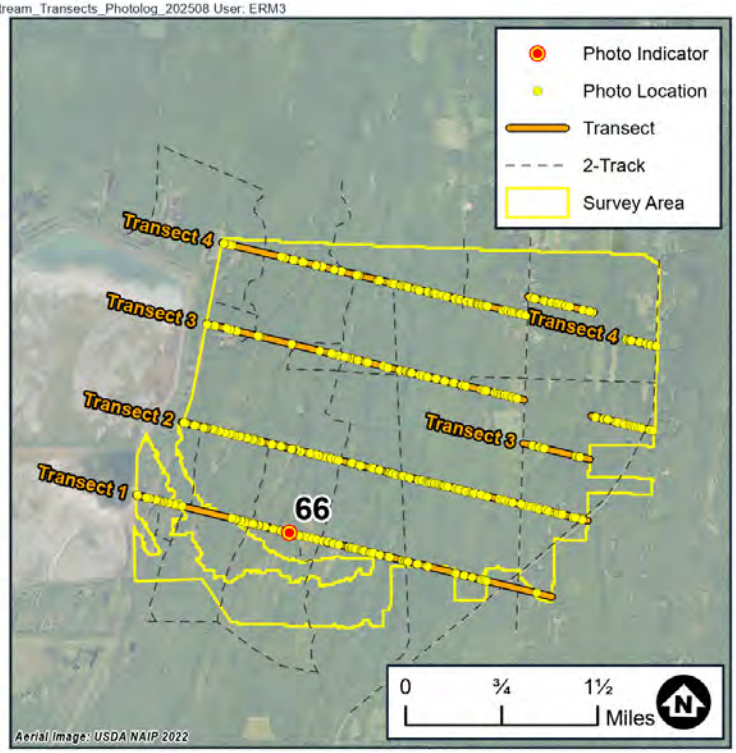
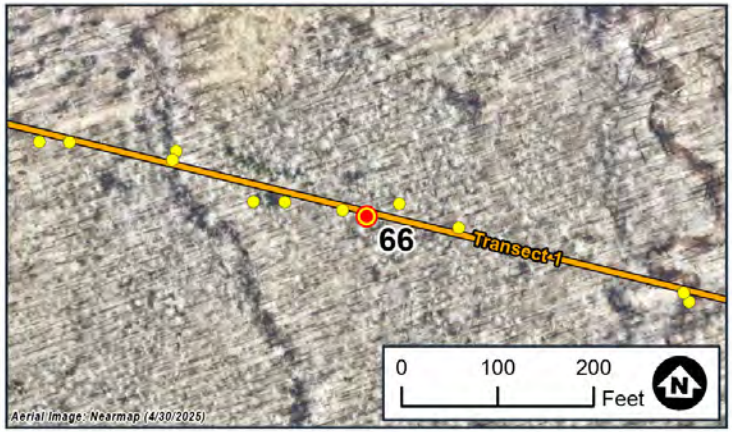



**Photo 66-2**






Page 66 of 504

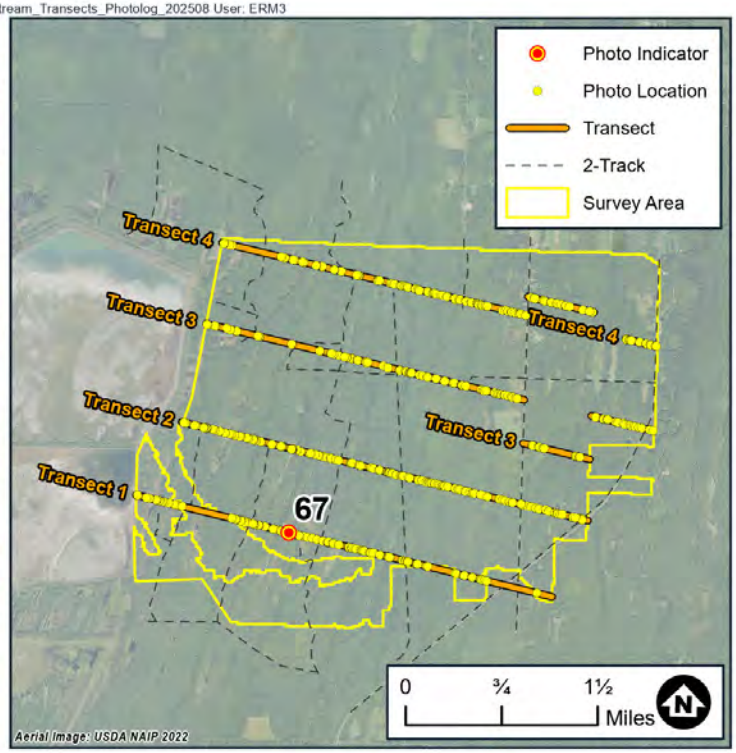
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP03-A, Wetland
**Photo 2 Caption:** T1W-BP03-A, Upland

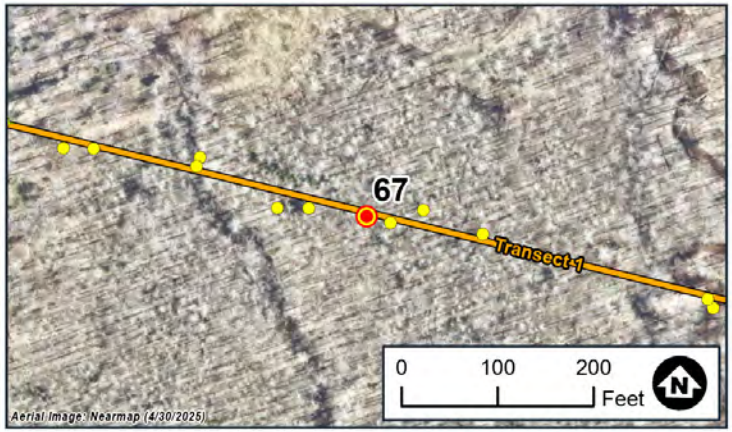
*Note: Photo locations are approximate*











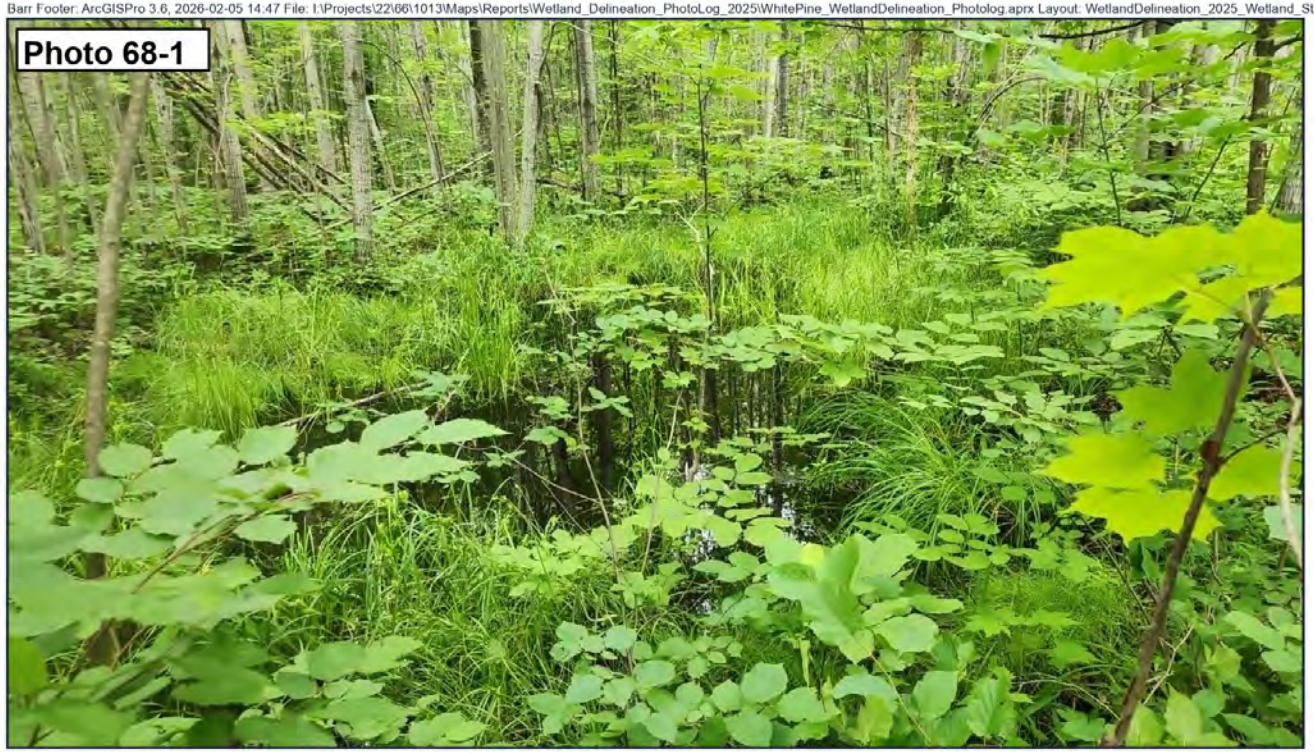

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

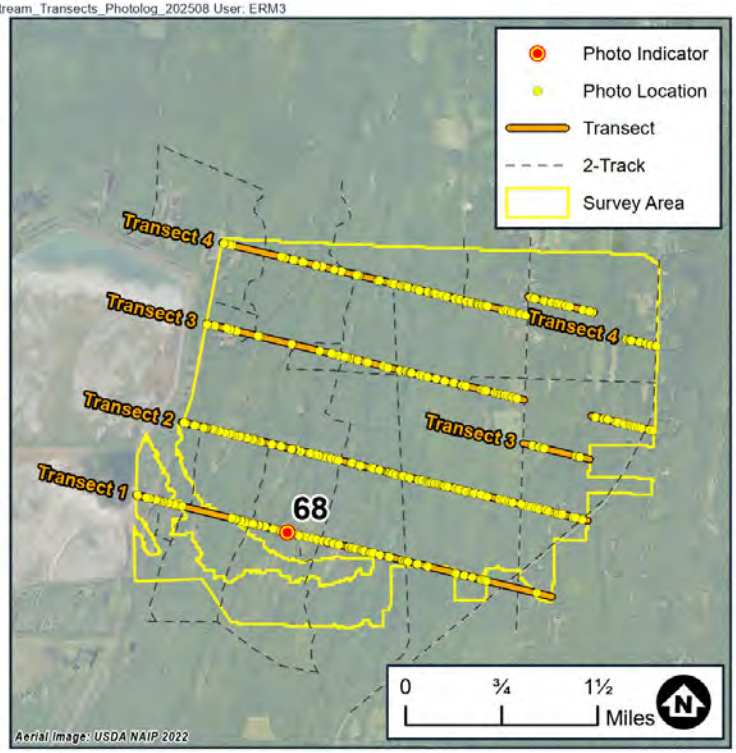
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP03-B, Wetland
**Photo 2 Caption:** T1W-BP03-B, Upland

*Note: Photo locations are approximate*

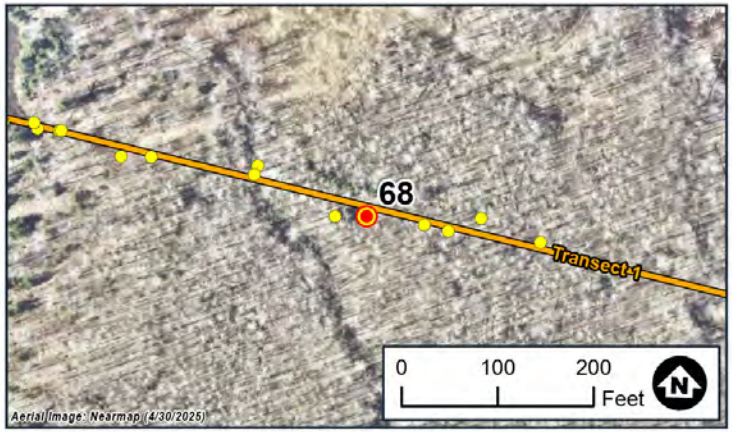
## Photo 68-1






## Photo 68-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

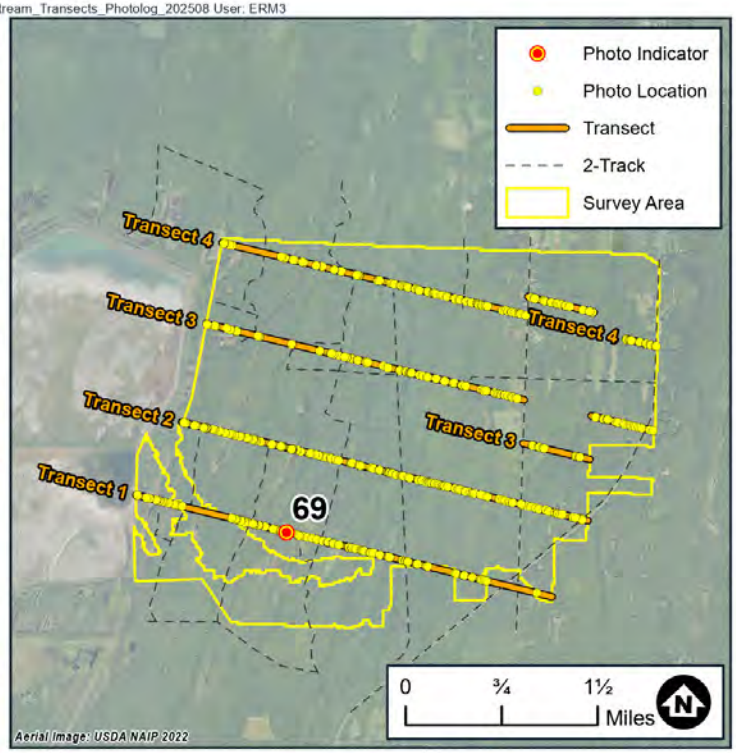
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP04-A, Wetland
**Photo 2 Caption:** T1W-BP04-A, Upland

*Note: Photo locations are approximate*

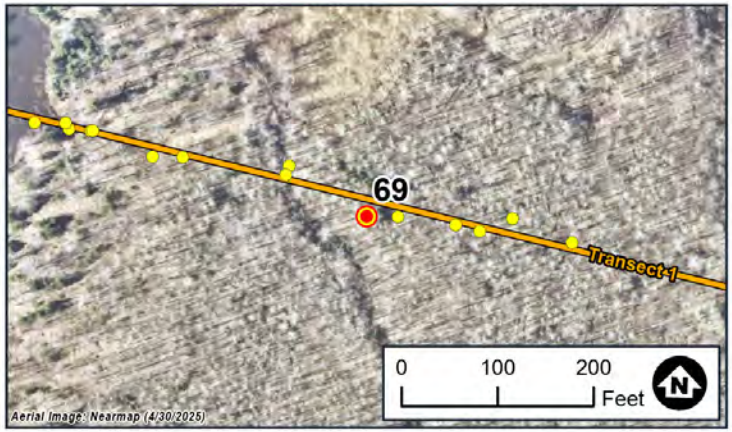
## Photo 69-1






## Photo 69-2







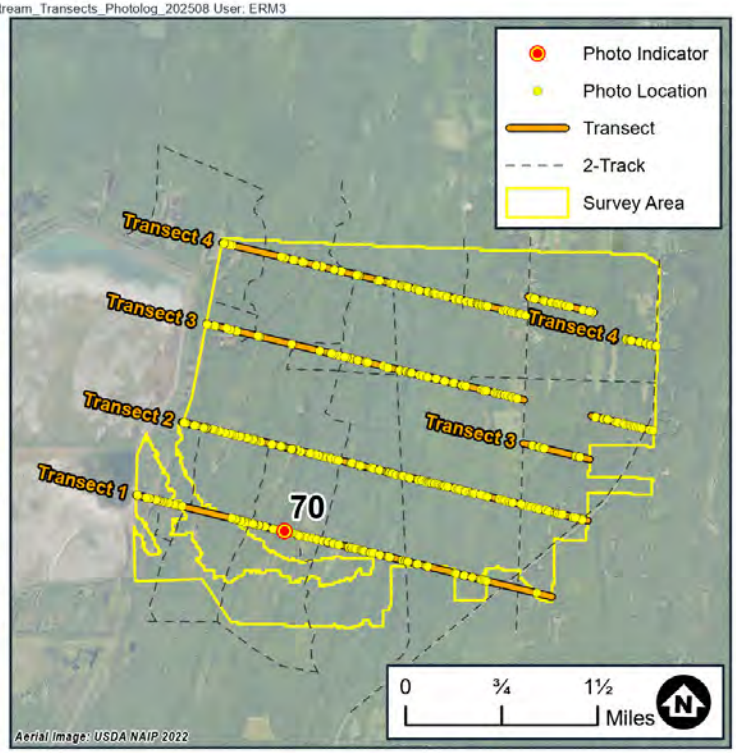

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP04-B, Wetland
**Photo 2 Caption:** T1W-BP04-B, Upland

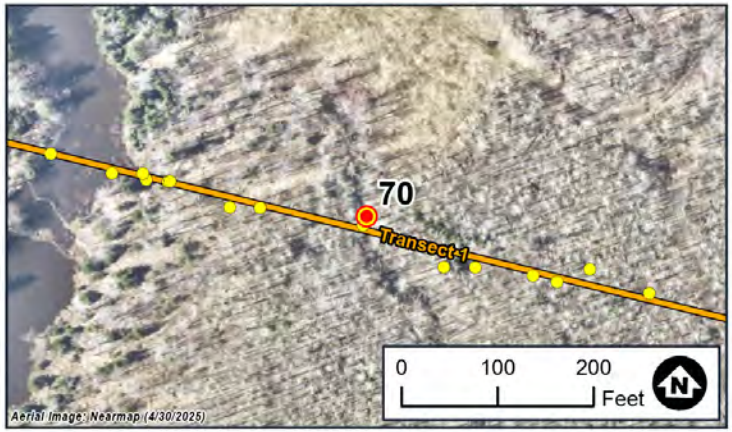
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

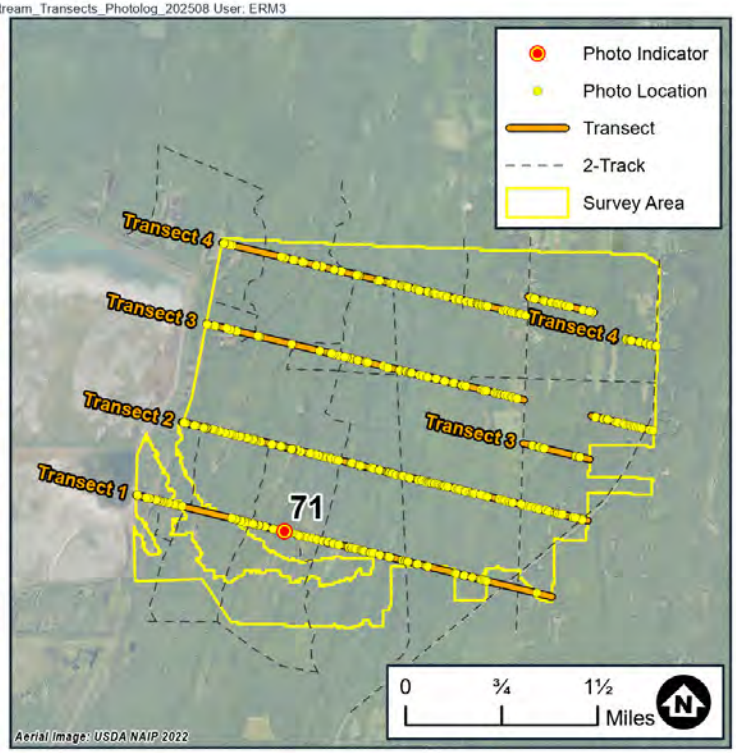
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP05-A, Wetland
**Photo 2 Caption:** T1W-BP05-A, Upland

*Note: Photo locations are approximate*

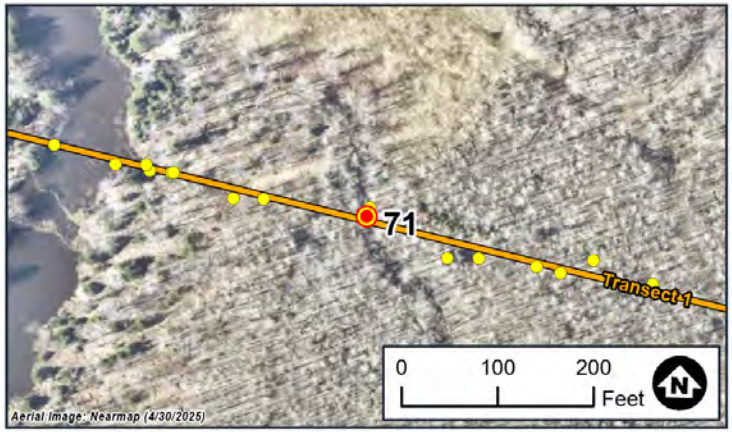
## Photo 71-1






## Photo 71-2







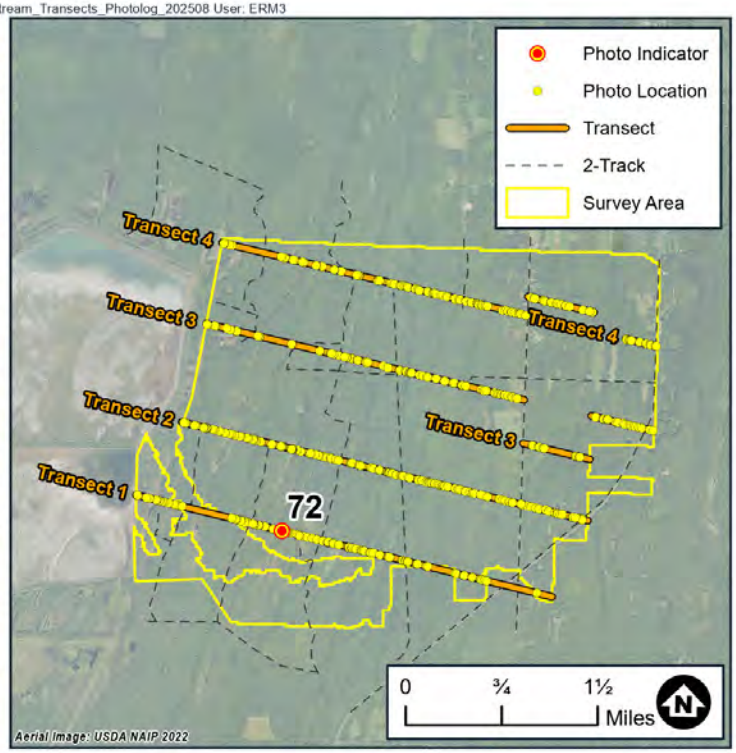

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP05-B, Wetland
**Photo 2 Caption:** T1W-BP05-B, Upland

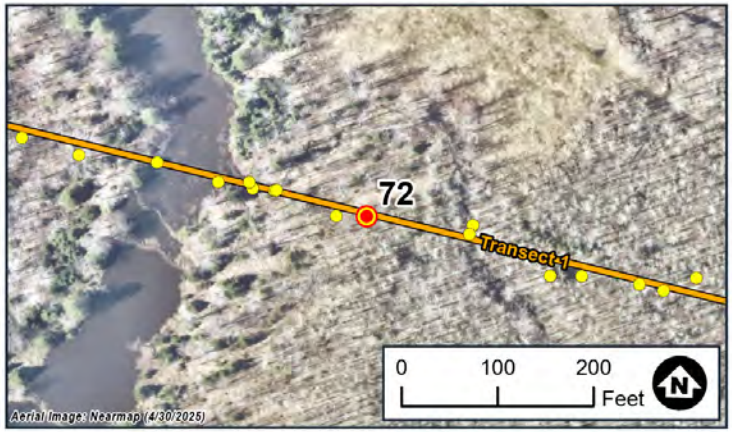
*Note: Photo locations are approximate*











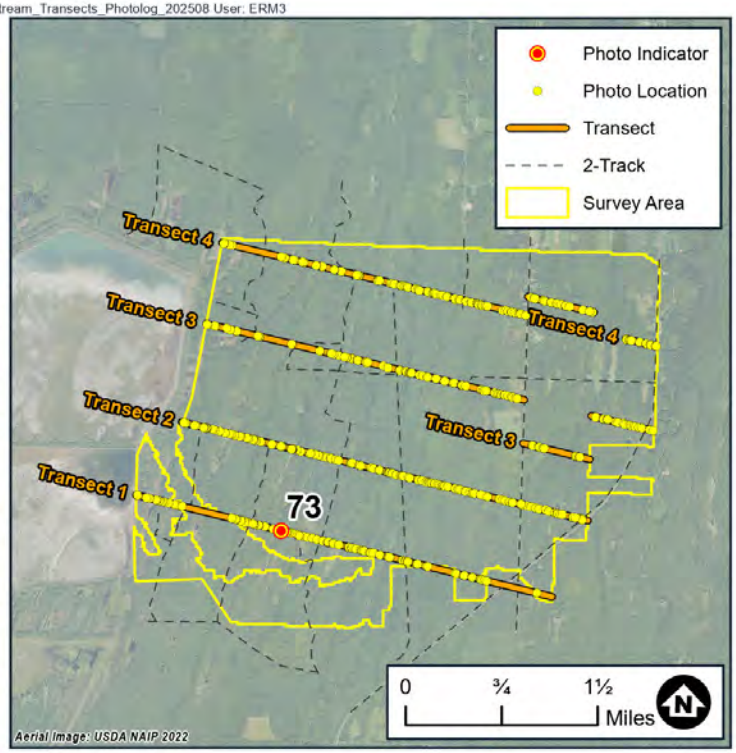

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP06-A, Wetland
**Photo 2 Caption:** T1W-BP06-A, Upland

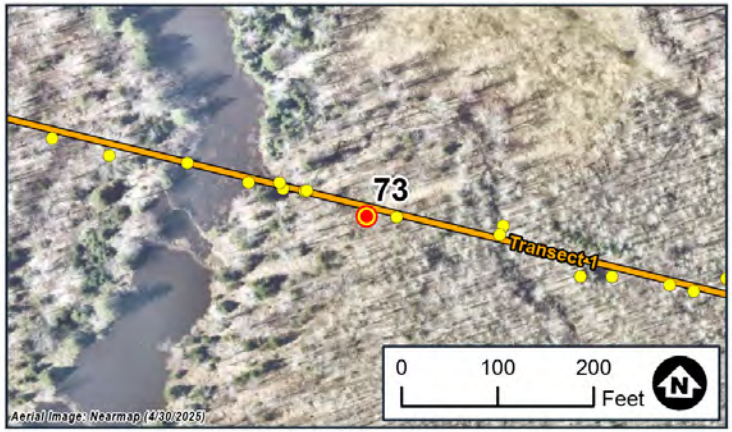
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

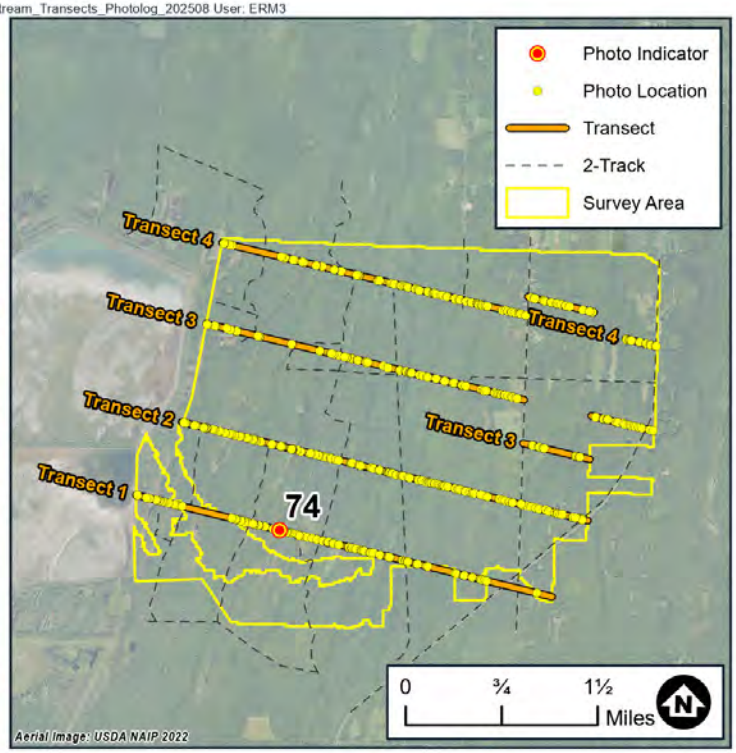
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP06-B, Wetland
**Photo 2 Caption:** T1W-BP06-B, Upland

*Note: Photo locations are approximate*

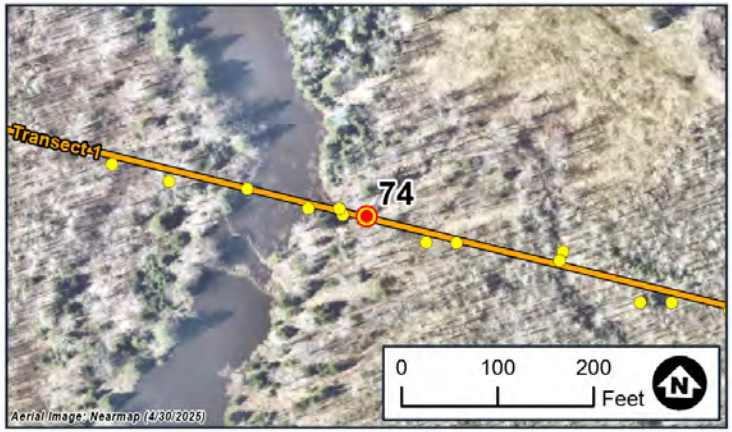
## Photo 74-1






## Photo 74-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

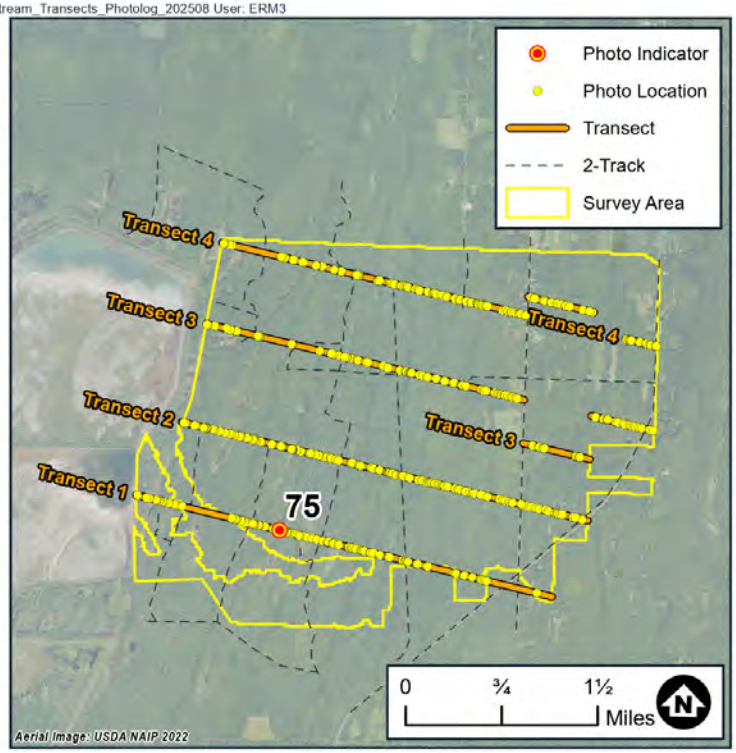
**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S02-RB, Upstream
**Photo 2 Caption:** T1W-S02-RB, Downstream

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3

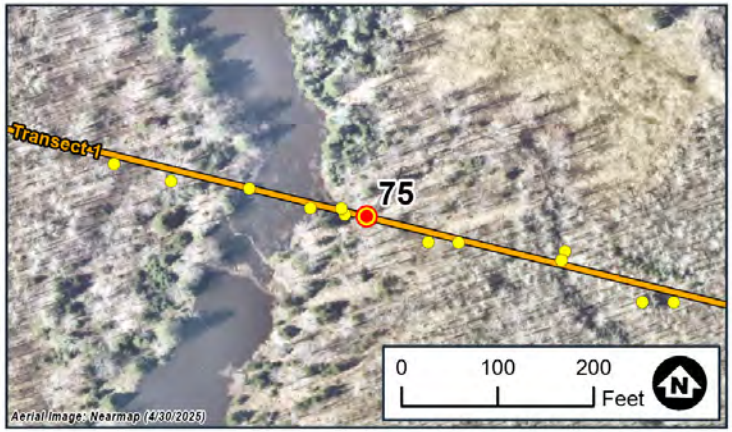
## Photo 75-1






## Photo 75-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

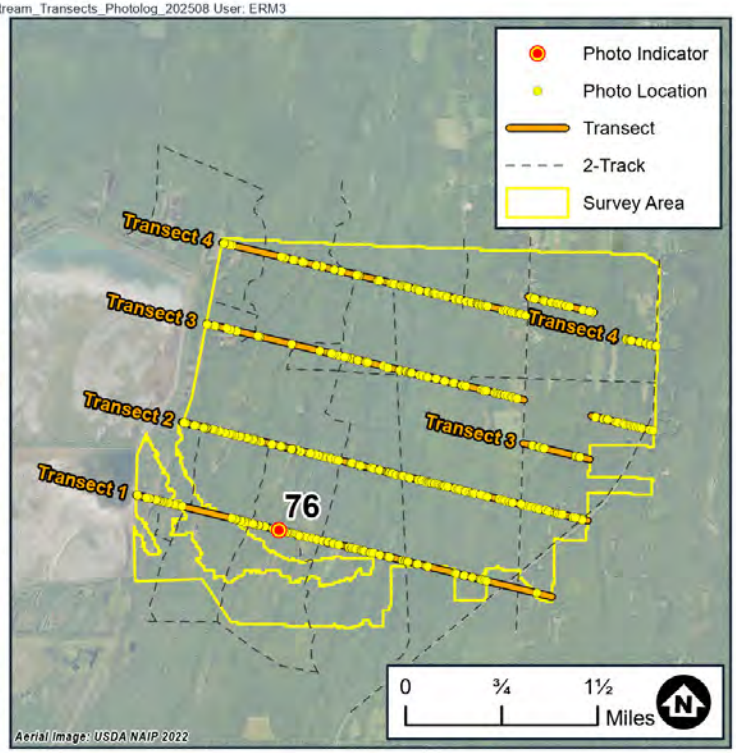
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S02-LB, Upstream
**Photo 2 Caption:** T1W-S02-LB, Downstream

*Note: Photo locations are approximate*

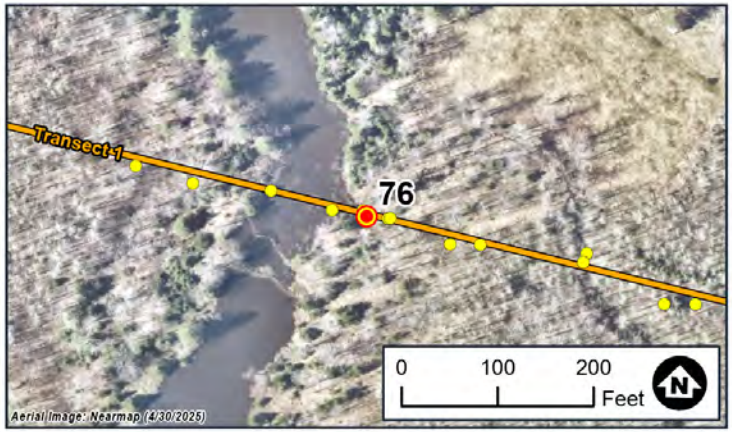
## Photo 76-1






## Photo 76-2







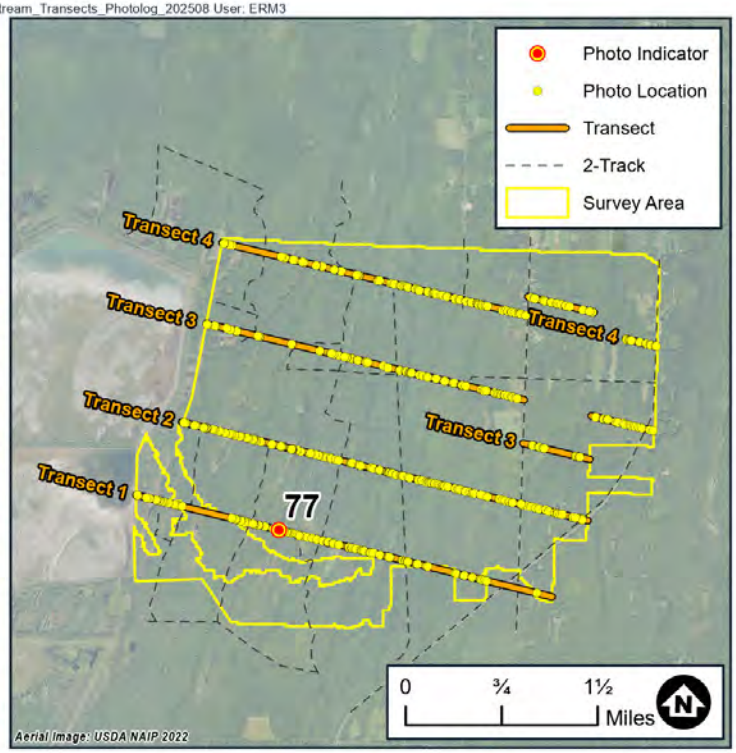

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP07-A, Wetland
**Photo 2 Caption:** T1W-BP07-A, Upland

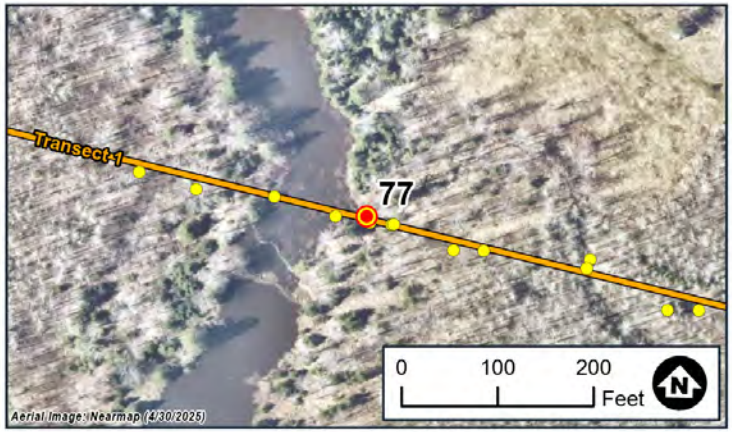
*Note: Photo locations are approximate*











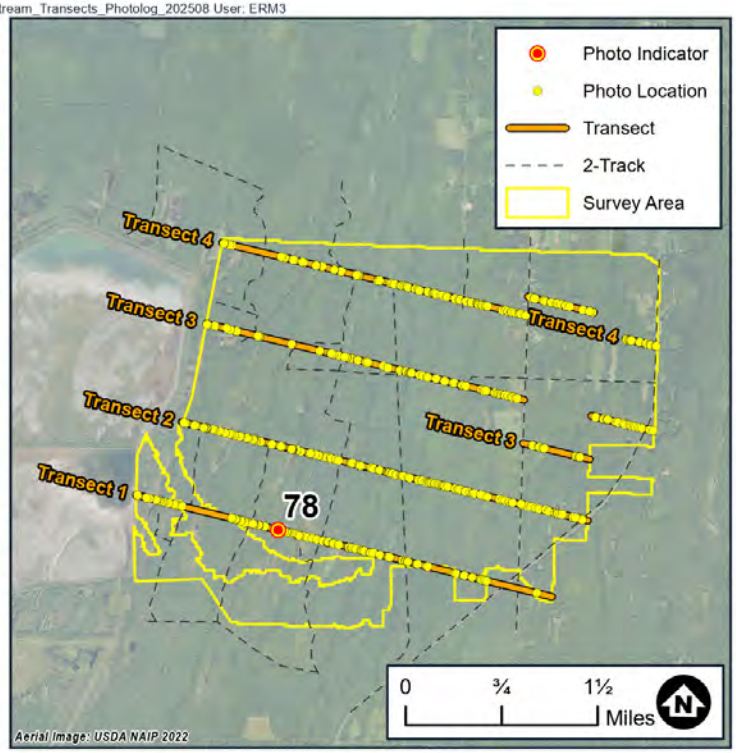

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP07-B, Wetland
**Photo 2 Caption:** T1W-BP07-B, Upland

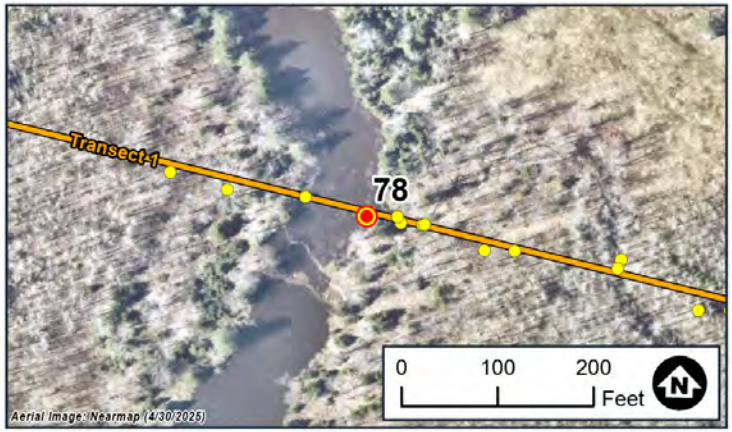
*Note: Photo locations are approximate*











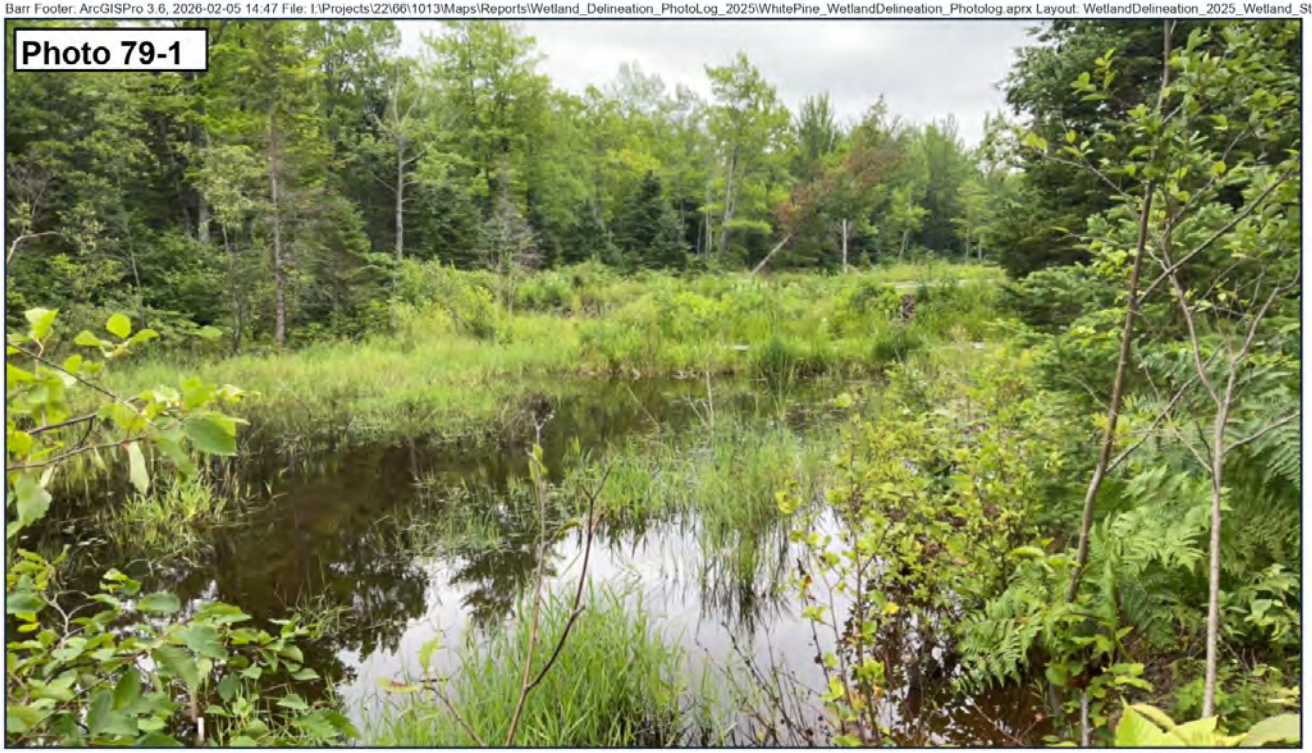

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

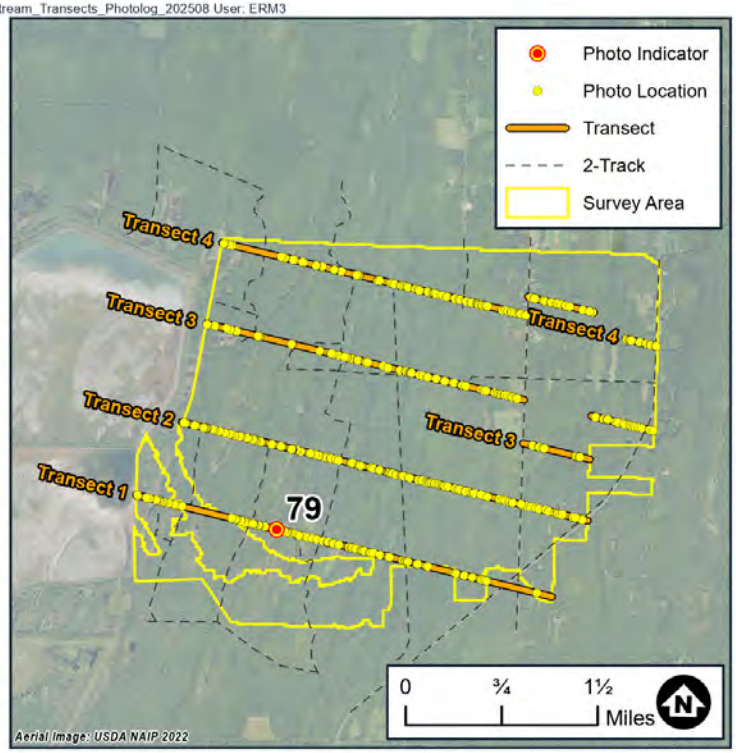
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S03-RB, Upstream
**Photo 2 Caption:** T1W-S03-RB, Downstream

*Note: Photo locations are approximate*

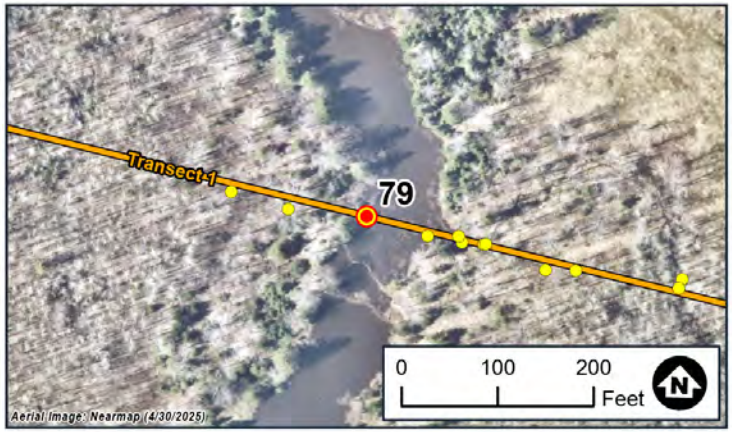
## Photo 79-1






## Photo 79-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

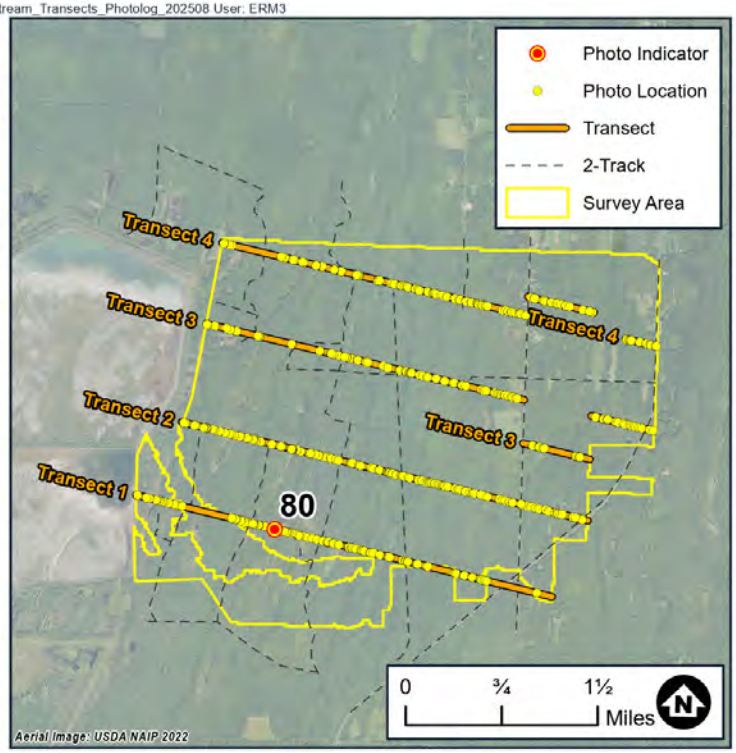
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S03-LB, Upstream
**Photo 2 Caption:** T1W-S03-LB, Downstream

*Note: Photo locations are approximate*

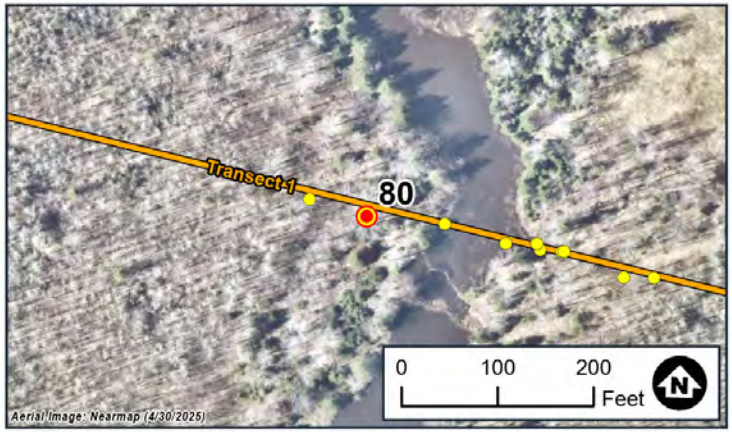
## Photo 80-1






## Photo 80-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

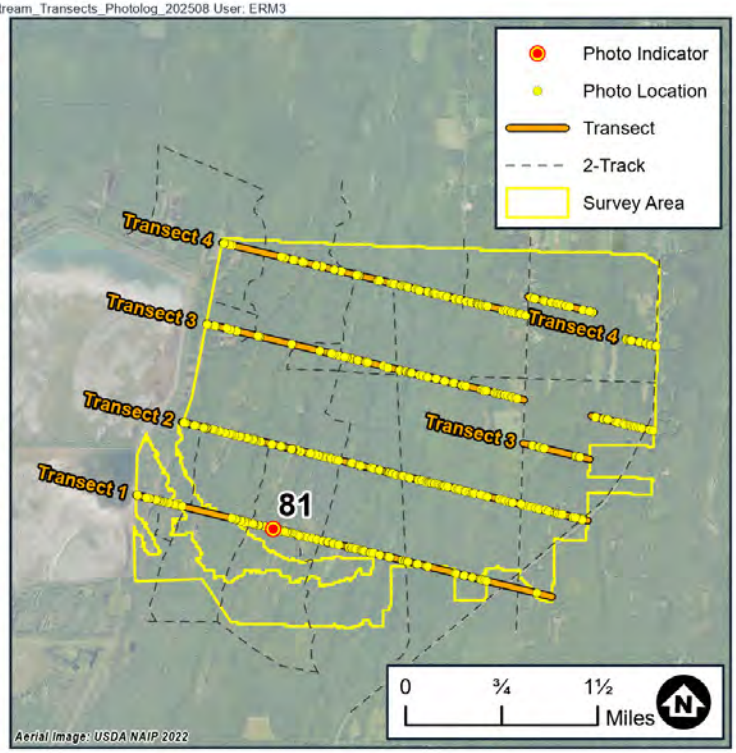
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP08-A, Wetland
**Photo 2 Caption:** T1W-BP08-A, Upland

*Note: Photo locations are approximate*

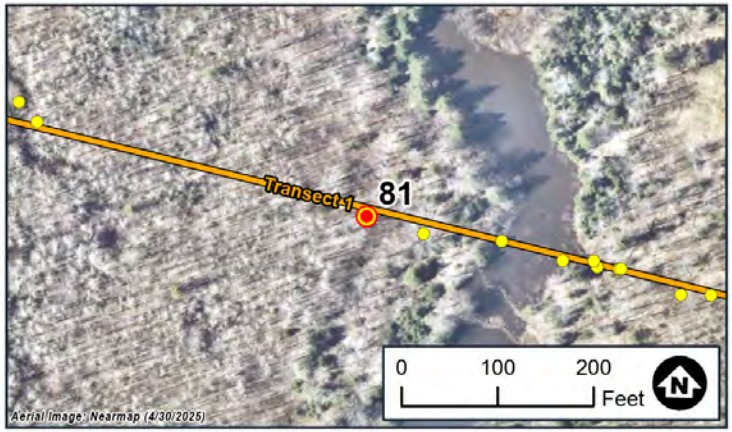
## Photo 81-1






## Photo 81-2







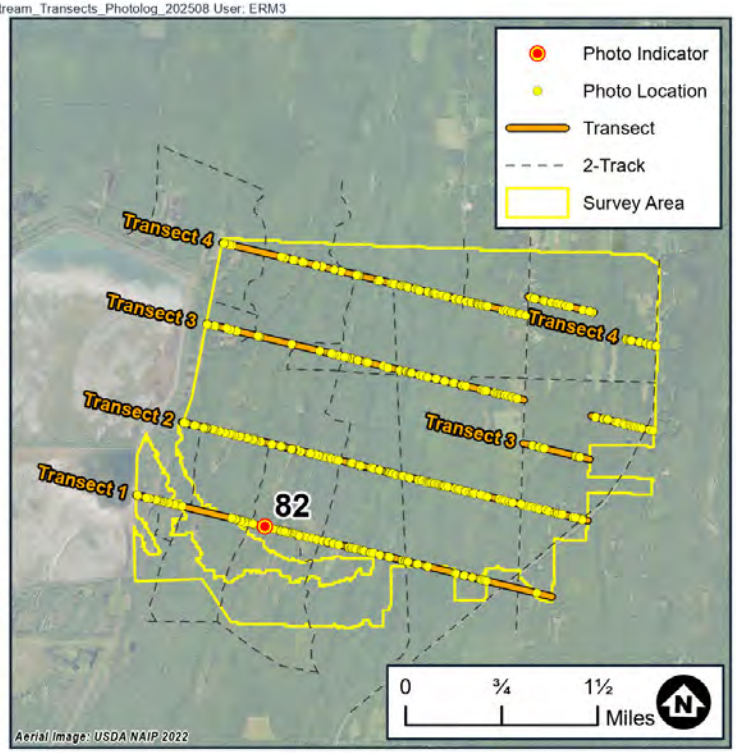

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP08-B, Wetland
**Photo 2 Caption:** T1W-BP08-B, Upland

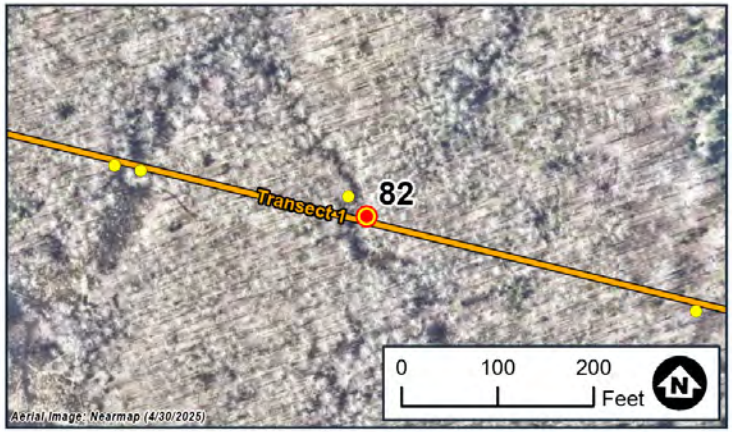
*Note: Photo locations are approximate*











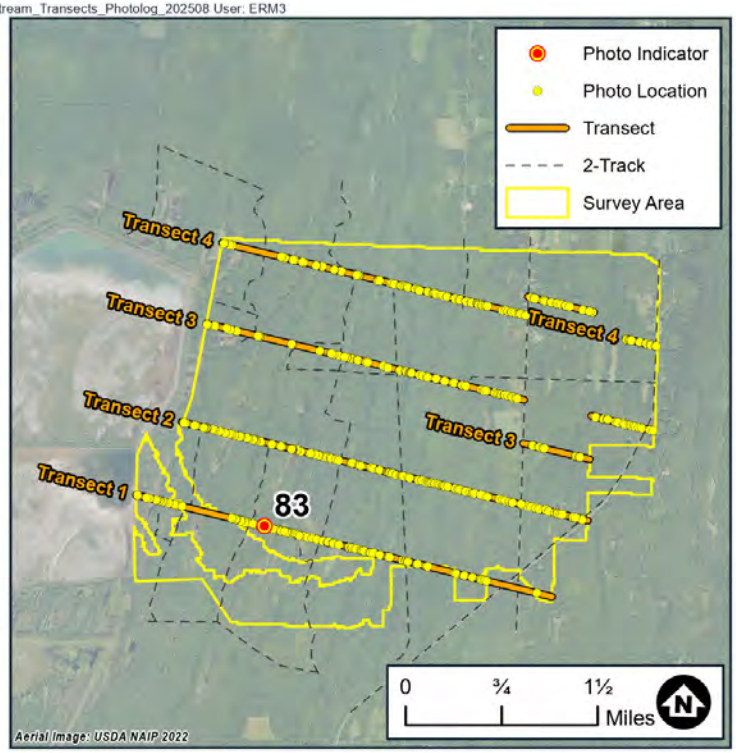

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP09-A, Wetland
**Photo 2 Caption:** T1W-BP09-A, Upland

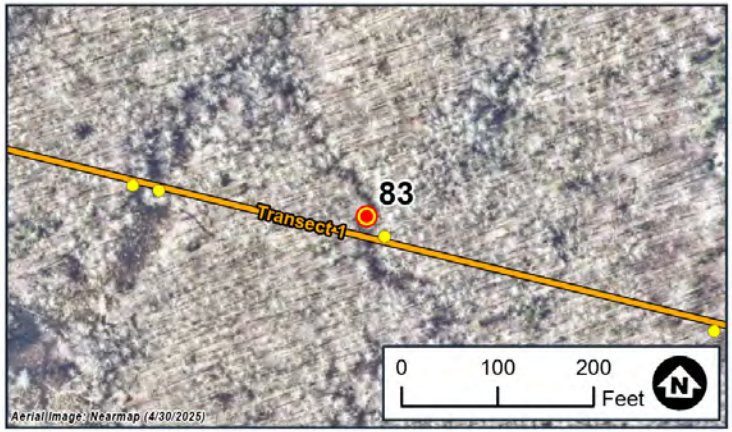
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

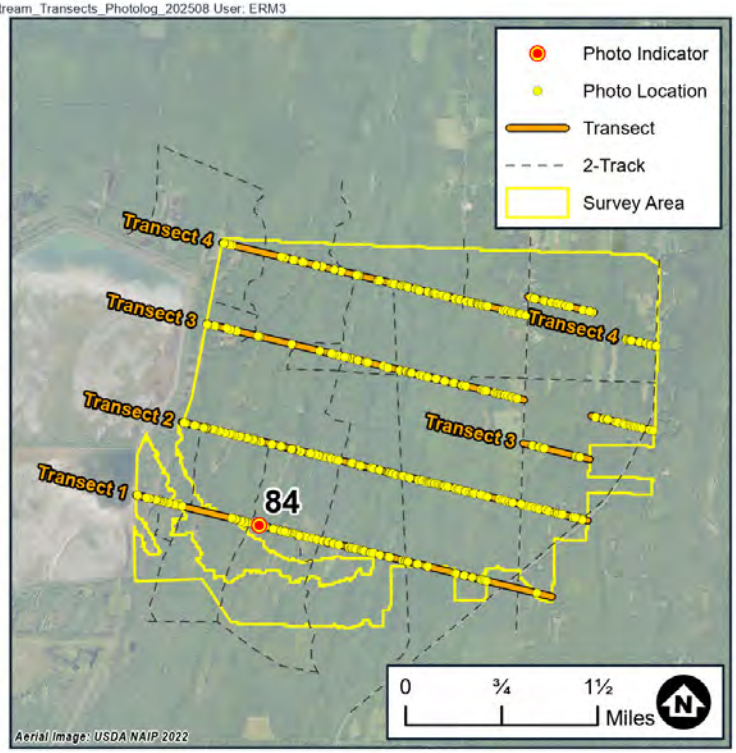
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP09-B, Wetland
**Photo 2 Caption:** T1W-BP09-B, Upland

*Note: Photo locations are approximate*

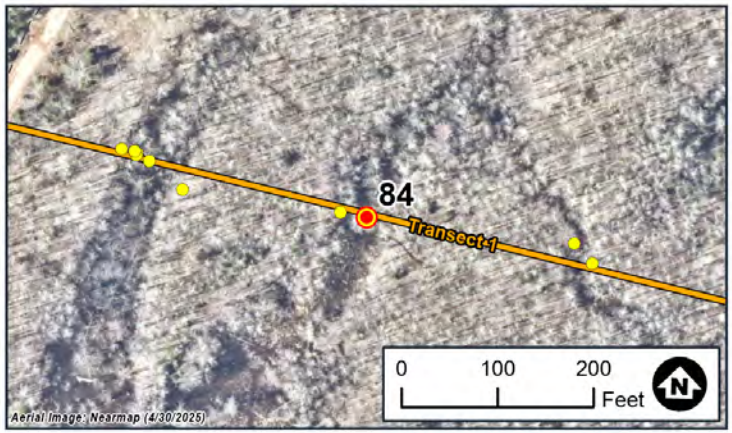
## Photo 84-1






## Photo 84-2







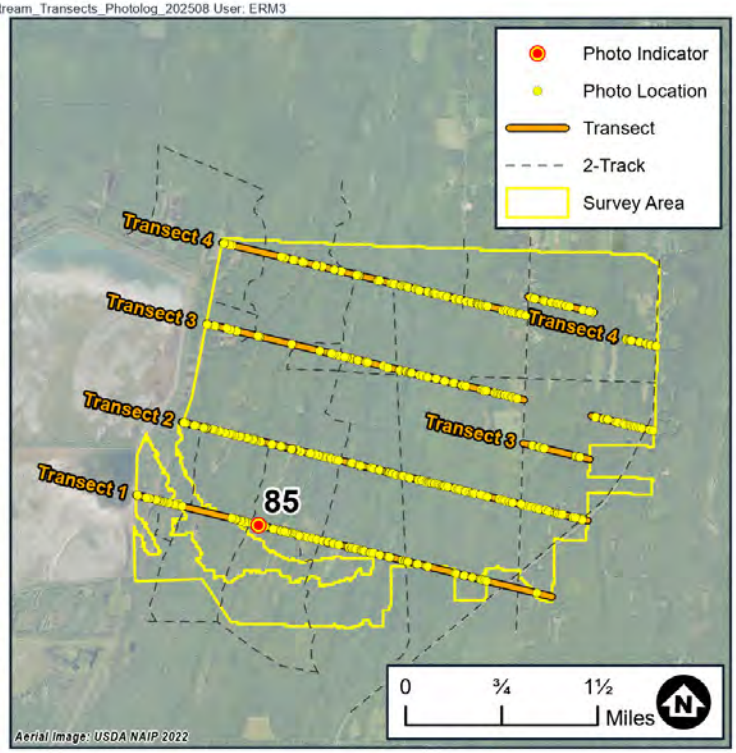

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP10-A, Wetland
**Photo 2 Caption:** T1W-BP10-A, Upland

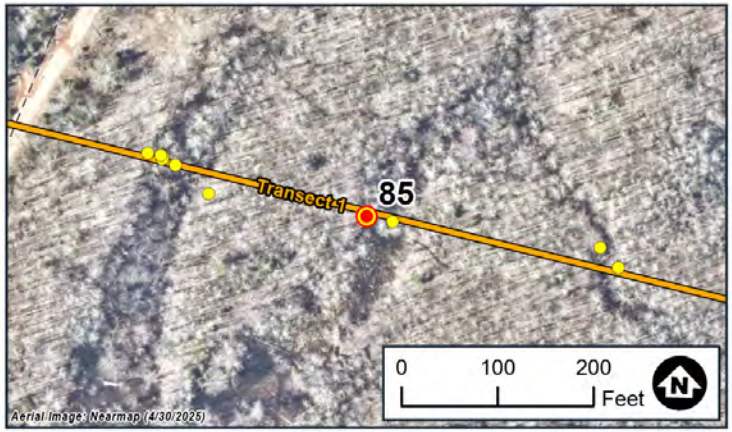
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

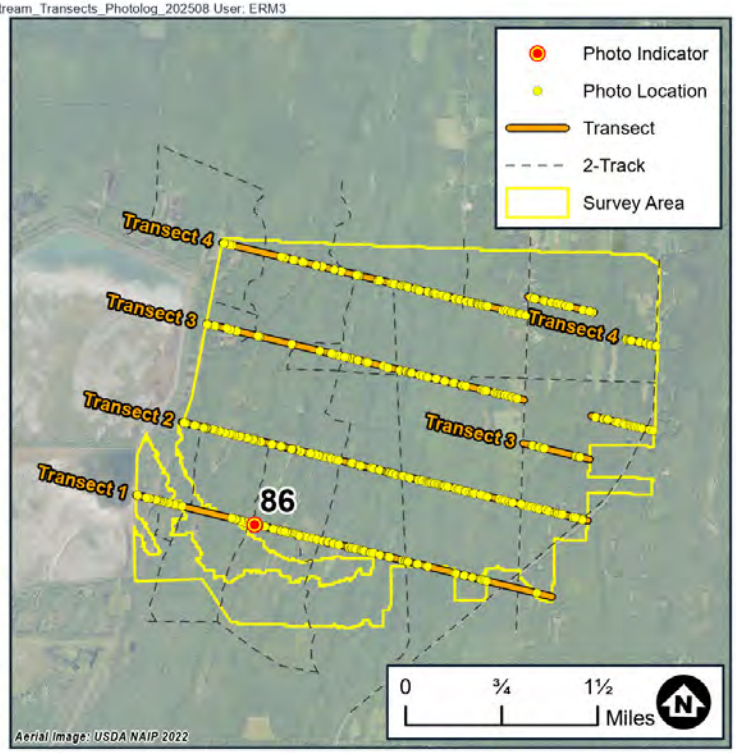
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP10-B, Wetland
**Photo 2 Caption:** T1W-BP10-B, Upland

*Note: Photo locations are approximate*

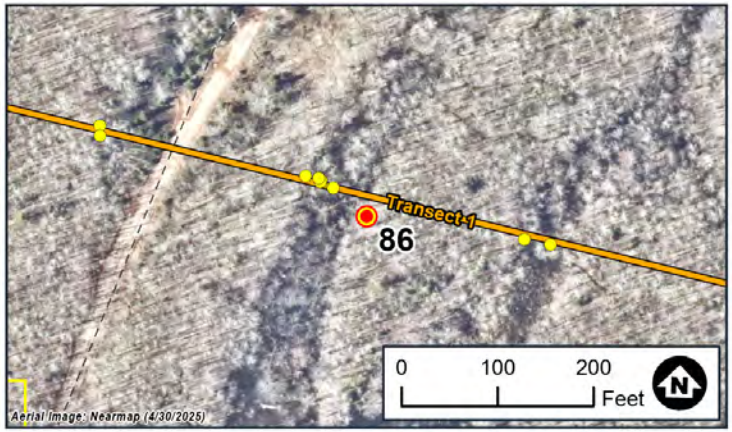
## Photo 86-1






## Photo 86-2







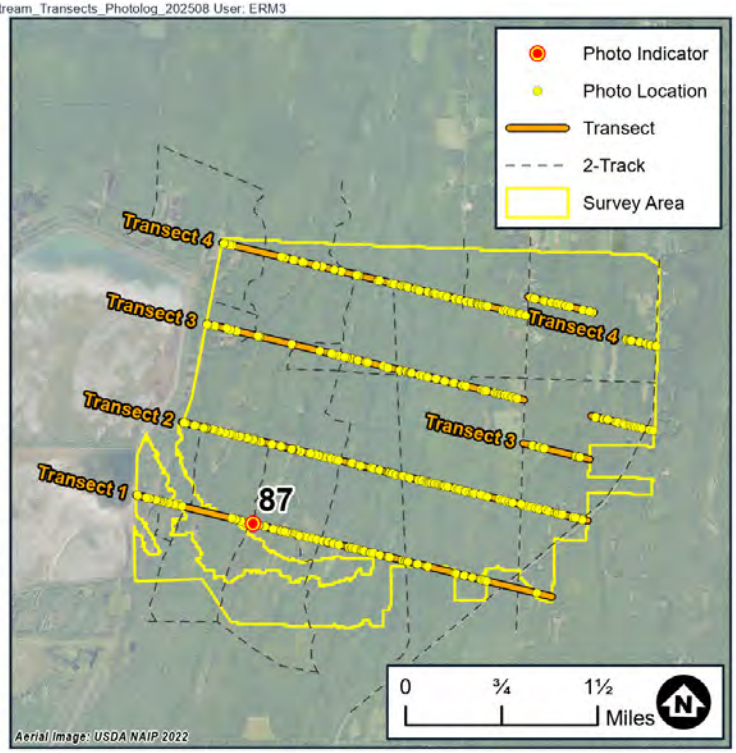

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-BP11-A, Wetland
**Photo 2 Caption:** T1W-BP11-A, Upland

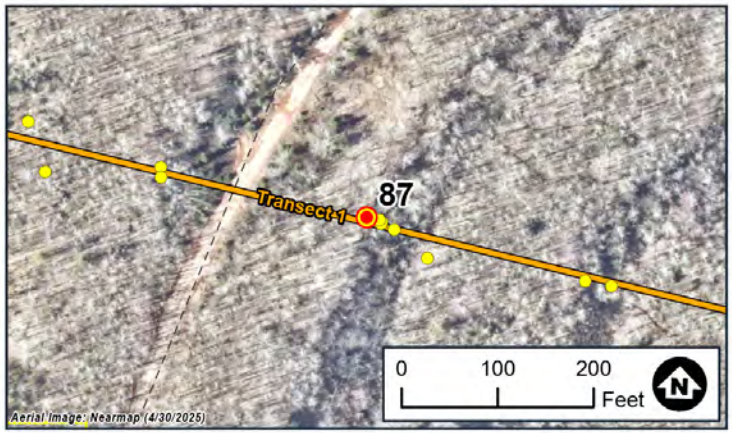
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

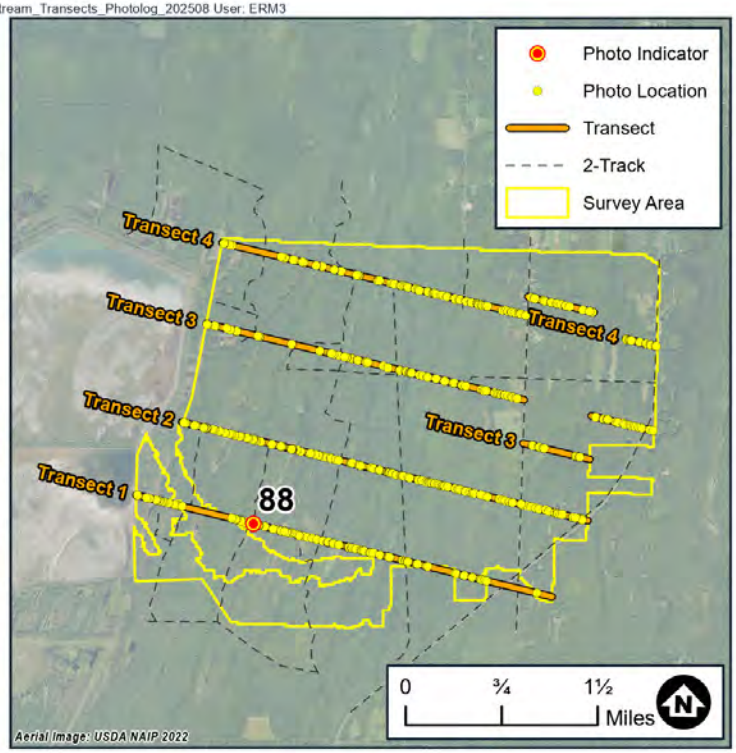
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T1W-BP11-B, Wetland
**Photo 2 Caption:** T1W-BP11-B, Upland

*Note: Photo locations are approximate*

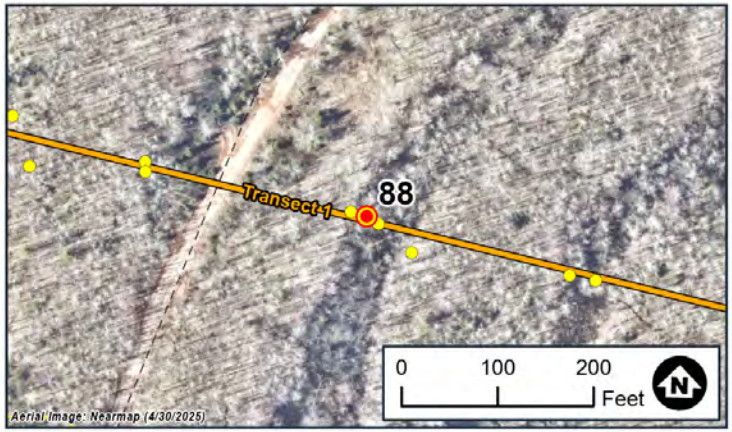
## Photo 88-1






## Photo 88-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S04-RB, Upstream
**Photo 2 Caption:** T1W-S04-RB, Downstream

*Note: Photo locations are approximate*

**Photo 89-1**



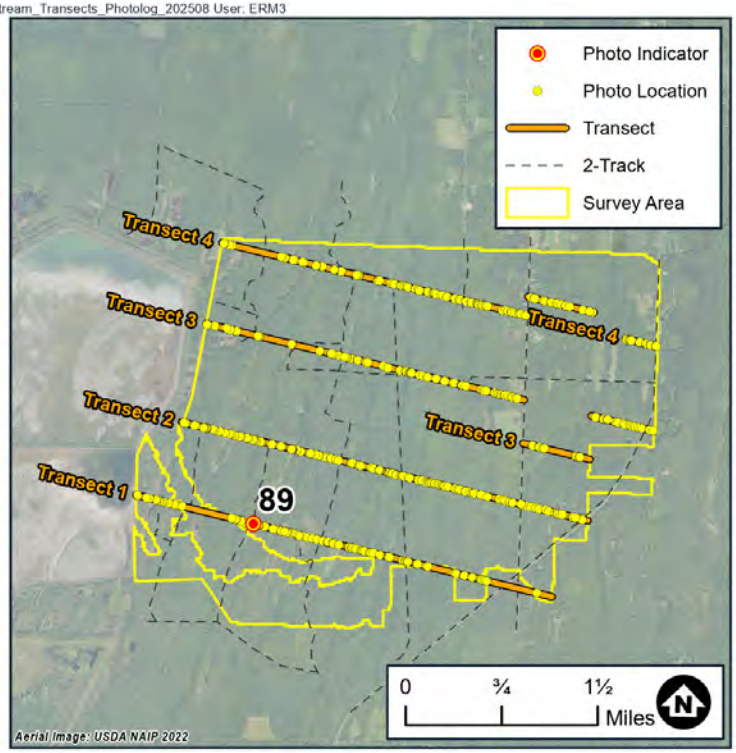
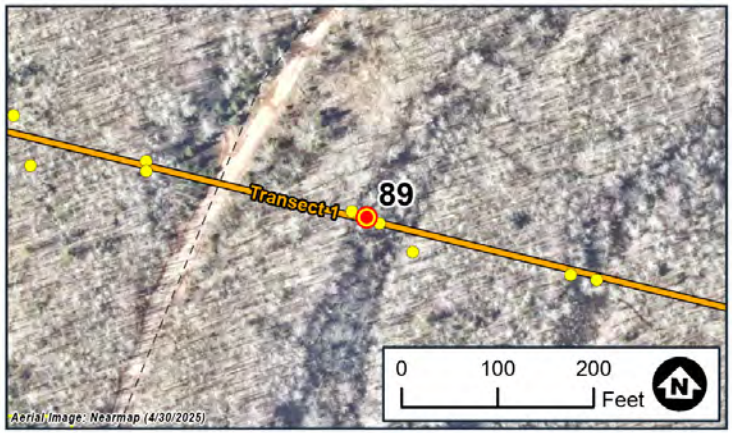



**Photo 89-2**








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

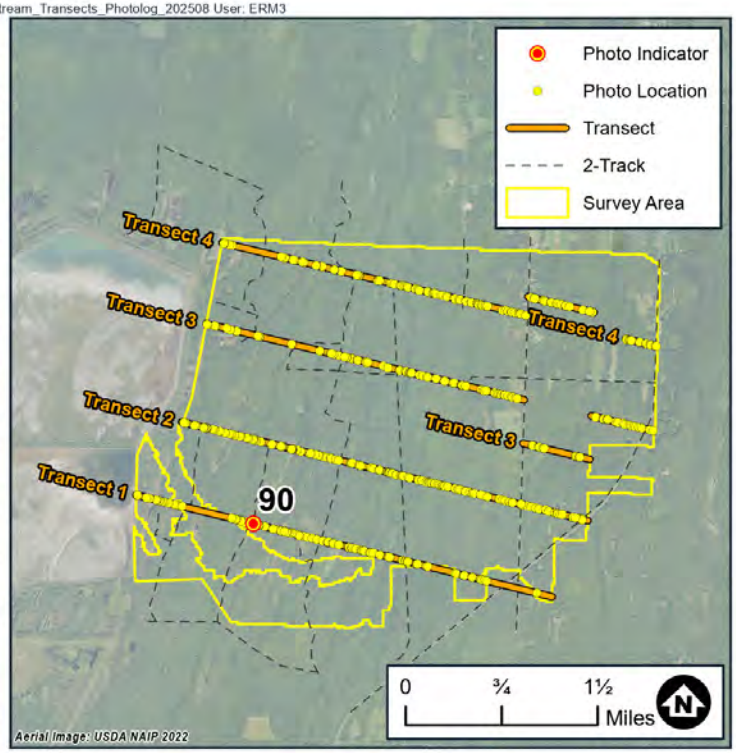
BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S04-LB, Upstream
**Photo 2 Caption:** T1W-S04-LB, Downstream

*Note: Photo locations are approximate*

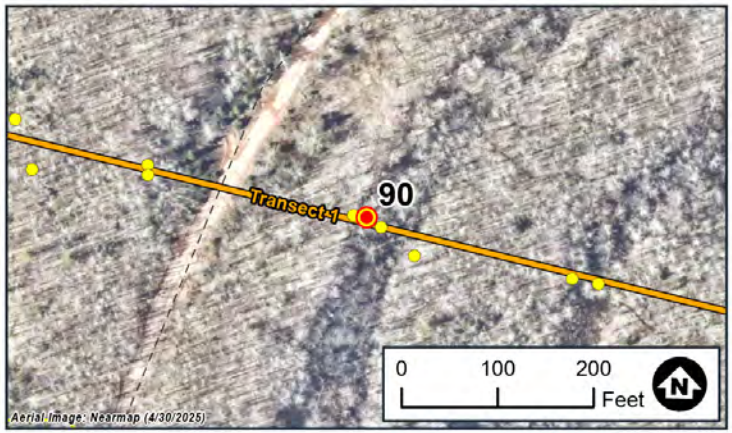
## Photo 90-1






## Photo 90-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S05-RB, Upstream
**Photo 2 Caption:** T1W-S05-RB, Downstream

*Note: Photo locations are approximate*

**Photo 91-1**



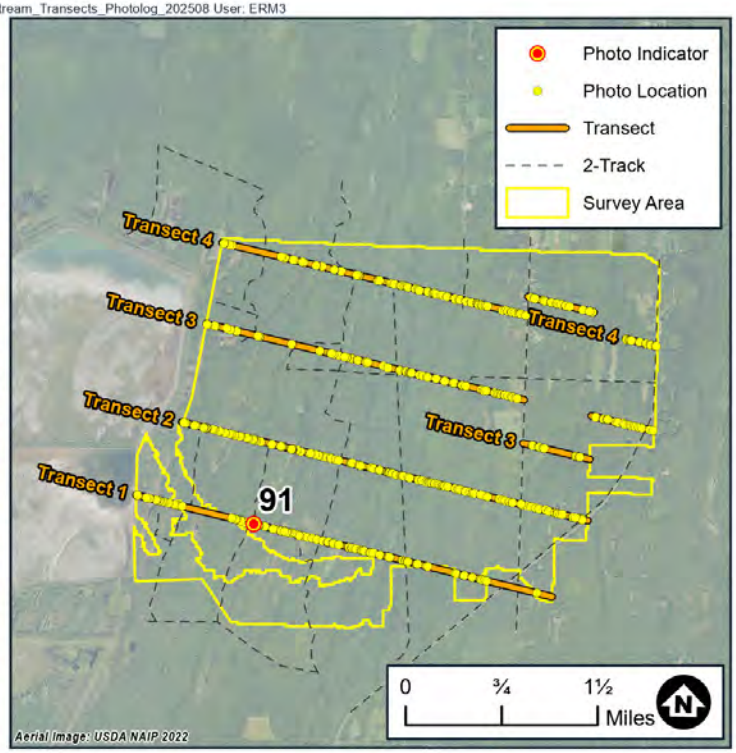
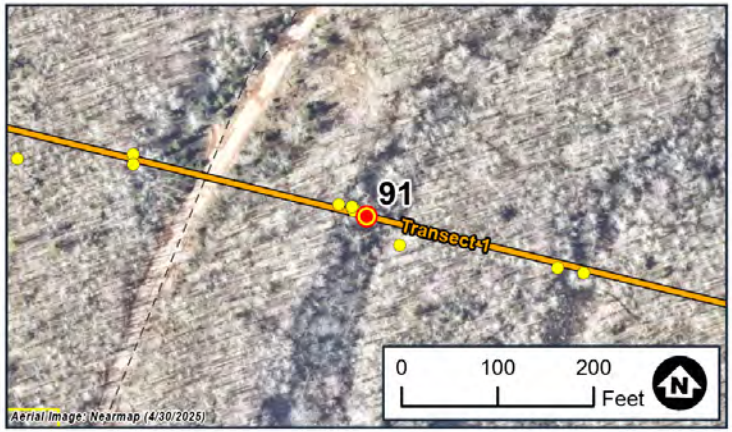



**Photo 91-2**







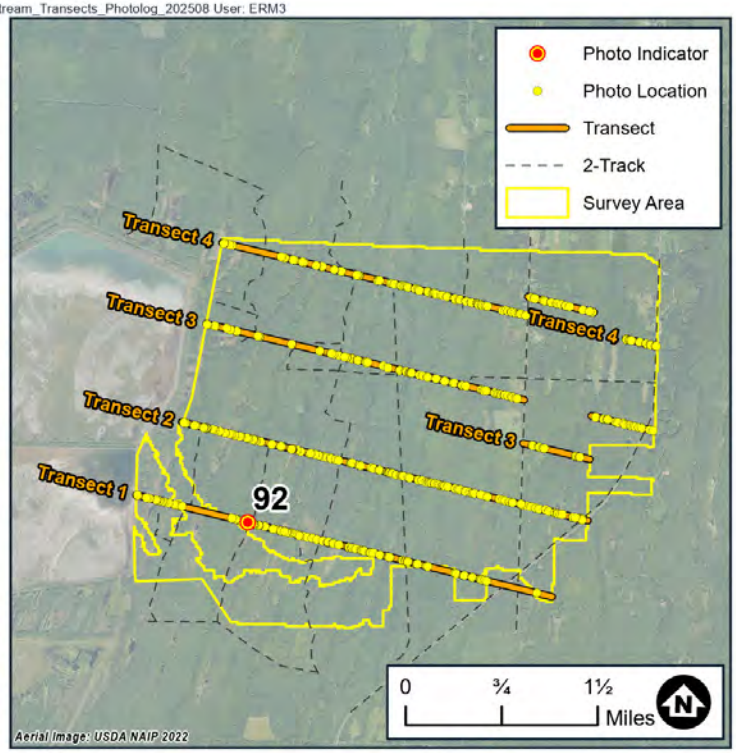

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/22/2025
**Photo 1 Caption:** T1W-S05-LB, Upstream
**Photo 2 Caption:** T1W-S05-LB, Downstream

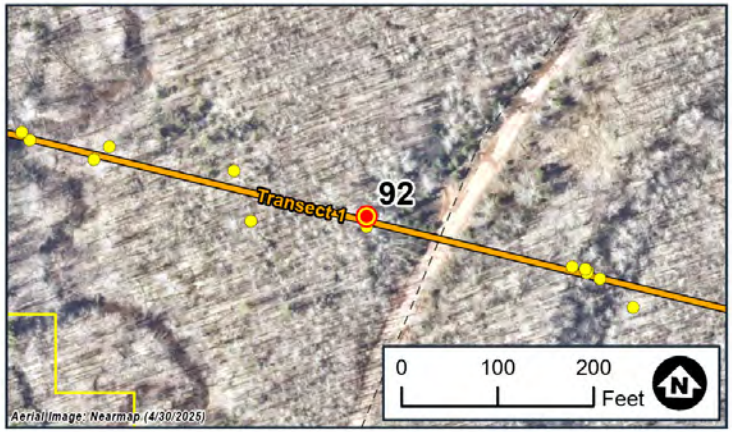
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

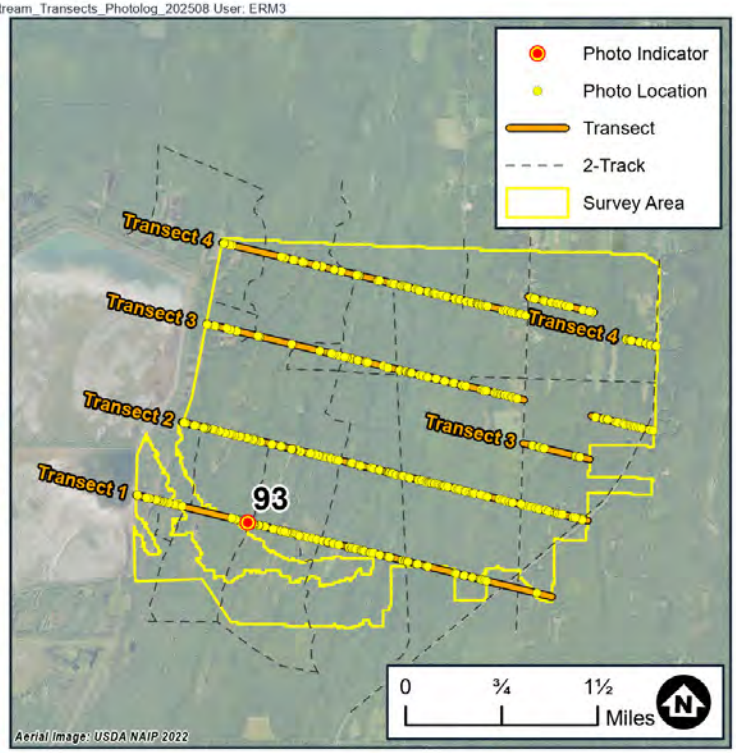
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP12-A, Wetland
**Photo 2 Caption:** T1W-BP12-A, Upland

*Note: Photo locations are approximate*

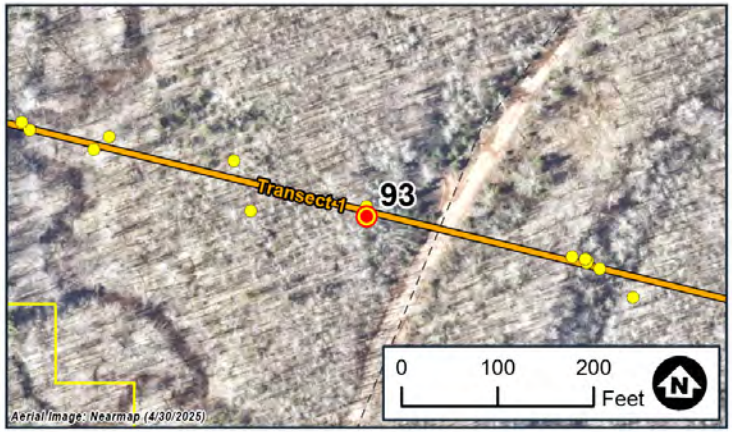
## Photo 93-1






## Photo 93-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP12-B, Wetland
**Photo 2 Caption:** T1W-BP12-B, Upland

*Note: Photo locations are approximate*

**Photo 94-1**



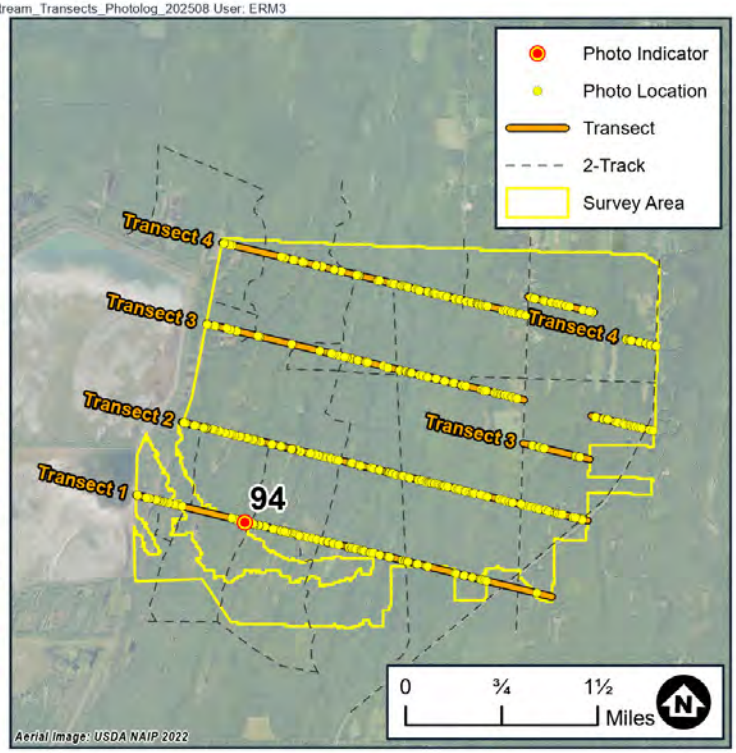
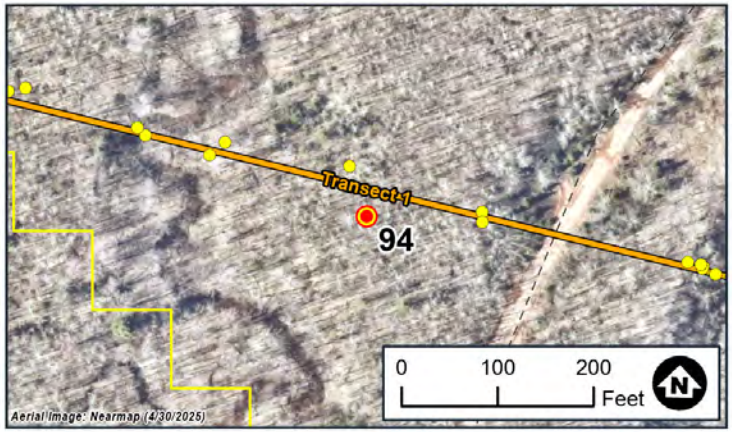



**Photo 94-2**






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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

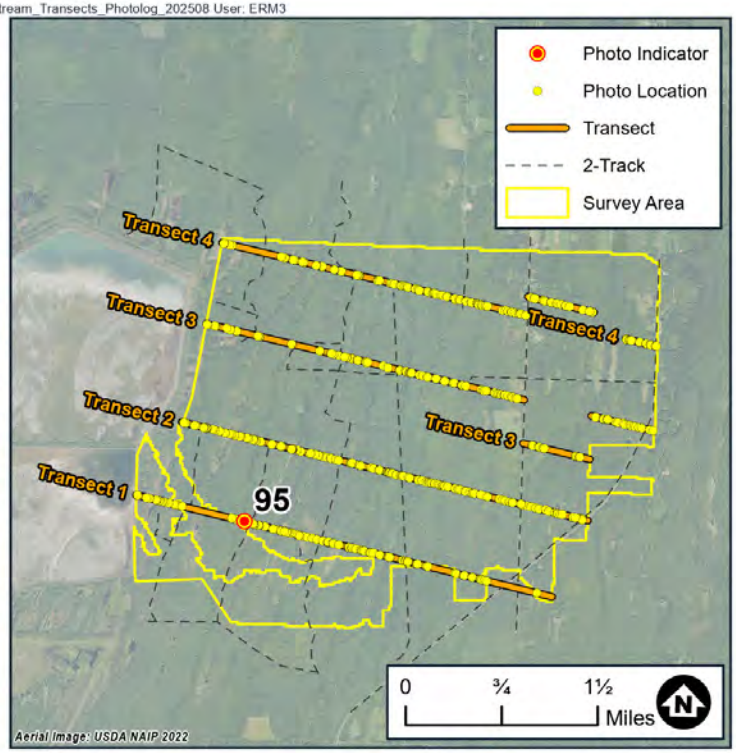
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-DP13-A, Wetland
**Photo 2 Caption:** T1W-DP13-A, Upland

*Note: Photo locations are approximate*

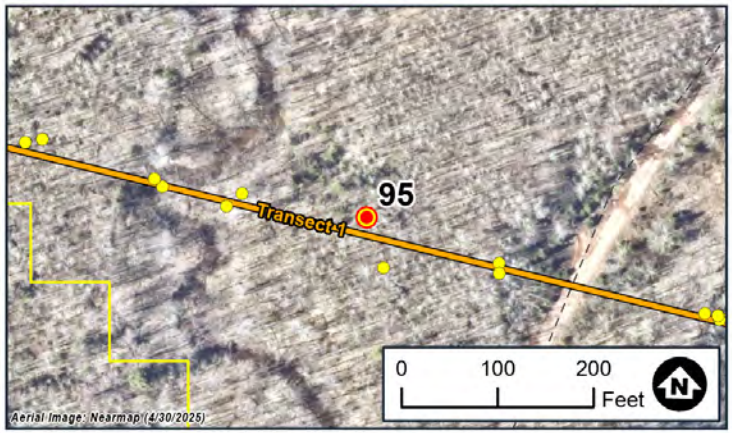
## Photo 95-1






## Photo 95-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP13-B, Wetland
**Photo 2 Caption:** T1W-BP13-B, Upland

*Note: Photo locations are approximate*

**Photo 96-1**



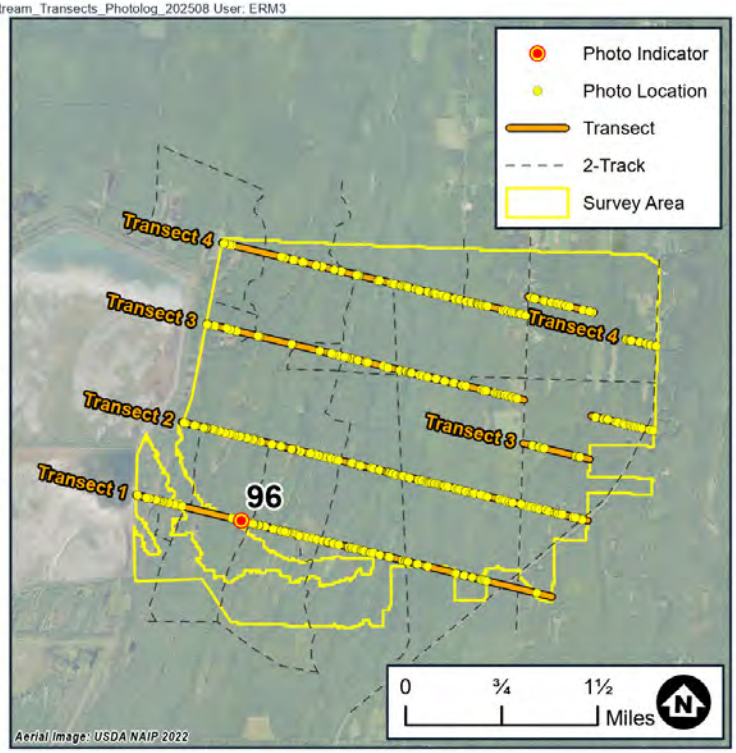
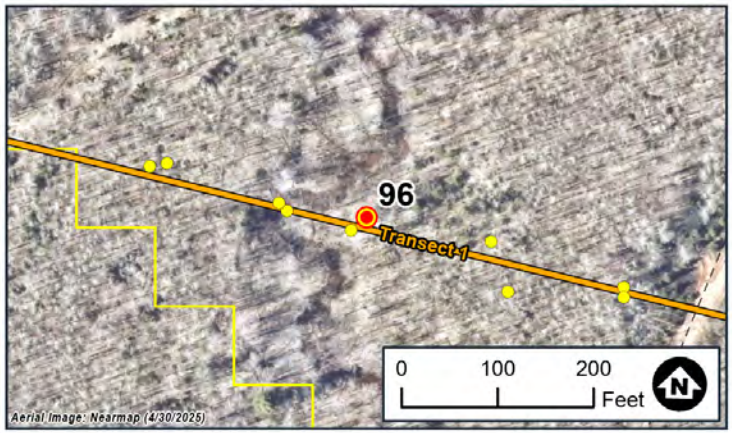



**Photo 96-2**







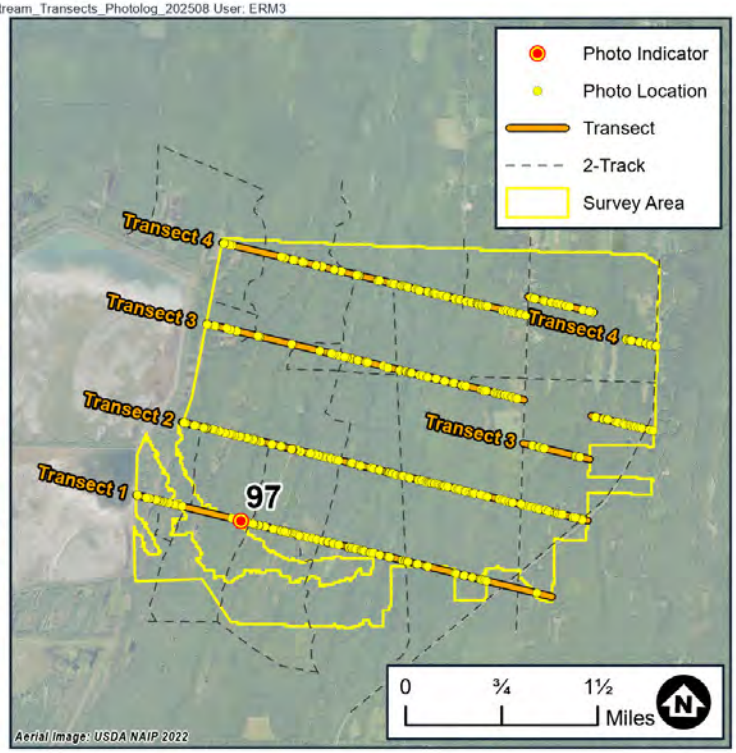

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP14-A, Wetland
**Photo 2 Caption:** T1W-BP14-A, Upland

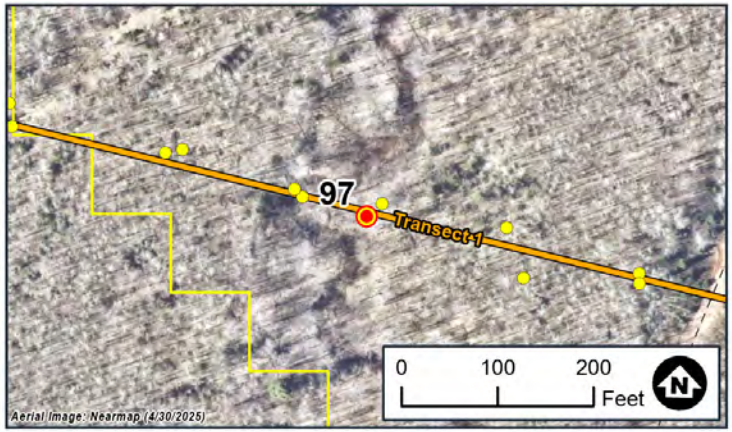
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

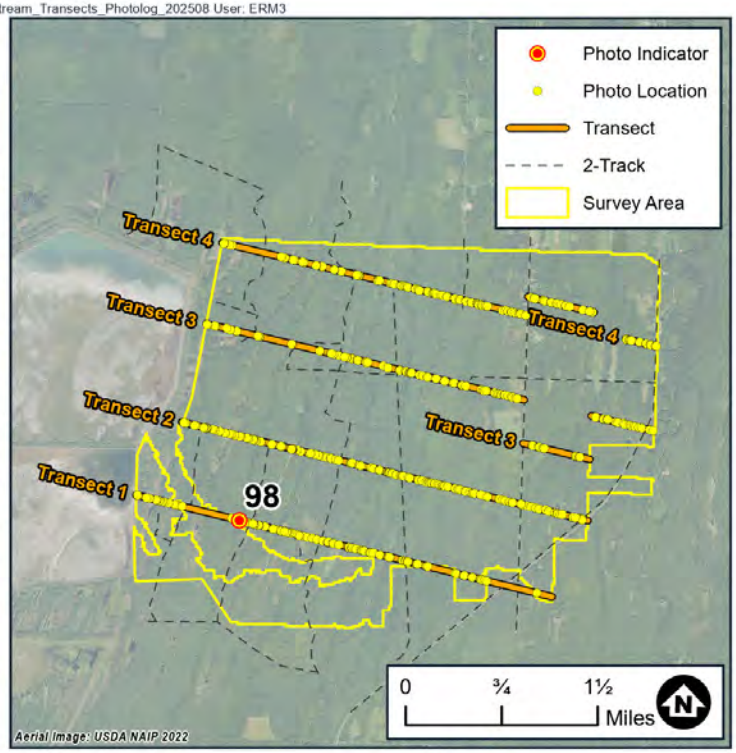
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP14-B, Wetland
**Photo 2 Caption:** T1W-BP14-B, Upland

*Note: Photo locations are approximate*

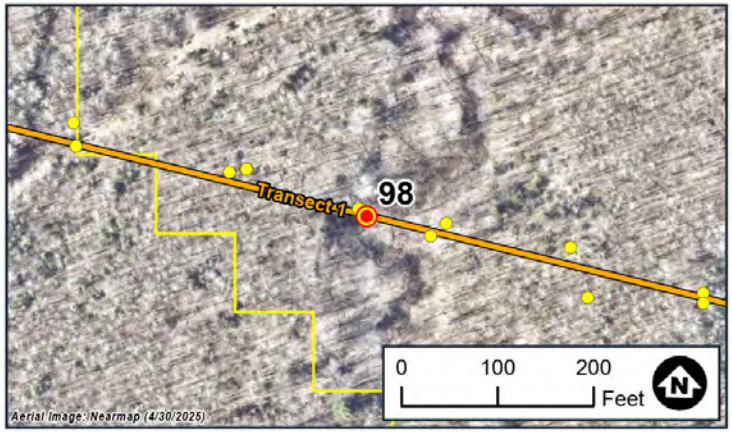
## Photo 98-1






## Photo 98-2







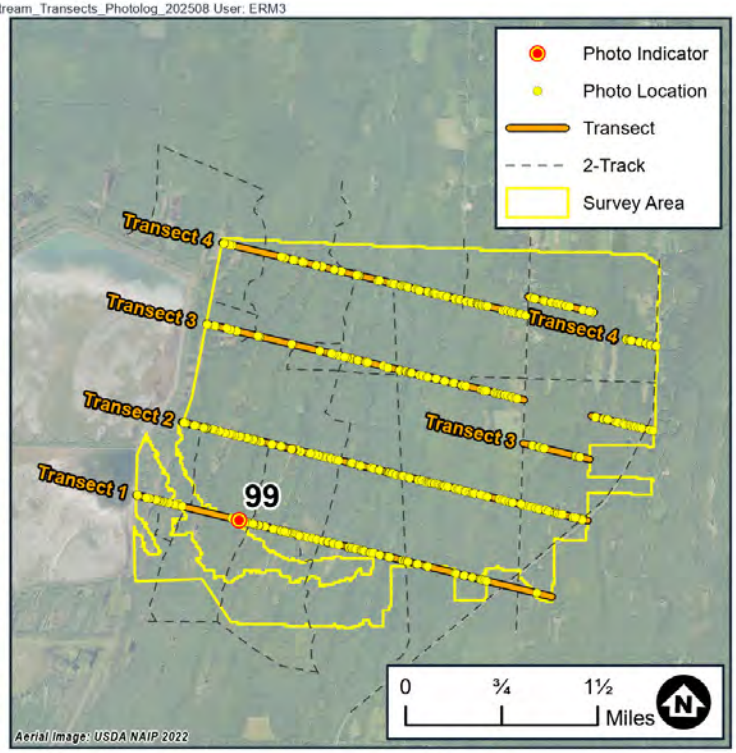

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-S06-RB, Upstream
**Photo 2 Caption:** T1W-S06-RB, Downstream

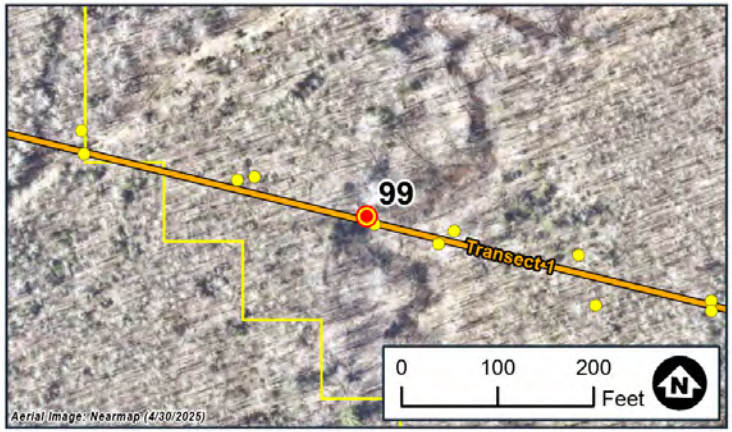
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

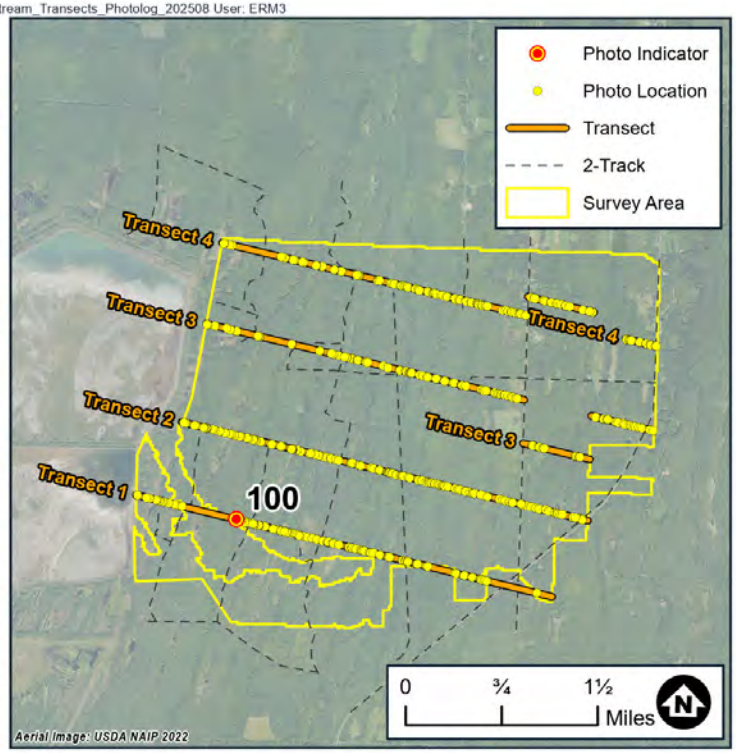
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-S06-LB, Upstream
**Photo 2 Caption:** T1W-S06-LB, Downstream

*Note: Photo locations are approximate*

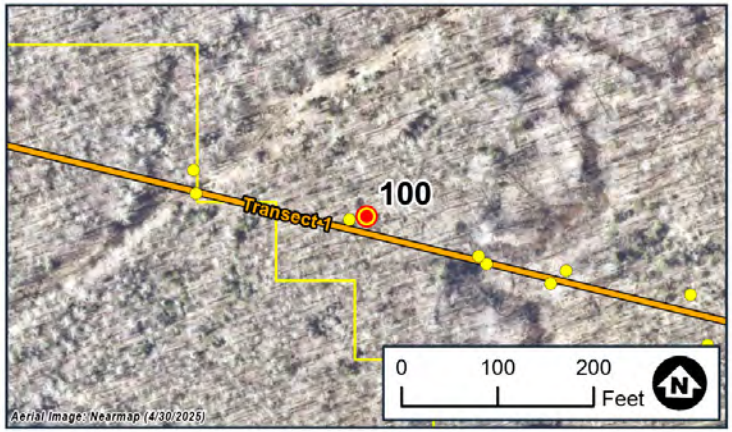
## Photo 100-1






## Photo 100-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP15-A, Wetland
**Photo 2 Caption:** T1W-BP15-A, Upland

*Note: Photo locations are approximate*

**Photo 101-1**



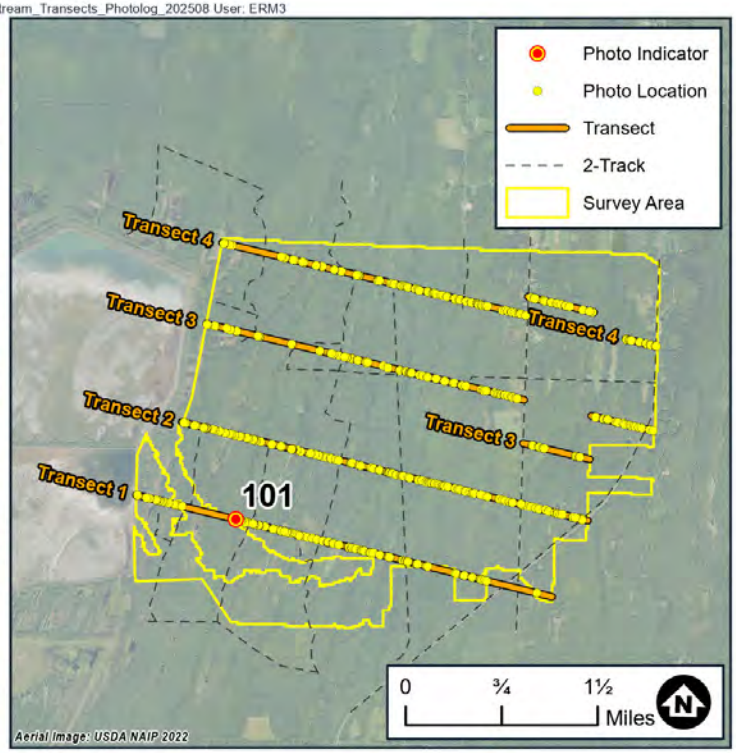
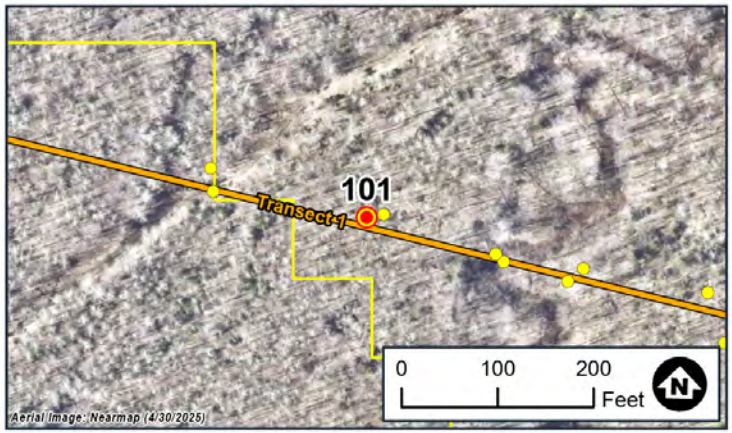



**Photo 101-2**







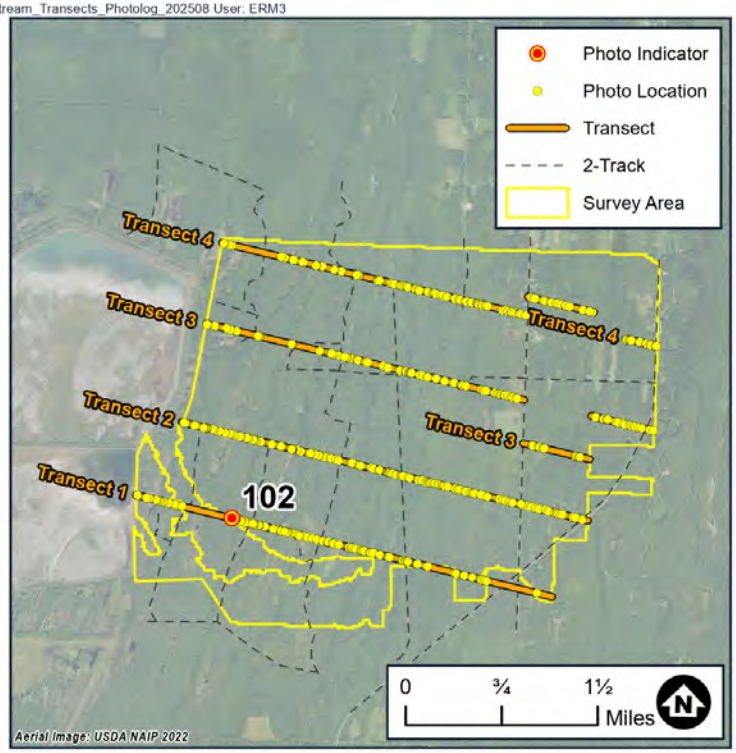

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP15-B, Wetland
**Photo 2 Caption:** T1W-BP15-B, Upland

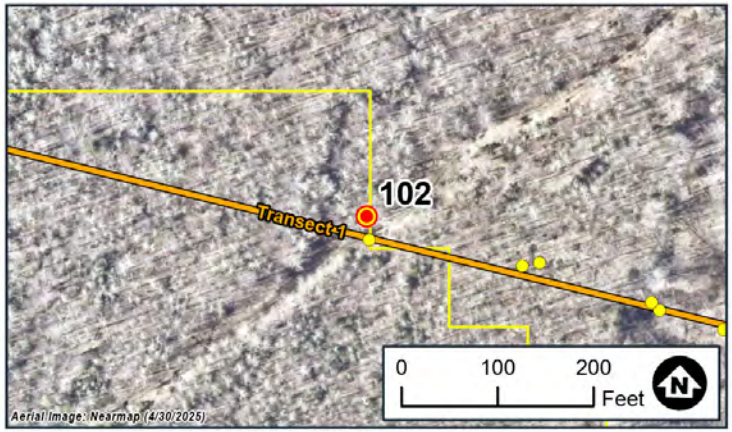
*Note: Photo locations are approximate*










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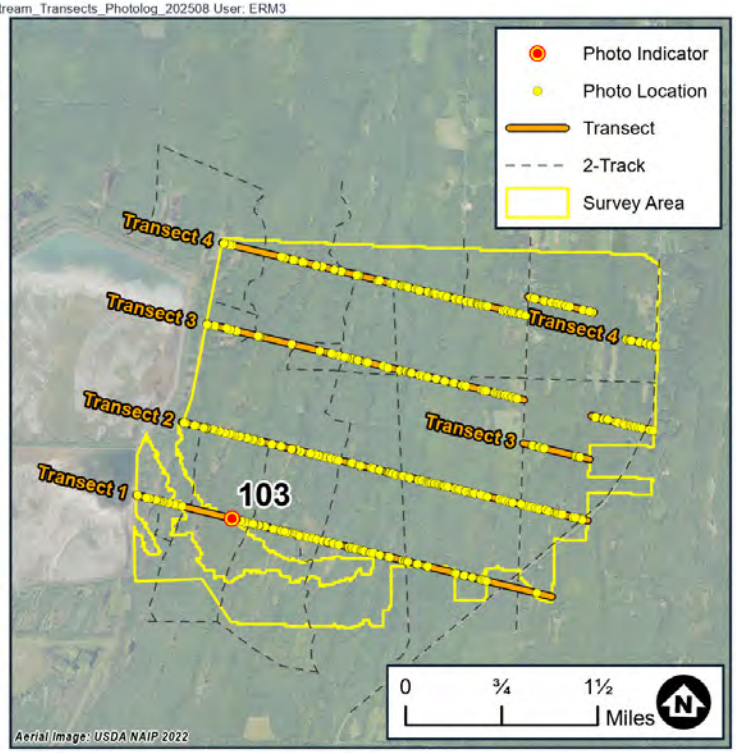
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP16-A, Wetland
**Photo 2 Caption:** T1W-BP16-A, Upland

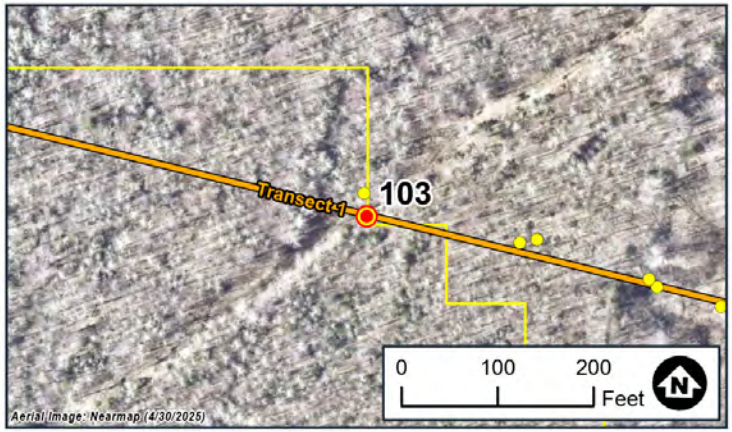
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

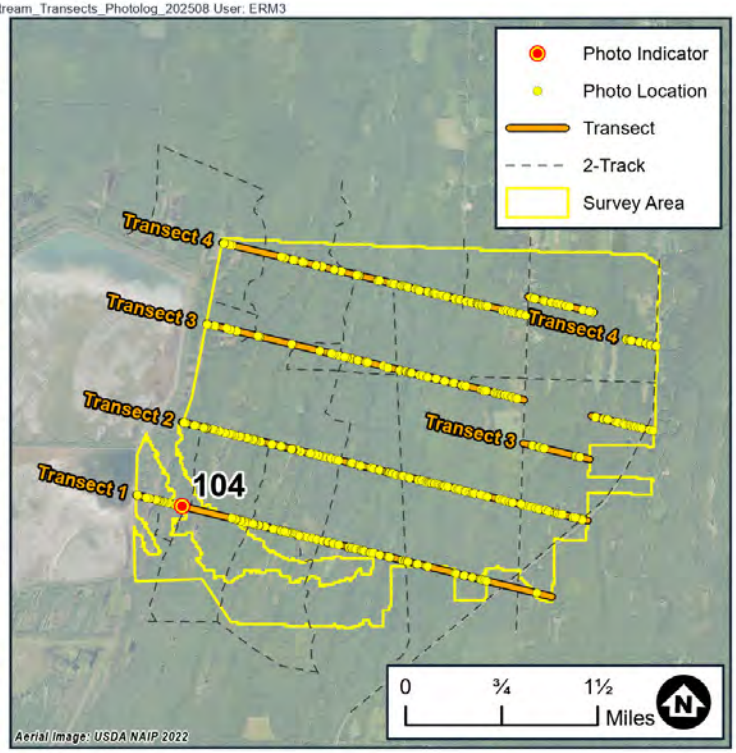
**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP16-B, Wetland
**Photo 2 Caption:** T1W-BP16-B, Upland

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3

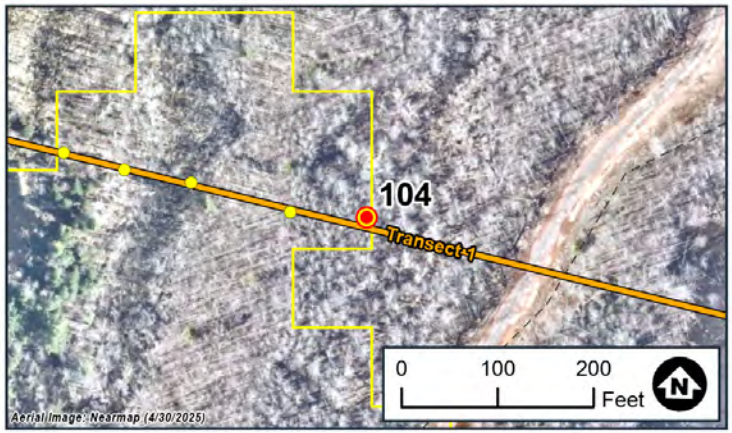
## Photo 104-1






## Photo 104-2







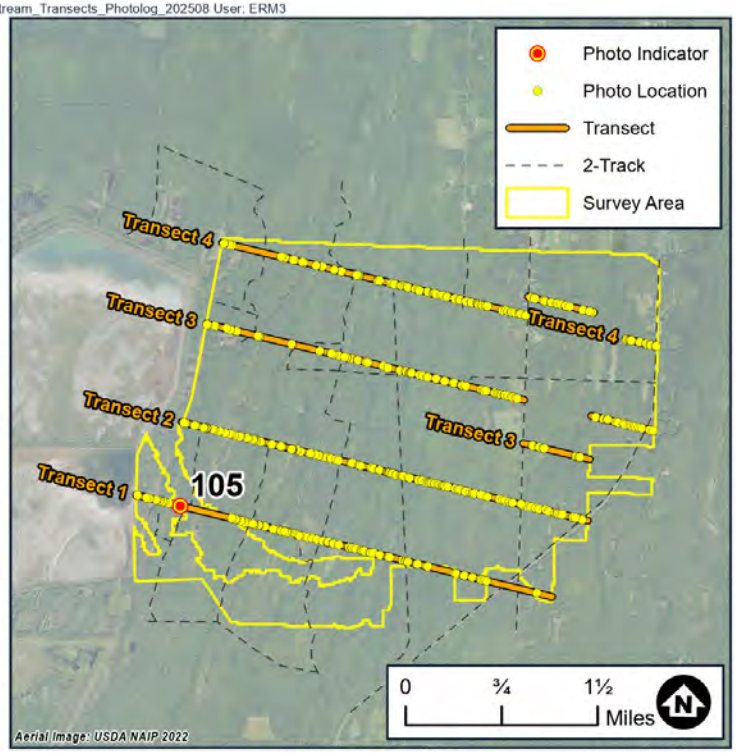

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP17-A, Wetland
**Photo 2 Caption:** T1W-BP17-A, Wetland (Wetland continues past edge of AOI)

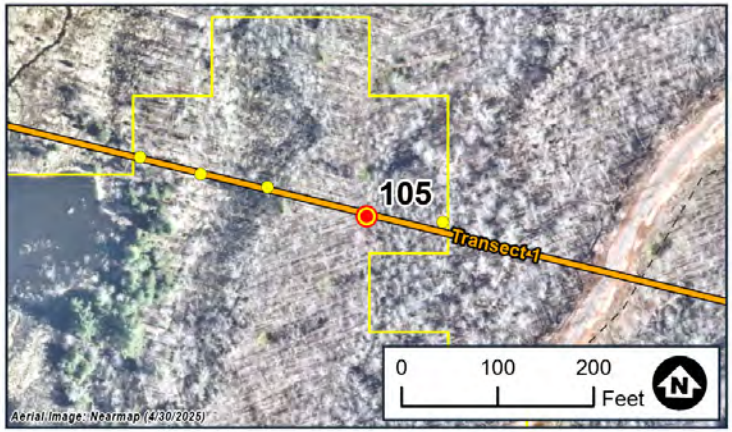
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP17-B, Wetland
**Photo 2 Caption:** T1W-BP17-B, Upland

*Note: Photo locations are approximate*

**Photo 106-1**



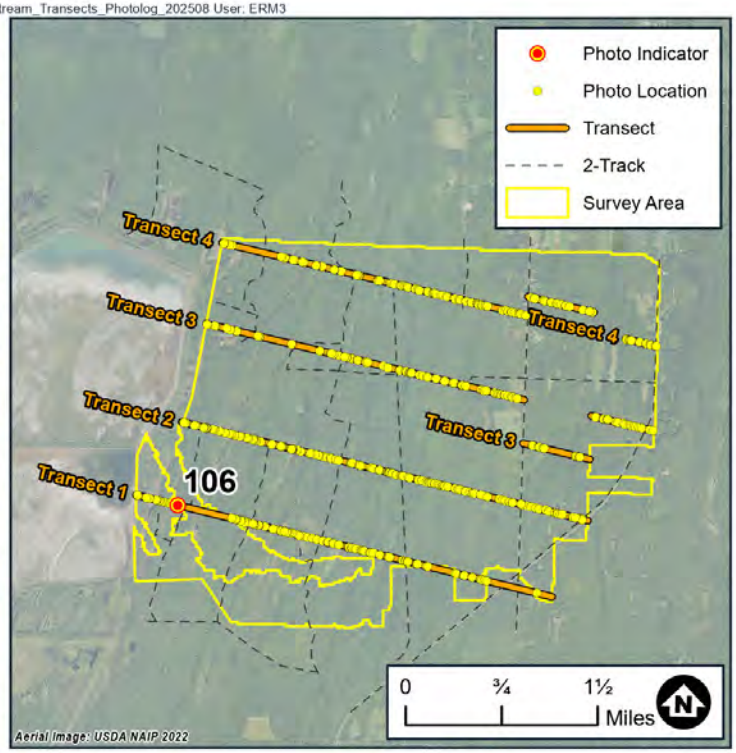
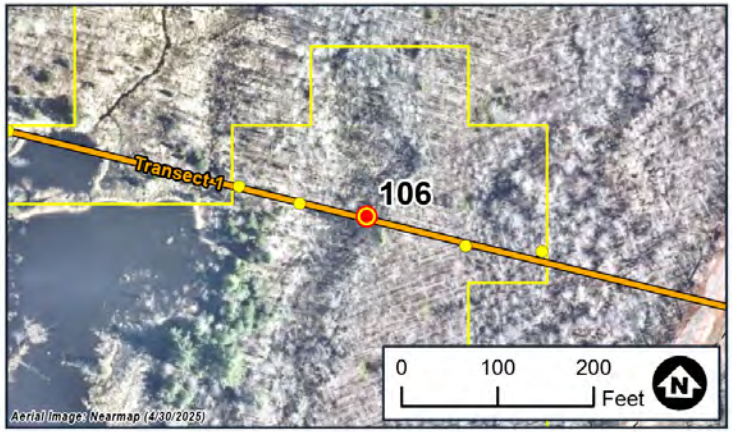



**Photo 106-2**







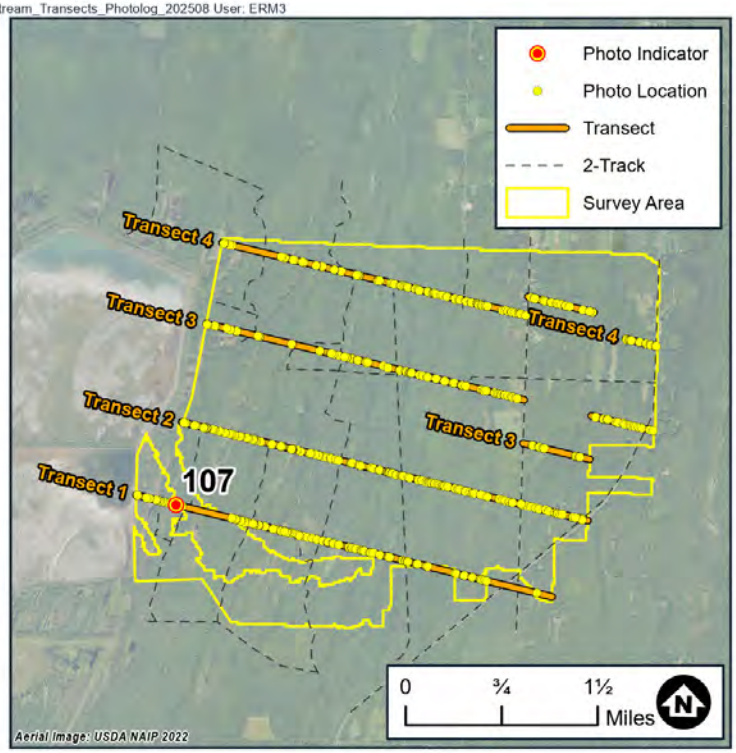

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP18-A, Wetland
**Photo 2 Caption:** T1W-BP18-A, Upland

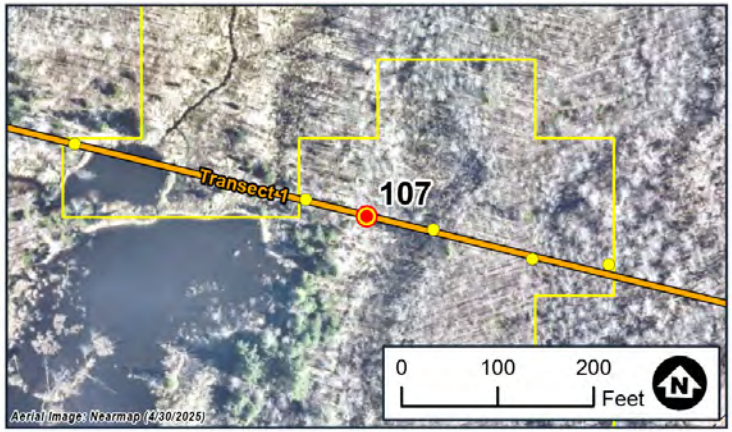
*Note: Photo locations are approximate*









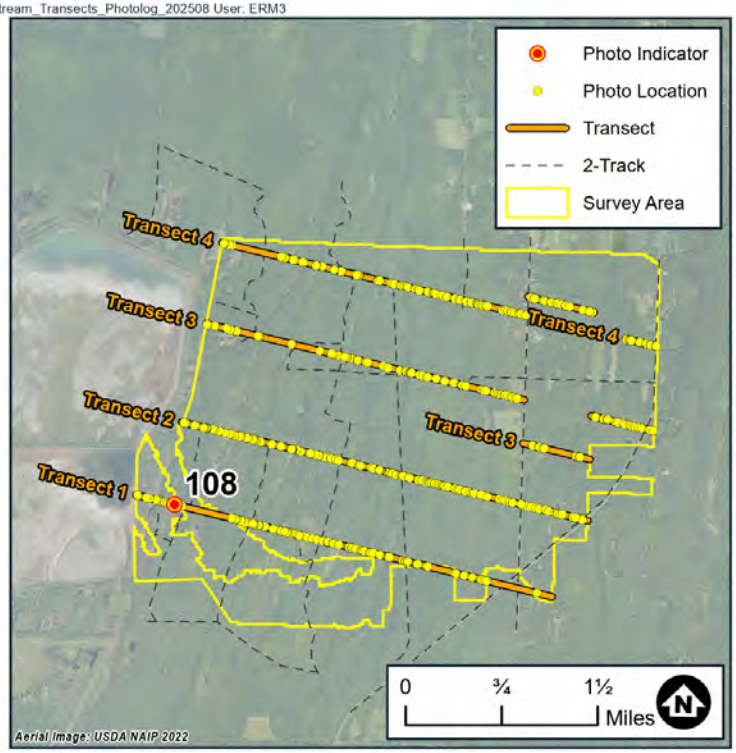

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP18-B, Wetland
**Photo 2 Caption:** T1W-BP18-B, Upland

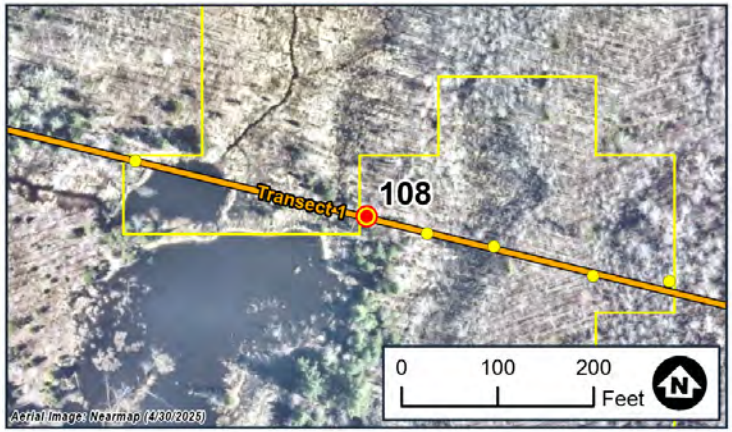
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP19-A, Wetland
**Photo 2 Caption:** T1W-BP19-A, Upland

*Note: Photo locations are approximate*

**Photo 109-1**



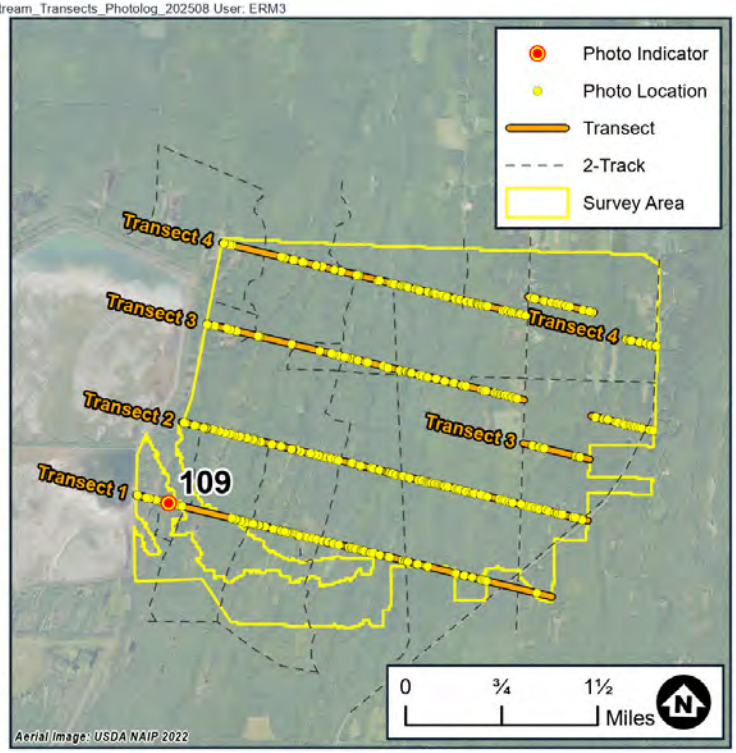
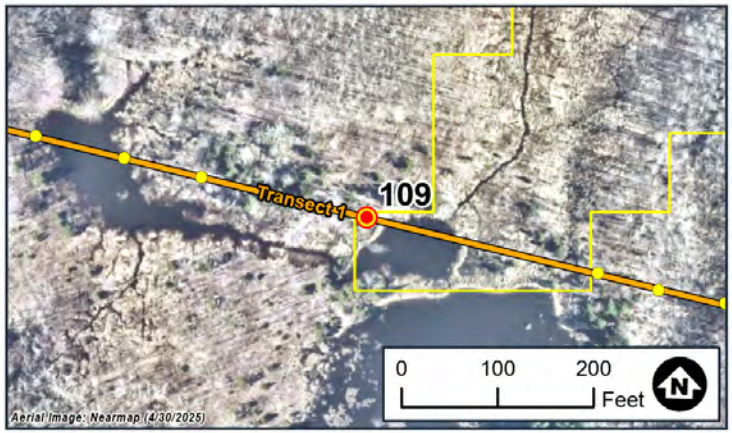



**Photo 109-2**






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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

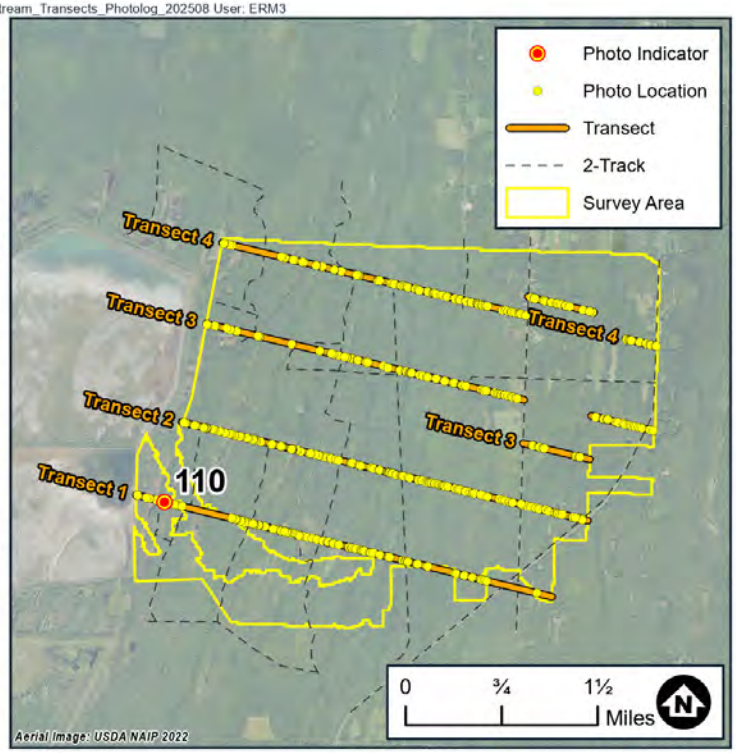
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP19-B, Wetland
**Photo 2 Caption:** T1W-BP19-B, Upland

*Note: Photo locations are approximate*

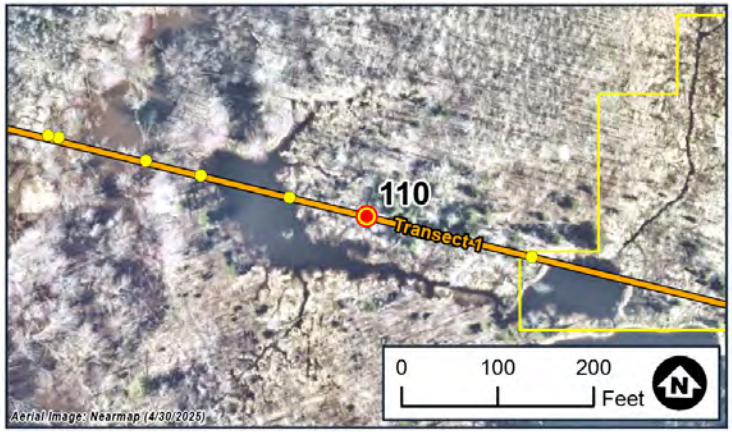
## Photo 110-1






## Photo 110-2






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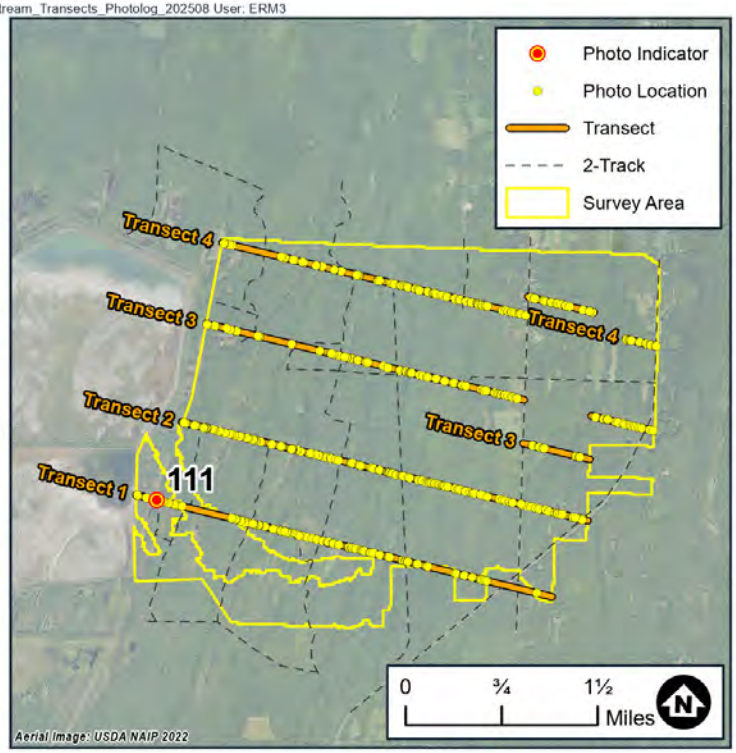
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP20-A, Wetland
**Photo 2 Caption:** T1W-BP20-A, Upland

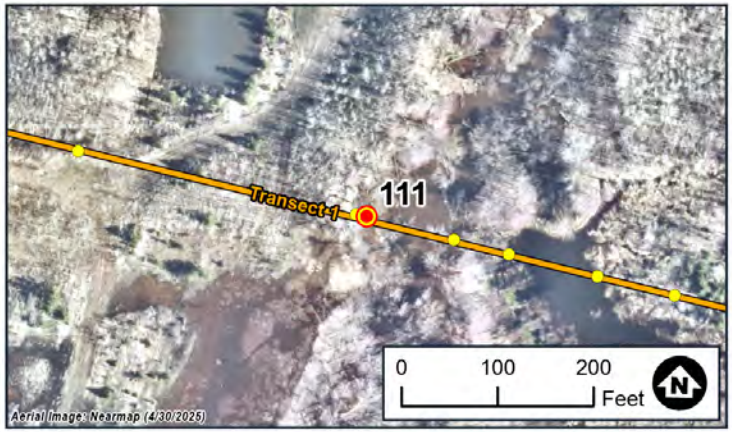
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

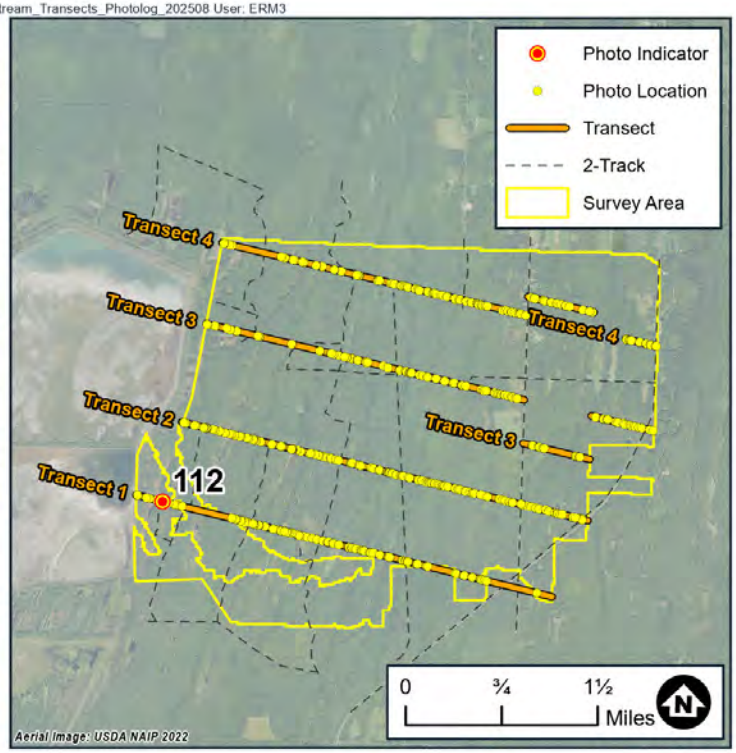
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP20-B, Wetland
**Photo 2 Caption:** T1W-BP20-B, Upland

*Note: Photo locations are approximate*

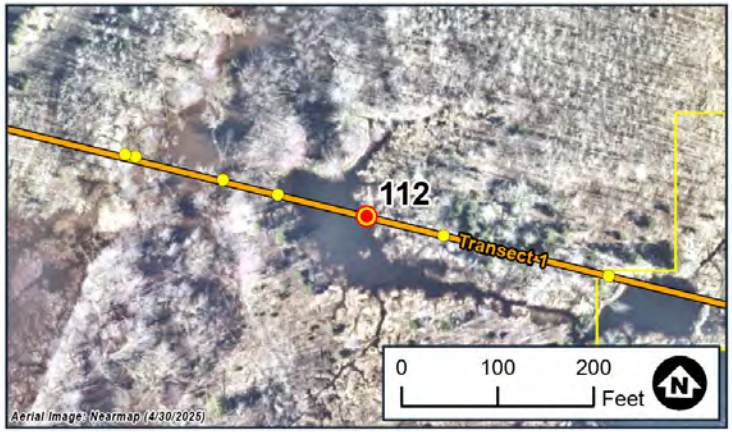
## Photo 112-1






## Photo 112-2






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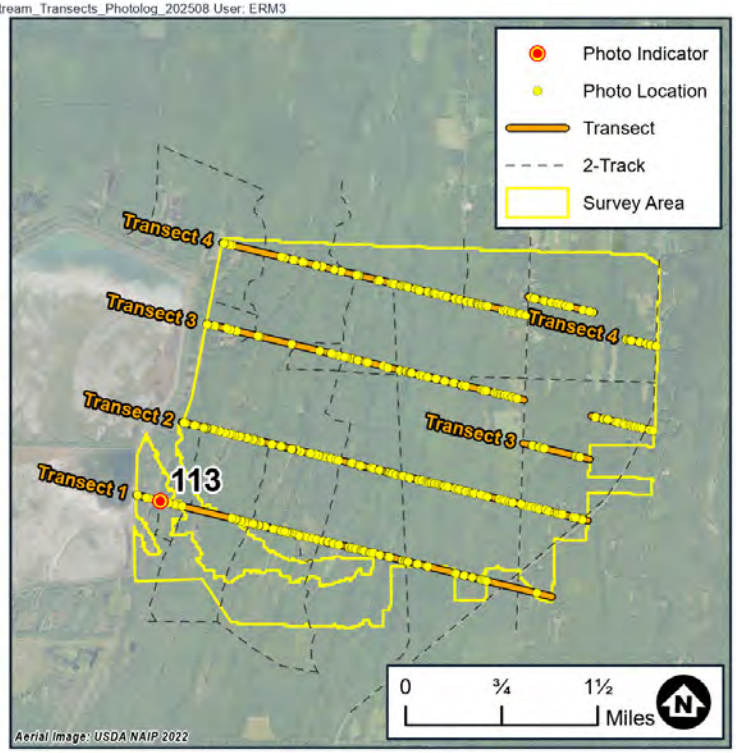
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-S07-RB, Upstream
**Photo 2 Caption:** T1W-S07-RB, Downstream

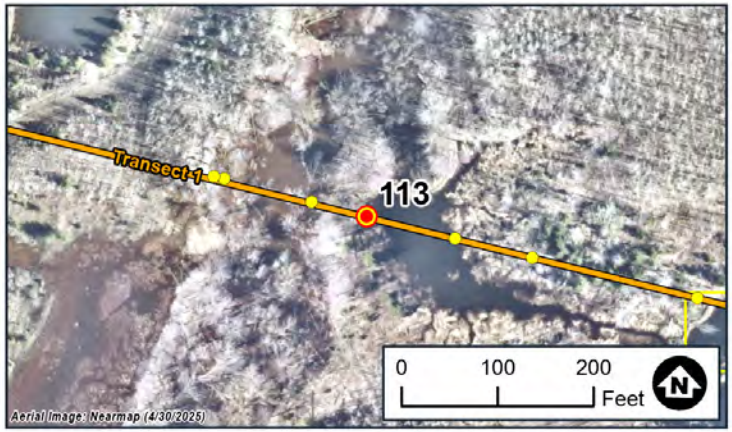
*Note: Photo locations are approximate*











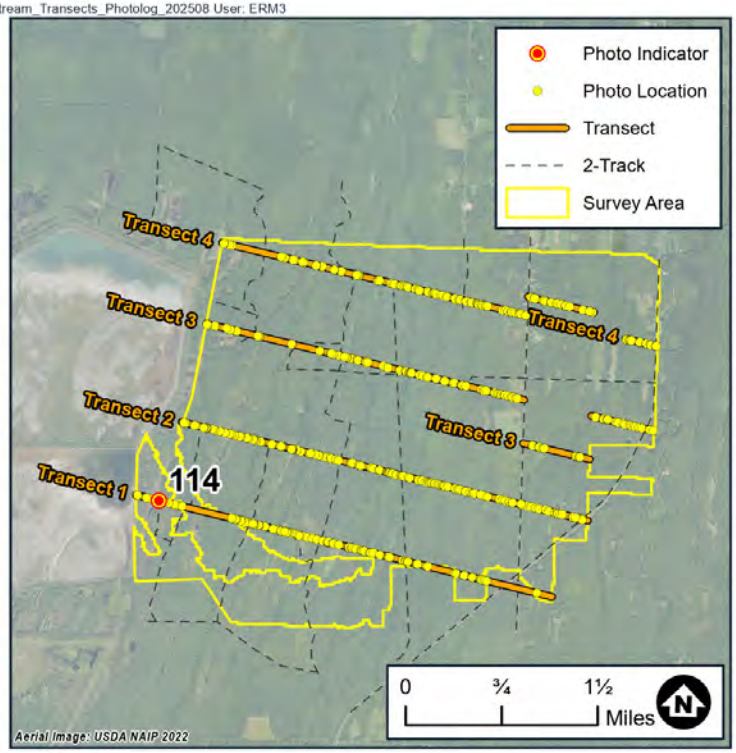

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-S07-LB, Upstream
**Photo 2 Caption:** T1W-S07-LB, Downstream

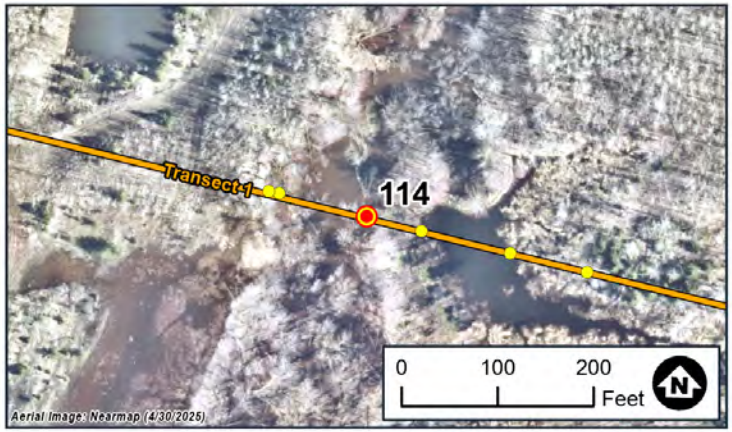
*Note: Photo locations are approximate*











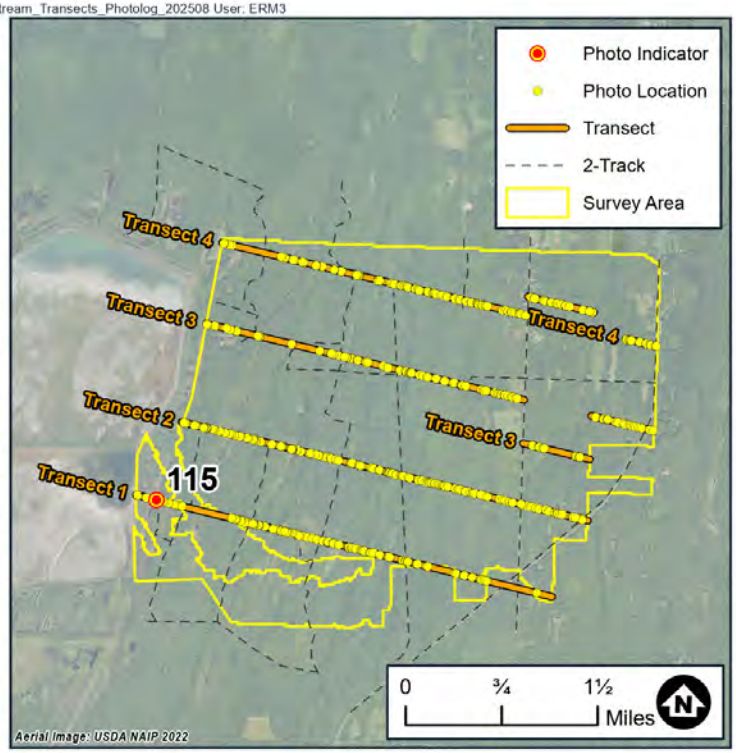

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-S08-RB, Upstream
**Photo 2 Caption:** T1W-S08-RB, Downstream

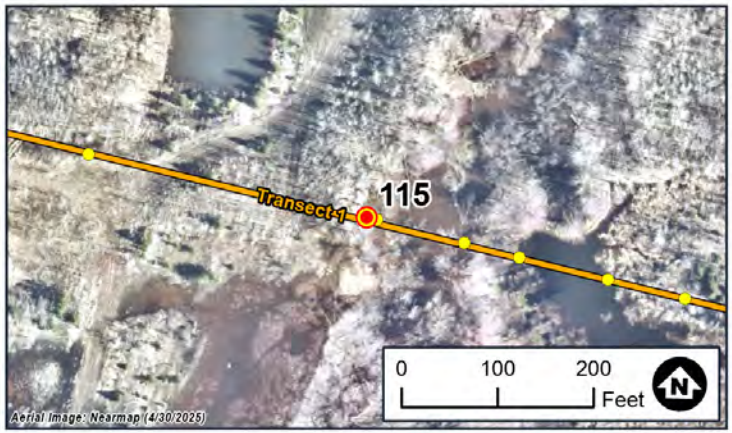
*Note: Photo locations are approximate*











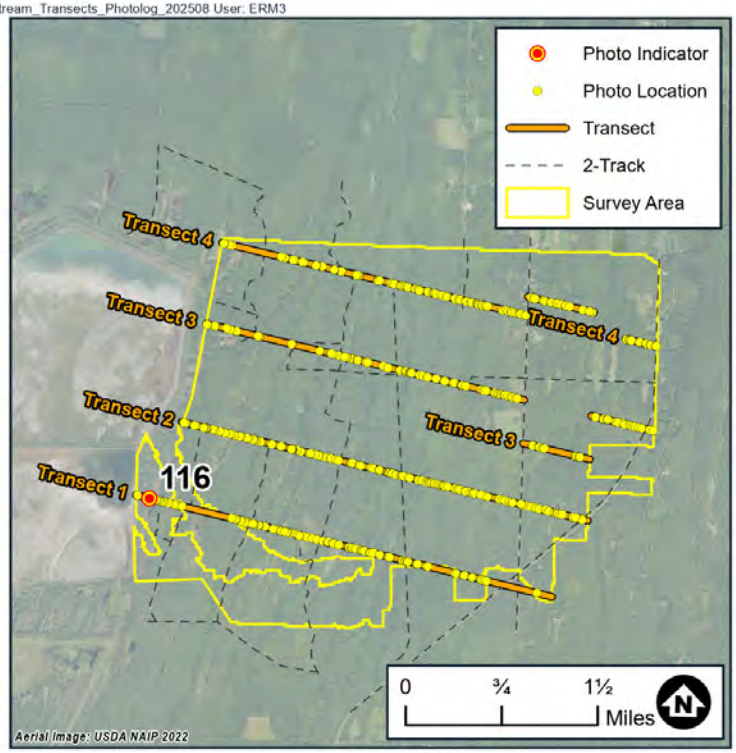

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-S08-LB, Upstream
**Photo 2 Caption:** T1W-S08-LB, Downstream

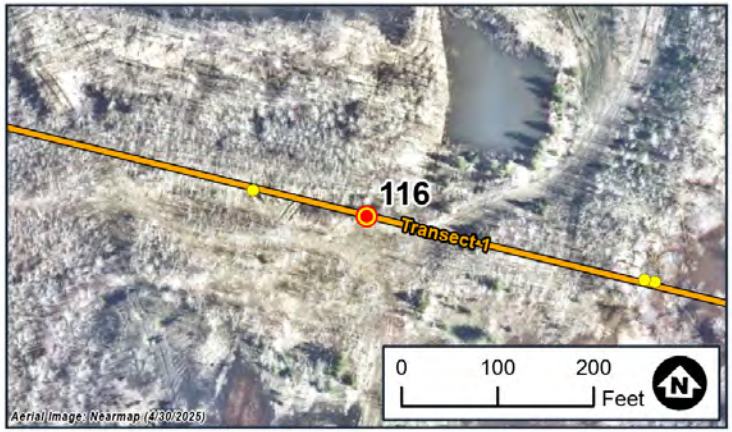
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

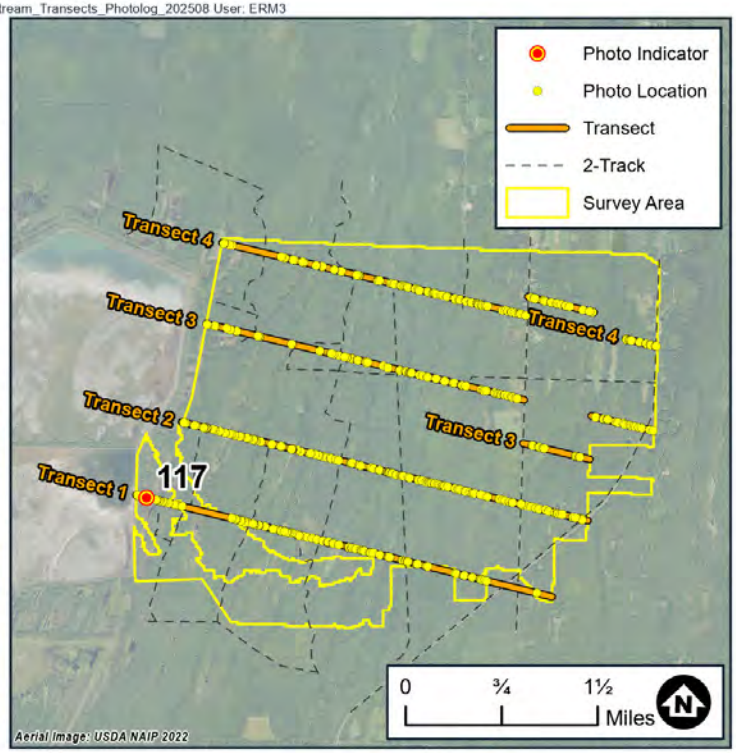
BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP21-A, Wetland
**Photo 2 Caption:** T1W-BP21-A, Upland

*Note: Photo locations are approximate*

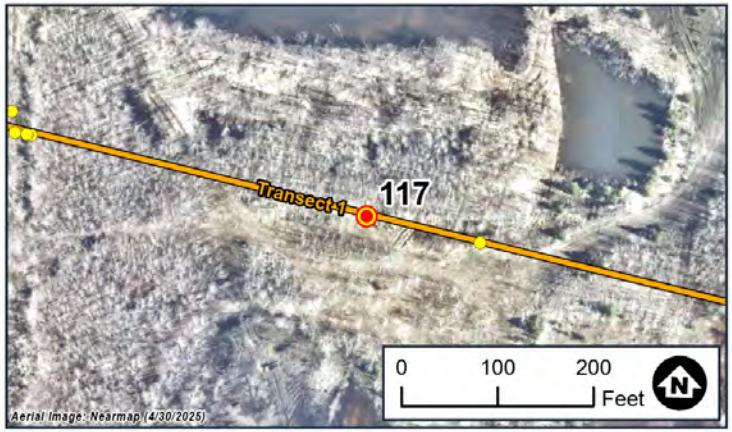
## Photo 117-1






## Photo 117-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/23/2025
**Photo 1 Caption:** T1W-BP21-B, Wetland
**Photo 2 Caption:** T1W-BP21-B, Upland

*Note: Photo locations are approximate*

**Photo 118-1**



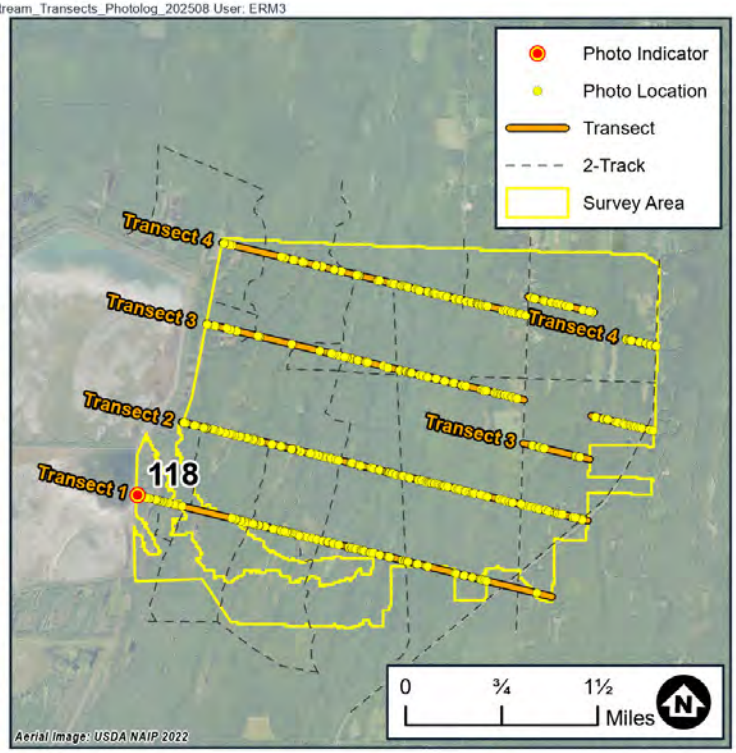
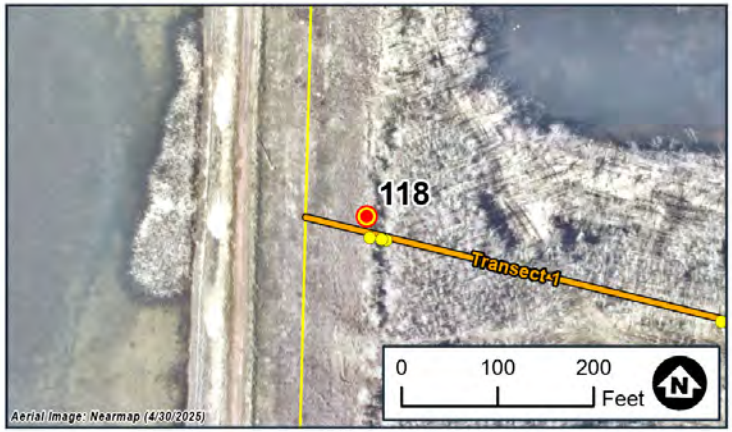



**Photo 118-2**







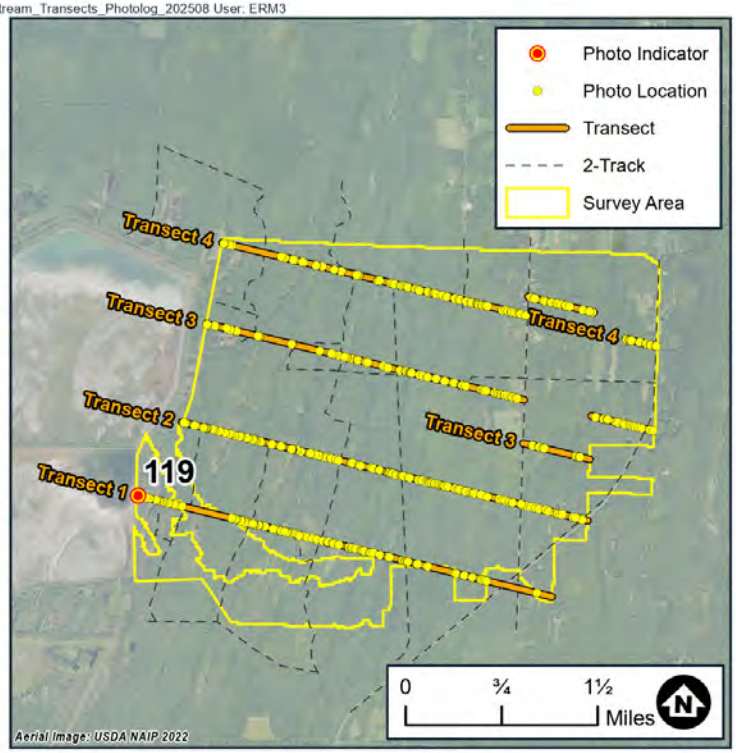

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T1W-S09-RB, Upstream
**Photo 2 Caption:** T1W-S09-RB, Downstream

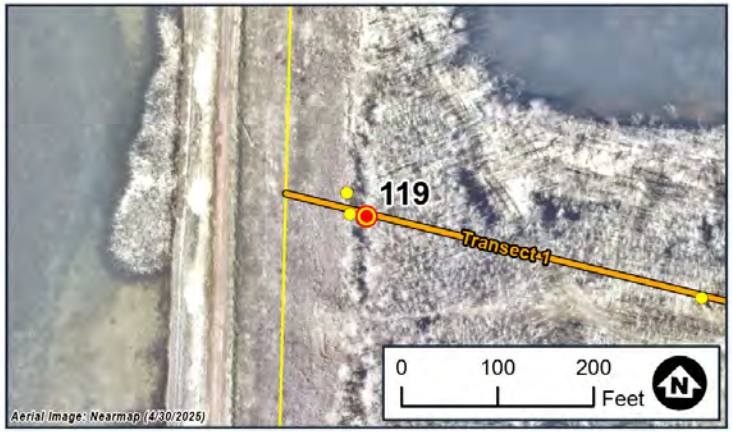
*Note: Photo locations are approximate*









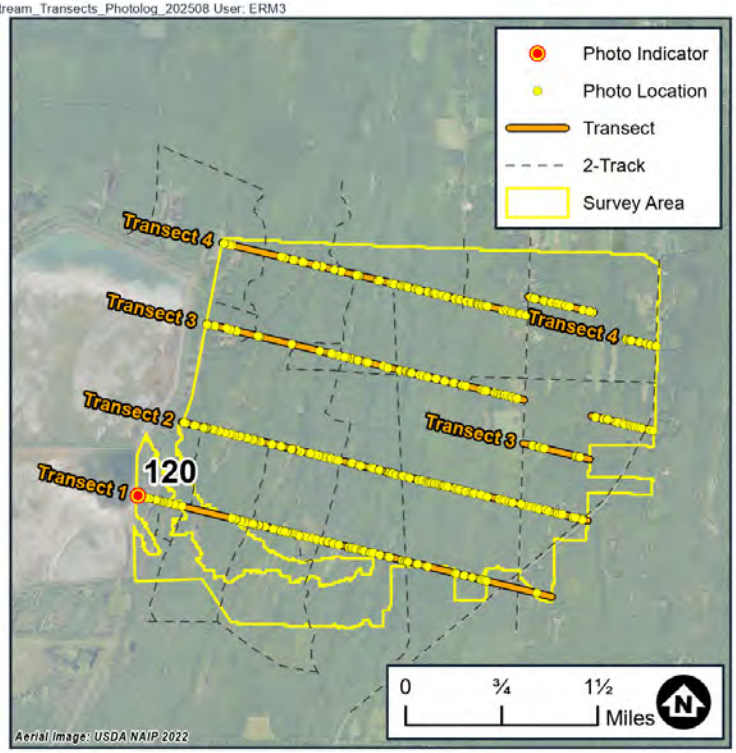

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T1W-S09-LB, Upstream
**Photo 2 Caption:** T1W-S09-LB, Downstream

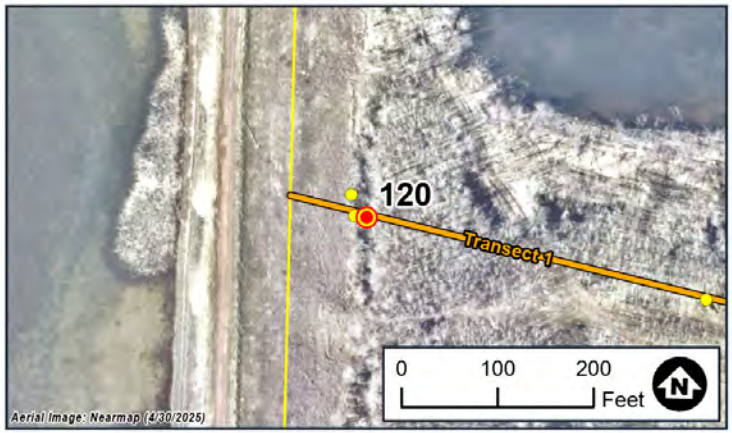
*Note: Photo locations are approximate*











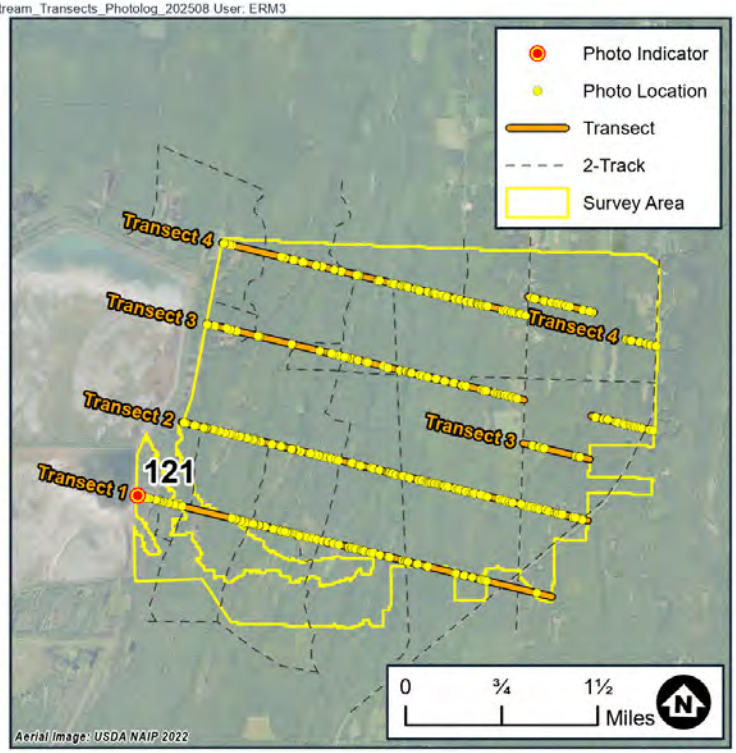

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T1W-BP22-A, Wetland
**Photo 2 Caption:** T1W-BP22-A, Upland

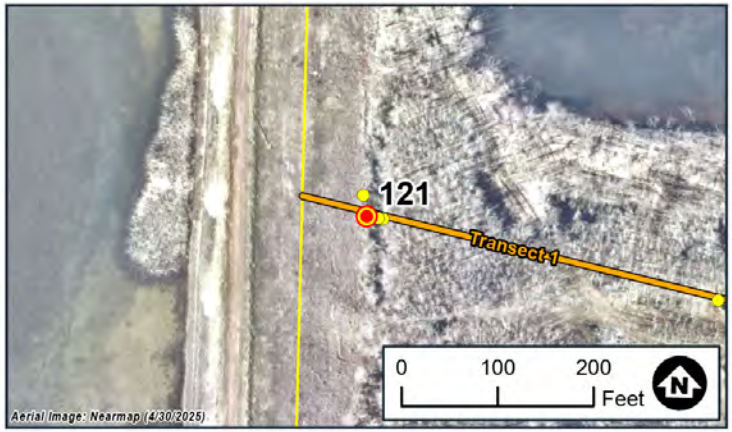
*Note: Photo locations are approximate*











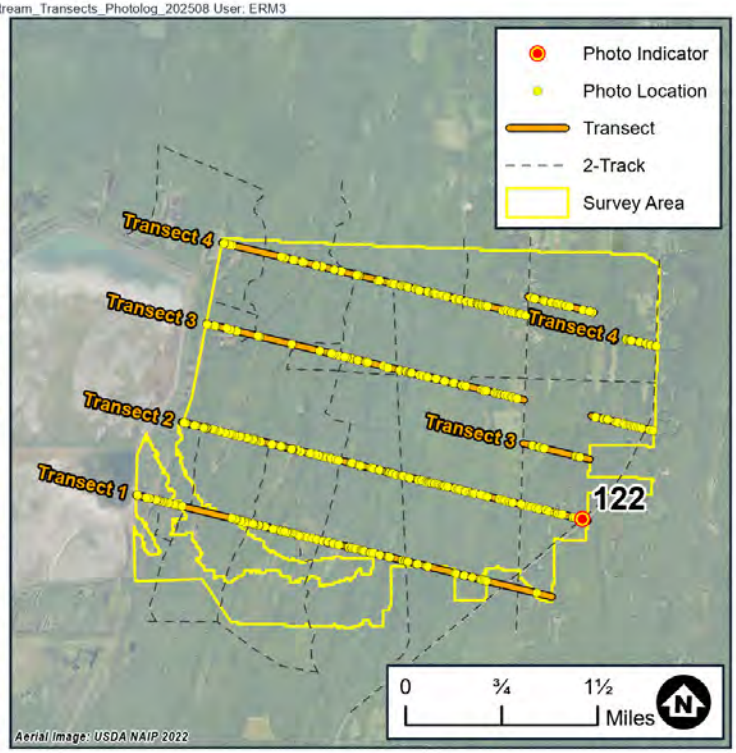

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T1W-BP22-B, Wetland
**Photo 2 Caption:** T1W-BP22-B, Upland

*Note: Photo locations are approximate*











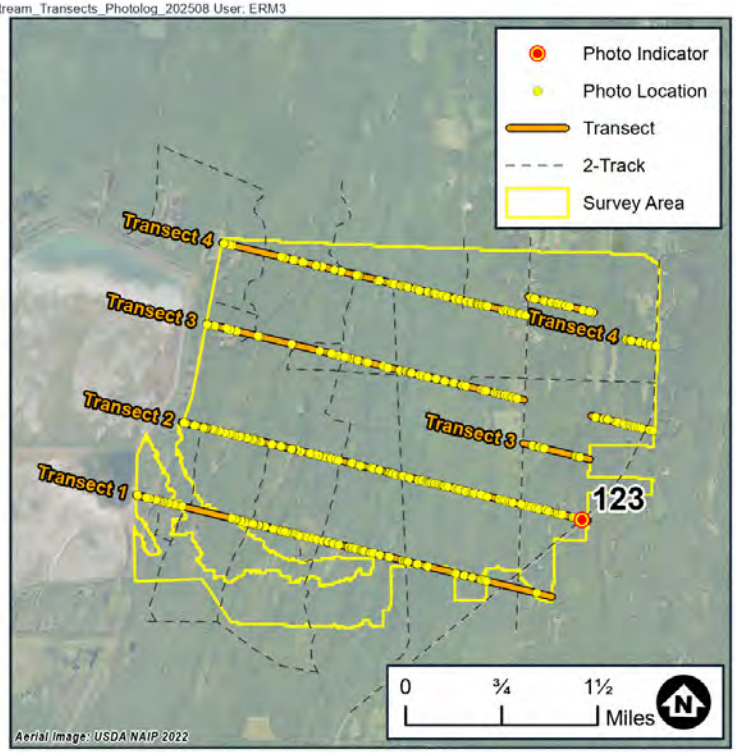

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S13-LB, Upstream
**Photo 2 Caption:** T2E-S13-LB, Downstream

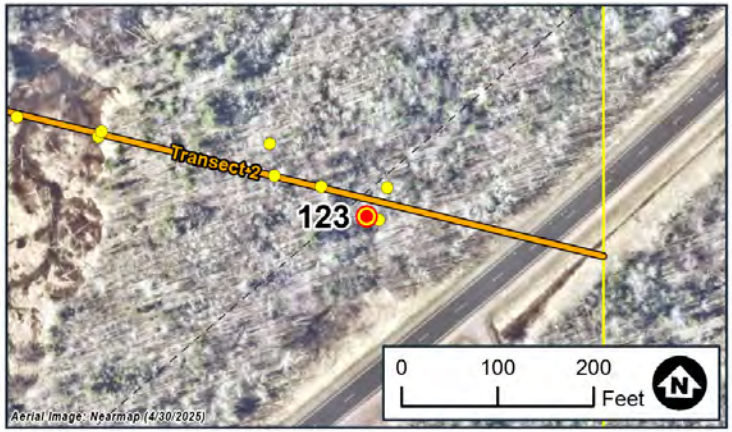
*Note: Photo locations are approximate*











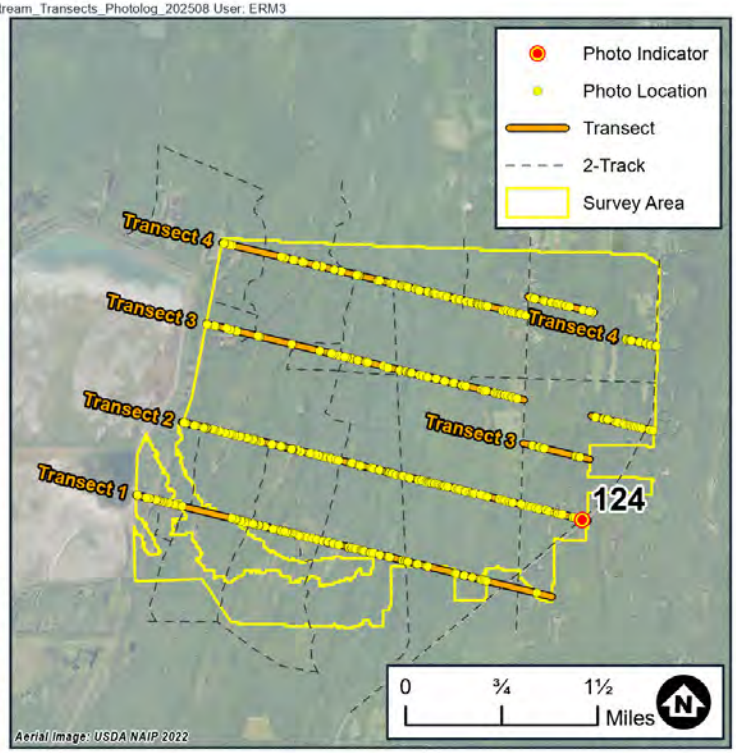

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S13-RB, Upstream
**Photo 2 Caption:** T2E-S13-RB, Downstream

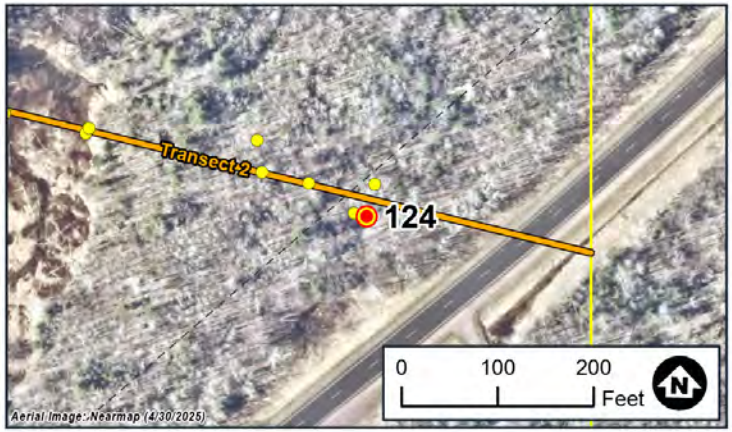
*Note: Photo locations are approximate*









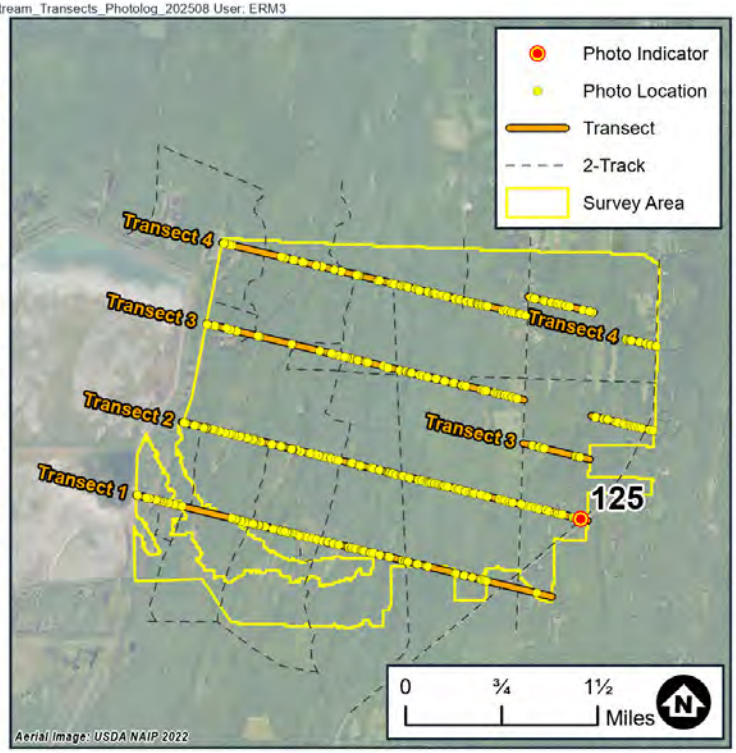

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP36-B, Wetland
**Photo 2 Caption:** T2E-BP36-B, Upland

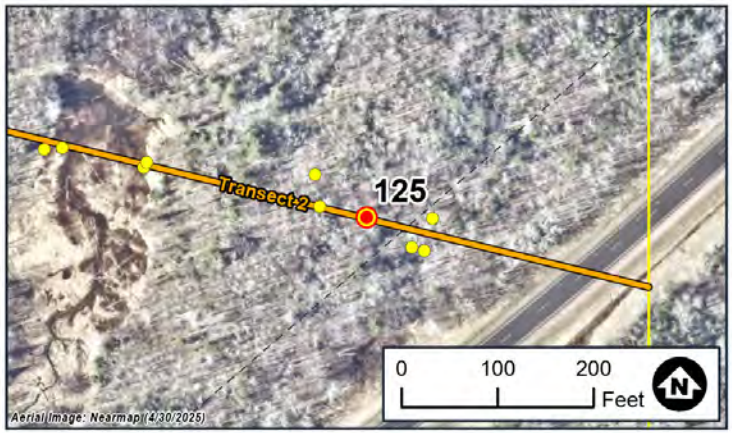
*Note: Photo locations are approximate*











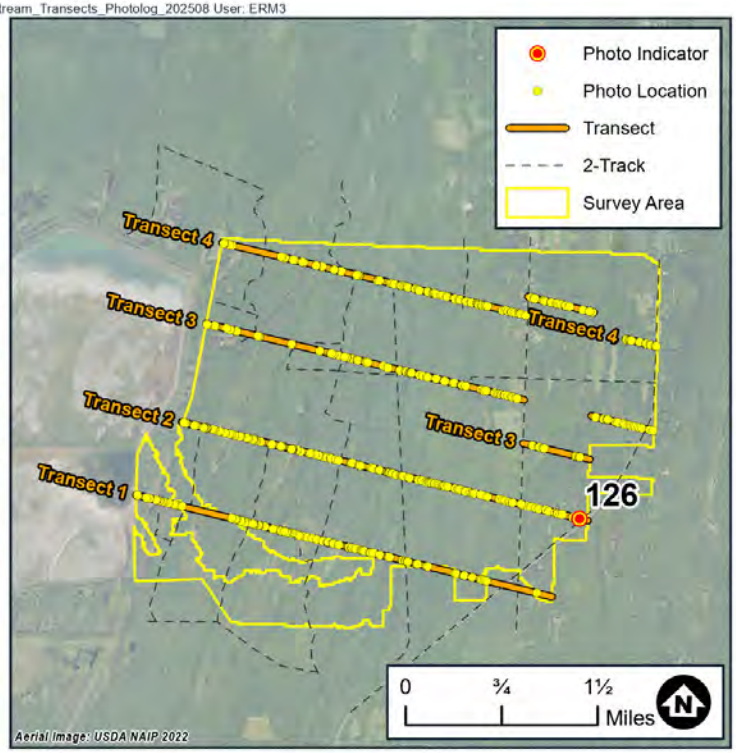

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP36-A, Wetland
**Photo 2 Caption:** T2E-BP36-A, Upland

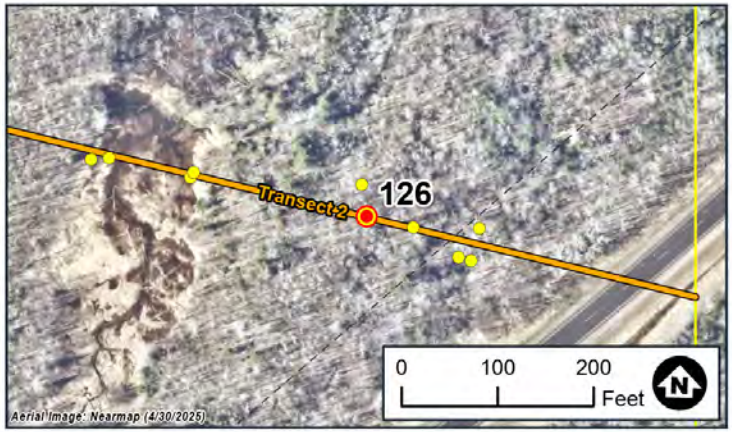
*Note: Photo locations are approximate*











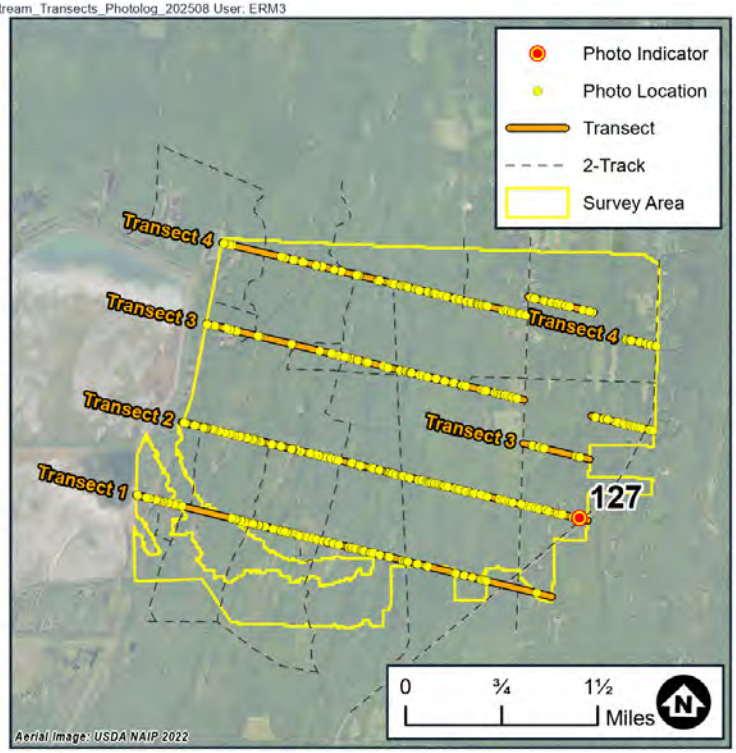

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP35-B, Wetland
**Photo 2 Caption:** T2E-BP35-B, Upland

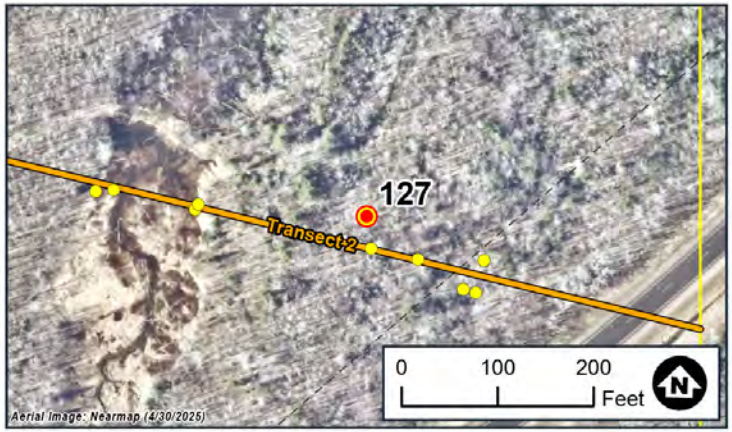
*Note: Photo locations are approximate*










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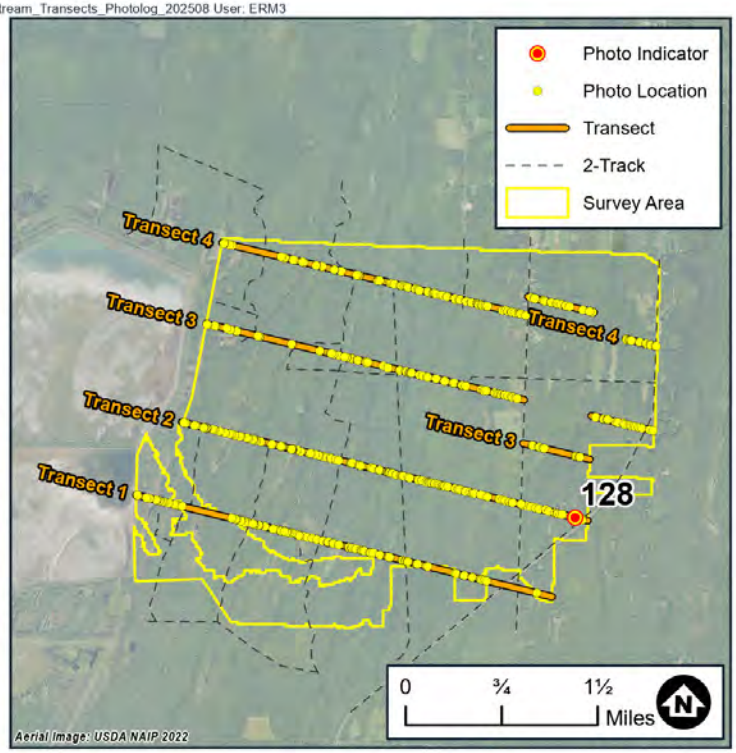
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP35-A, Wetland
**Photo 2 Caption:** T2E-BP35-A, Upland

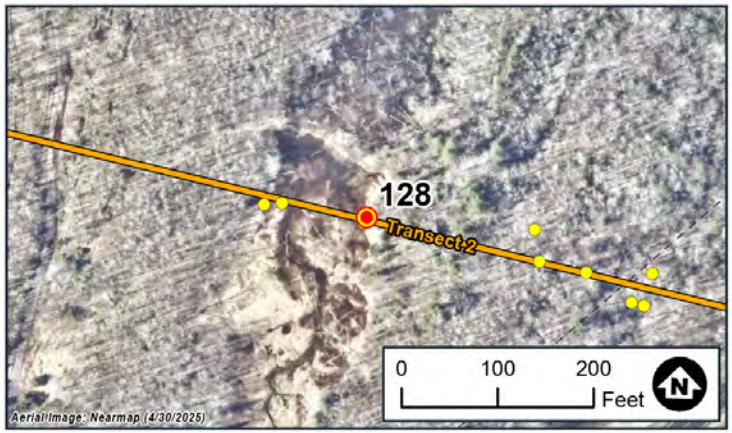
*Note: Photo locations are approximate*











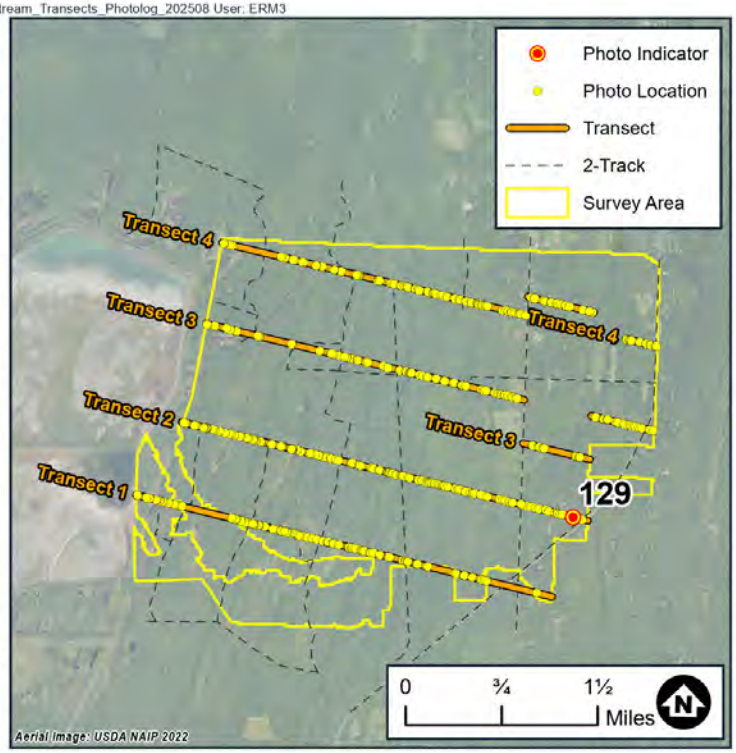

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/20/2025
**Photo 1 Caption:** T2E-BP34-B, Wetland
**Photo 2 Caption:** T2E-BP34-B, Upland

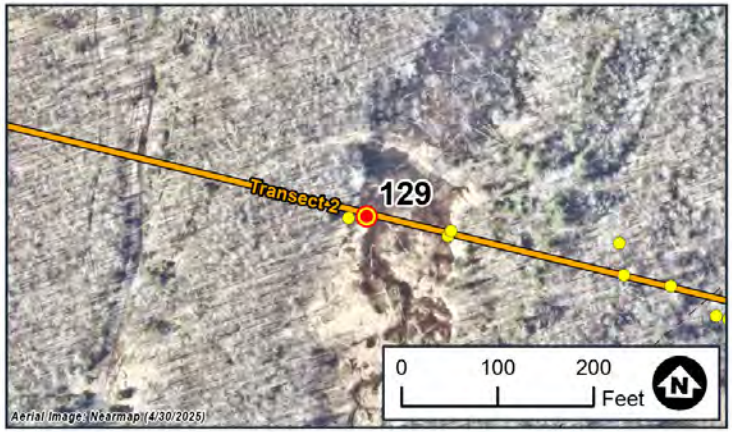
*Note: Photo locations are approximate*









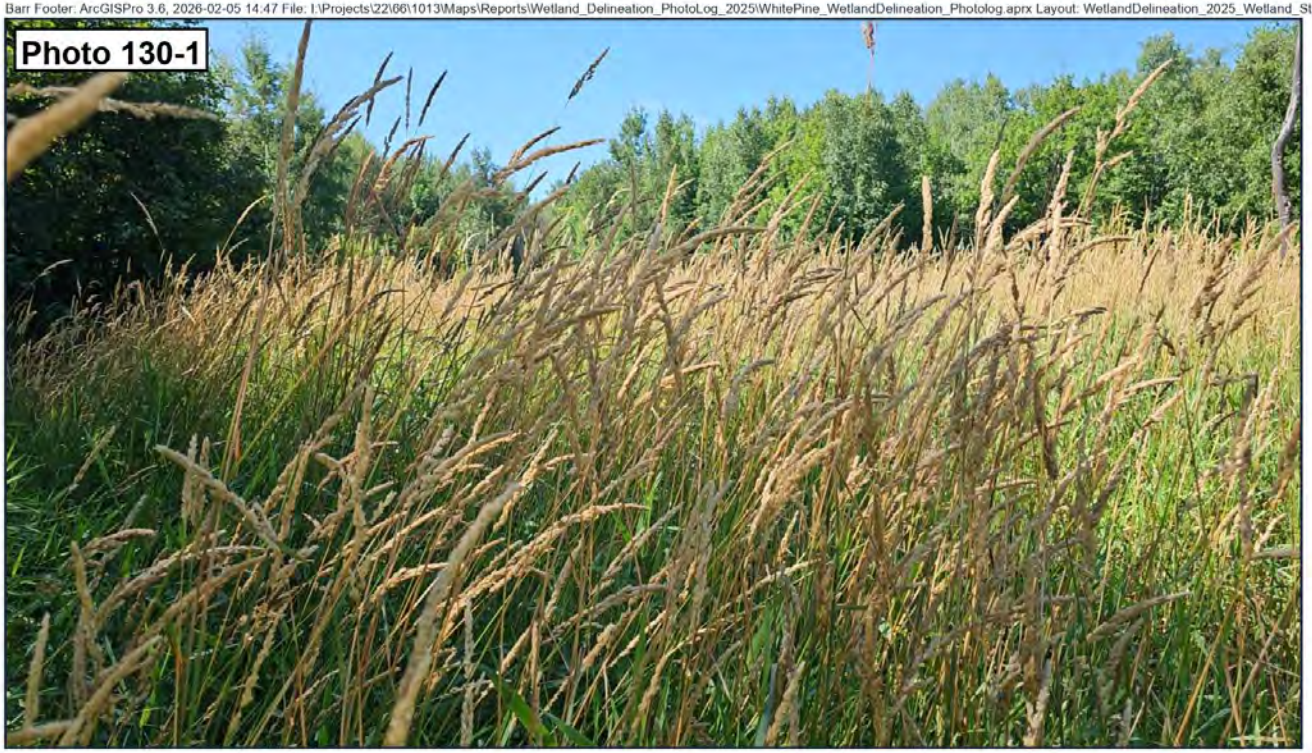

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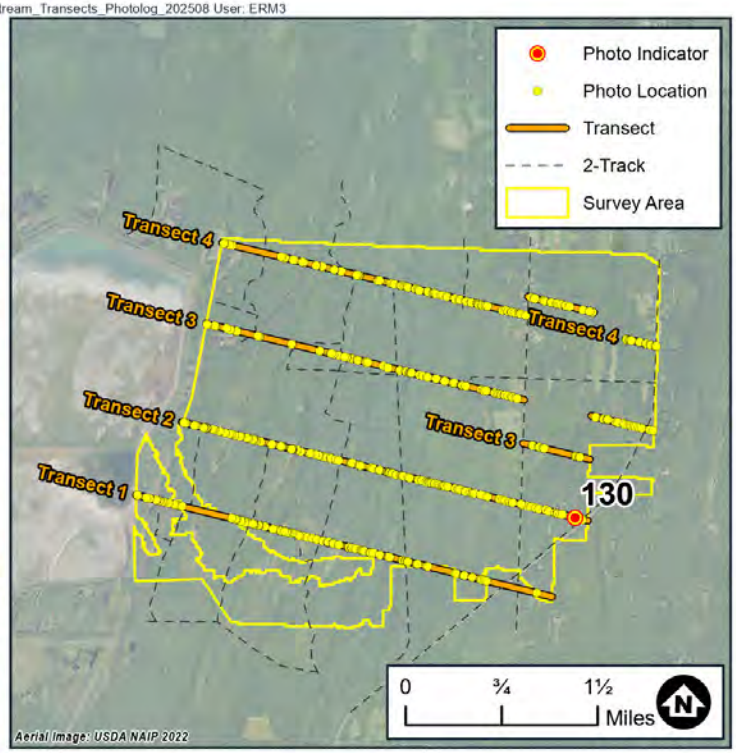
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S12-LB, Upstream
**Photo 2 Caption:** T2E-S12-LB, Downstream

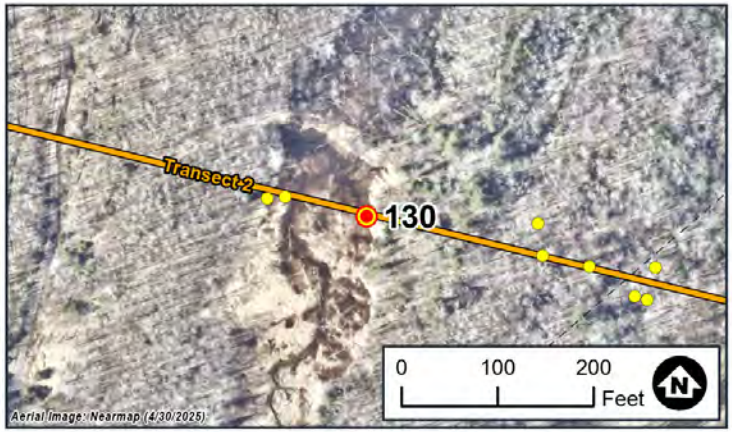
*Note: Photo locations are approximate*











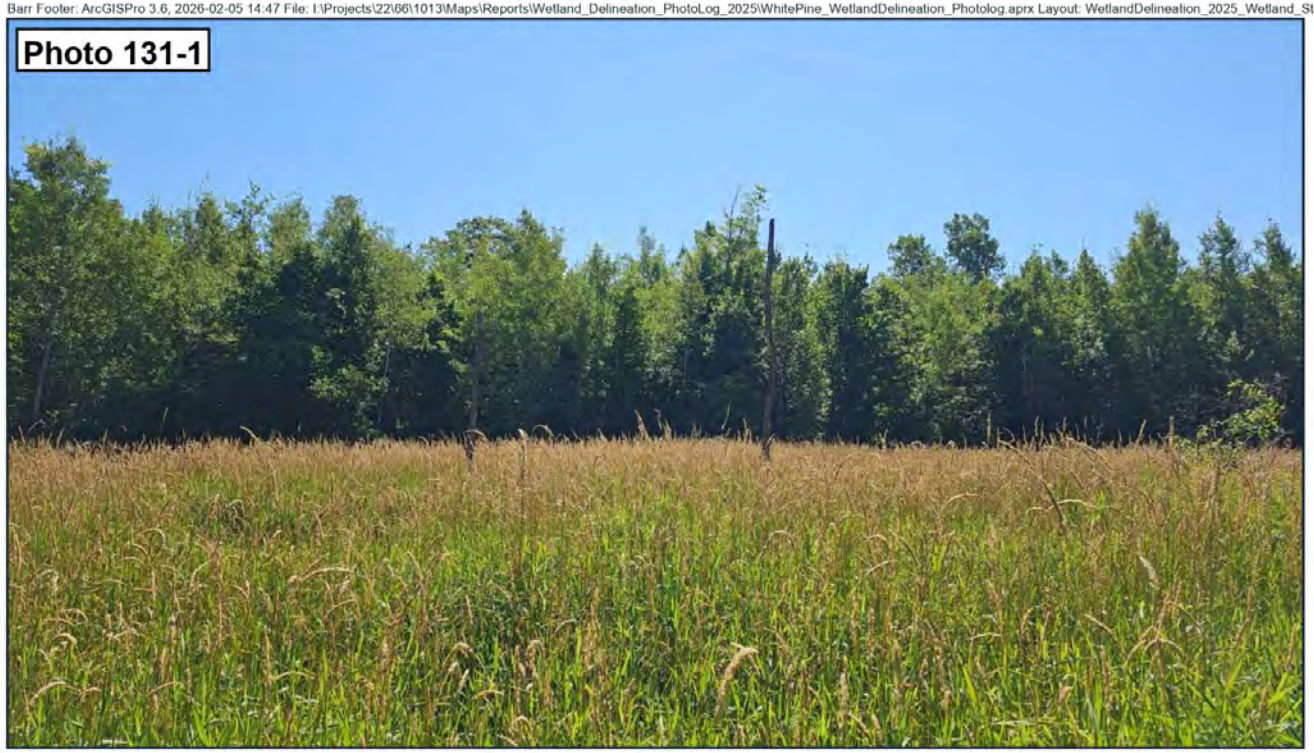

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S12-RB, Upstream
**Photo 2 Caption:** T2E-S12-RB, Downstream

*Note: Photo locations are approximate*

**Photo 131-1**



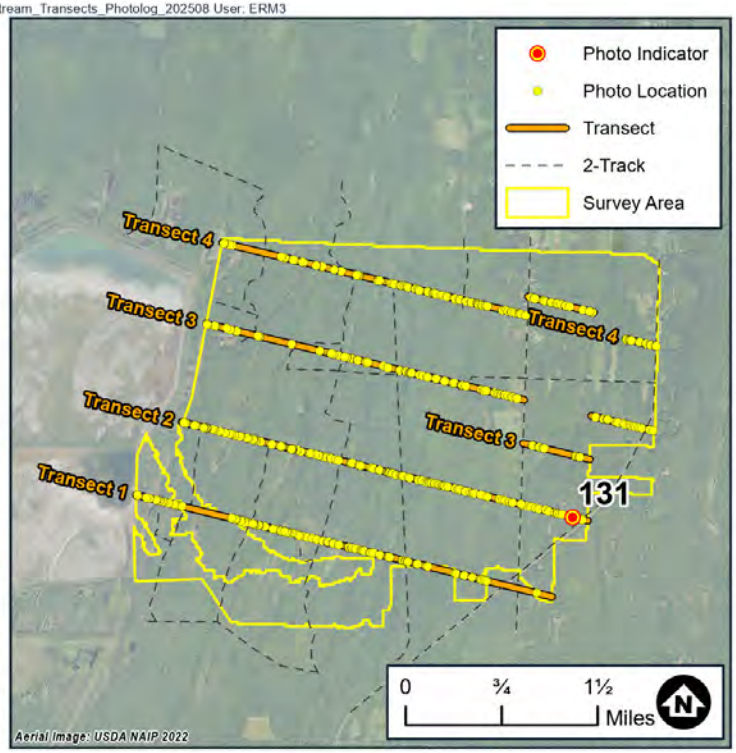
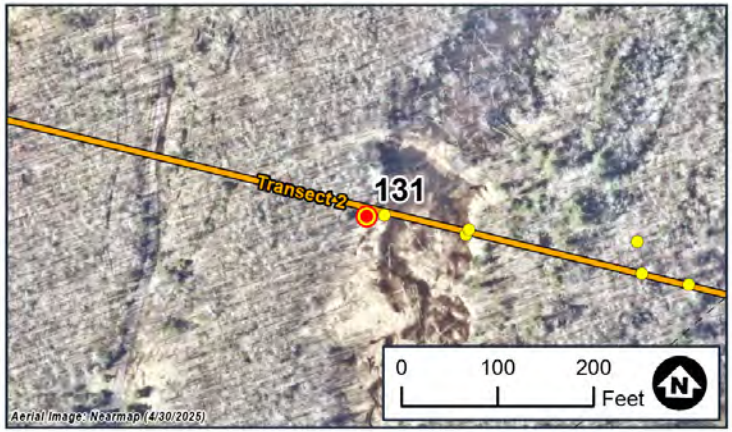



**Photo 131-2**






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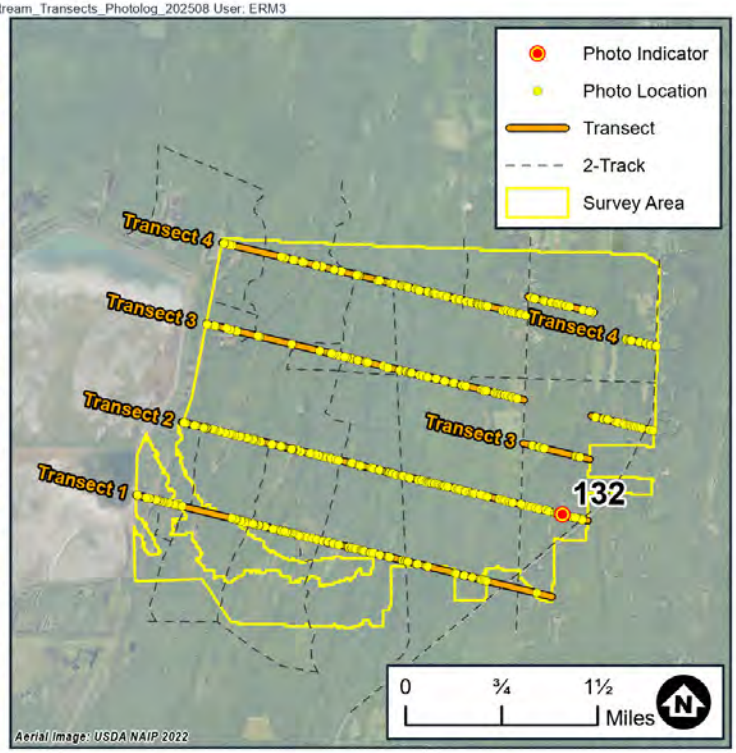
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP34-A, Wetland
**Photo 2 Caption:** T2E-BP34-A, Upland

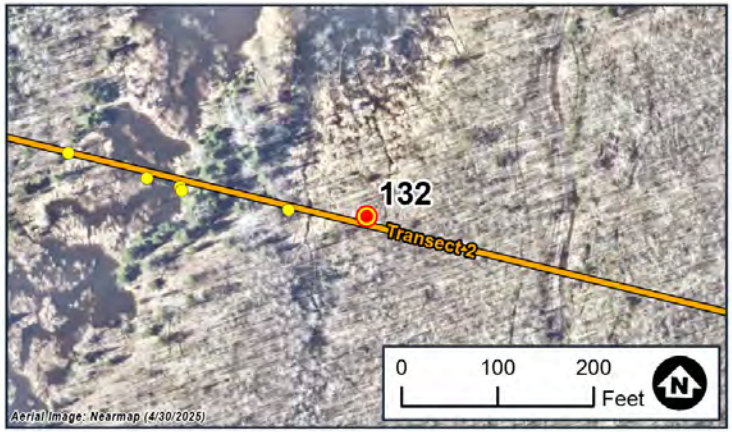
*Note: Photo locations are approximate*









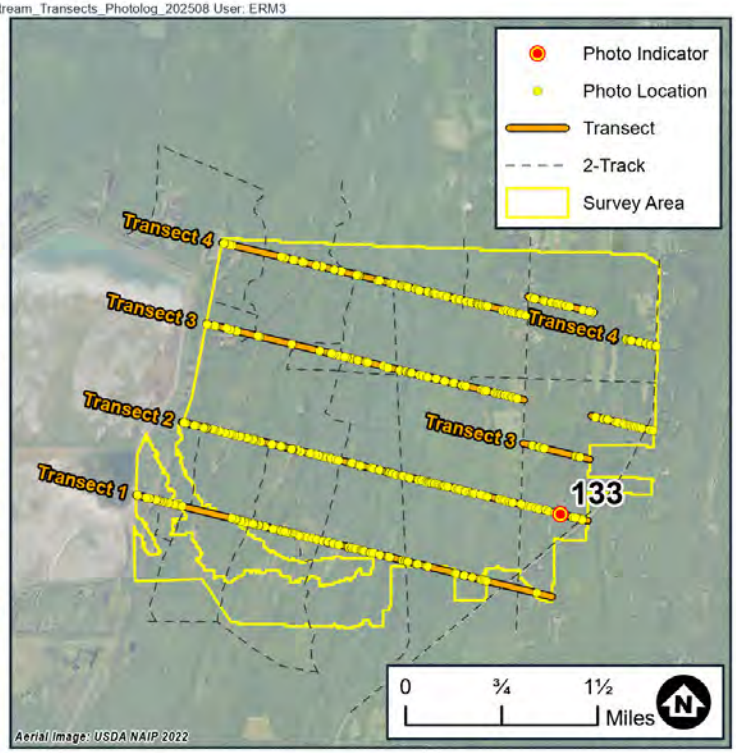

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP33-B, Wetland
**Photo 2 Caption:** T2E-BP33-B, Upland

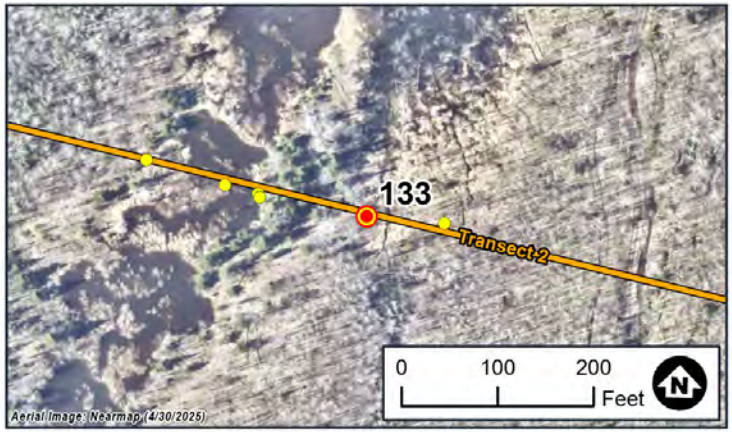
*Note: Photo locations are approximate*









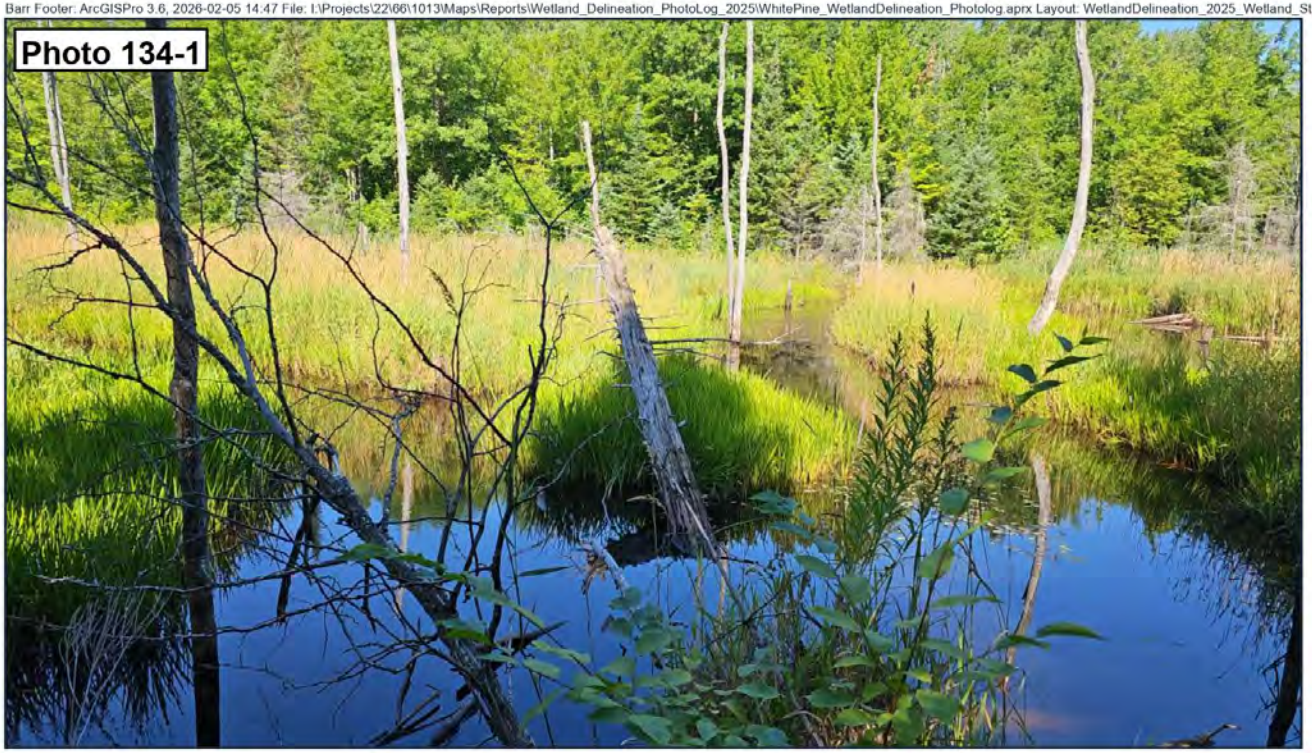


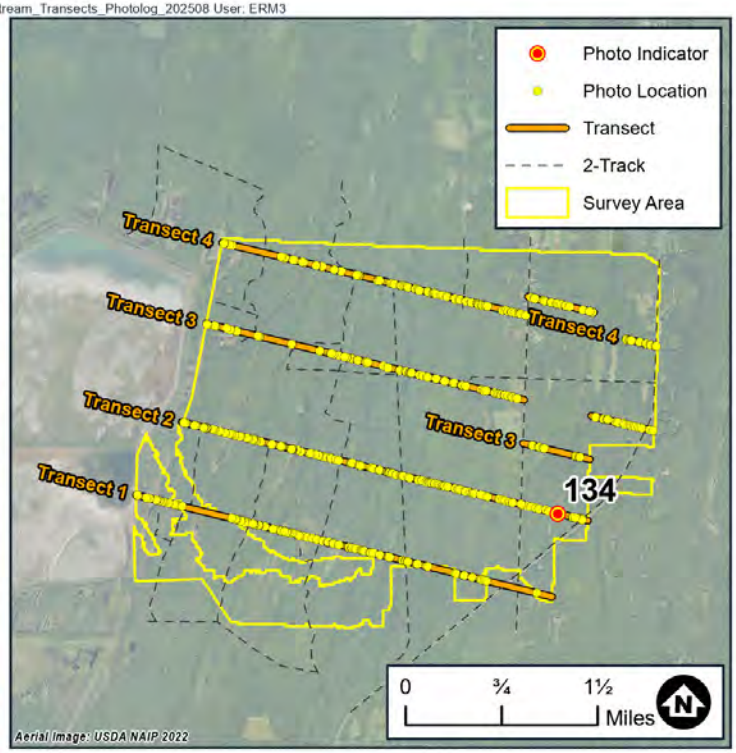

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP33-A, Wetland
**Photo 2 Caption:** T2E-BP33-A, Upland

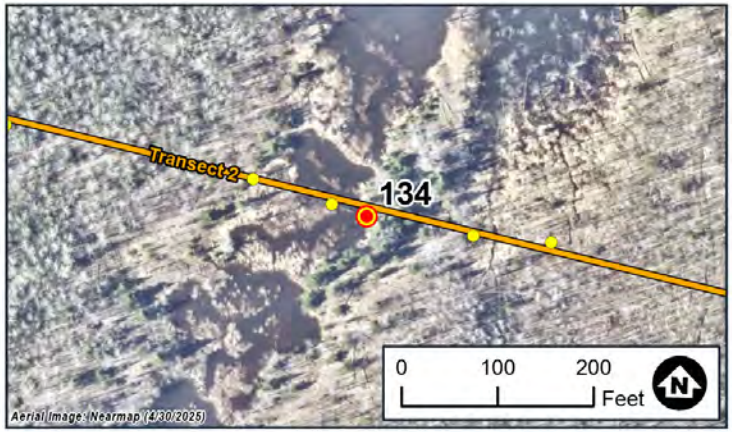
*Note: Photo locations are approximate*











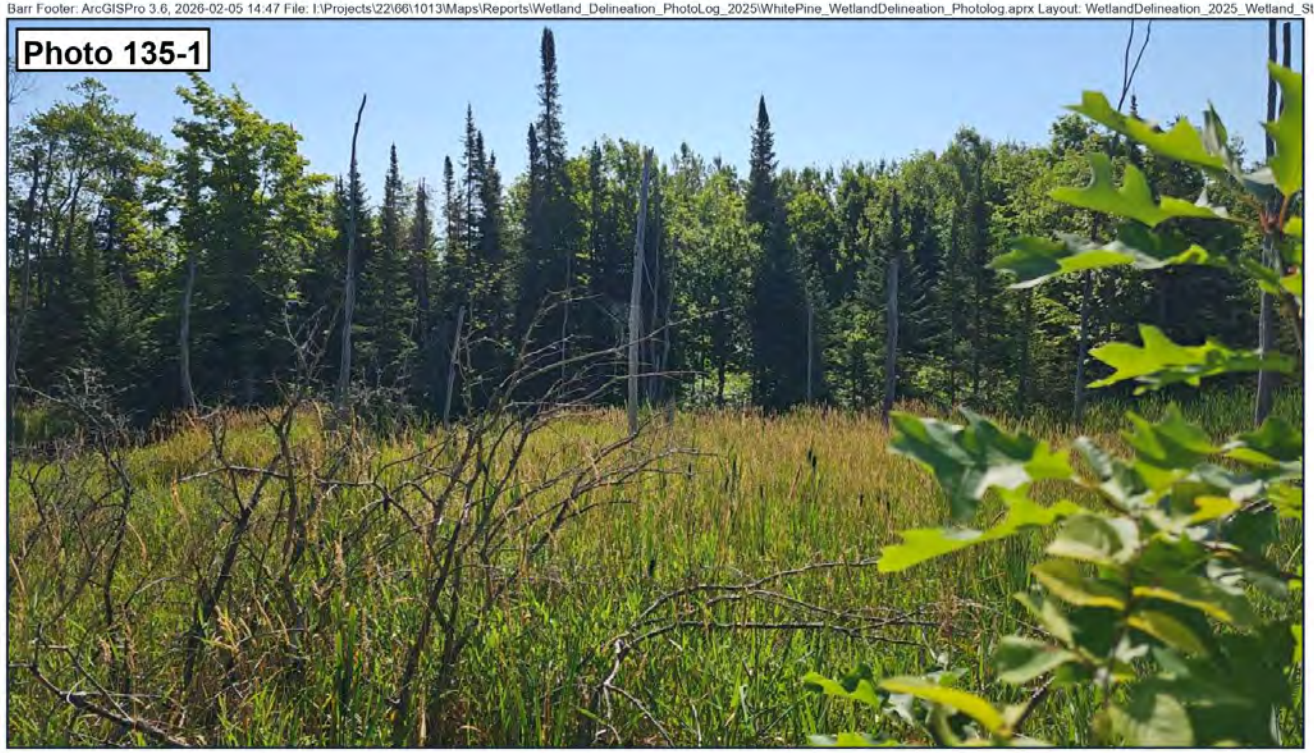

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP32-B, Wetland
**Photo 2 Caption:** T2E-BP32-B, Upland

*Note: Photo locations are approximate*

**Photo 135-1**



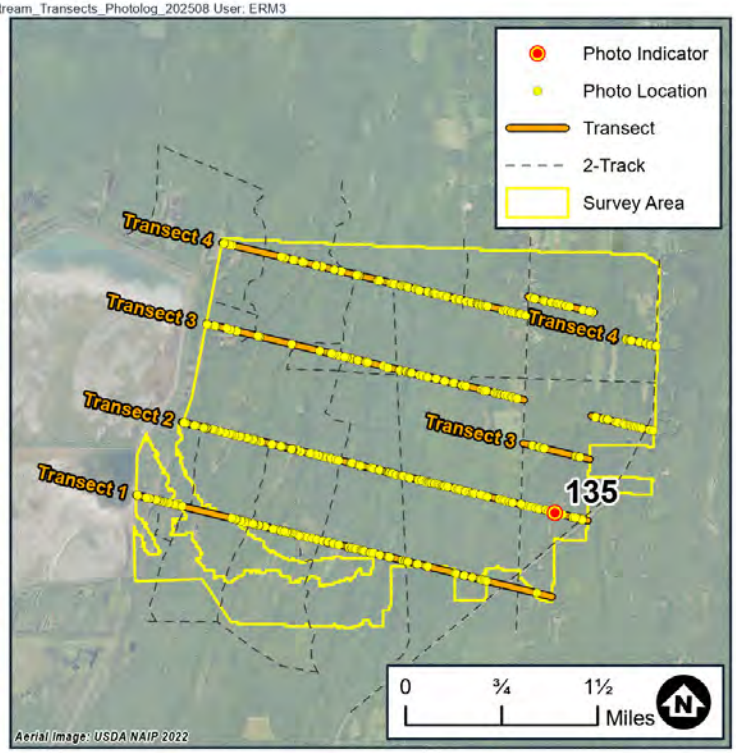
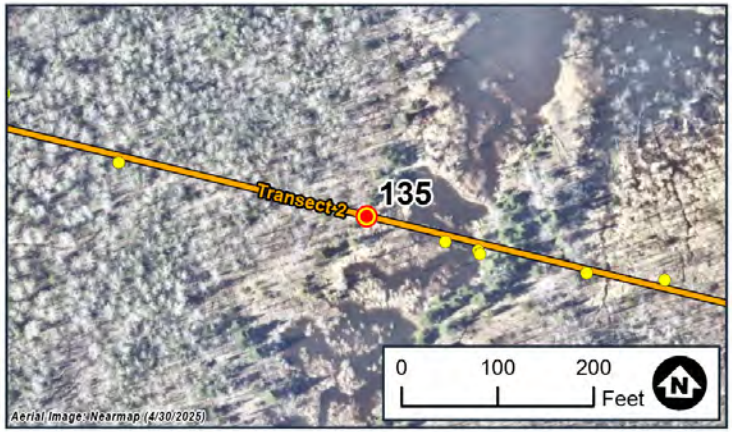



**Photo 135-2**





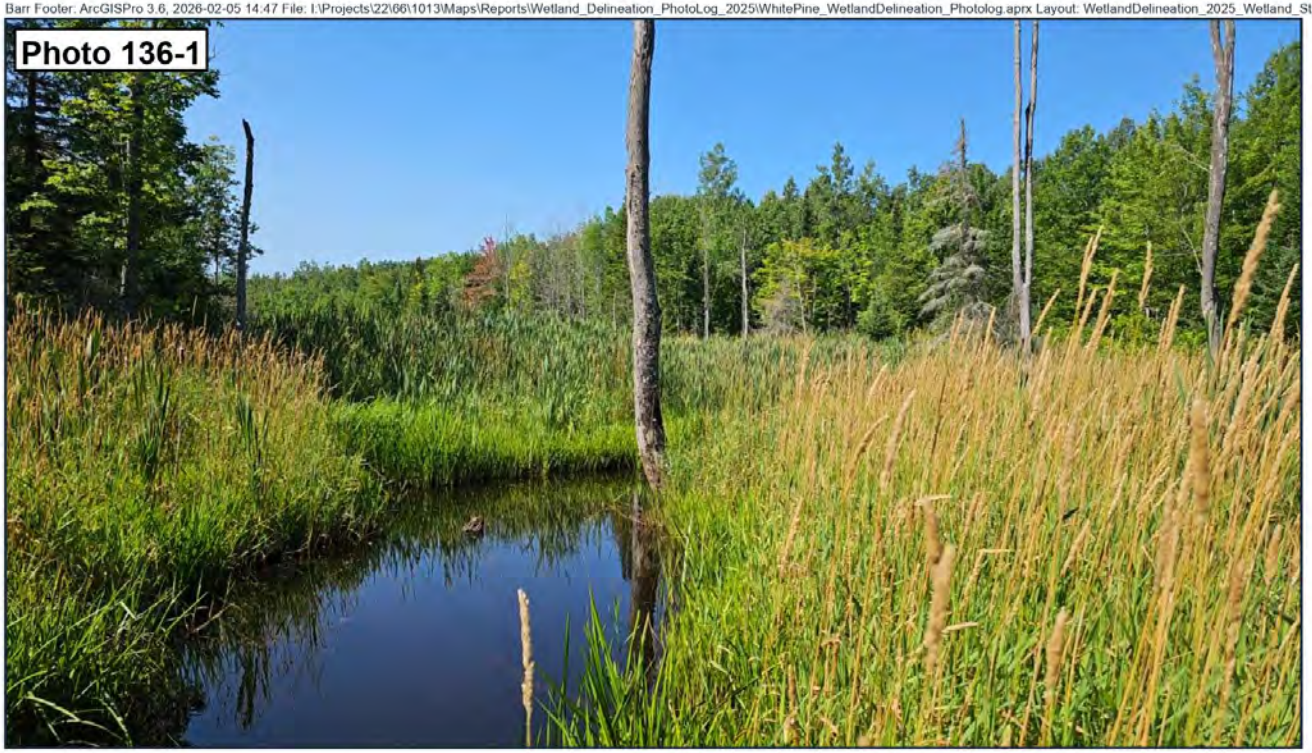

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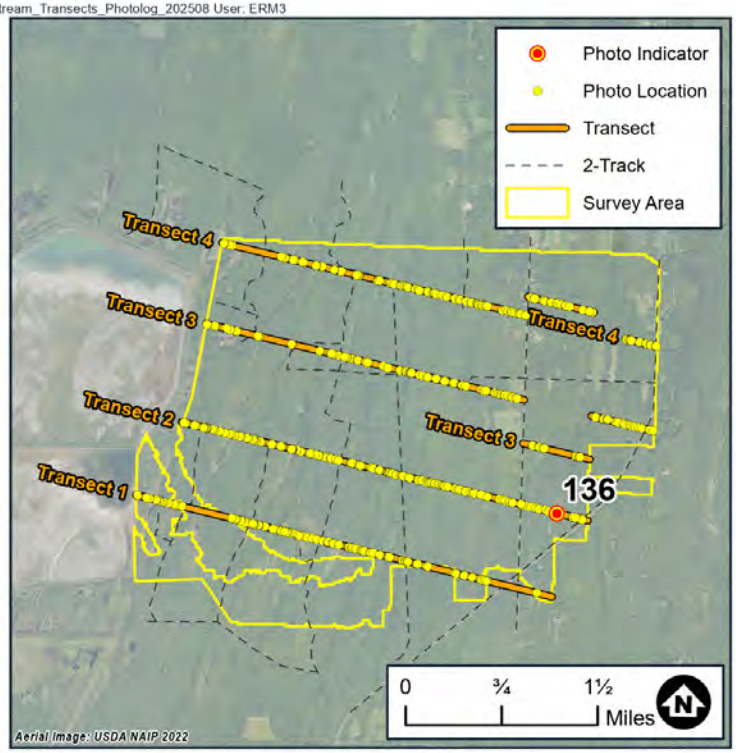
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP32-A, Wetland
**Photo 2 Caption:** T2E-BP32-A, Upland

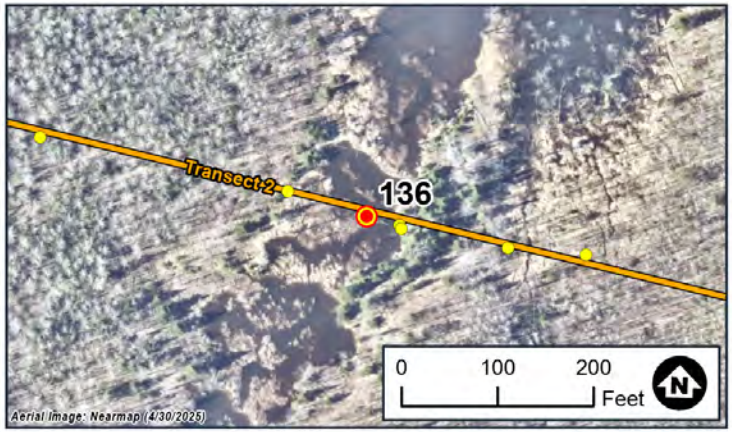
*Note: Photo locations are approximate*











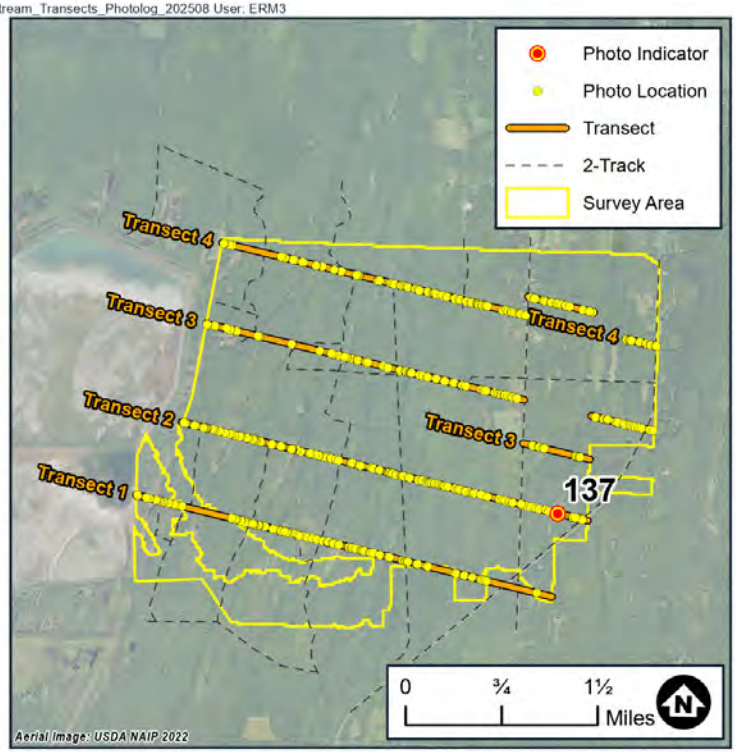

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S11-LB, Upstream
**Photo 2 Caption:** T2E-S11-LB, Downstream

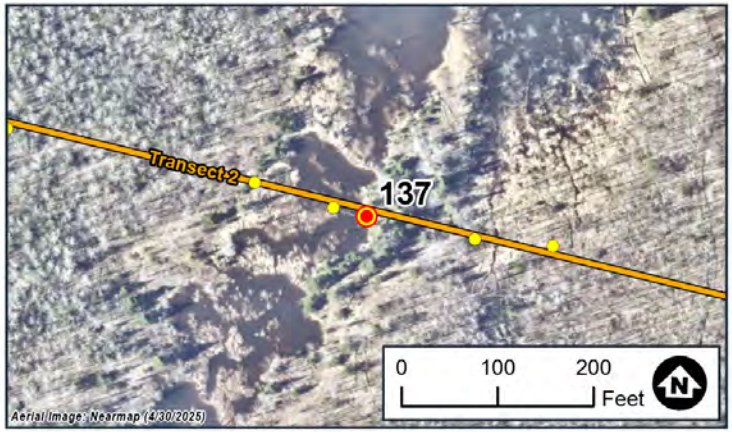
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S11-RB, Upstream
**Photo 2 Caption:** T2E-S11-RB, Downstream

*Note: Photo locations are approximate*

**Photo 138-1**



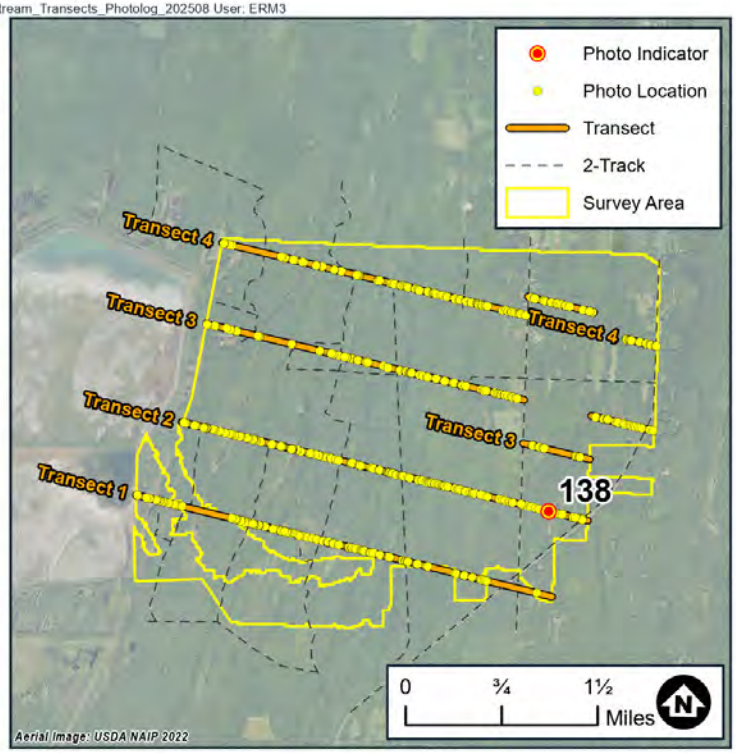
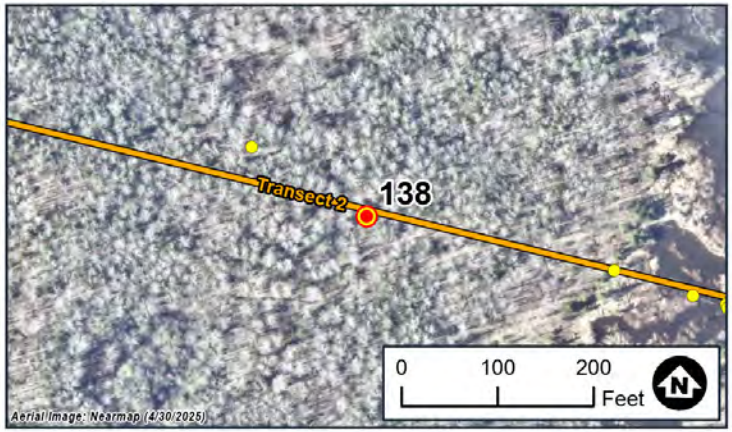



**Photo 138-2**







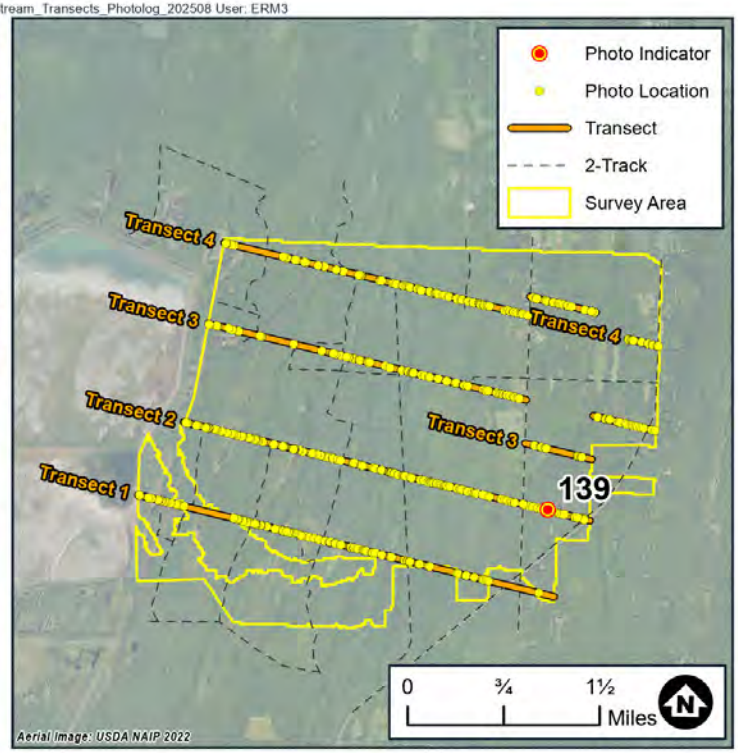

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP31-B, Wetland
**Photo 2 Caption:** T2E-BP31-B, Upland

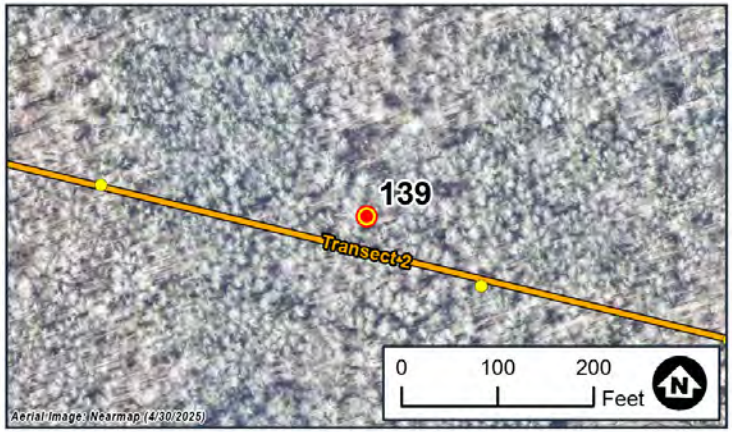
*Note: Photo locations are approximate*











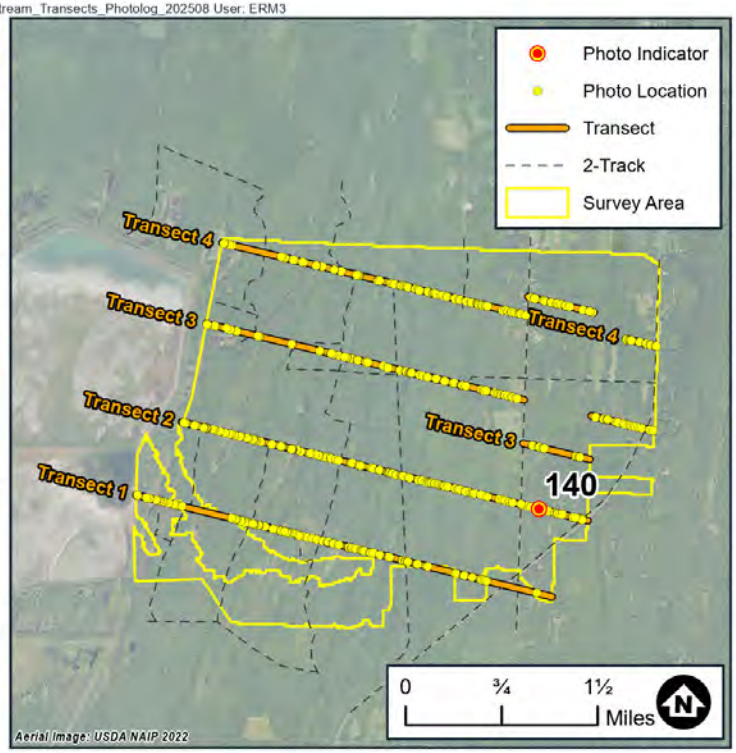

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP31-A, Wetland
**Photo 2 Caption:** T2E-BP31-A, Upland

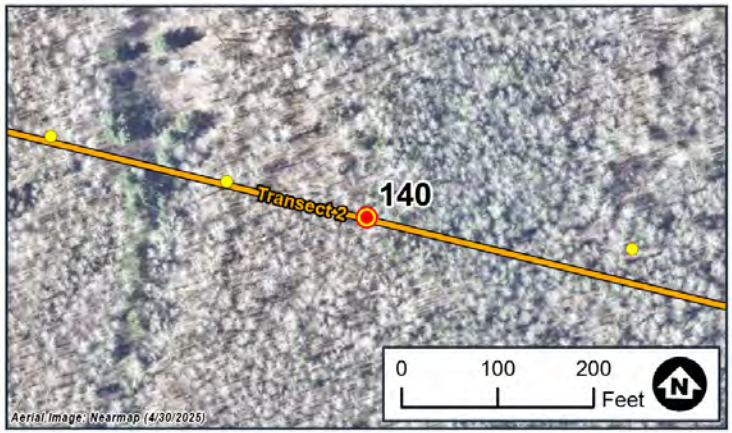
*Note: Photo locations are approximate*










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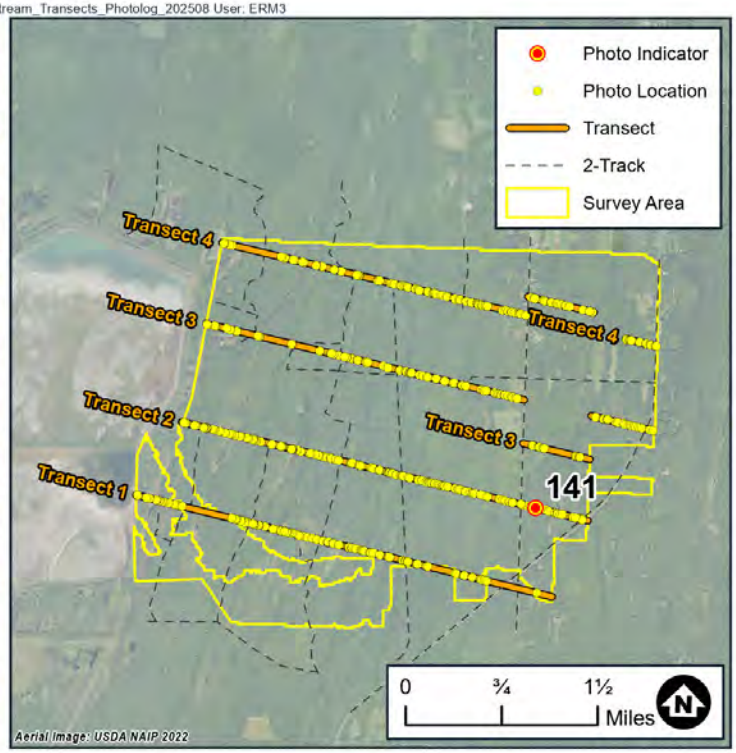
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP30-B, Wetland
**Photo 2 Caption:** T2E-BP30-B, Upland

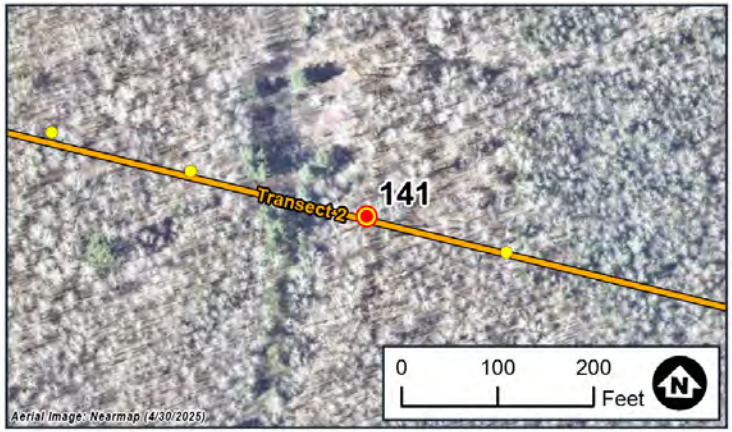
*Note: Photo locations are approximate*









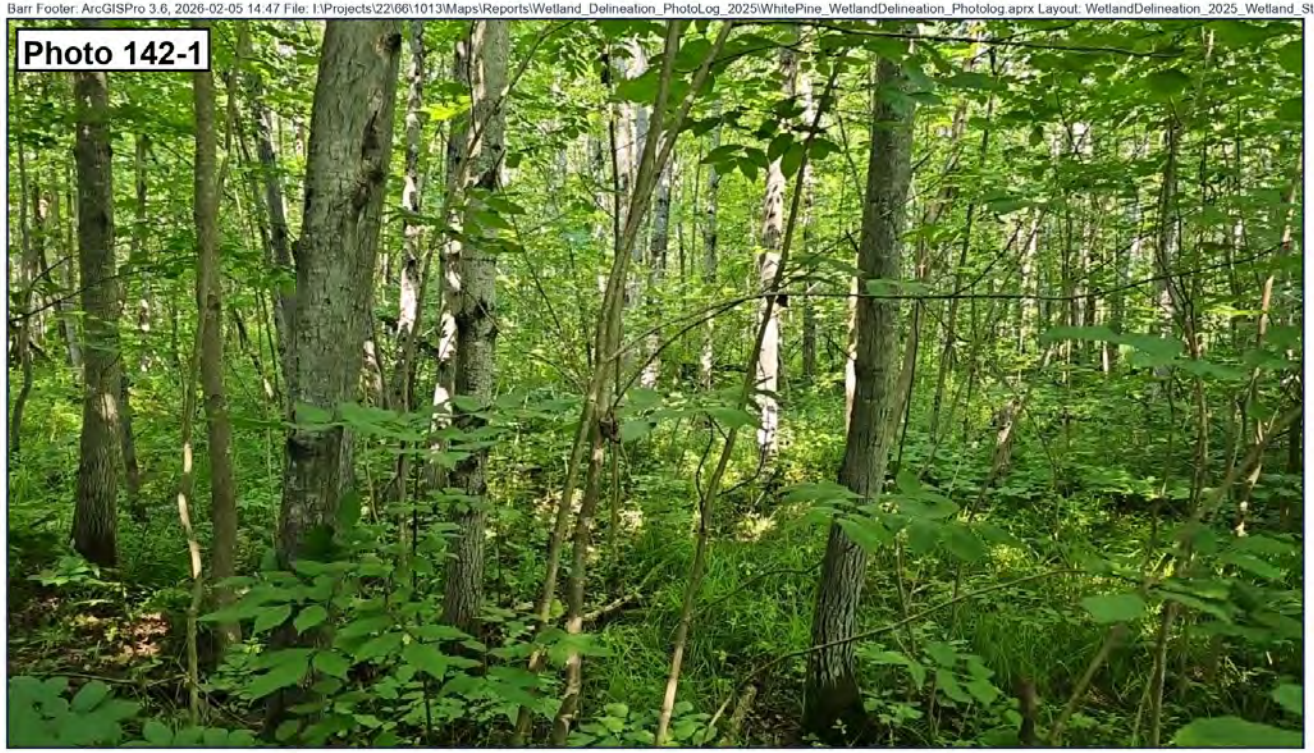


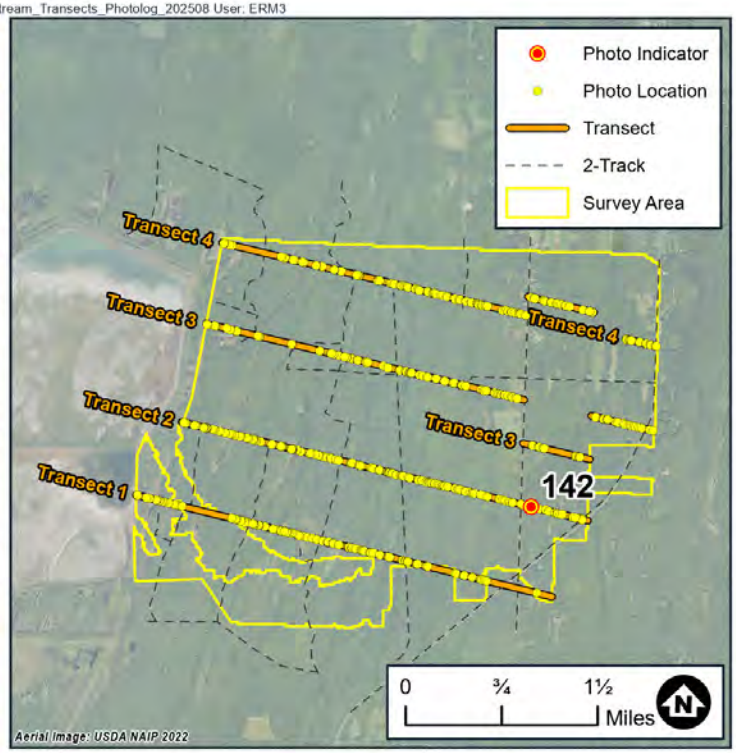

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP30-A, Wetland
**Photo 2 Caption:** T2E-BP30-A, Upland

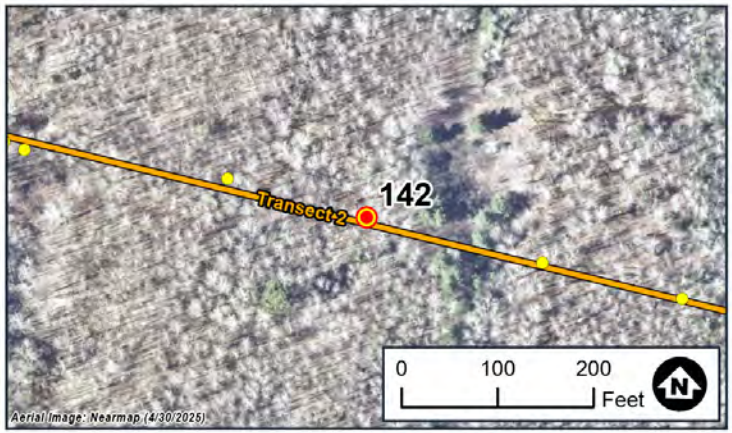
*Note: Photo locations are approximate*











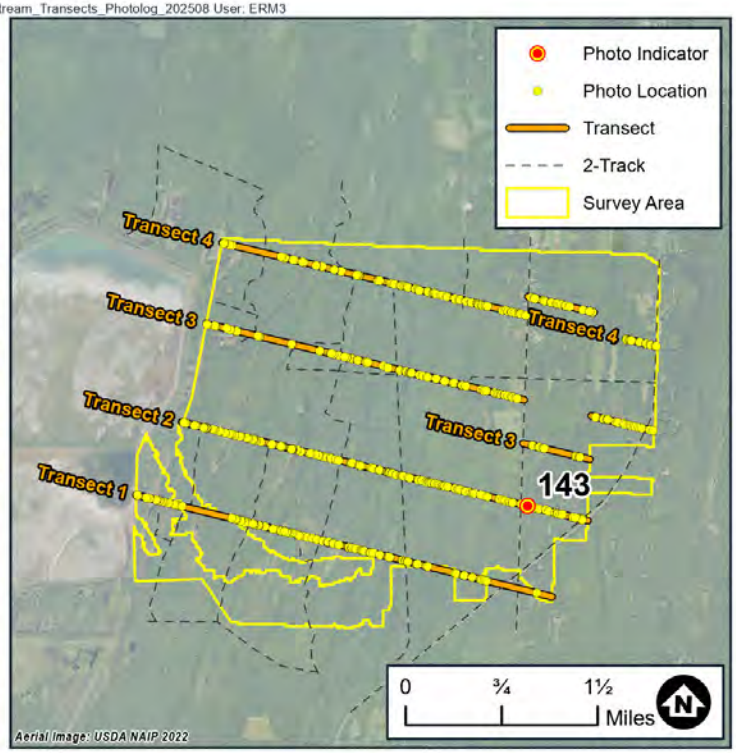

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP29-B, Wetland
**Photo 2 Caption:** T2E-BP29-B, Upland

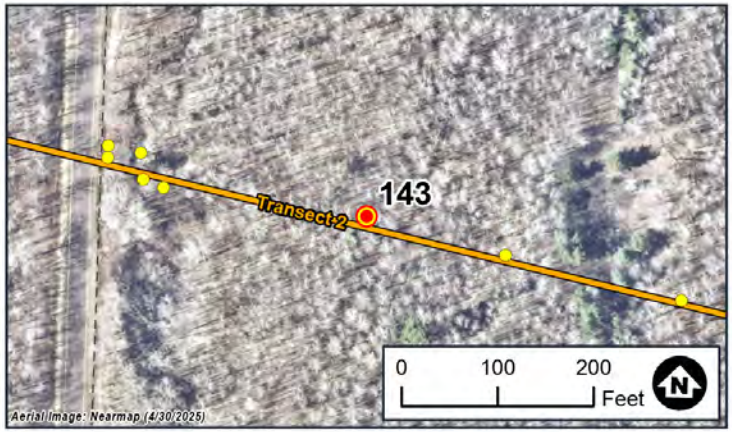
*Note: Photo locations are approximate*









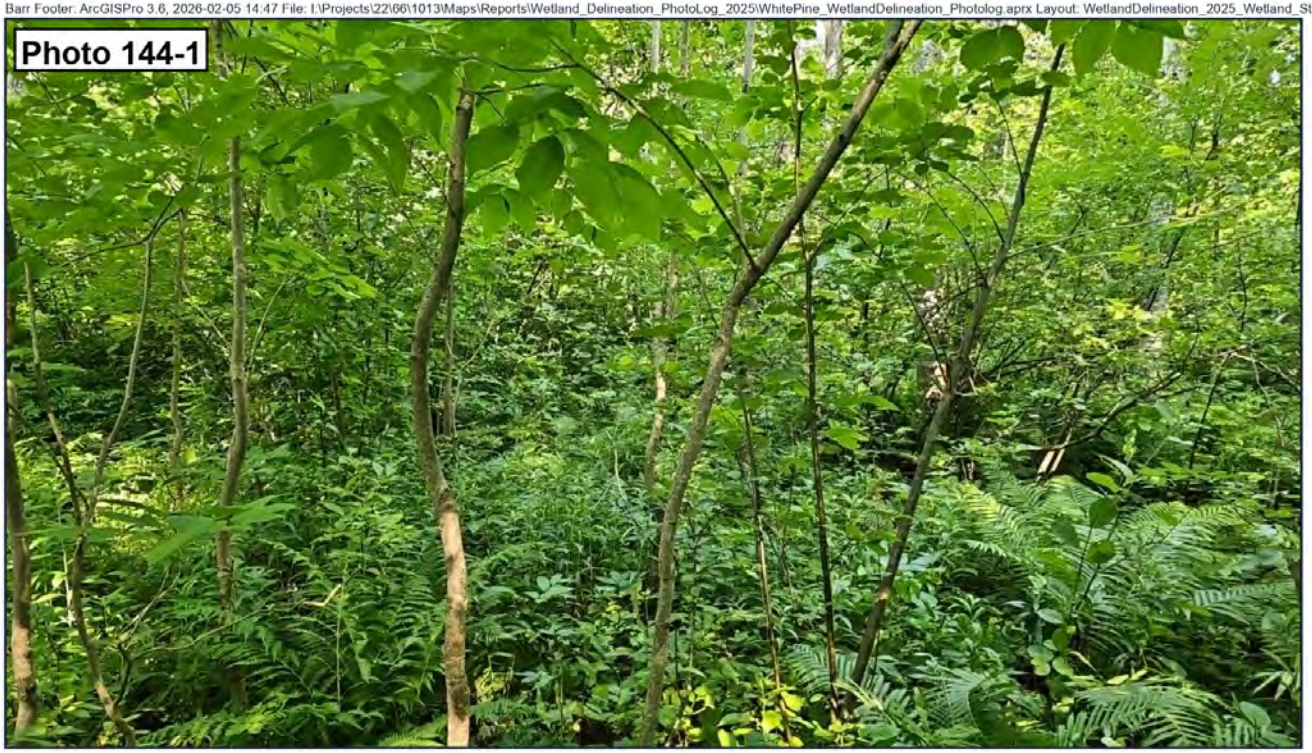


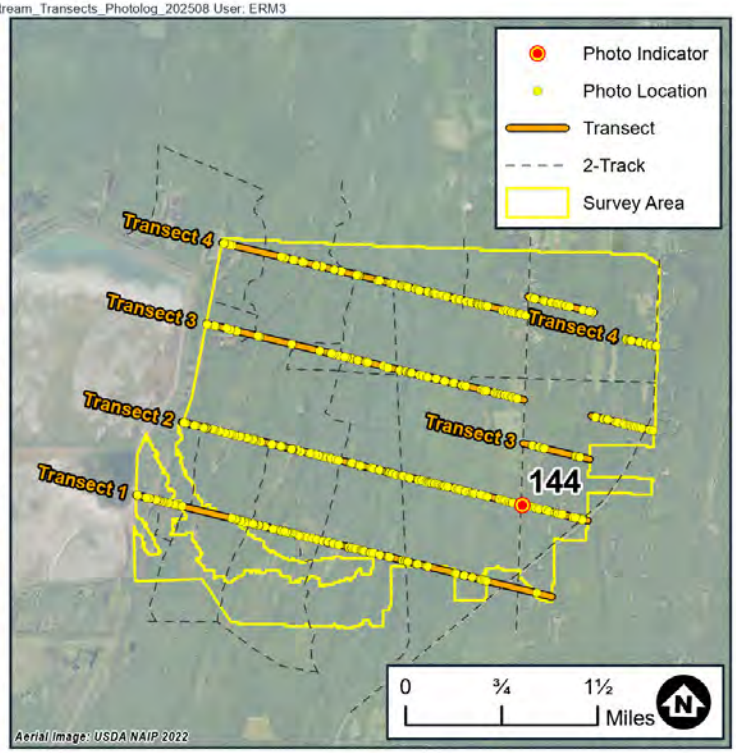

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP29-A, Wetland
**Photo 2 Caption:** T2E-BP29-A, Upland

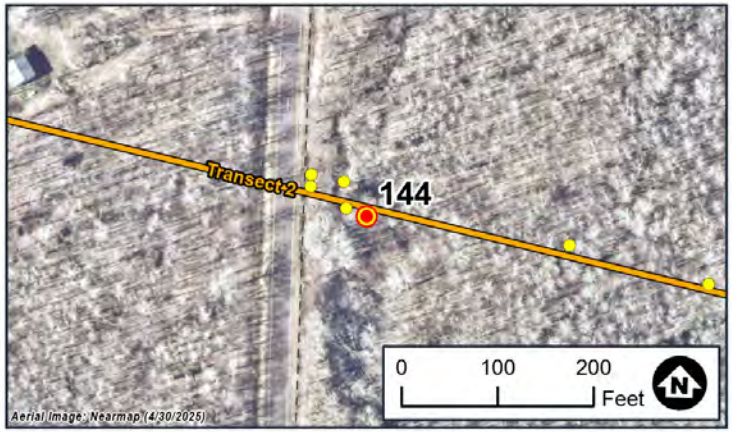
*Note: Photo locations are approximate*









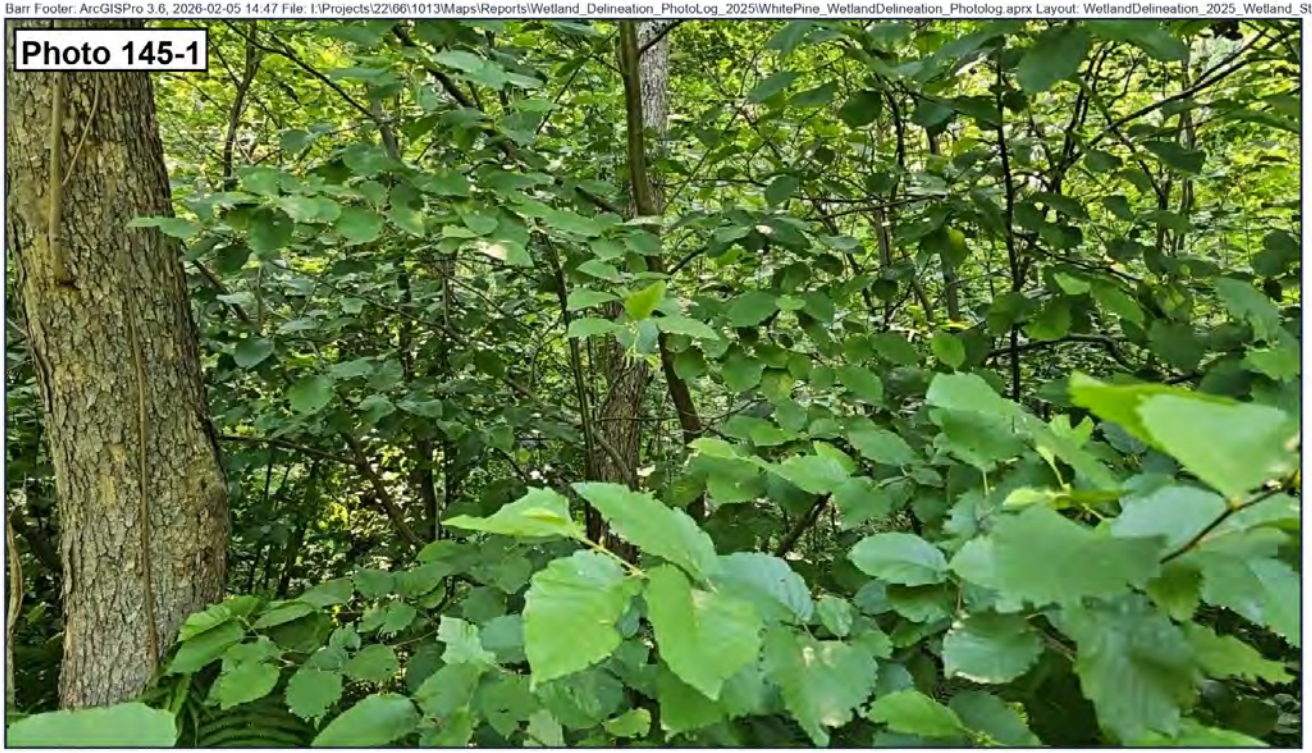


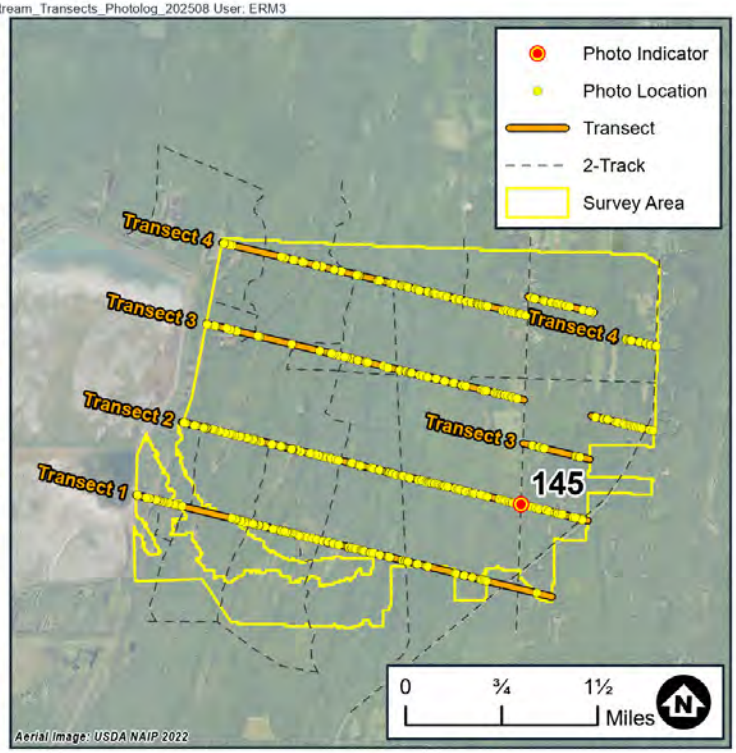

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP28-B, Wetland
**Photo 2 Caption:** T2E-BP28-B, Upland

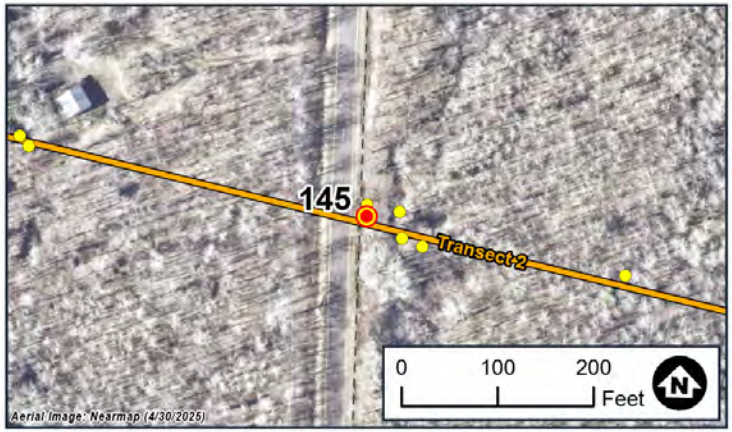
*Note: Photo locations are approximate*











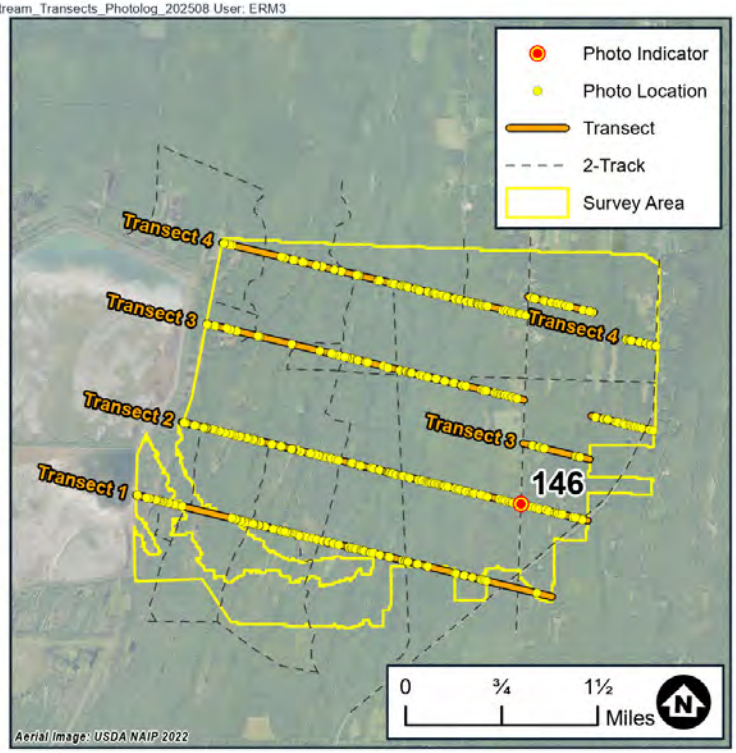

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP28-A, Wetland
**Photo 2 Caption:** T2E-BP28-A, Upland

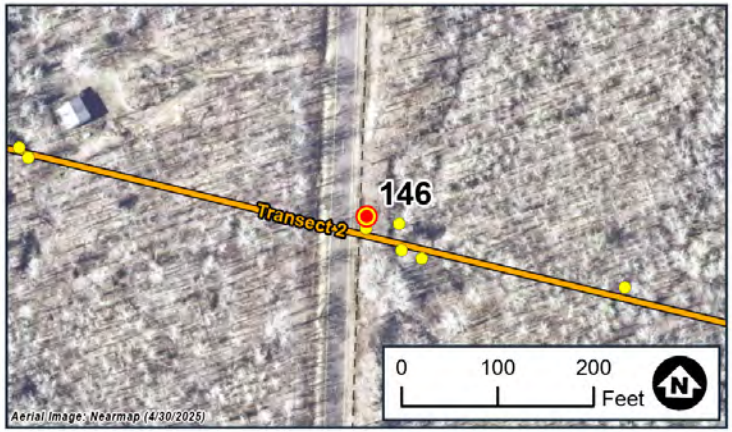
*Note: Photo locations are approximate*









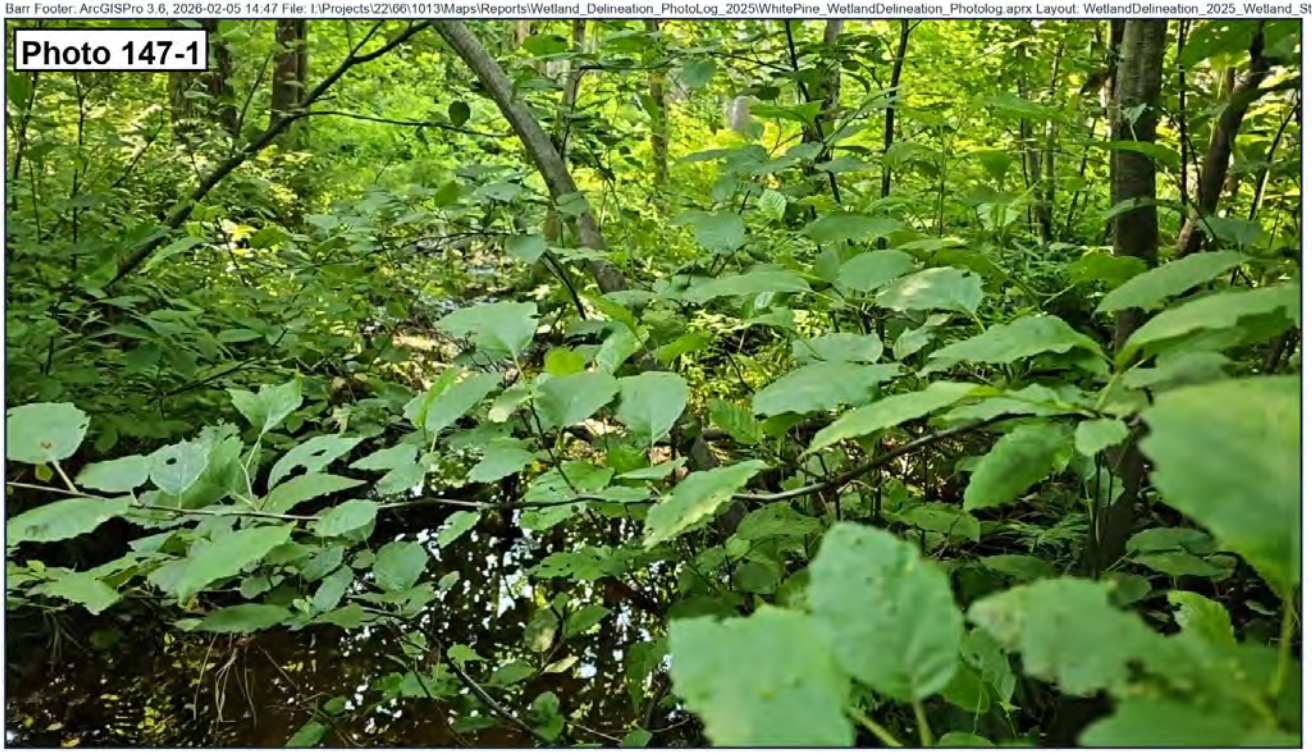


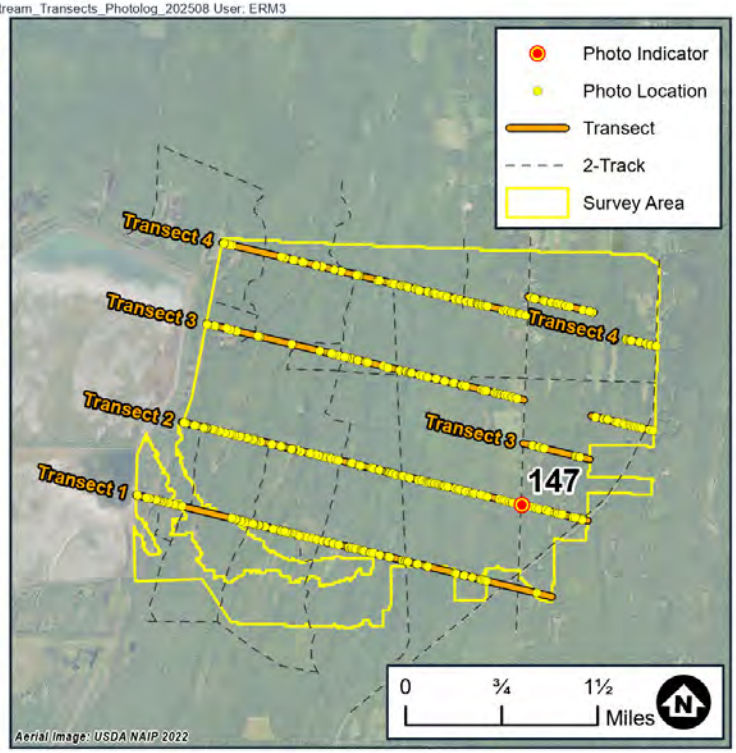

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/20/2025
**Photo 1 Caption:** T2W-BP28-A, Wetland
**Photo 2 Caption:** T2W-BP28-A, Upland

*Note: Photo locations are approximate*









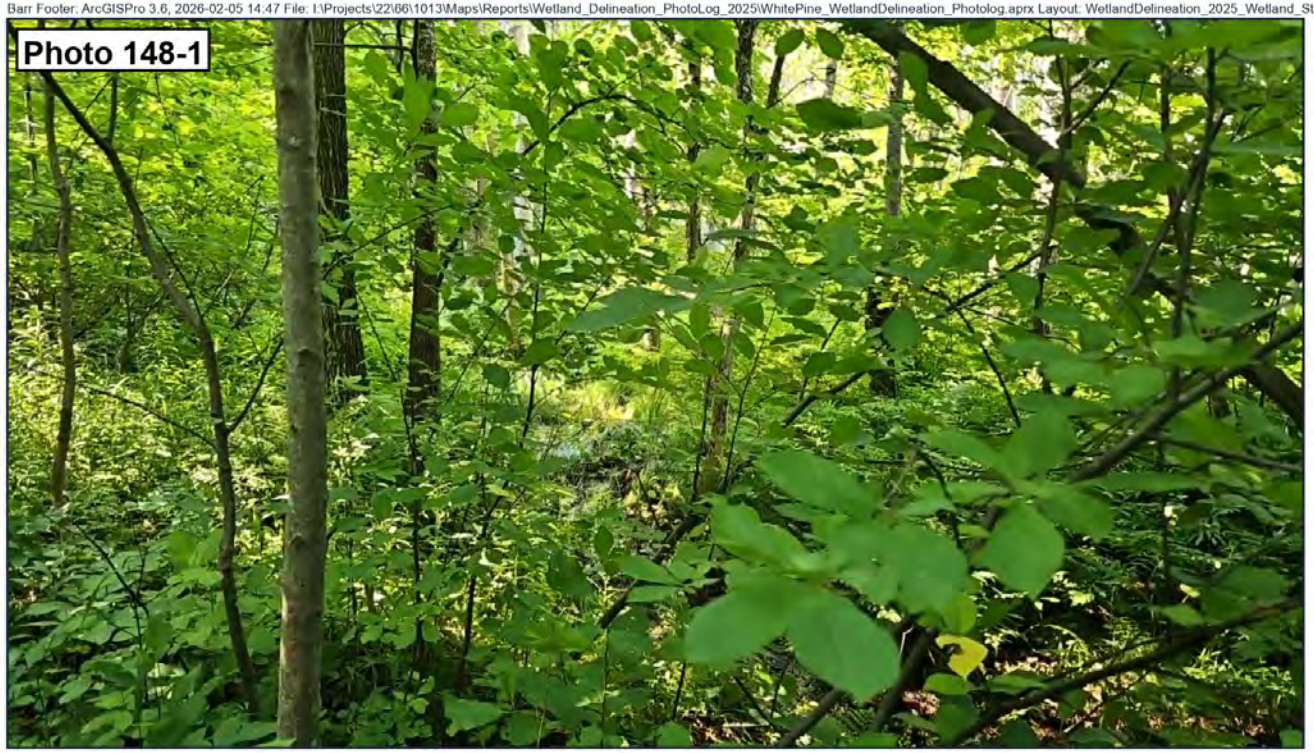


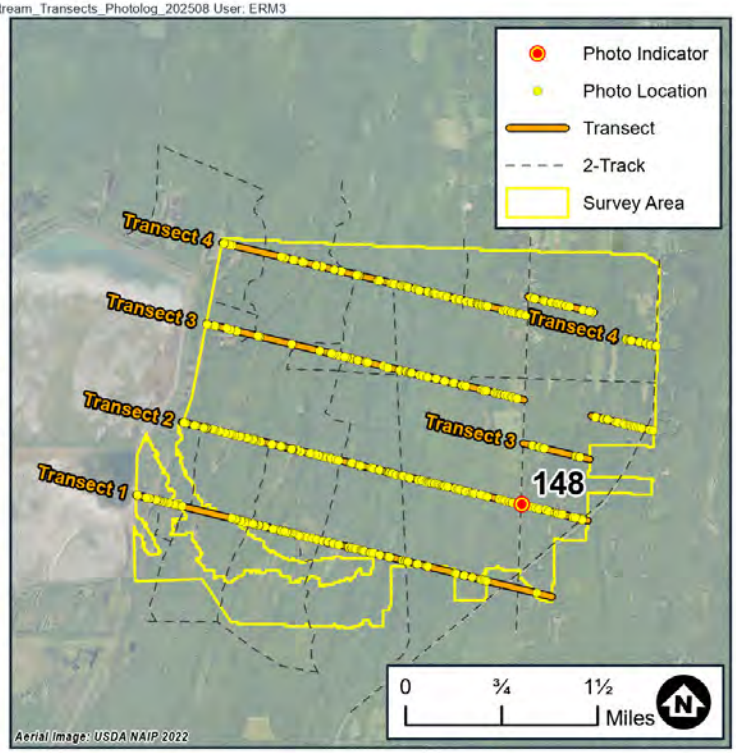

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S10-LB, Upstream
**Photo 2 Caption:** T2E-S10-LB, Downstream

*Note: Photo locations are approximate*











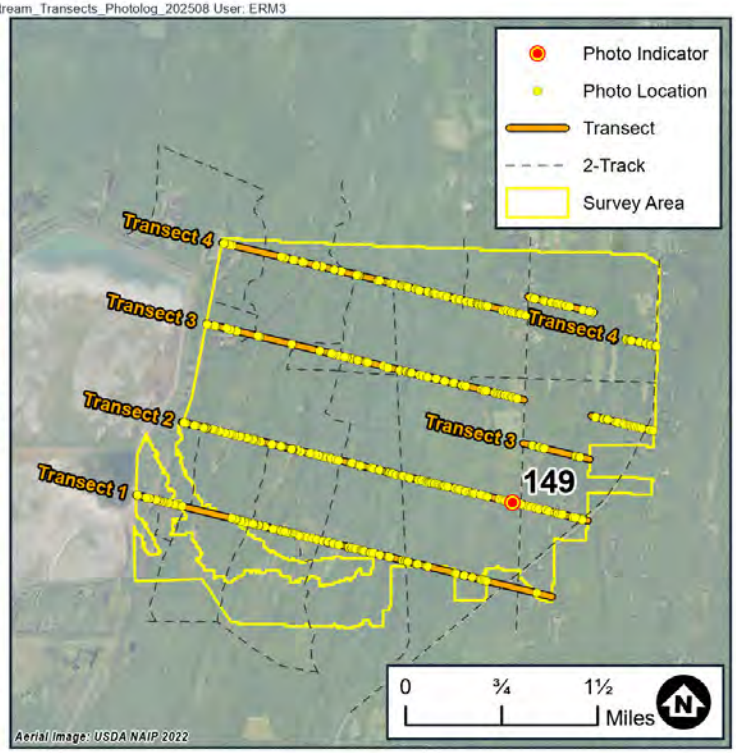

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-S10-RB, Upstream
**Photo 2 Caption:** T2E-S10-RB, Downstream

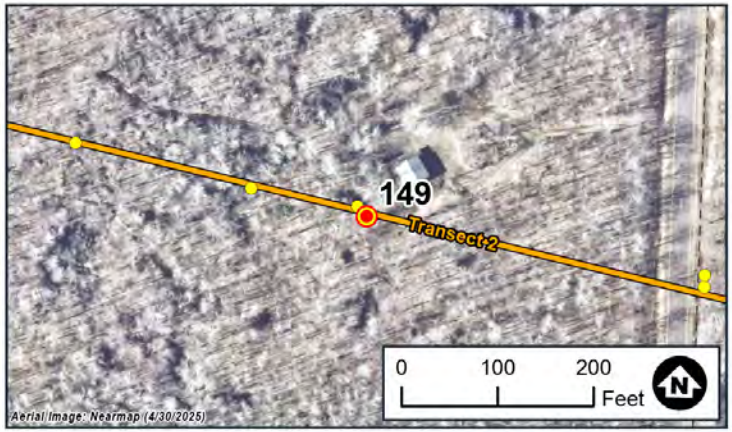
*Note: Photo locations are approximate*











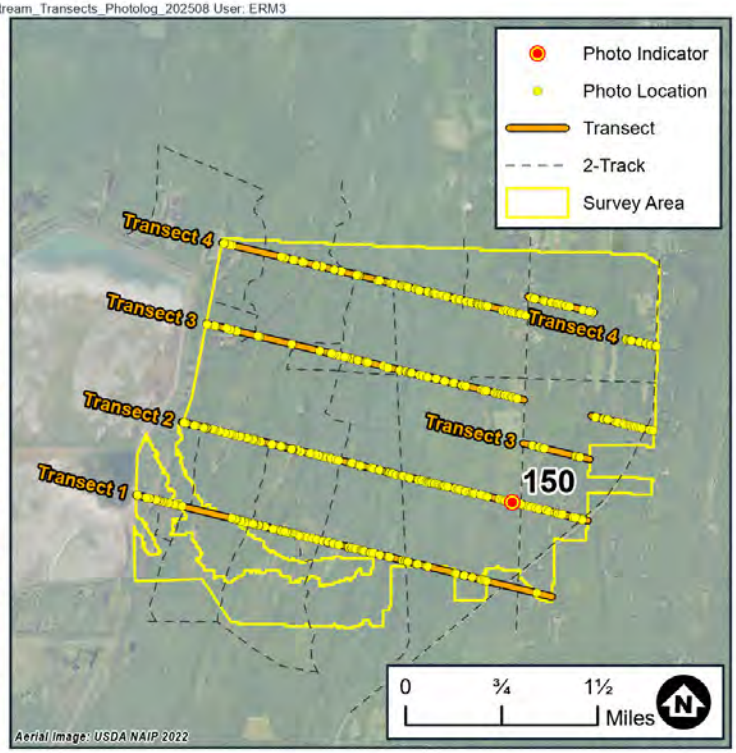

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP27-B, Wetland
**Photo 2 Caption:** T2E-BP27-B, Upland

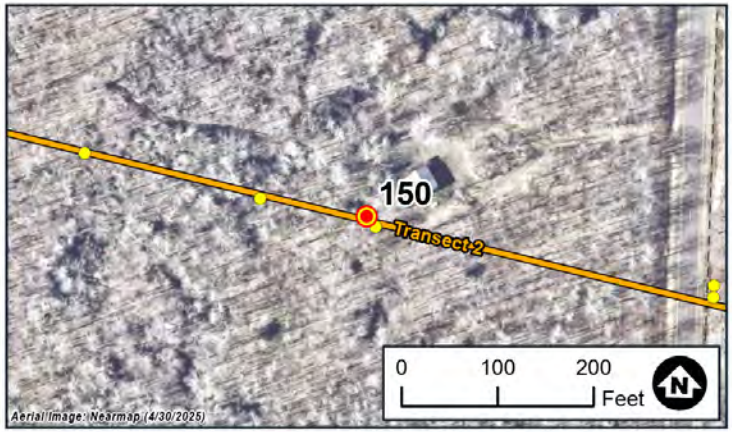
*Note: Photo locations are approximate*









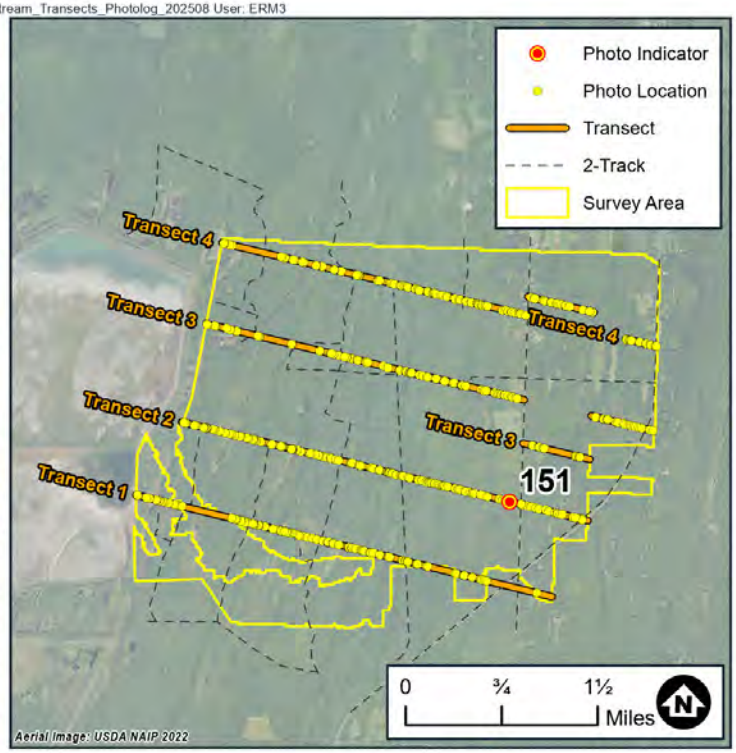

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP27-A, Wetland
**Photo 2 Caption:** T2E-BP27-A, Upland

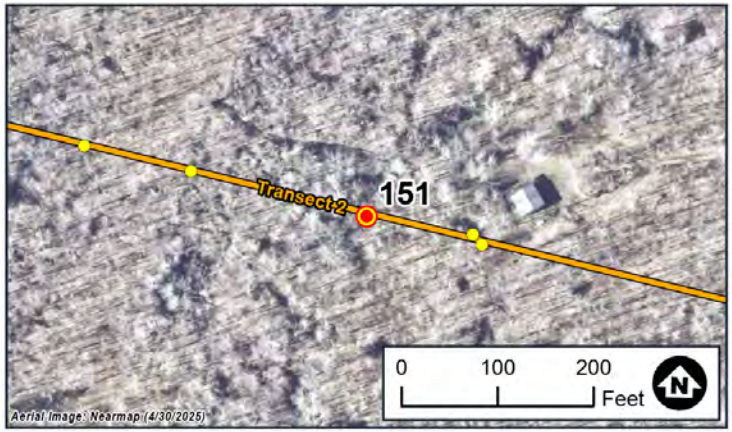
*Note: Photo locations are approximate*











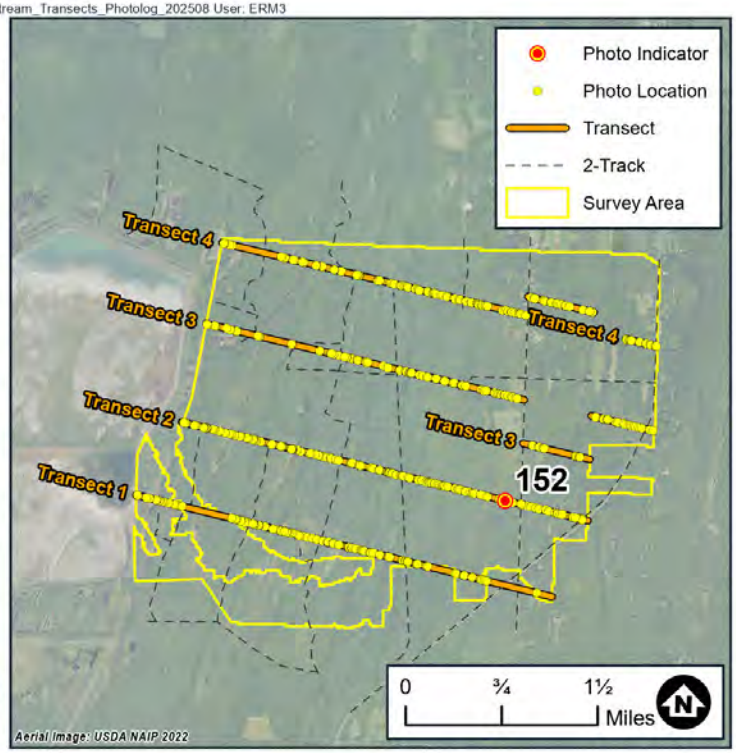

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP26-B, Wetland
**Photo 2 Caption:** T2E-BP26-B, Upland

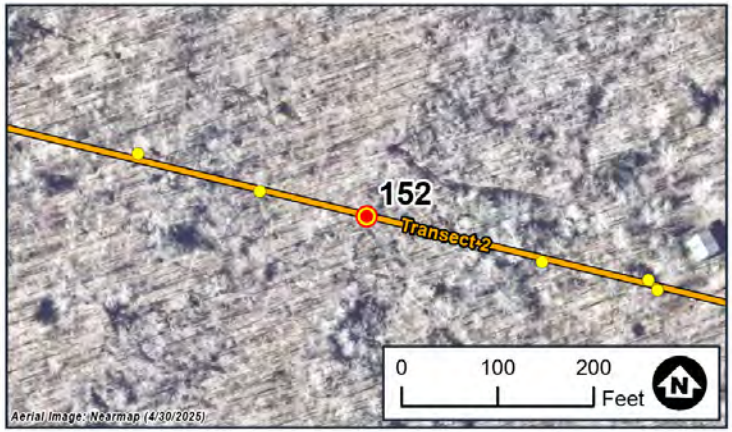
*Note: Photo locations are approximate*











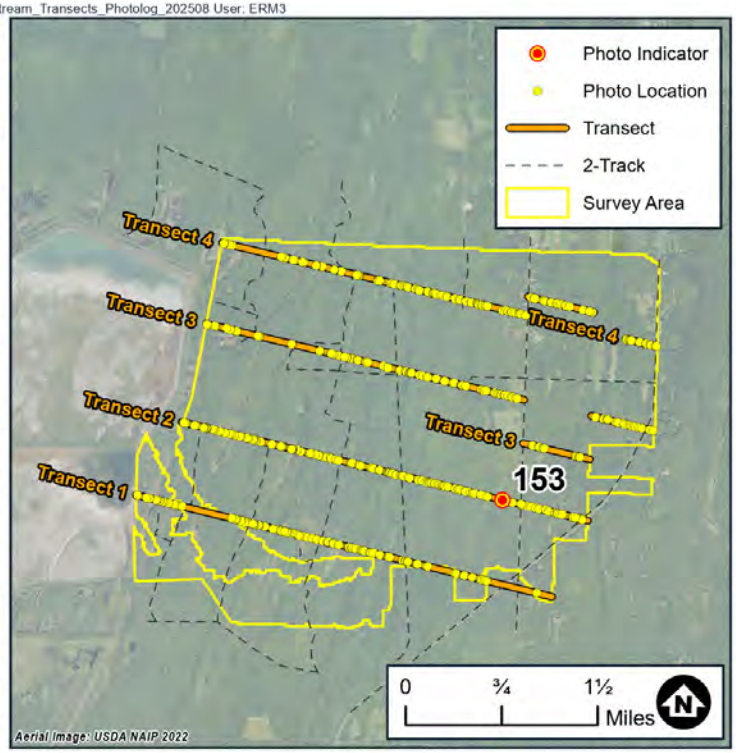

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP26-A, Wetland
**Photo 2 Caption:** T2E-BP26-A, Upland

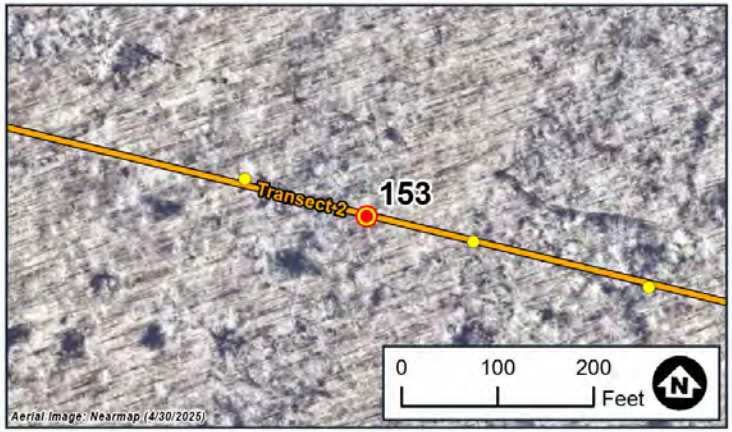
*Note: Photo locations are approximate*











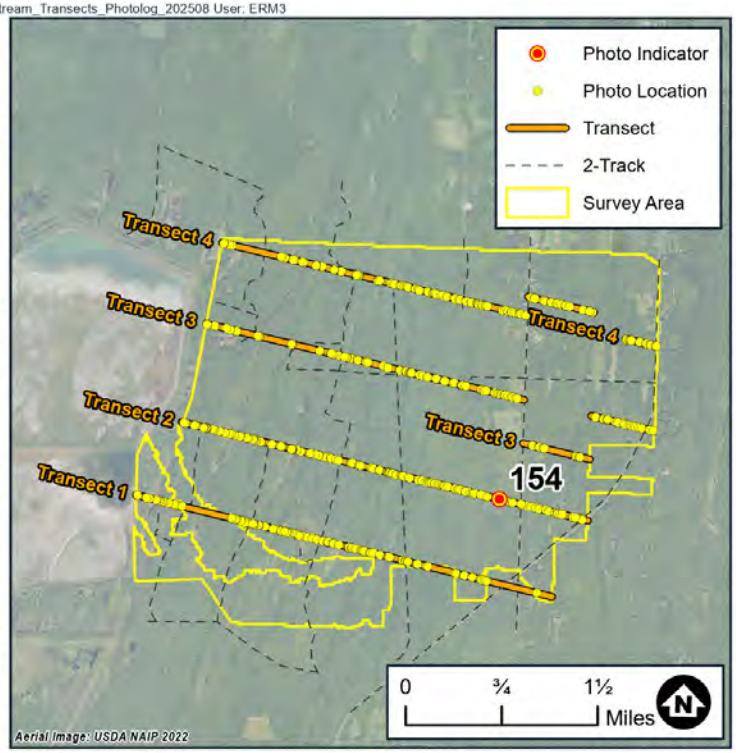

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP25-B, Wetland
**Photo 2 Caption:** T2E-BP25-B, Upland

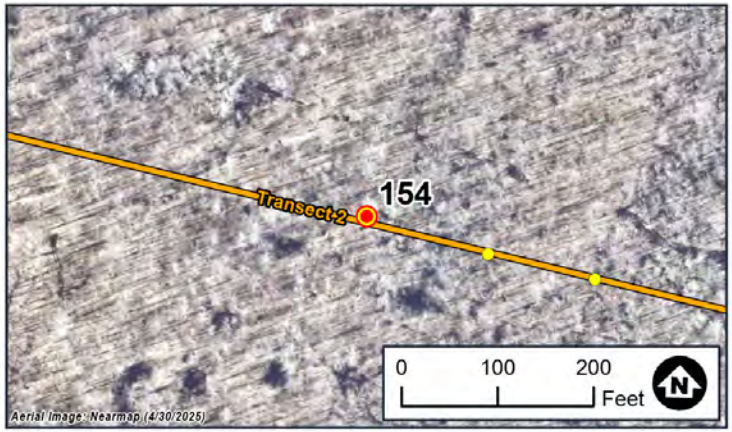
*Note: Photo locations are approximate*









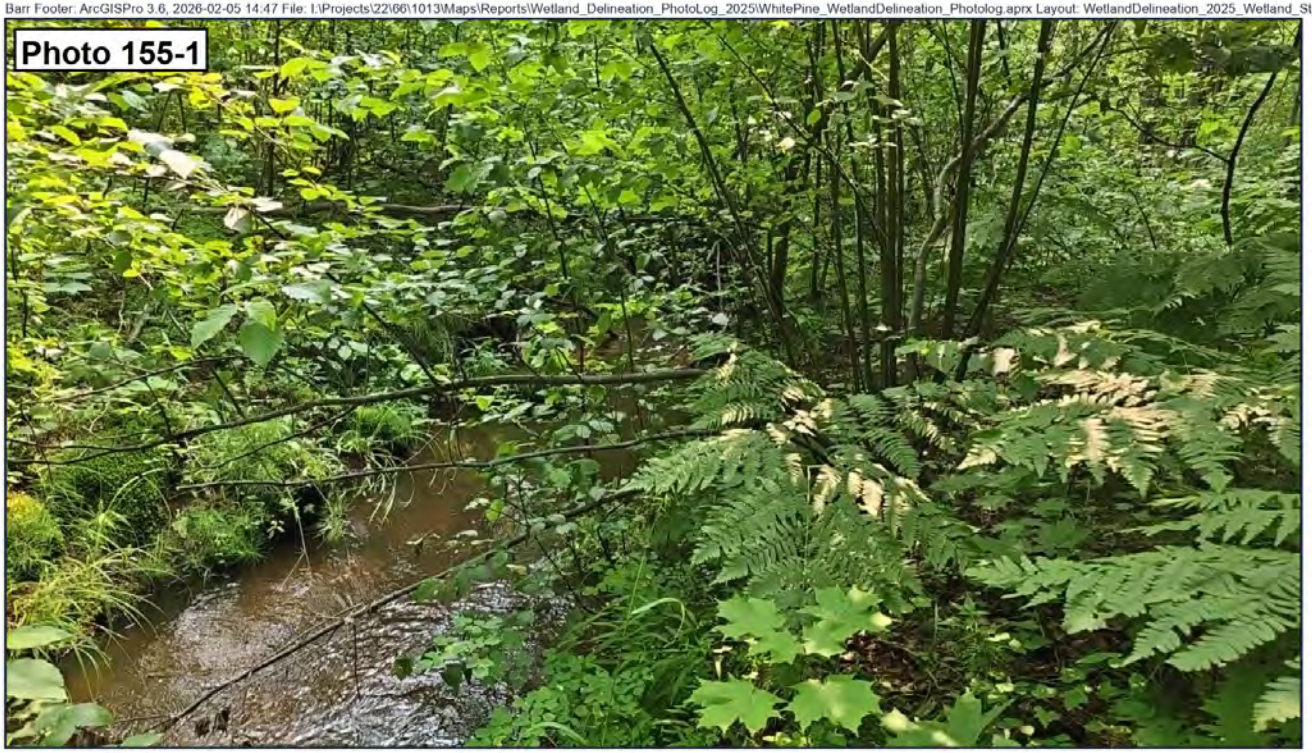


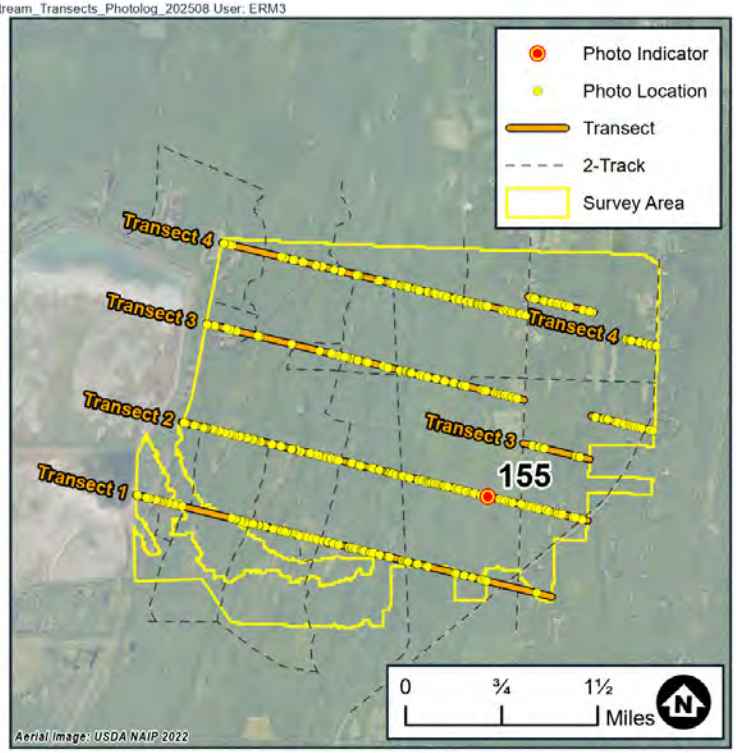

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2E-BP25-A, Wetland
**Photo 2 Caption:** T2E-BP25-A, Upland

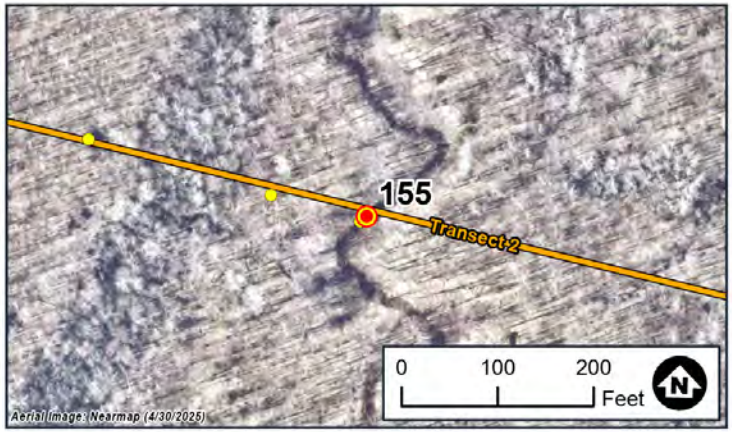
*Note: Photo locations are approximate*









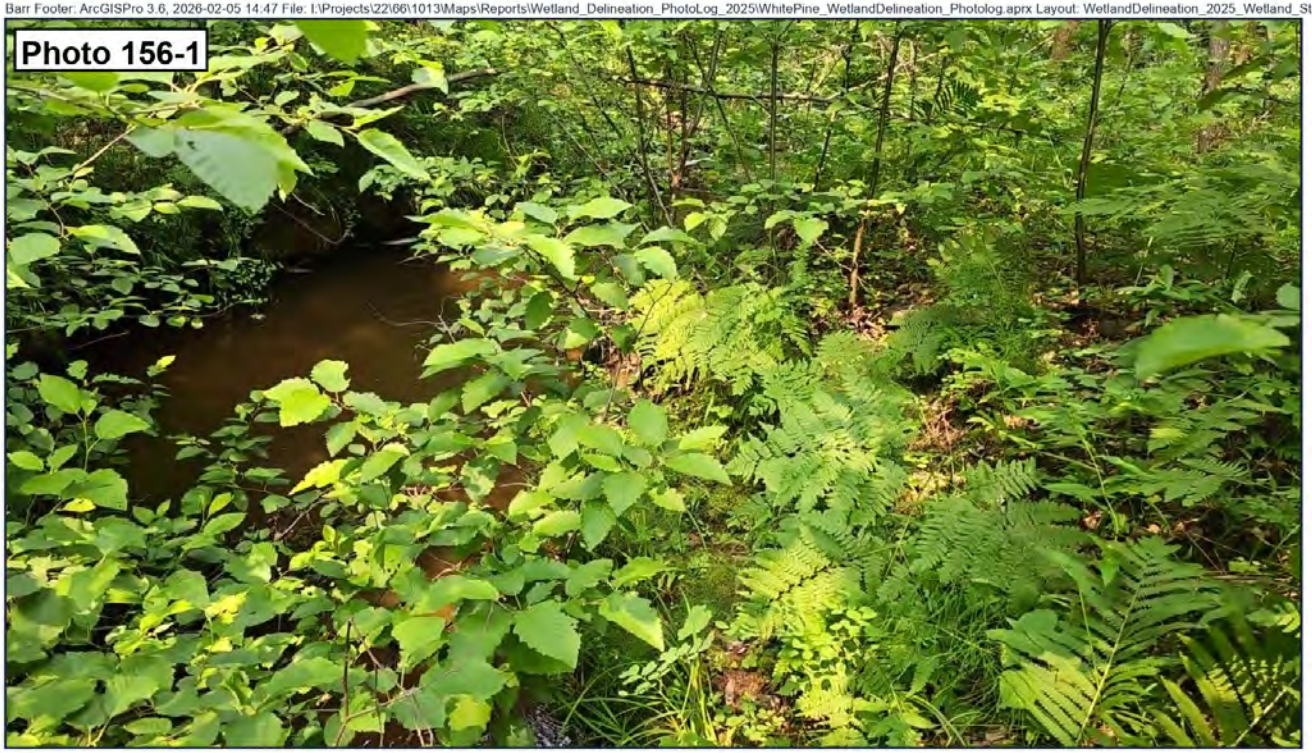


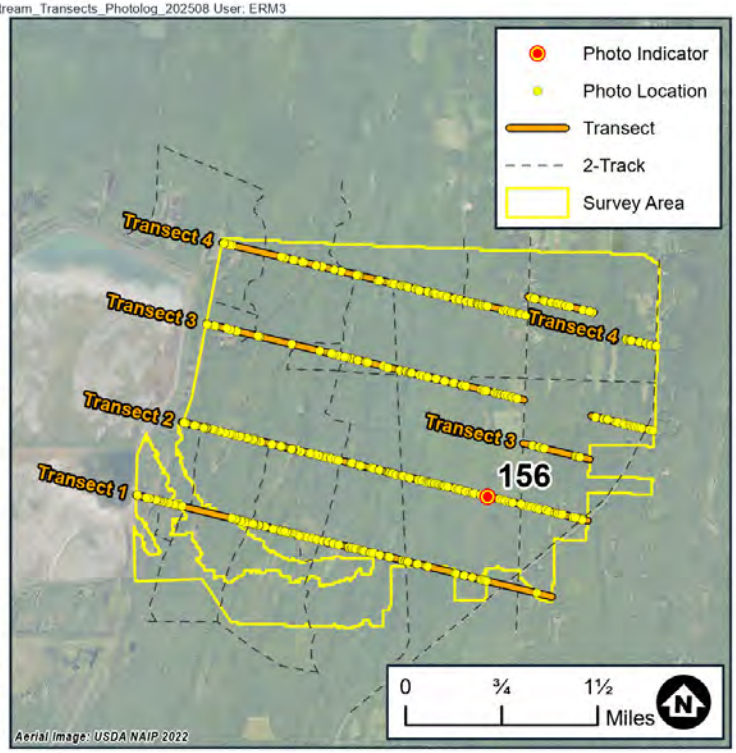

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S09-LB, Upstream
**Photo 2 Caption:** T2E-S09-LB, Downstream

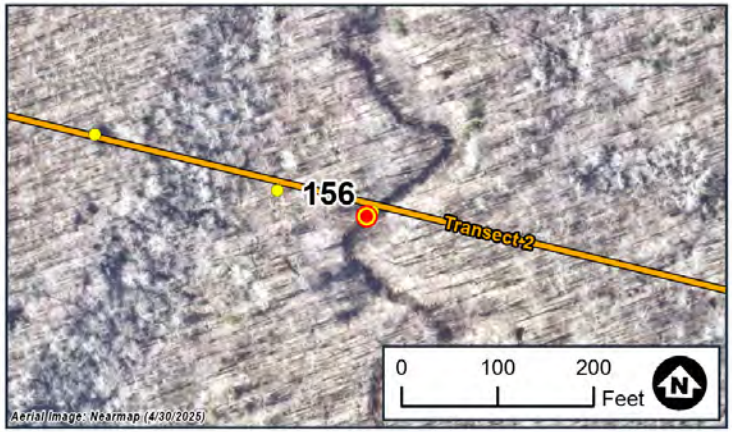
*Note: Photo locations are approximate*









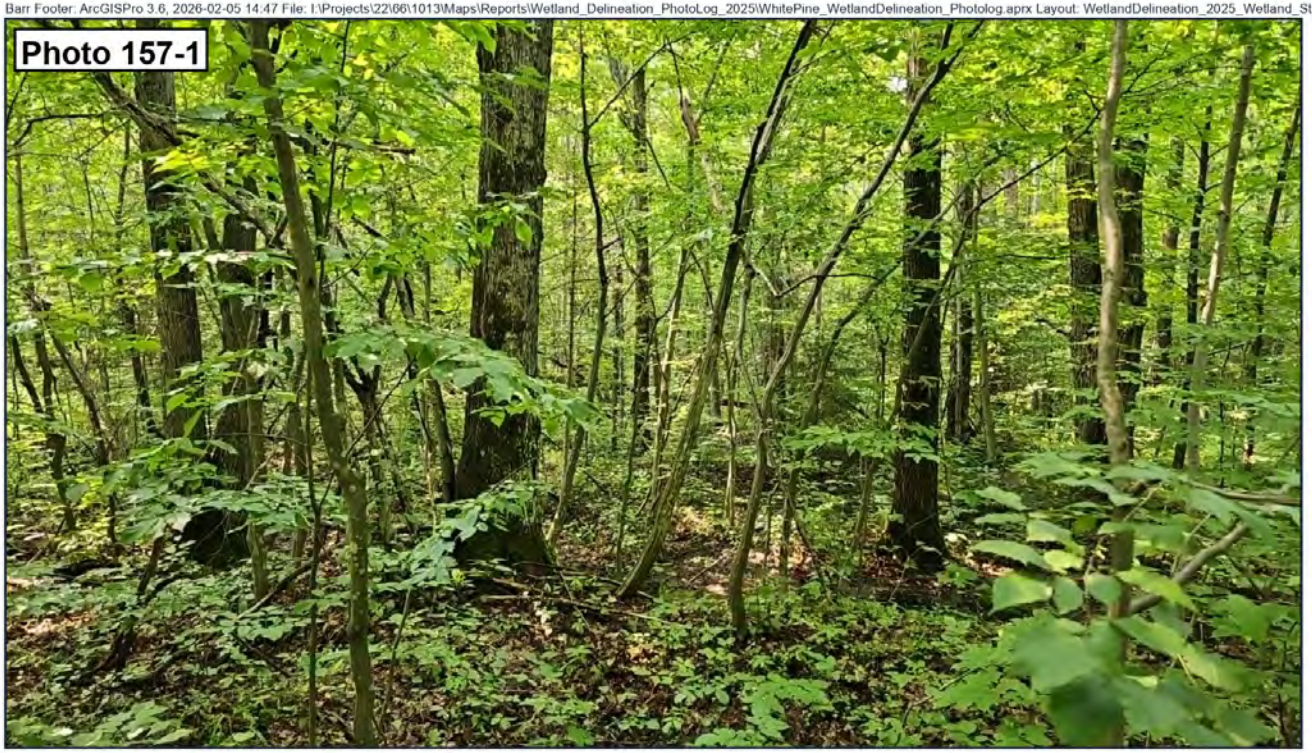

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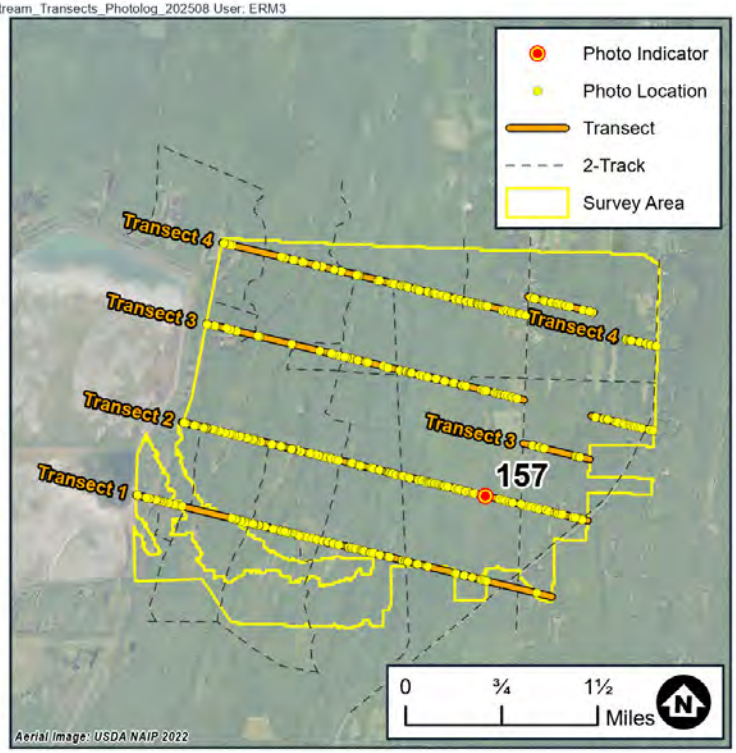
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S09-RB, Upstream
**Photo 2 Caption:** T2E-S09-RB, Downstream

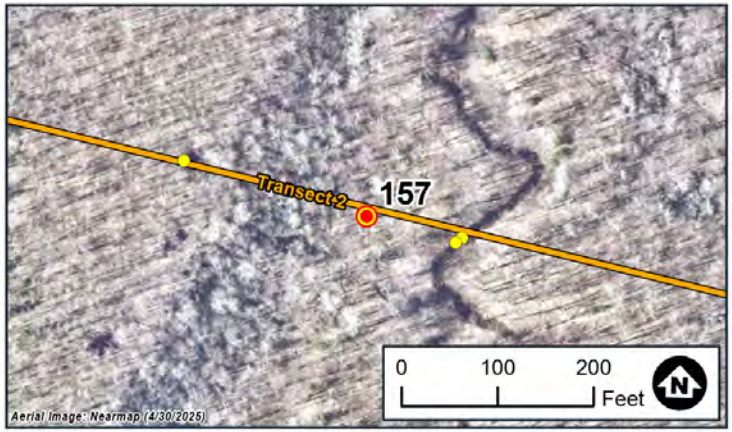
*Note: Photo locations are approximate*











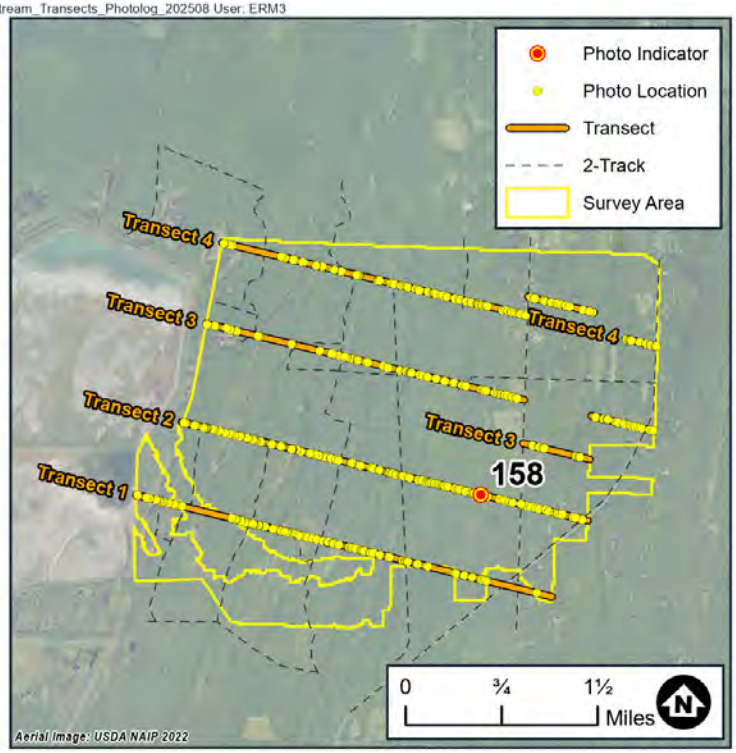

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP24-B, Wetland
**Photo 2 Caption:** T2E-BP24-B, Upland

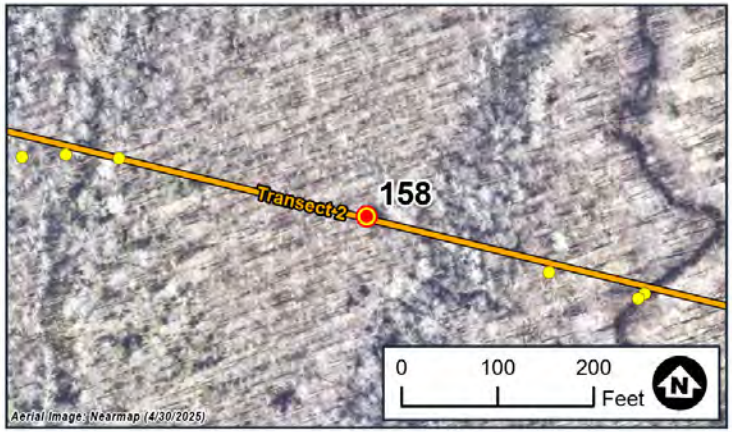
*Note: Photo locations are approximate*









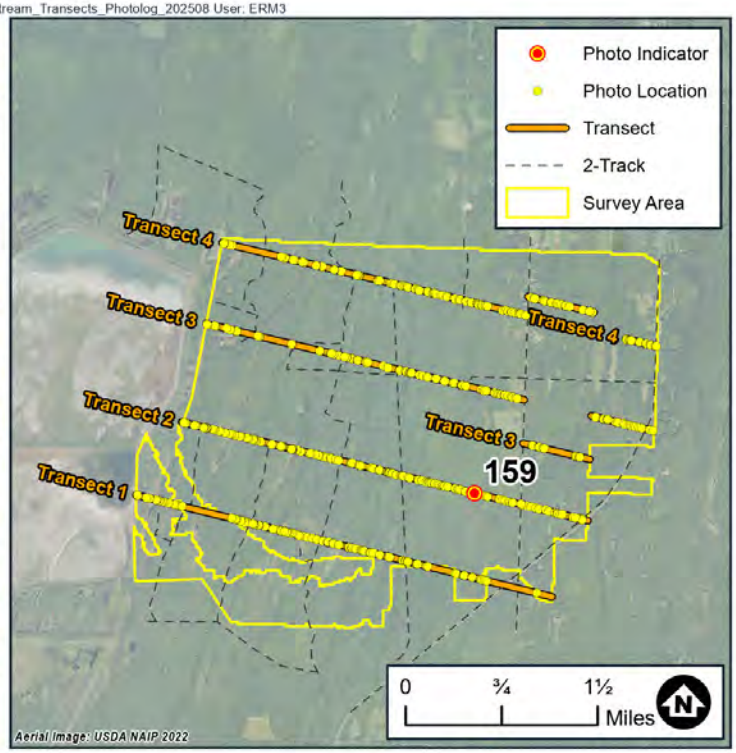

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP24-A, Wetland
**Photo 2 Caption:** T2E-BP24-A, Upland

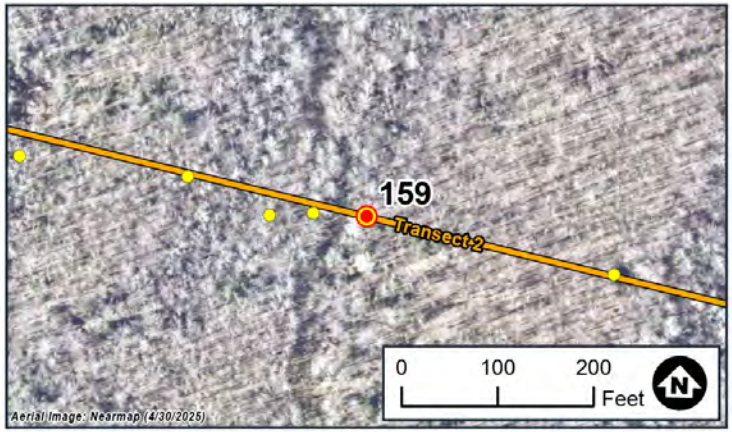
*Note: Photo locations are approximate*









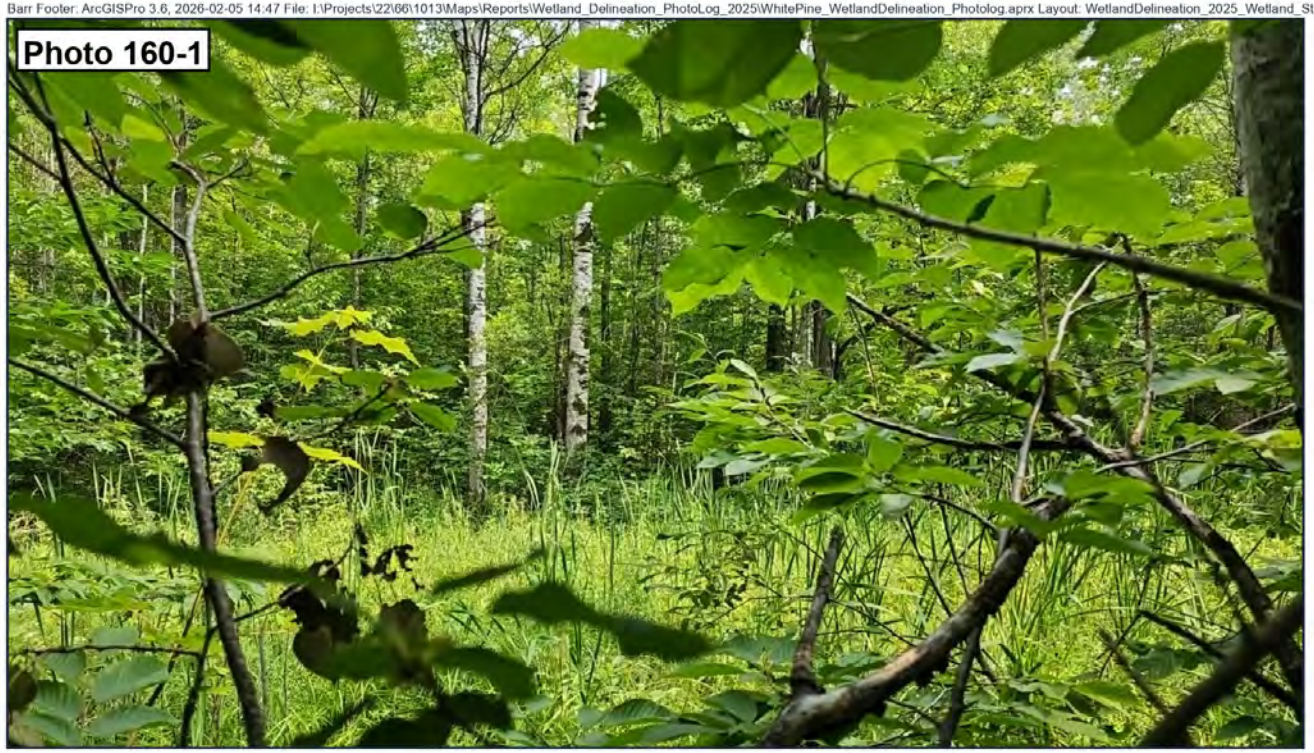

Page 159 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP23-B, Wetland
**Photo 2 Caption:** T2E-BP23-B, Upland

*Note: Photo locations are approximate*

**Photo 160-1**



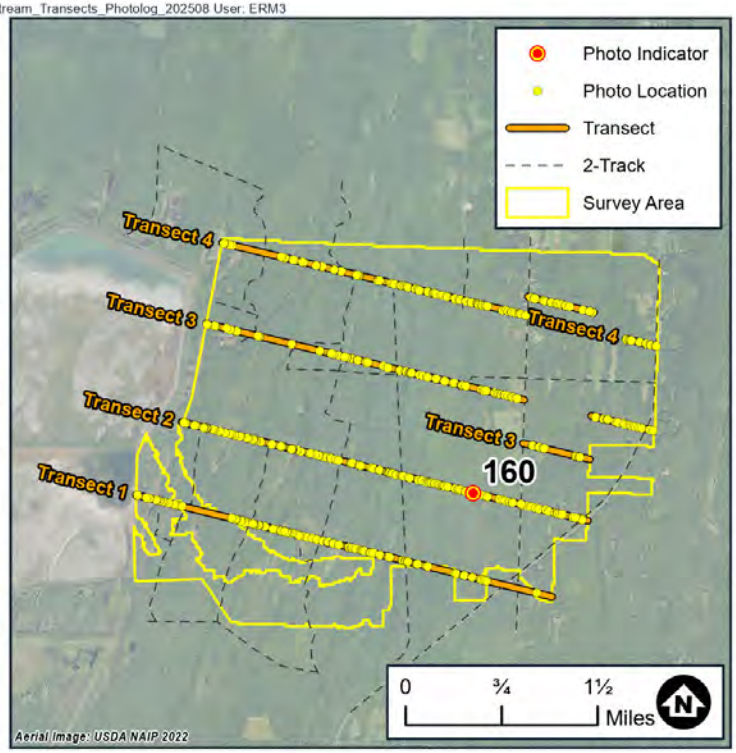
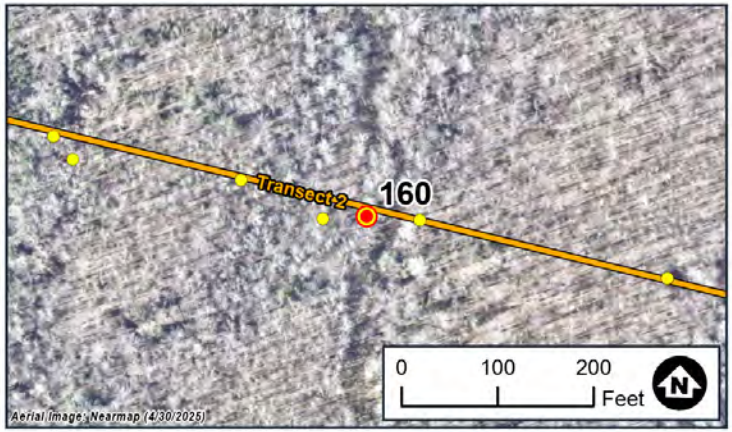



**Photo 160-2**






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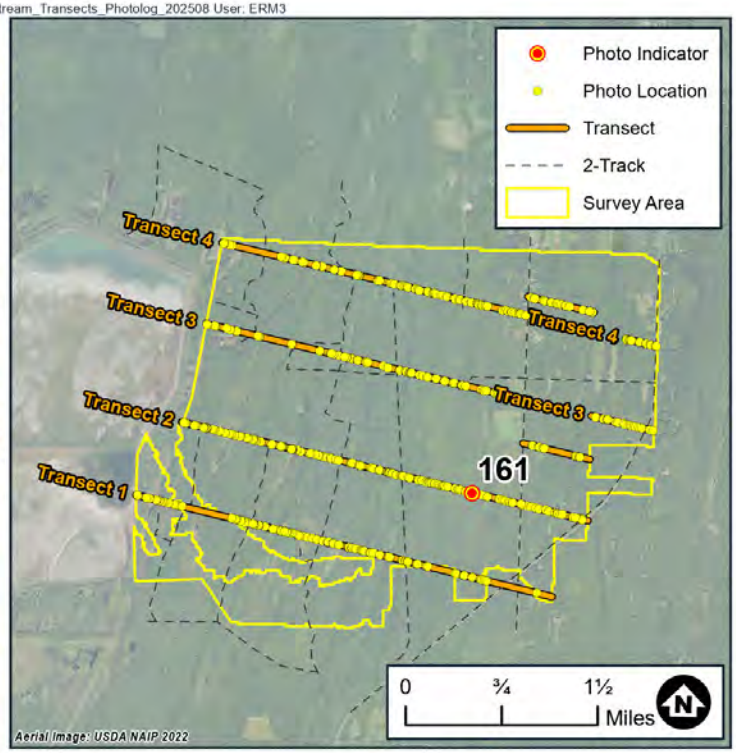
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP23-A, Wetland
**Photo 2 Caption:** T2E-BP23-A, Upland

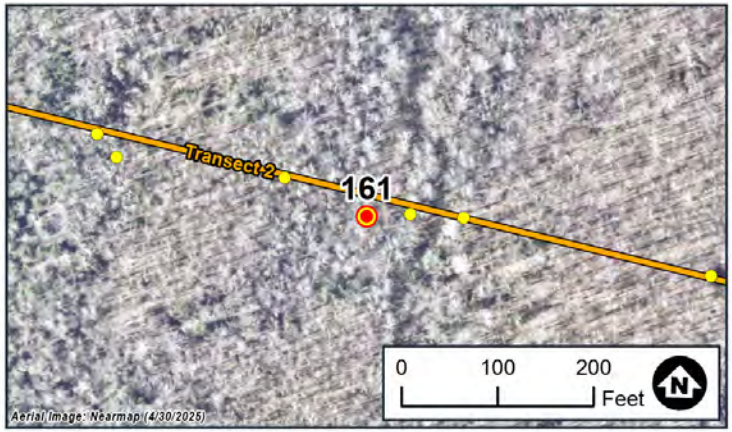
*Note: Photo locations are approximate*











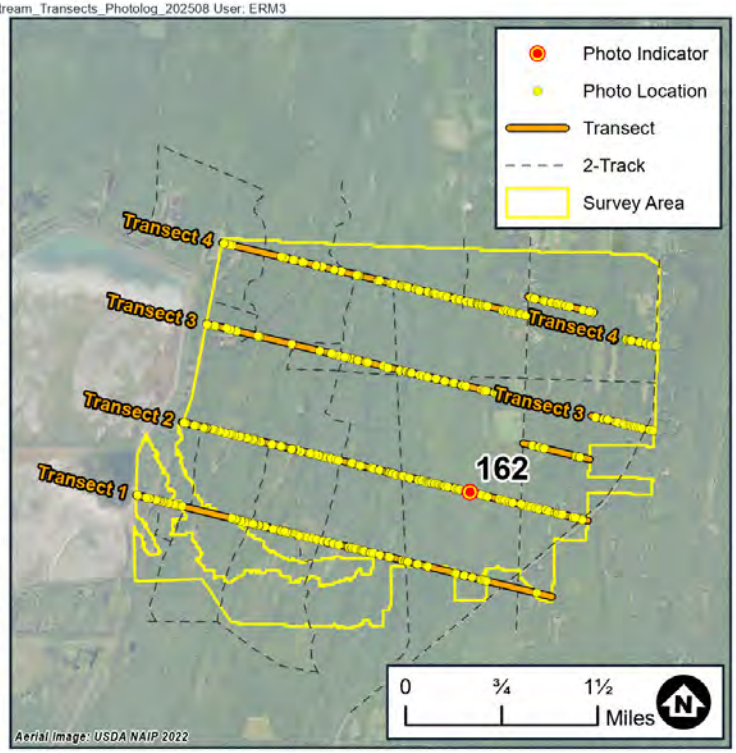

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP22-B, Wetland
**Photo 2 Caption:** T2E-BP22-B, Upland

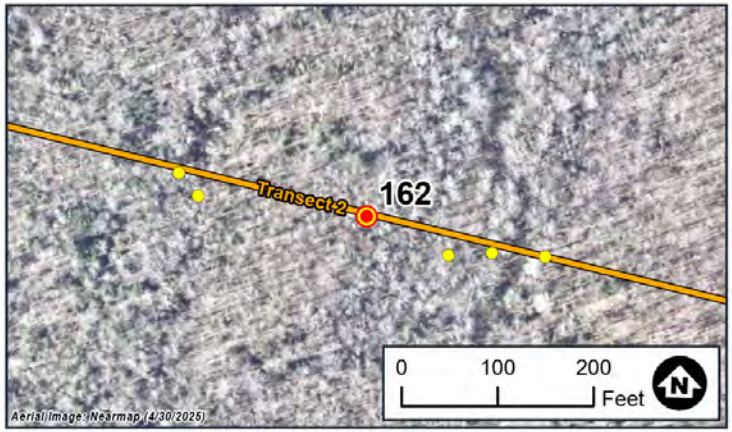
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

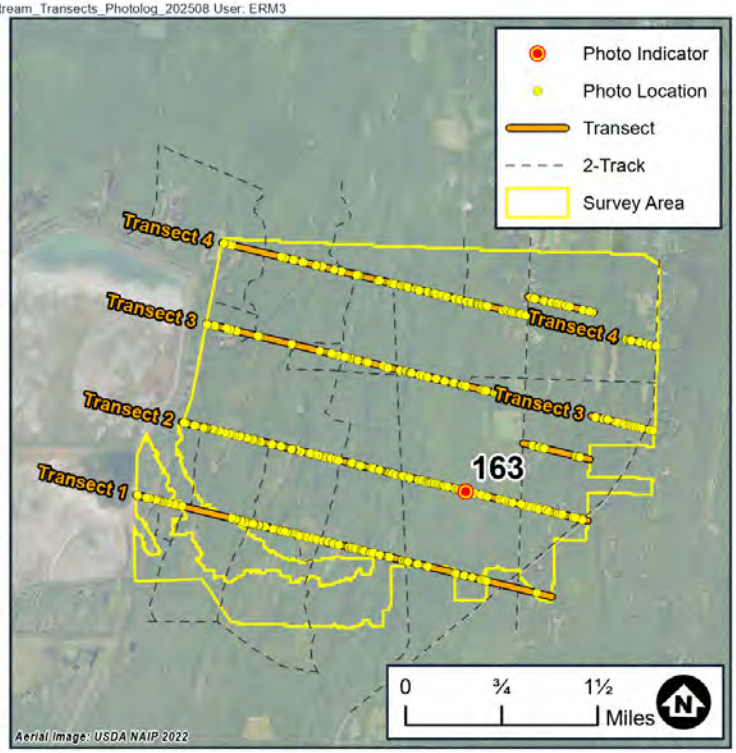
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP22-A, Wetland
**Photo 2 Caption:** T2E-BP22-A, Upland

*Note: Photo locations are approximate*

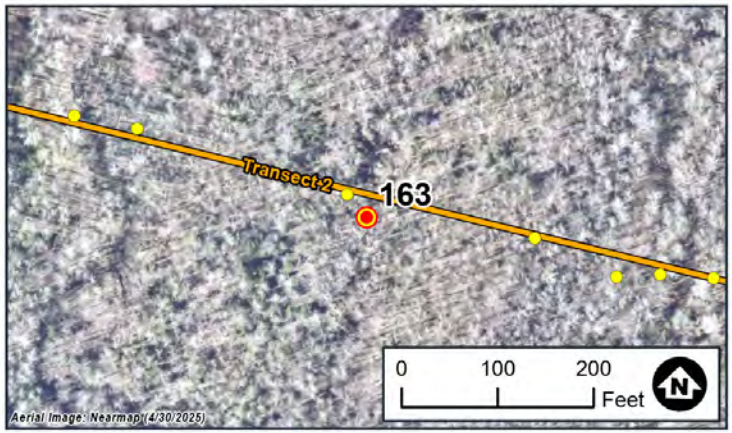
## Photo 163-1






## Photo 163-2






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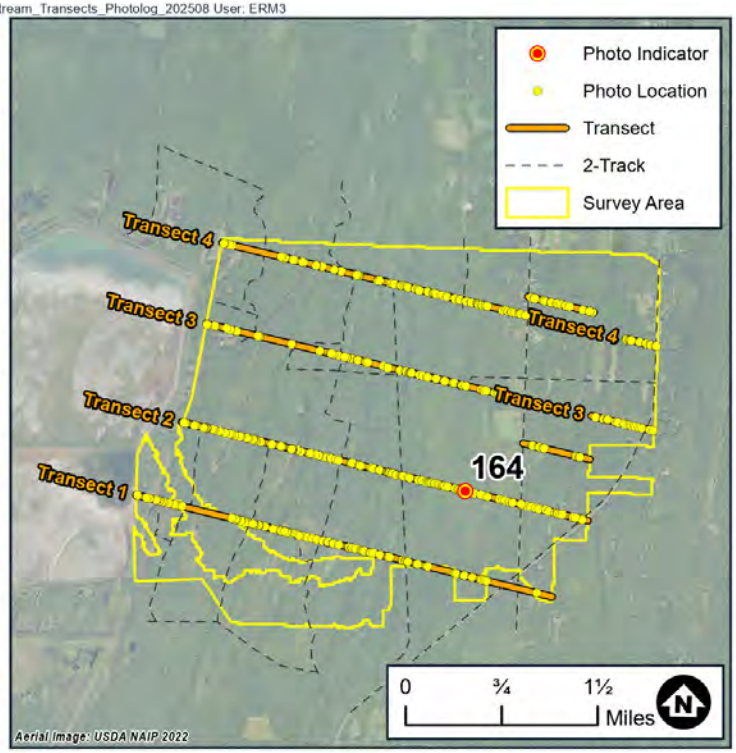
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP21-B, Wetland
**Photo 2 Caption:** T2E-BP21-B, Upland

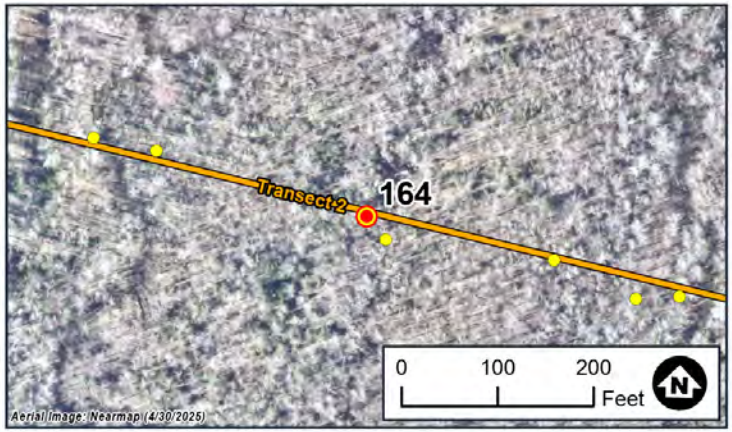
*Note: Photo locations are approximate*










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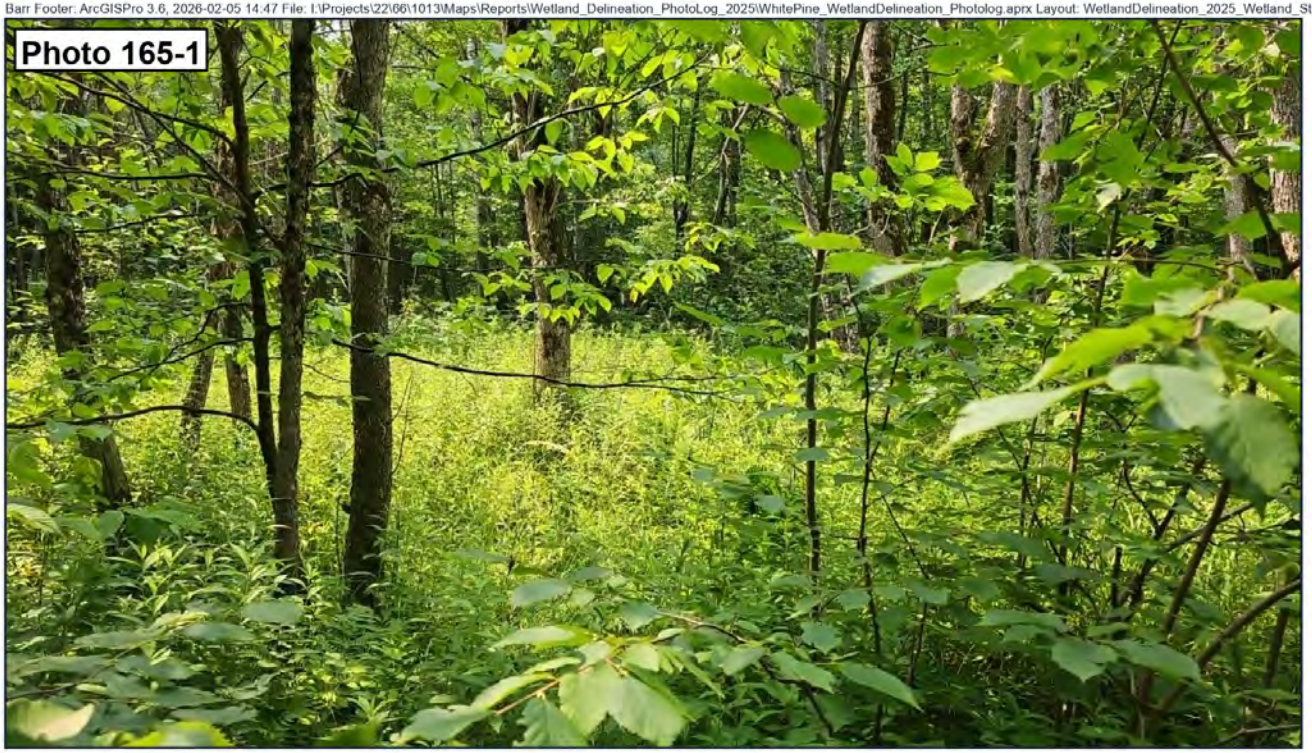
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

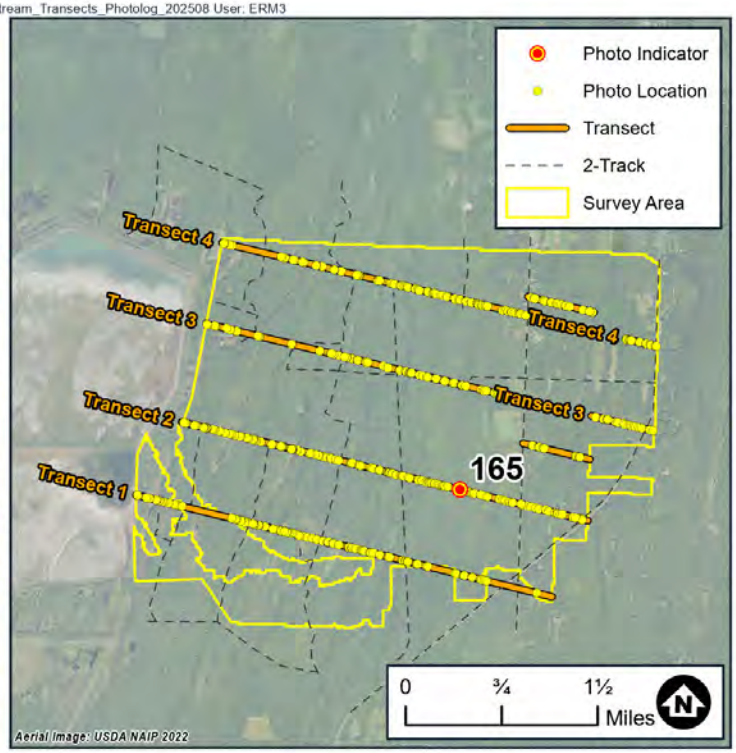
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP21-A, Wetland
**Photo 2 Caption:** T2E-BP21-A, Upland

*Note: Photo locations are approximate*

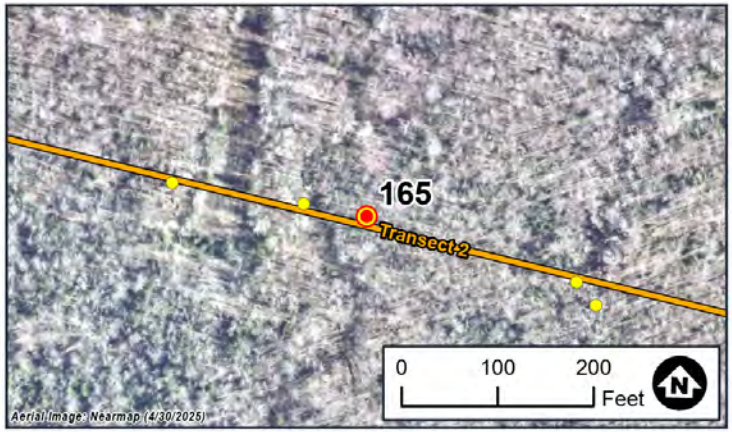
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3









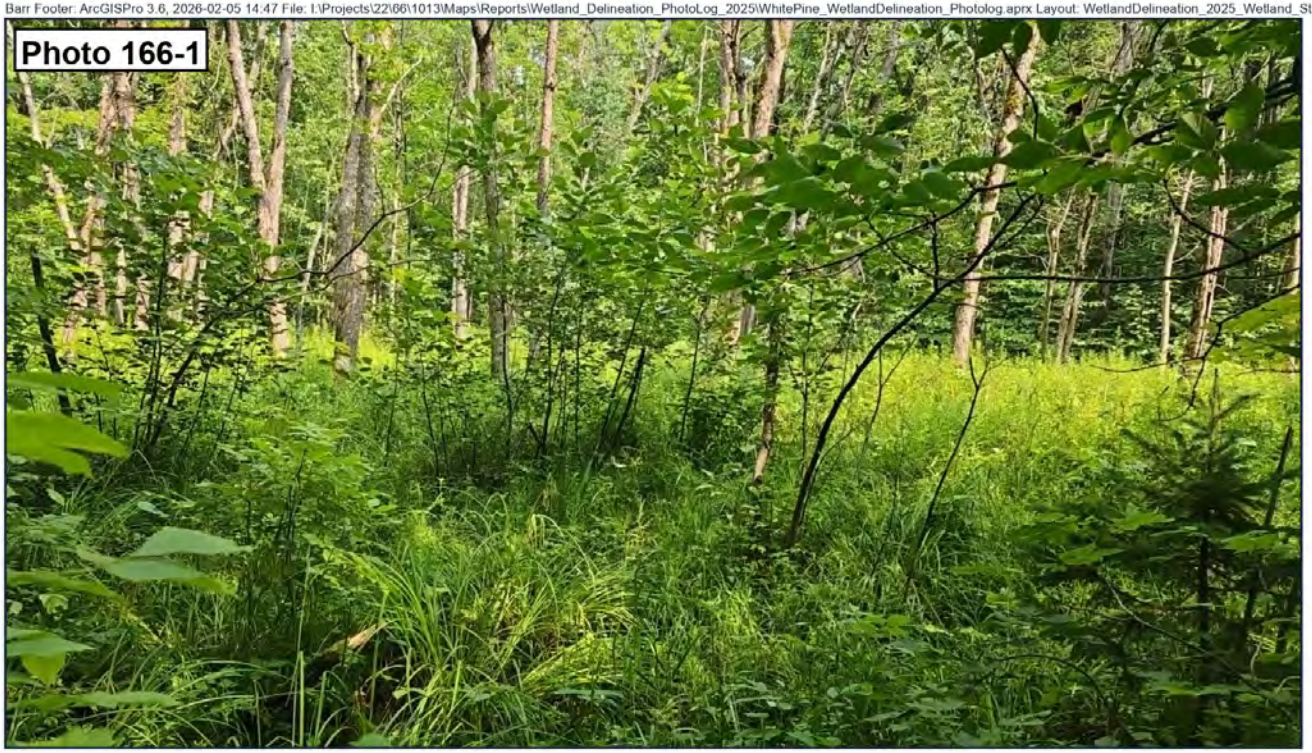


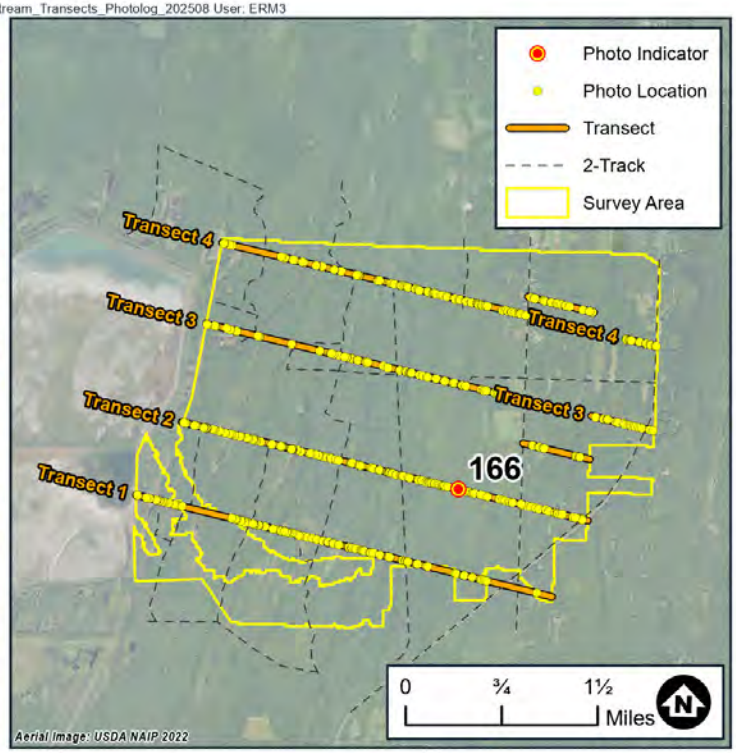

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP20-B, Wetland
**Photo 2 Caption:** T2E-BP20-B, Upland

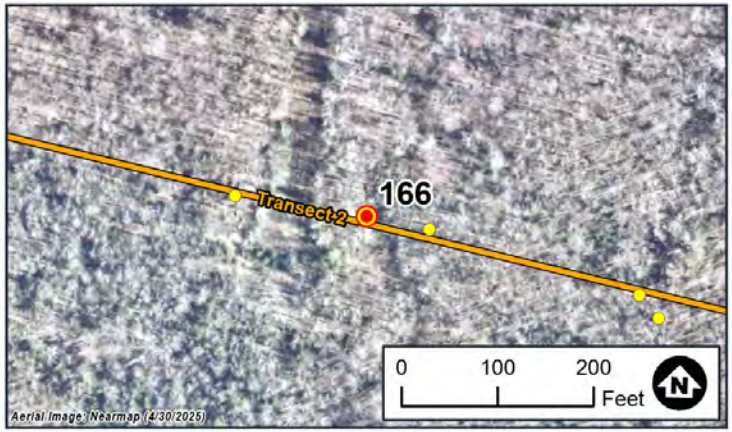
*Note: Photo locations are approximate*











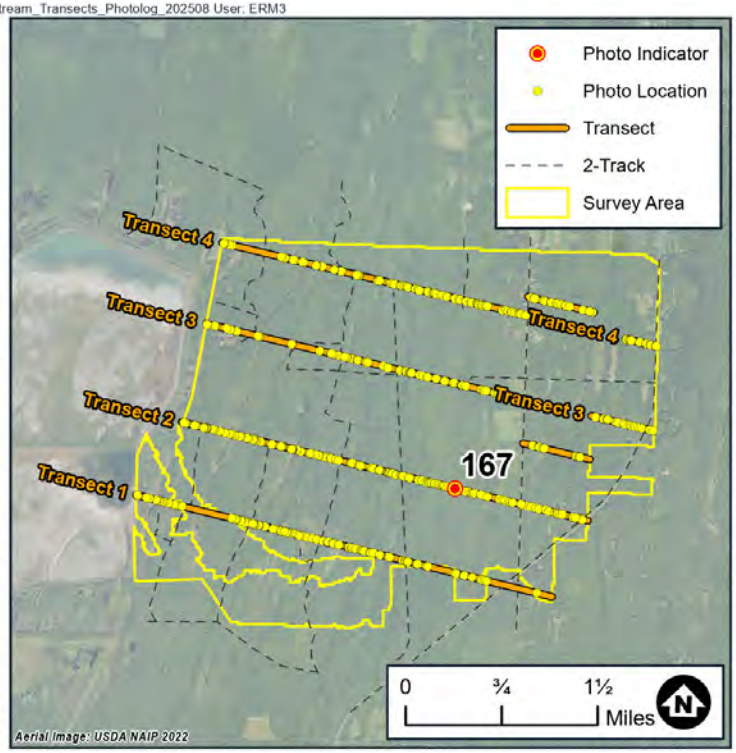

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP20-A, Wetland
**Photo 2 Caption:** T2E-BP20-A, Upland

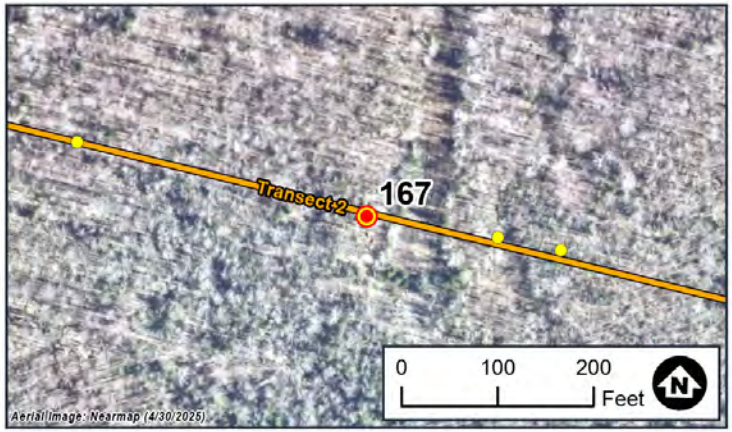
*Note: Photo locations are approximate*










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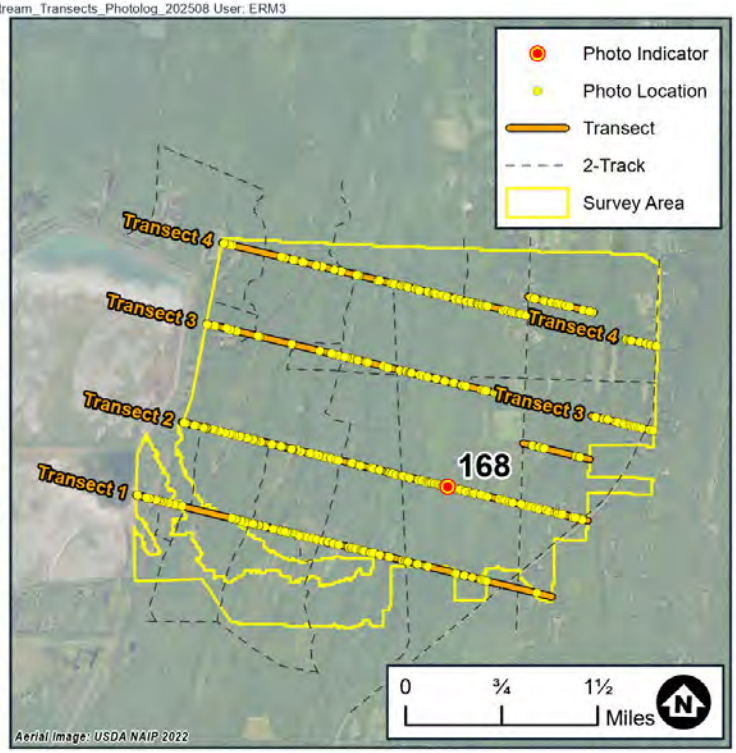
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP19-B, Wetland
**Photo 2 Caption:** T2E-BP19-B, Upland

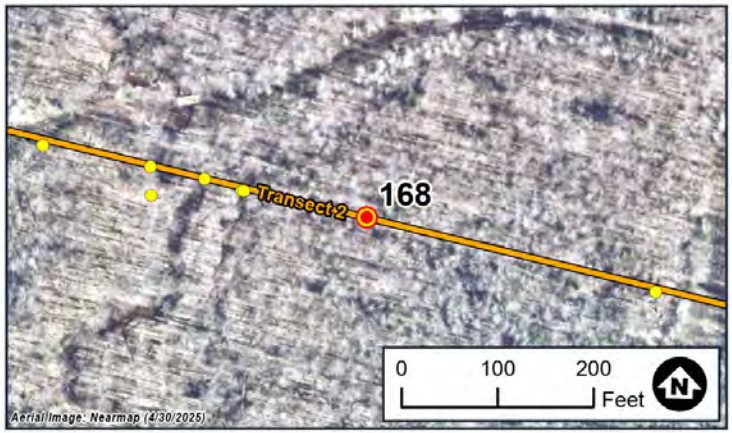
*Note: Photo locations are approximate*











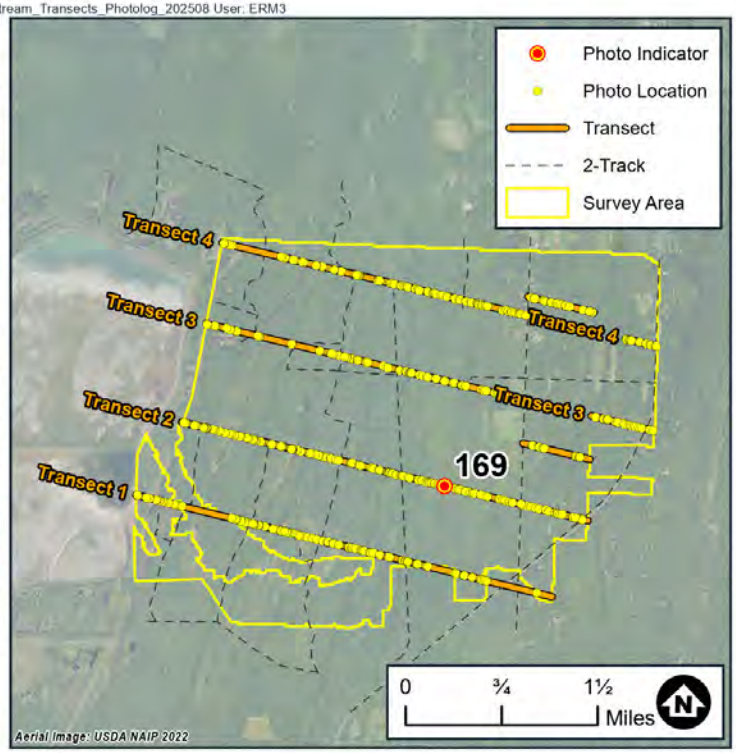

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP19-A, Wetland
**Photo 2 Caption:** T2E-BP19-A, Upland

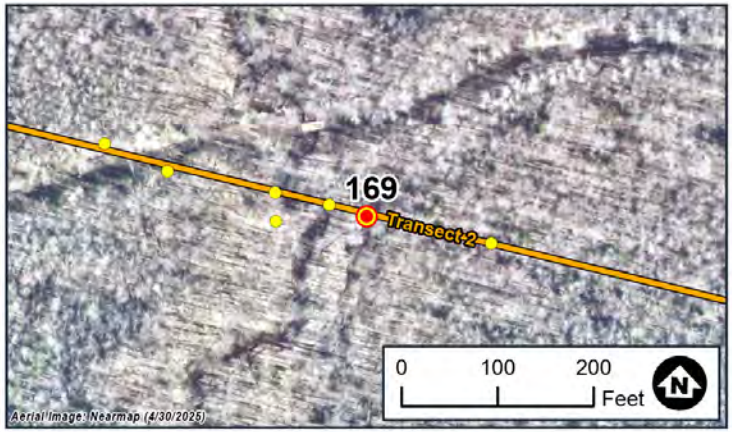
*Note: Photo locations are approximate*











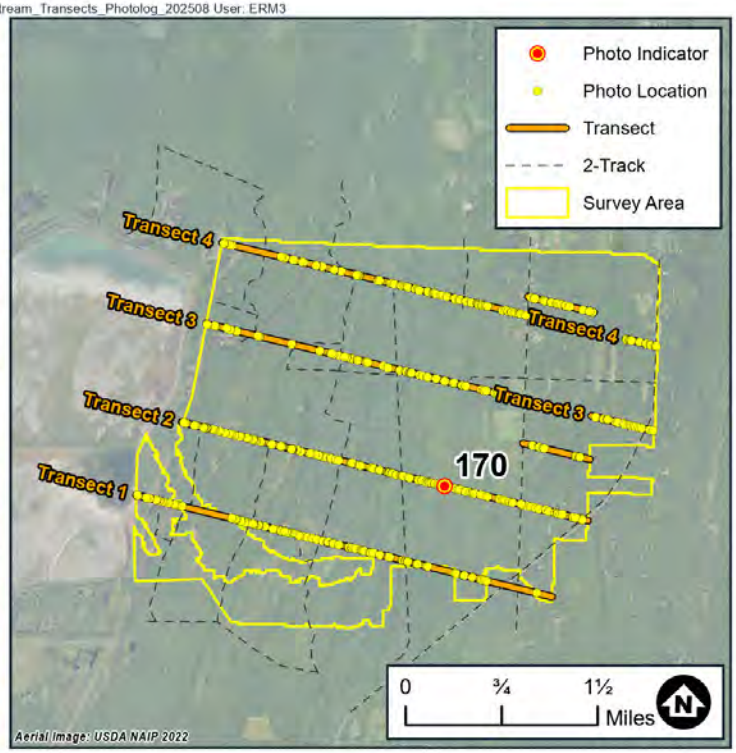

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S08-LB, Upstream
**Photo 2 Caption:** T2E-S08-LB, Downstream

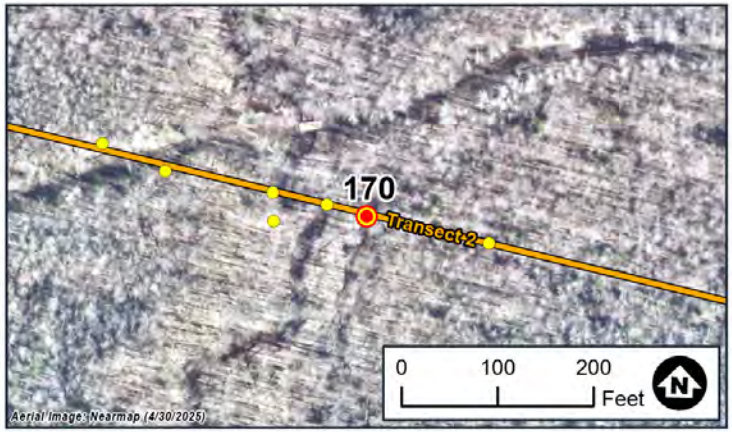
*Note: Photo locations are approximate*









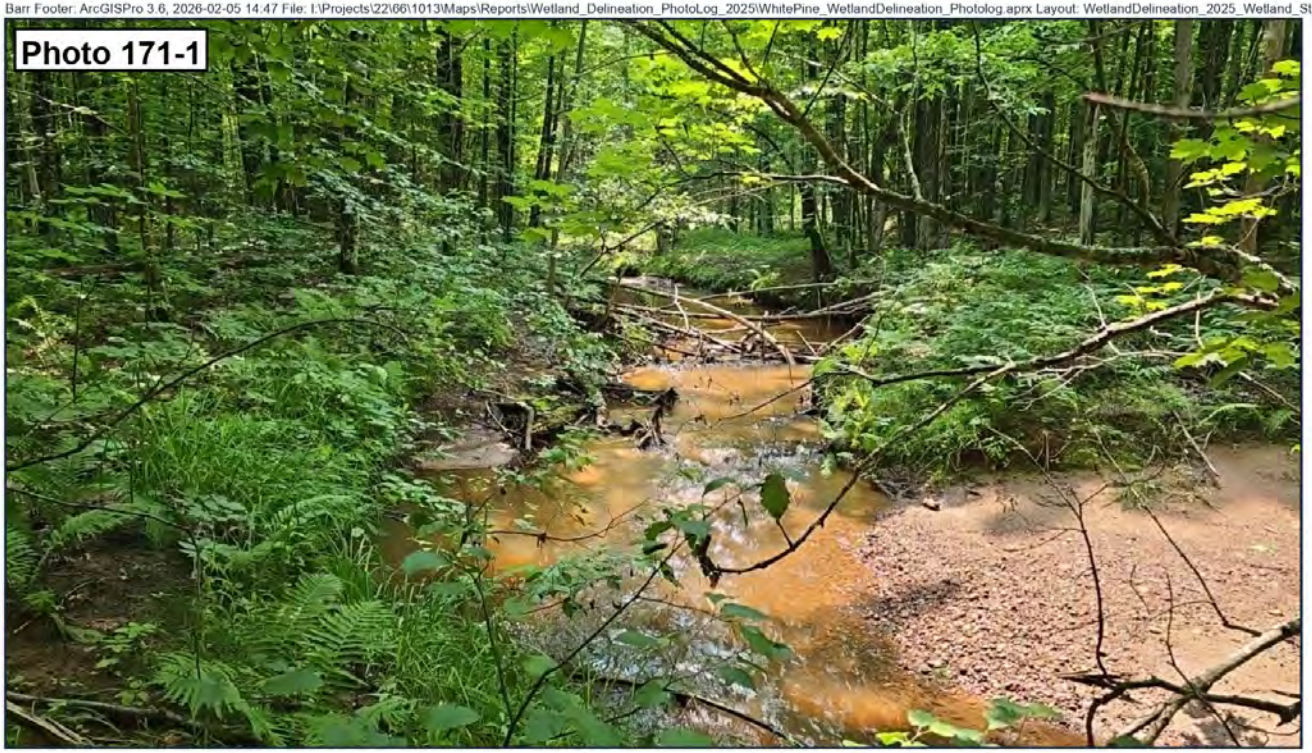

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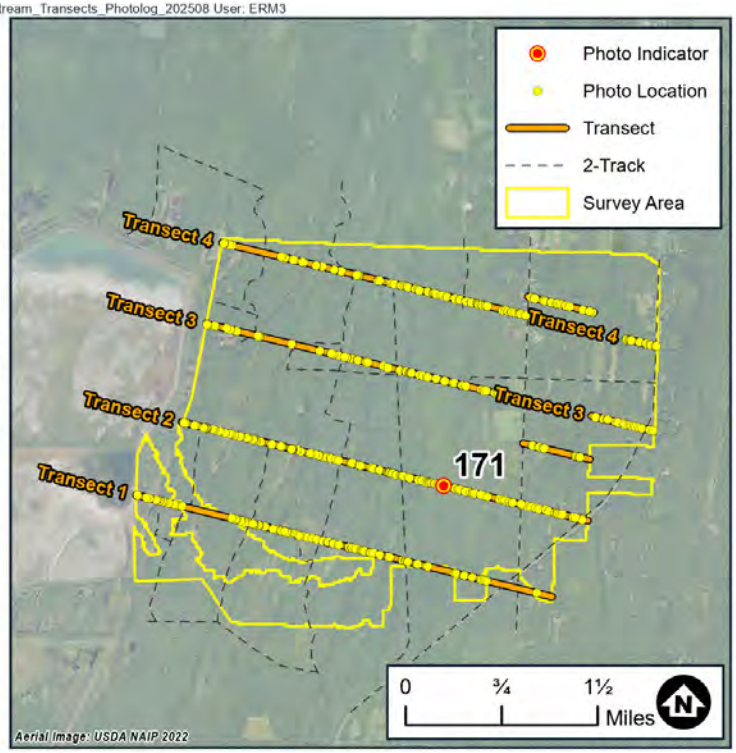
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S08-RB, Upstream
**Photo 2 Caption:** T2E-S08-RB, Downstream

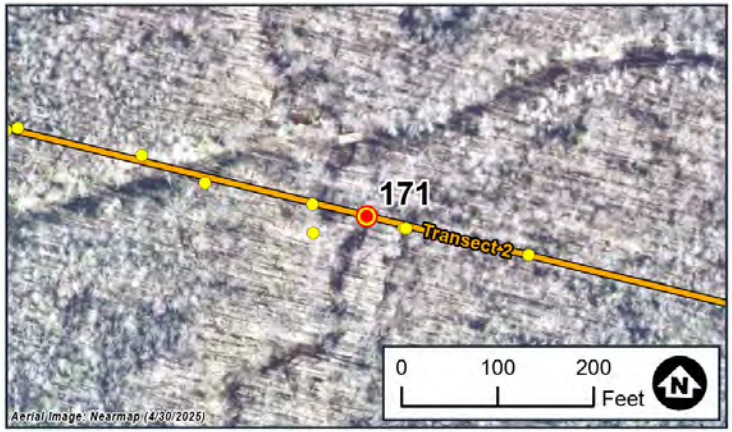
*Note: Photo locations are approximate*











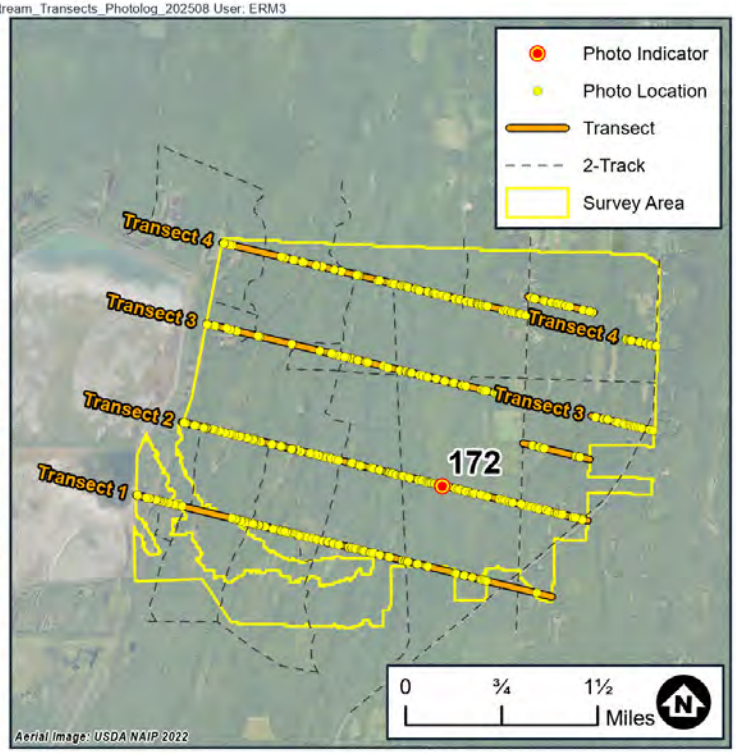

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S07-LB, Upstream
**Photo 2 Caption:** T2E-S07-LB, Downstream

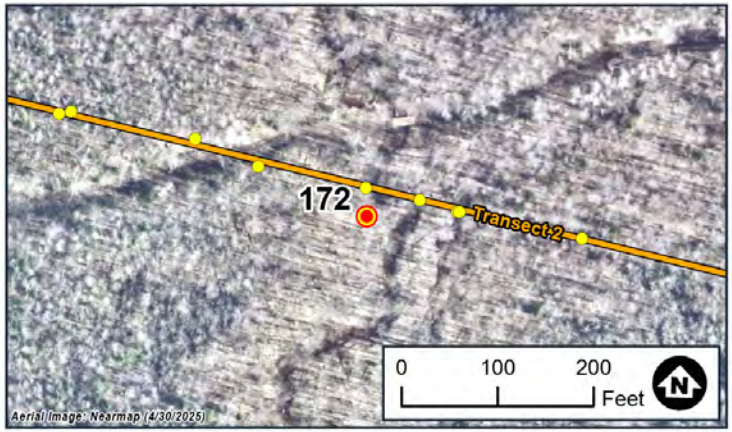
*Note: Photo locations are approximate*











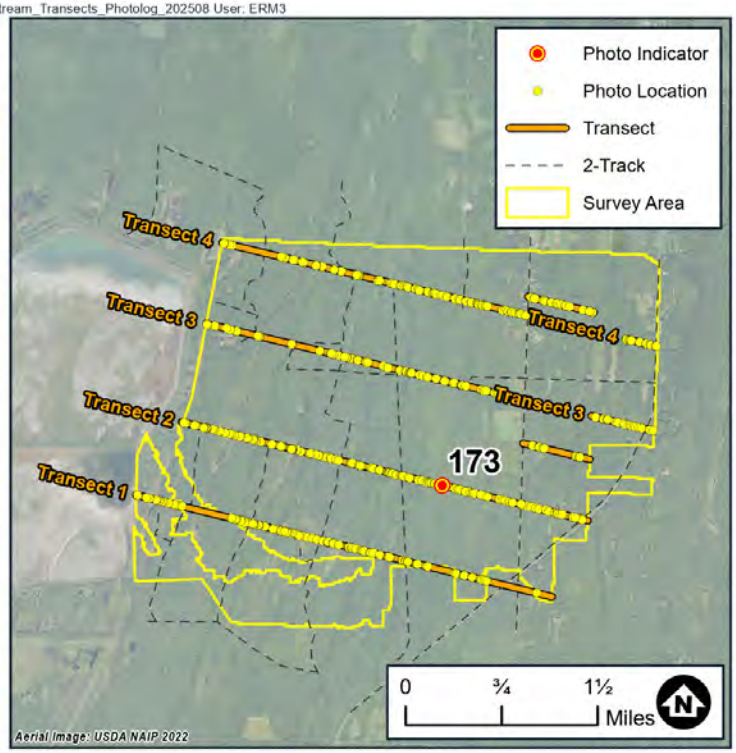

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S07-RB, Upstream
**Photo 2 Caption:** T2E-S07-RB, Downstream

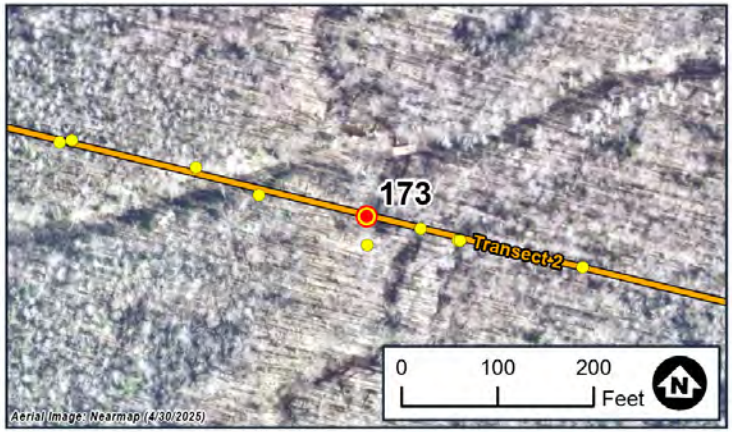
*Note: Photo locations are approximate*











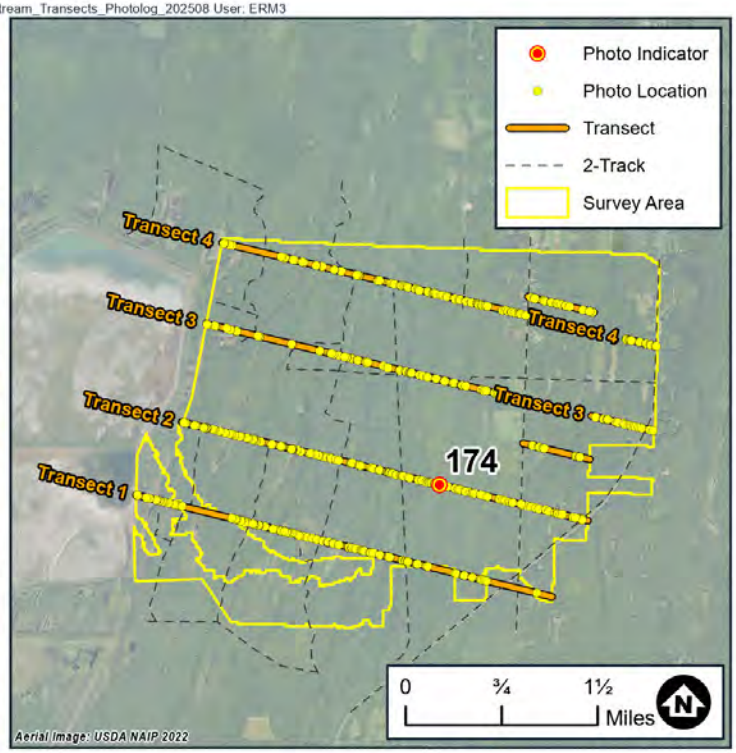

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S07-LB, Upstream
**Photo 2 Caption:** T2E-S07-LB, Downstream

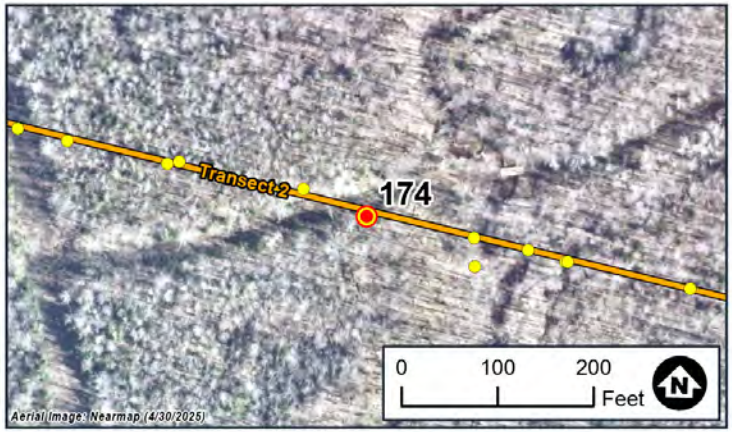
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

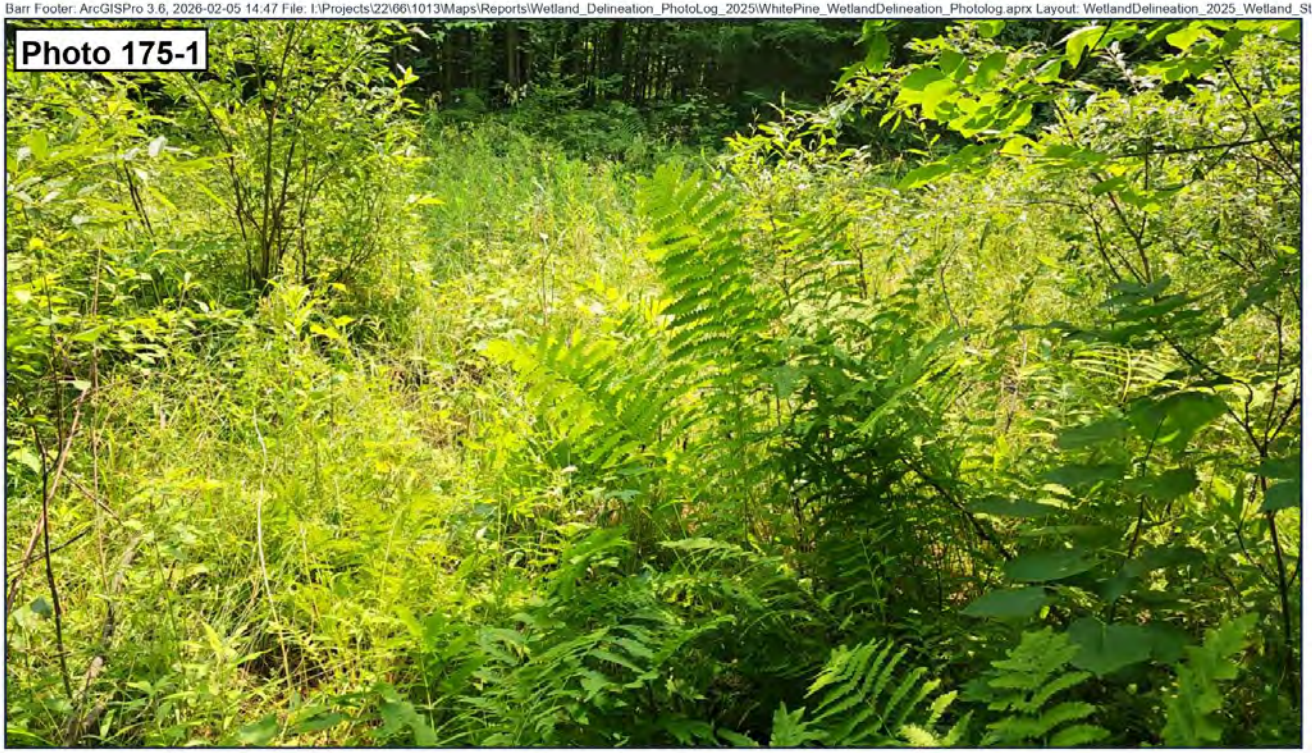
BARR

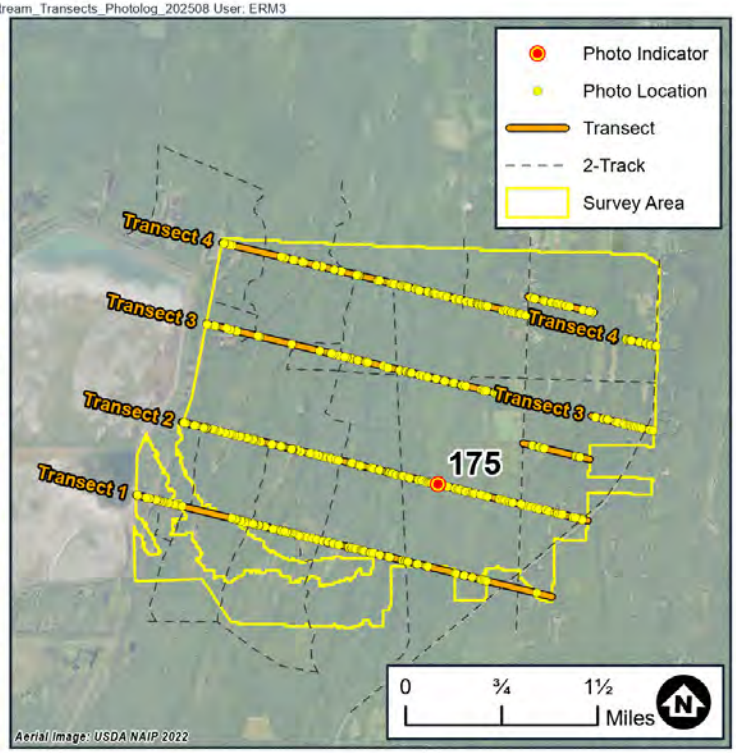
**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP18-B, Wetland
**Photo 2 Caption:** T2E-BP18-B, Upland

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3

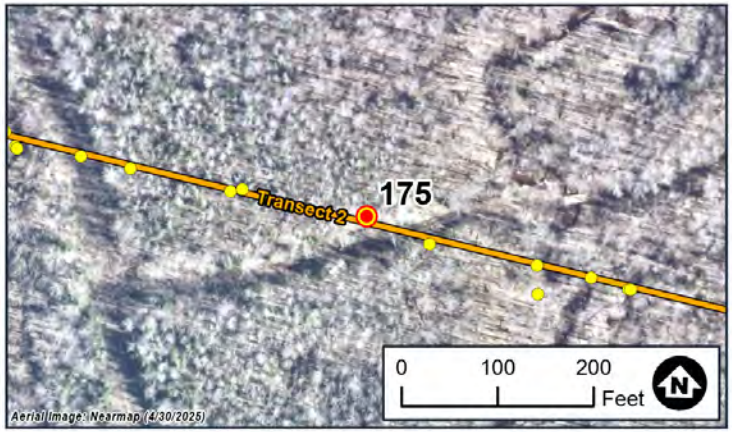
## Photo 175-1






## Photo 175-2






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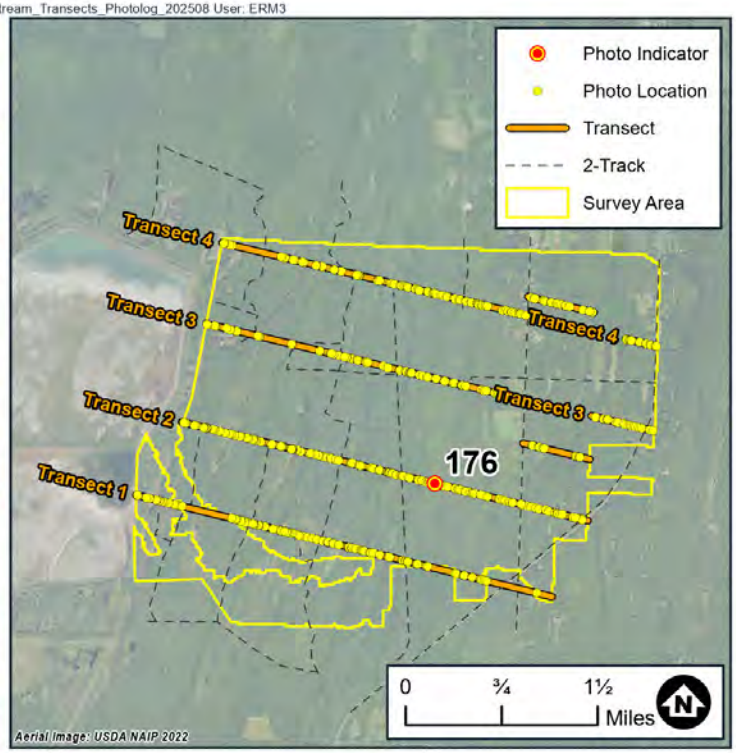
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP18-A, Wetland
**Photo 2 Caption:** T2E-BP18-A, Upland

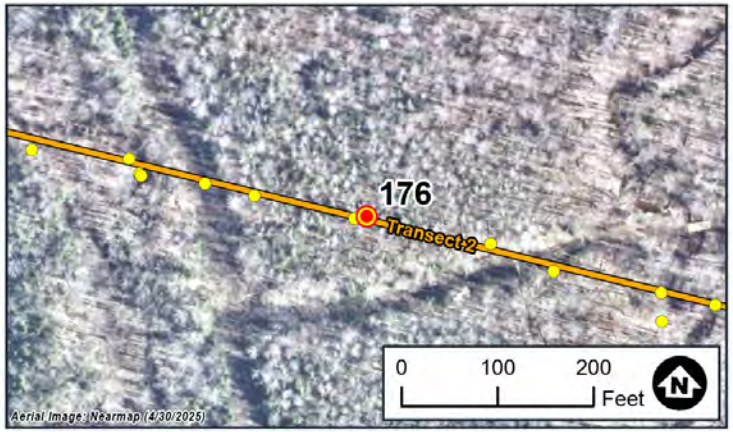
*Note: Photo locations are approximate*











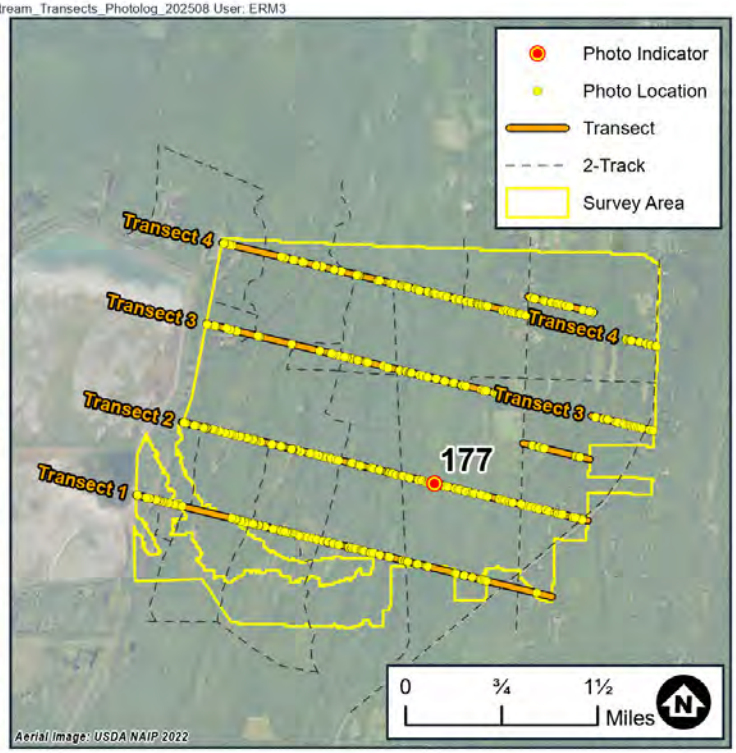

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP17-B, Wetland
**Photo 2 Caption:** T2E-BP17-B, Upland

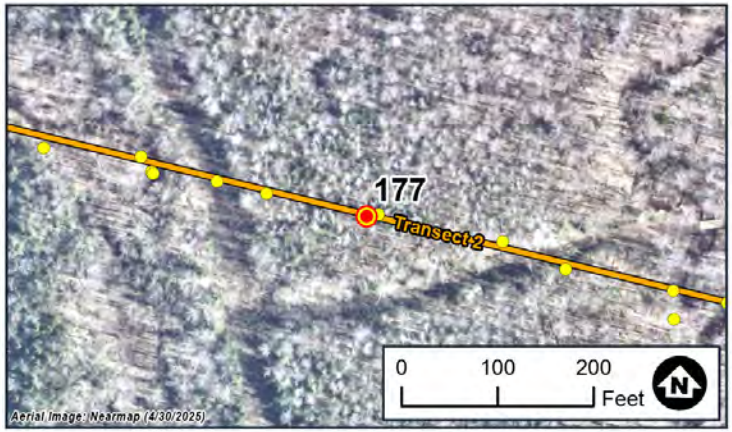
*Note: Photo locations are approximate*










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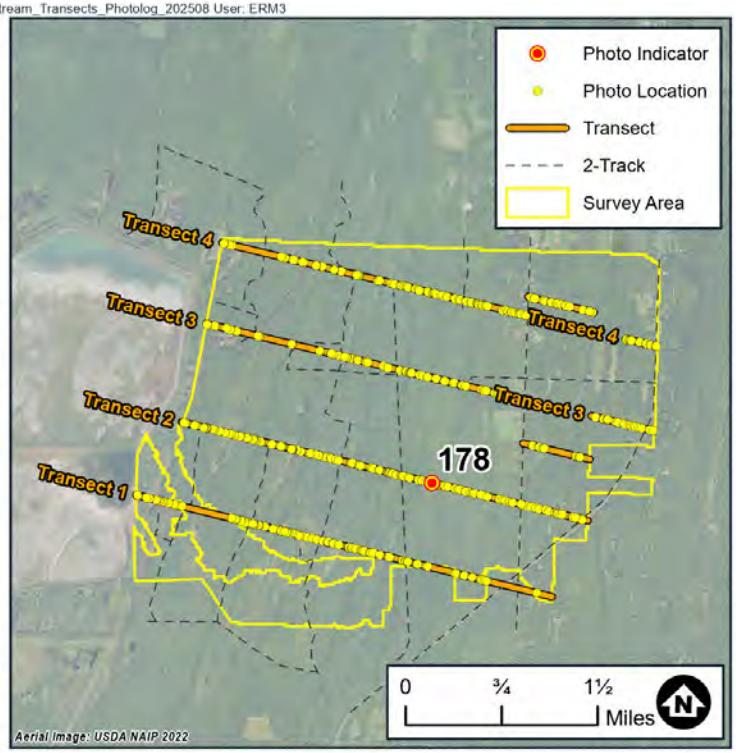
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP17-A, Wetland
**Photo 2 Caption:** T2E-BP17-A, Upland

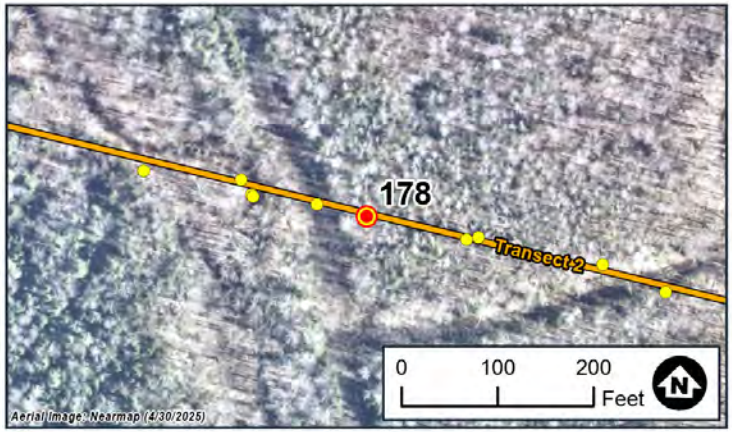
*Note: Photo locations are approximate*









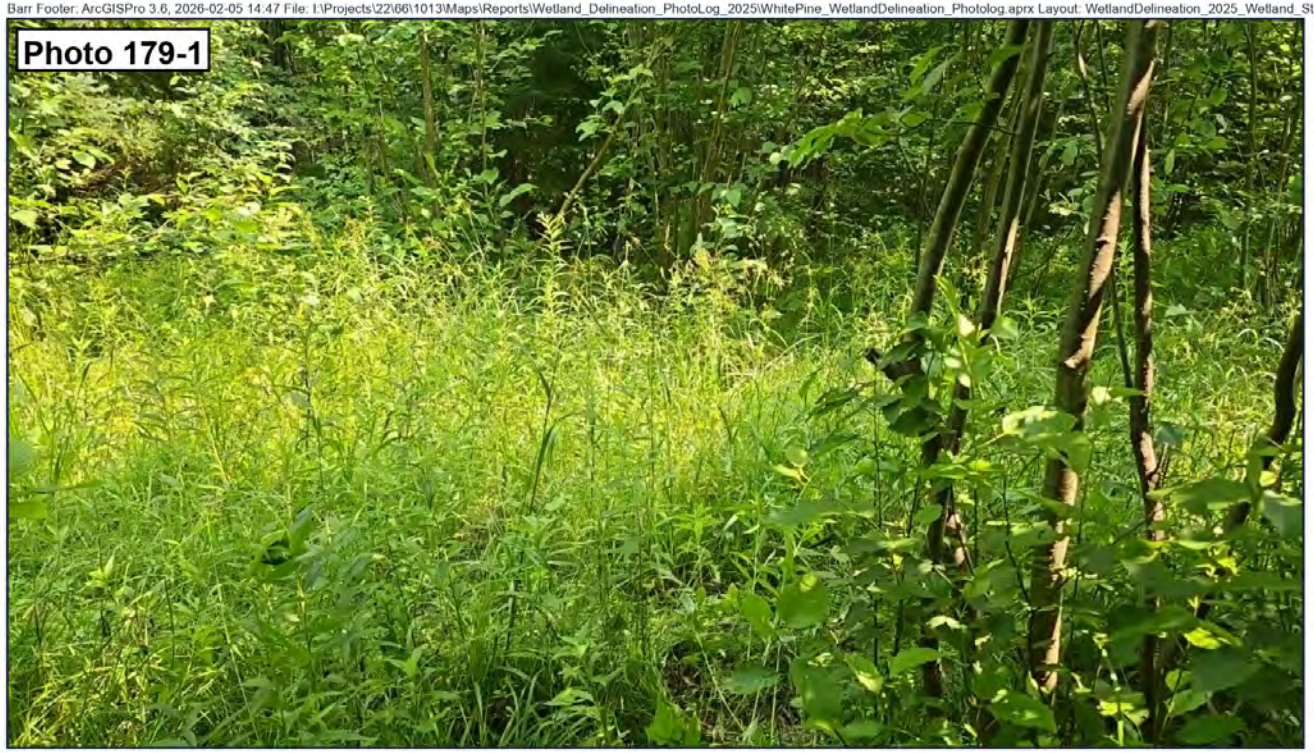


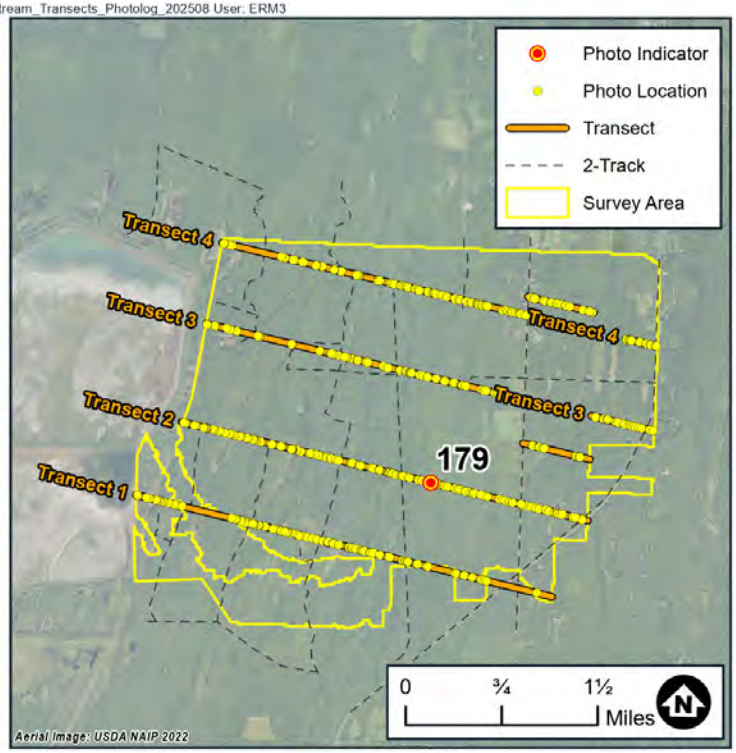

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP16-B, Wetland
**Photo 2 Caption:** T2E-BP16-B, Upland

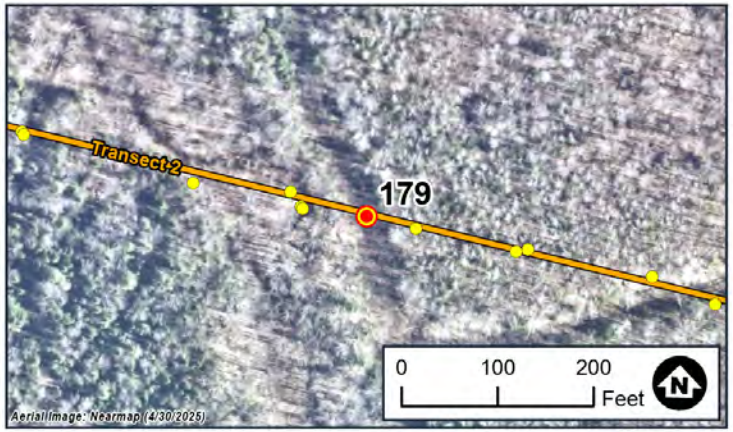
*Note: Photo locations are approximate*










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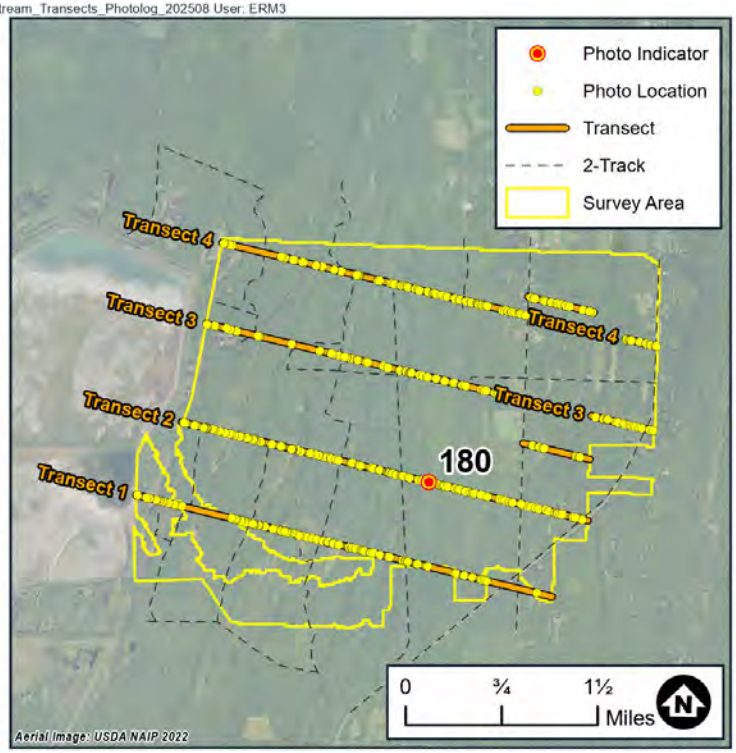
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP16-A, Wetland
**Photo 2 Caption:** T2E-BP16-A, Upland

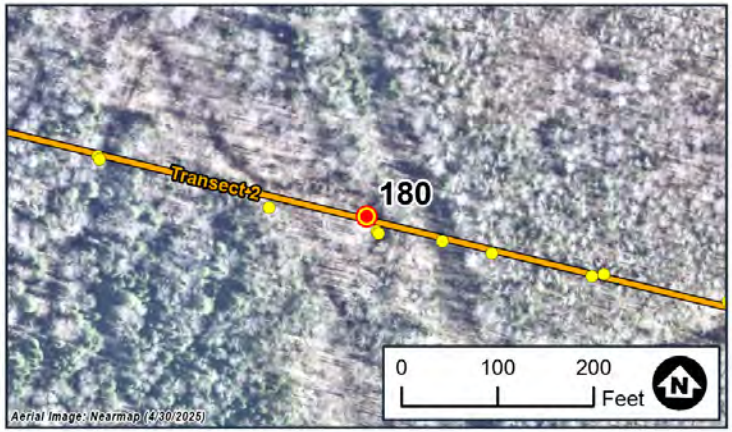
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S06-LB, Upstream
**Photo 2 Caption:** T2E-S06-LB, Downstream

*Note: Photo locations are approximate*

**Photo 181-1**



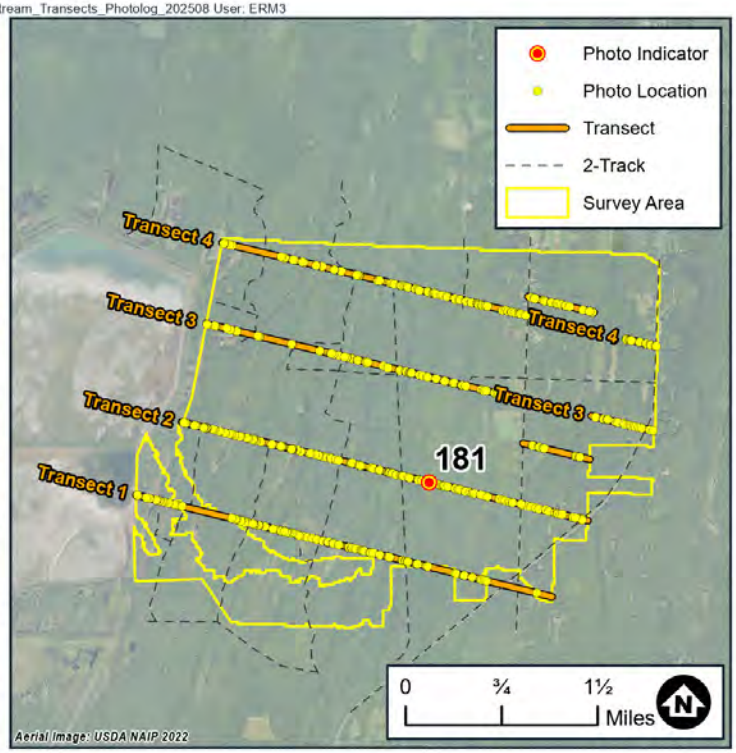
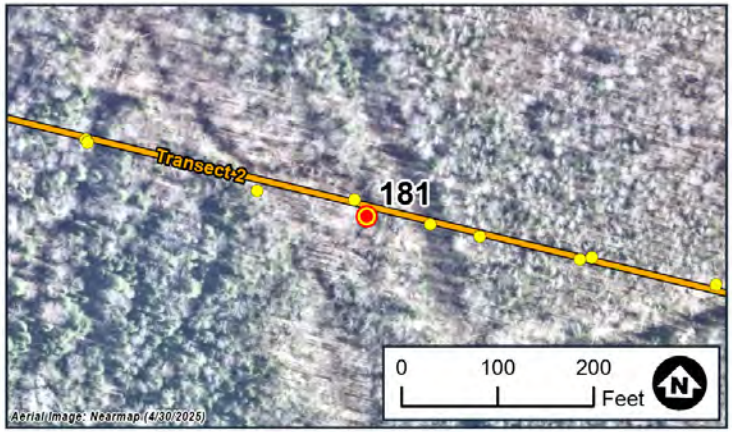



**Photo 181-2**







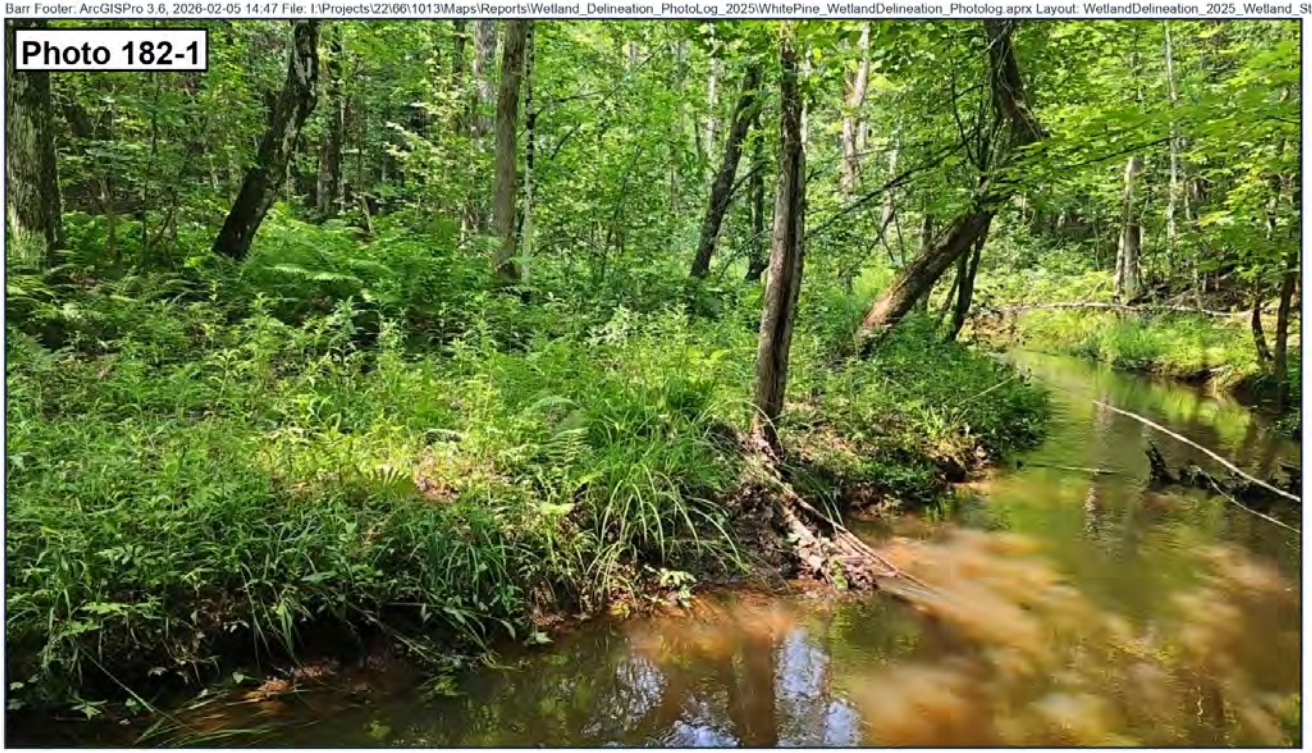

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

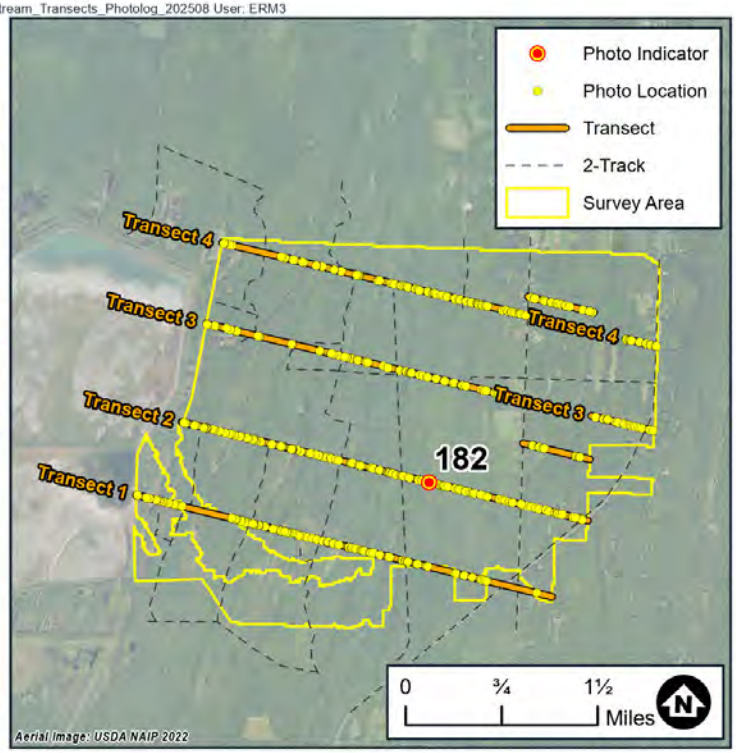
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S06-RB, Upstream
**Photo 2 Caption:** T2E-S06-RB, Upstream

*Note: Photo locations are approximate*

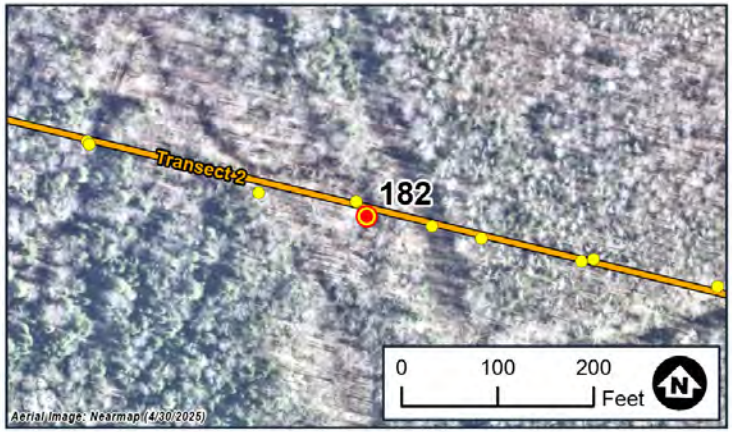
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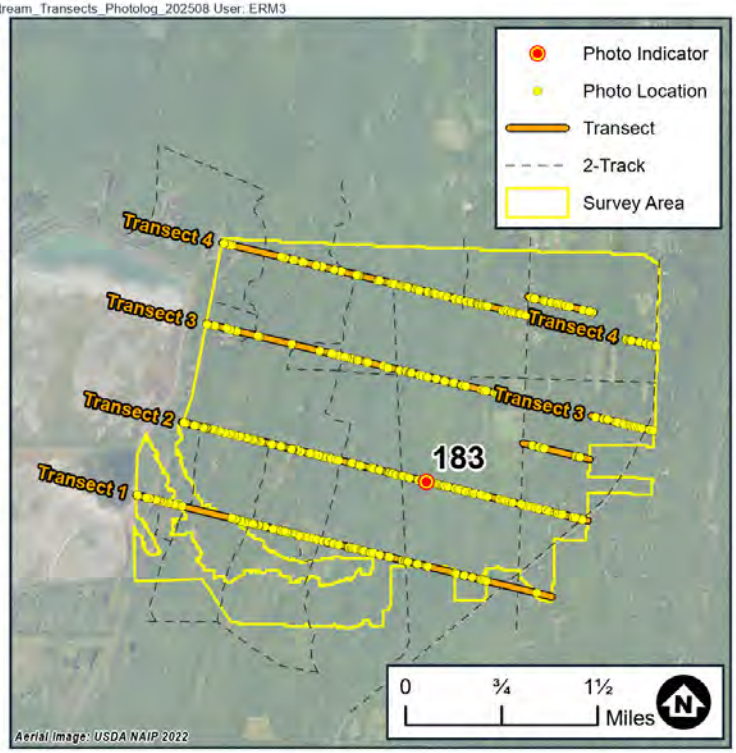

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP15-B, Wetland
**Photo 2 Caption:** T2E-BP15-B, Upland

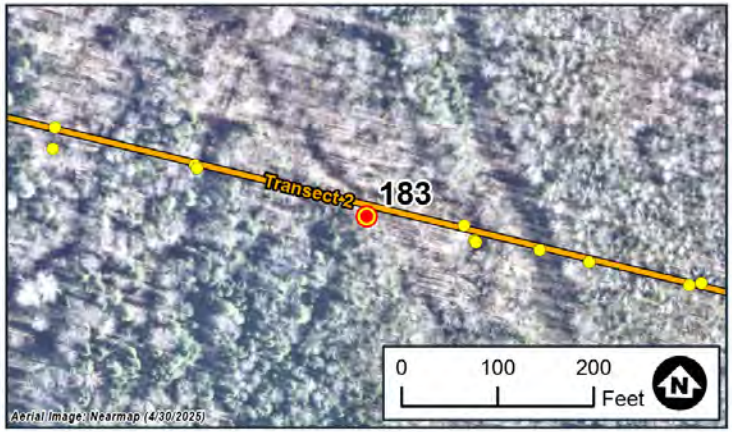
*Note: Photo locations are approximate*









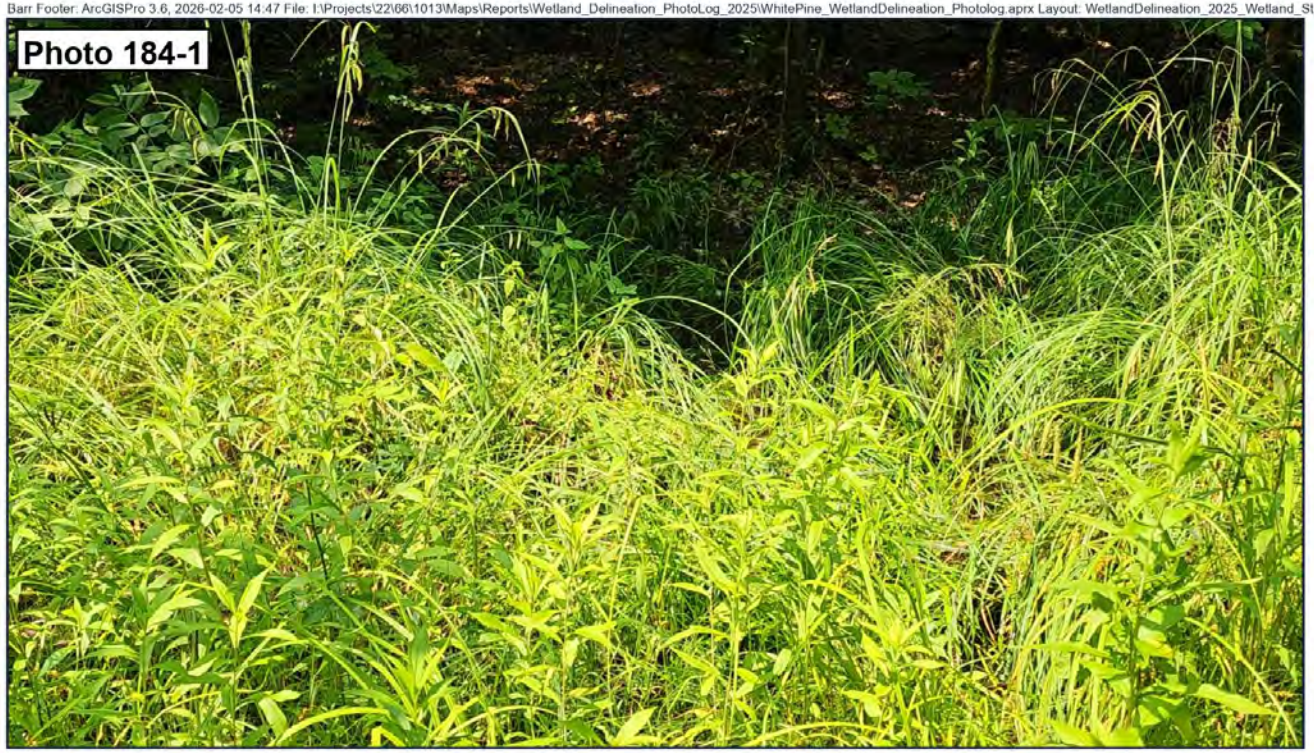


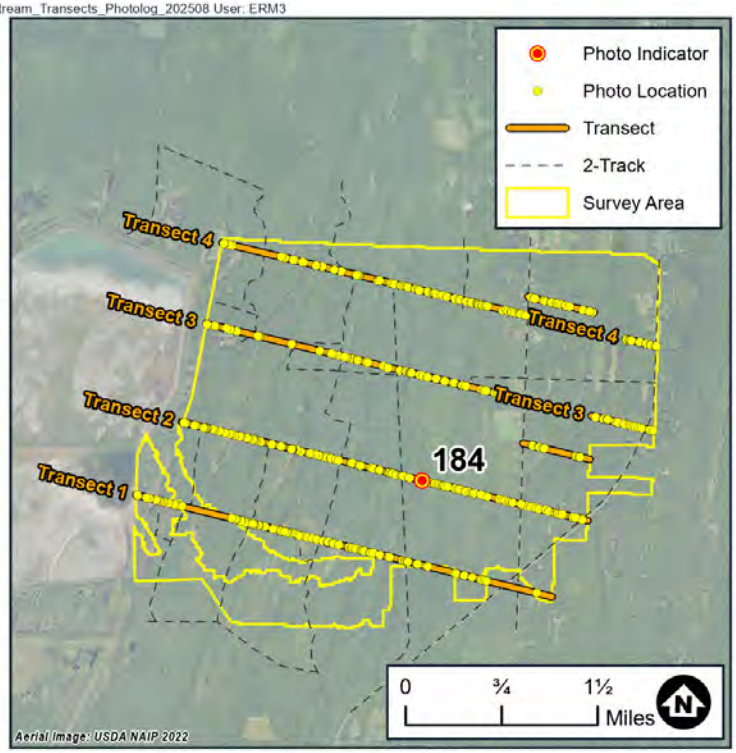

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP15-A, Wetland
**Photo 2 Caption:** T2E-BP15-A, Upland

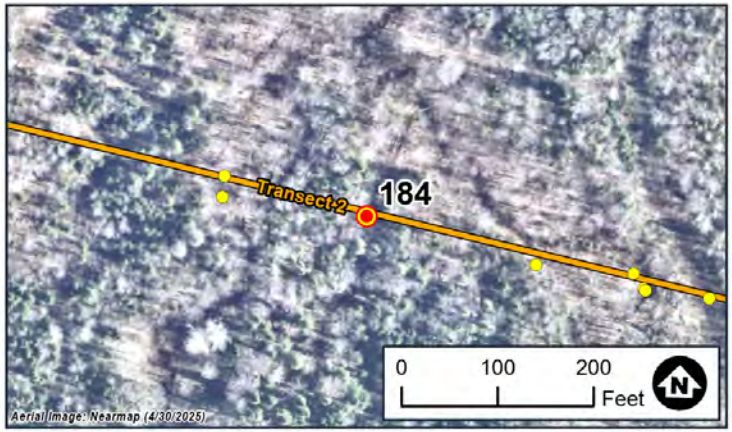
*Note: Photo locations are approximate*










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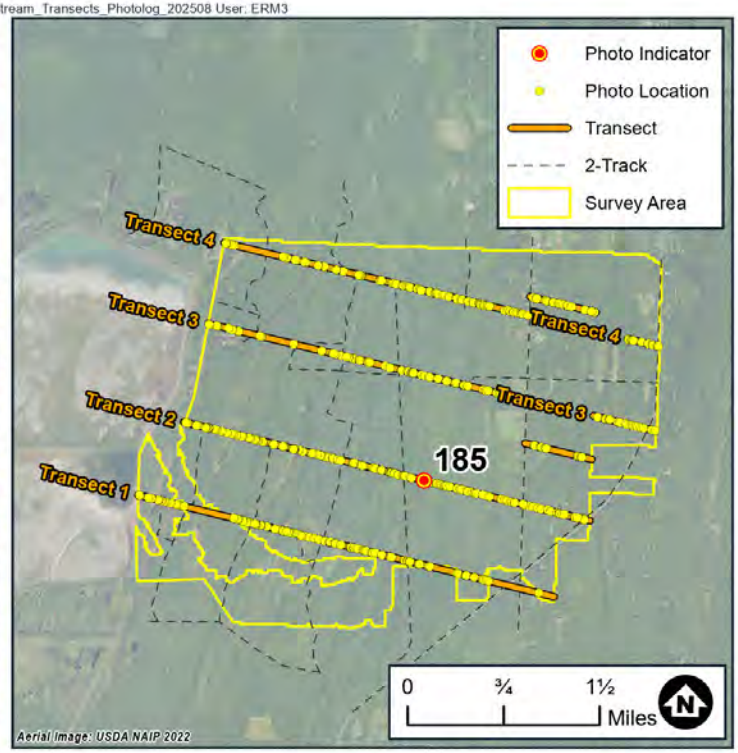
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP14-B, Wetland
**Photo 2 Caption:** T2E-BP14-B, Upland

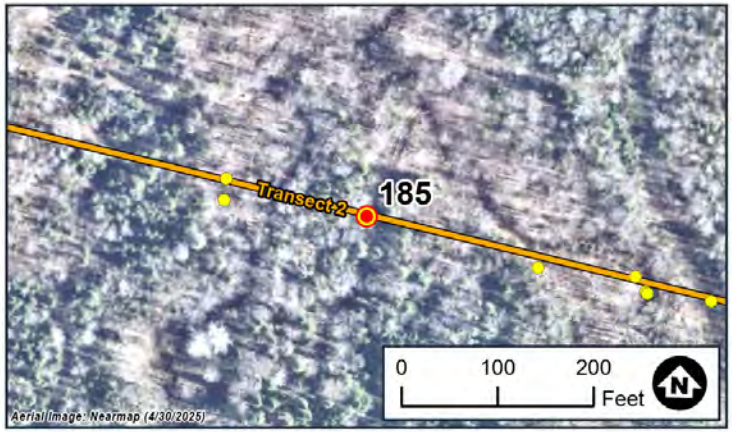
*Note: Photo locations are approximate*











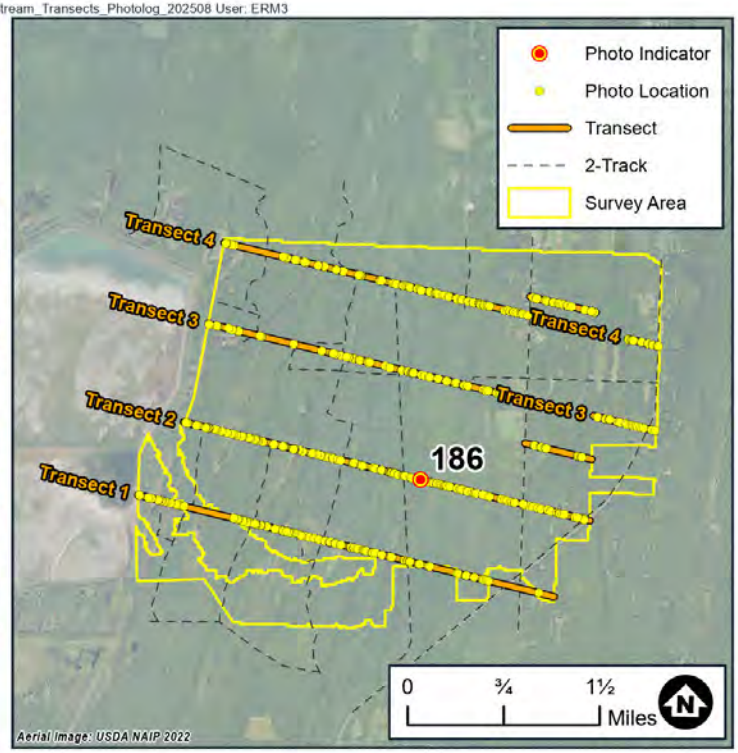

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP14-A, Wetland
**Photo 2 Caption:** T2E-BP14-A, Upland

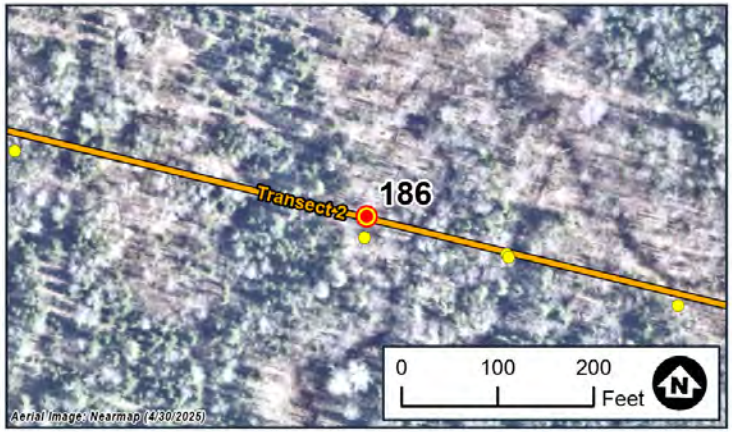
*Note: Photo locations are approximate*











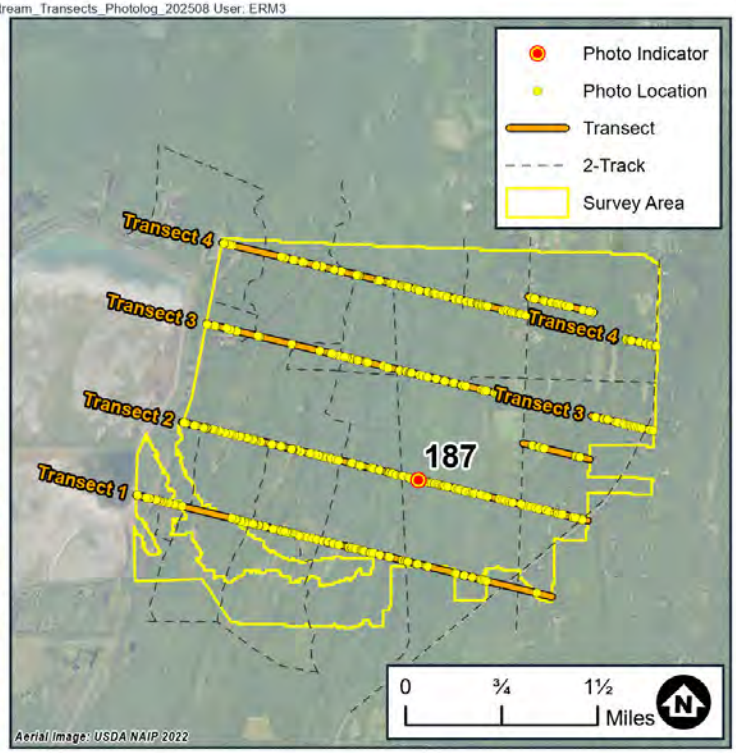

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S05-LB, Upstream
**Photo 2 Caption:** T2E-S05-LB, Downstream

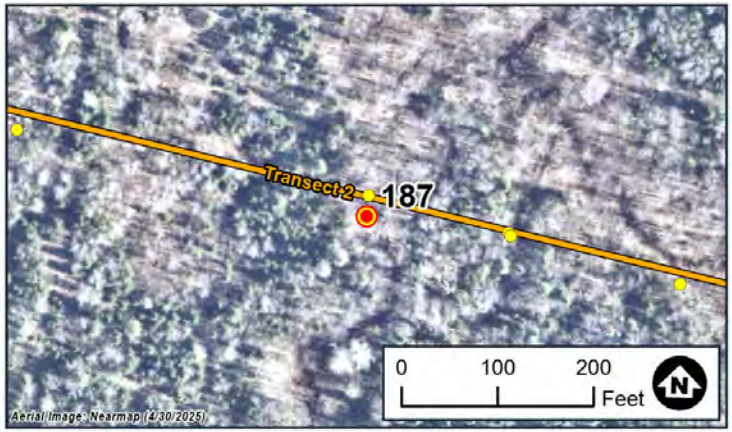
*Note: Photo locations are approximate*











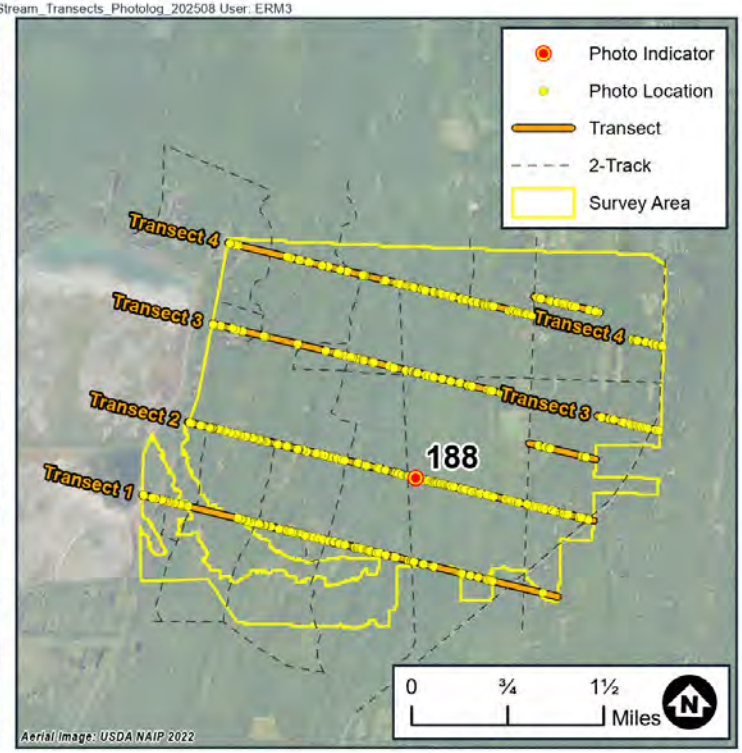

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S05-RB, Upstream
**Photo 2 Caption:** T2E-S05-RB, Downstream

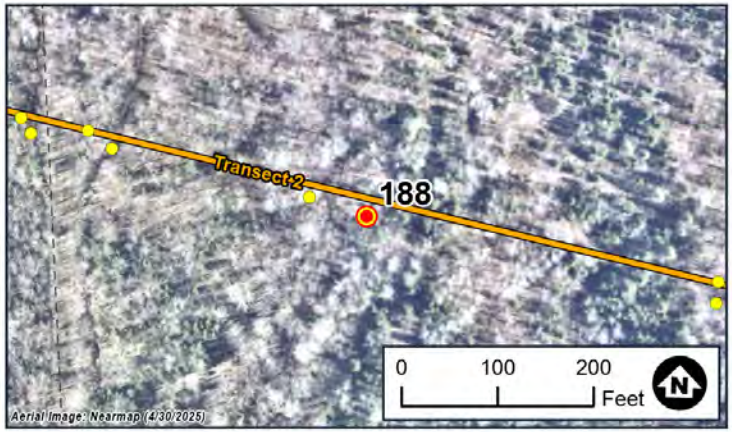
*Note: Photo locations are approximate*









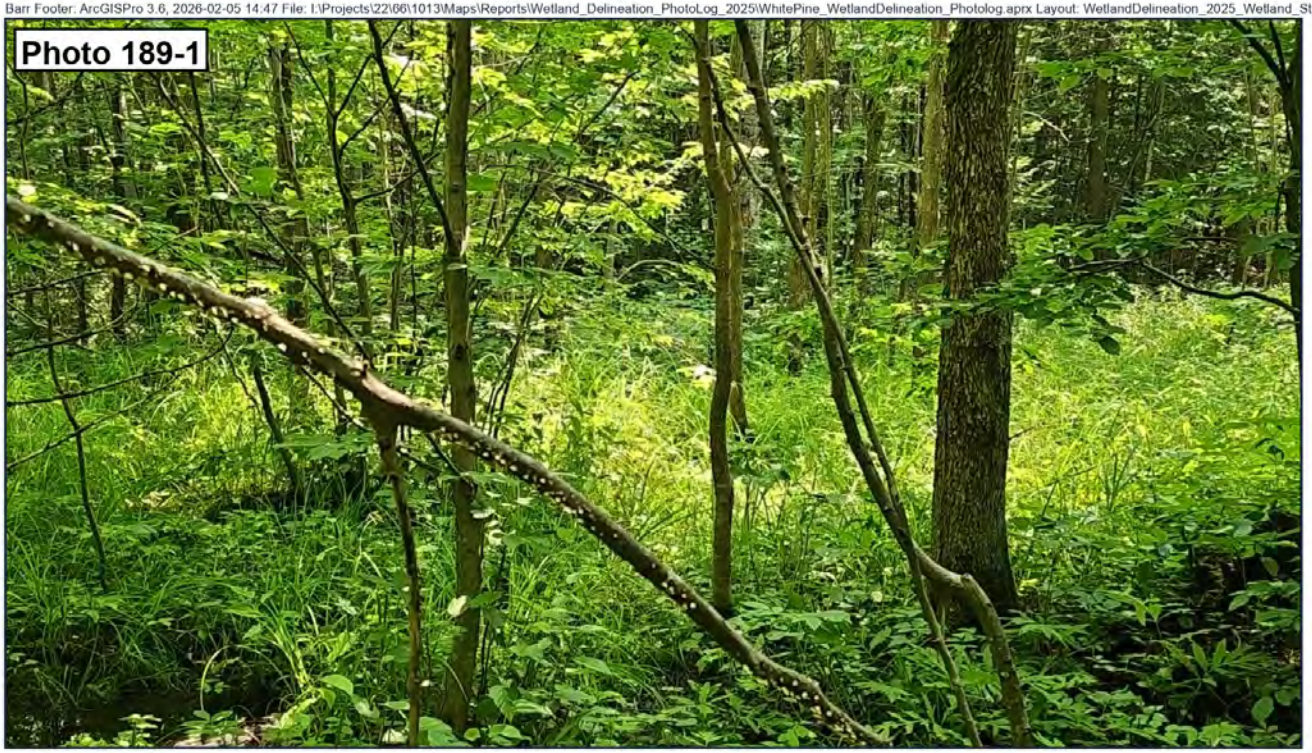


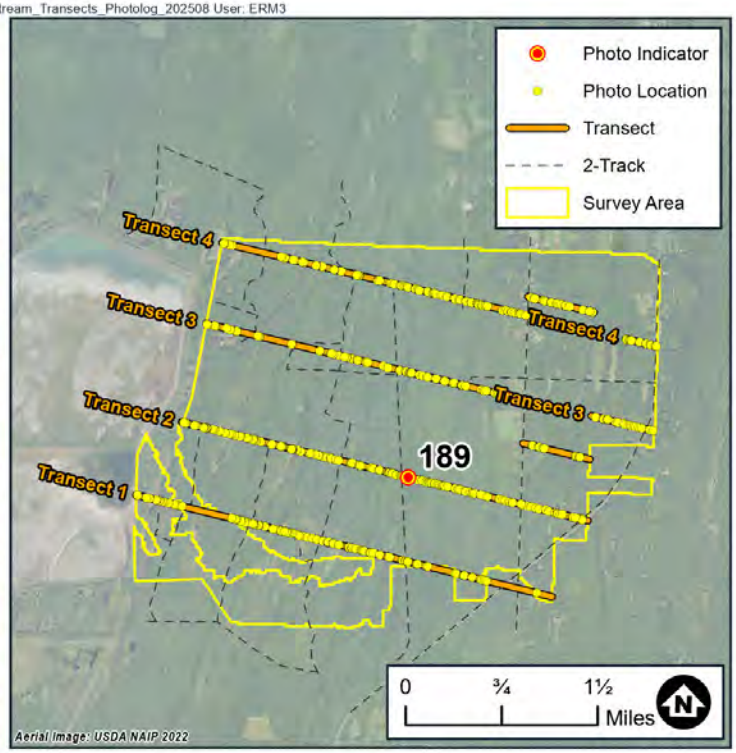

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP13-B, Wetland
**Photo 2 Caption:** T2E-BP13-B, Upland

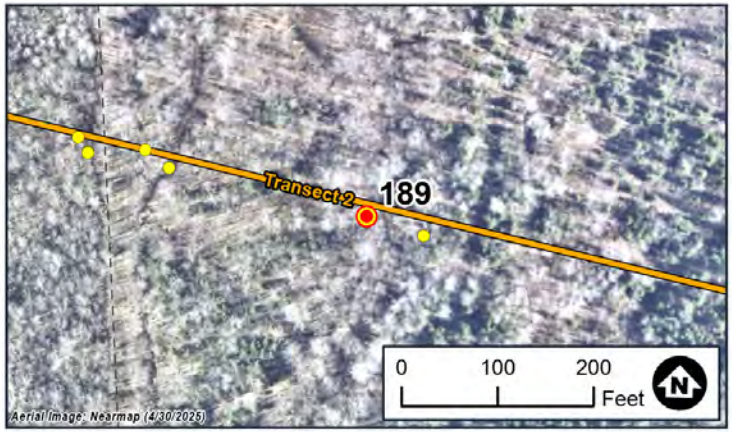
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP13-A, Wetland
**Photo 2 Caption:** T2E-BP13-A, Upland

*Note: Photo locations are approximate*

**Photo 190-1**



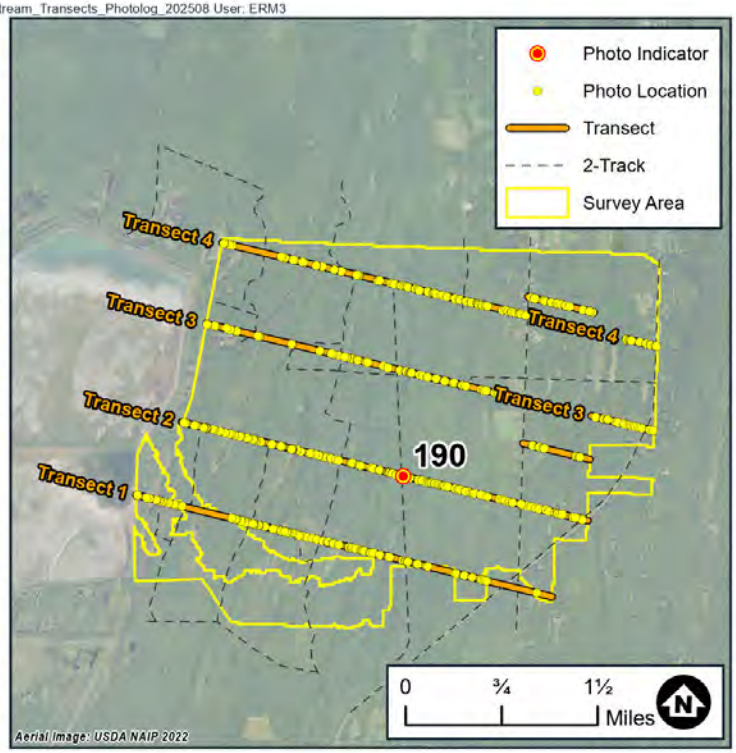
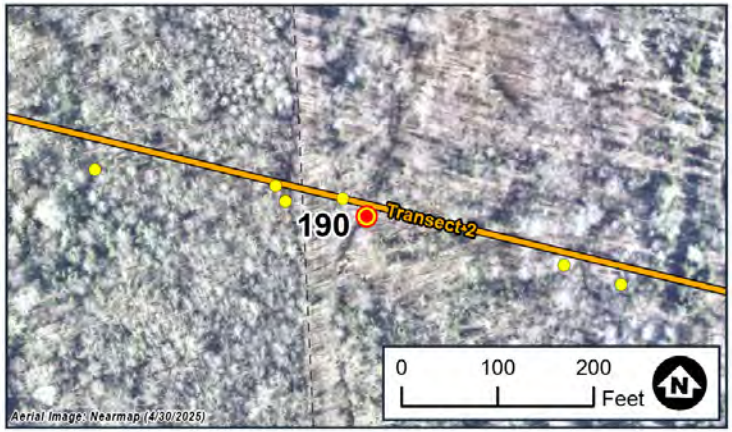



**Photo 190-2**







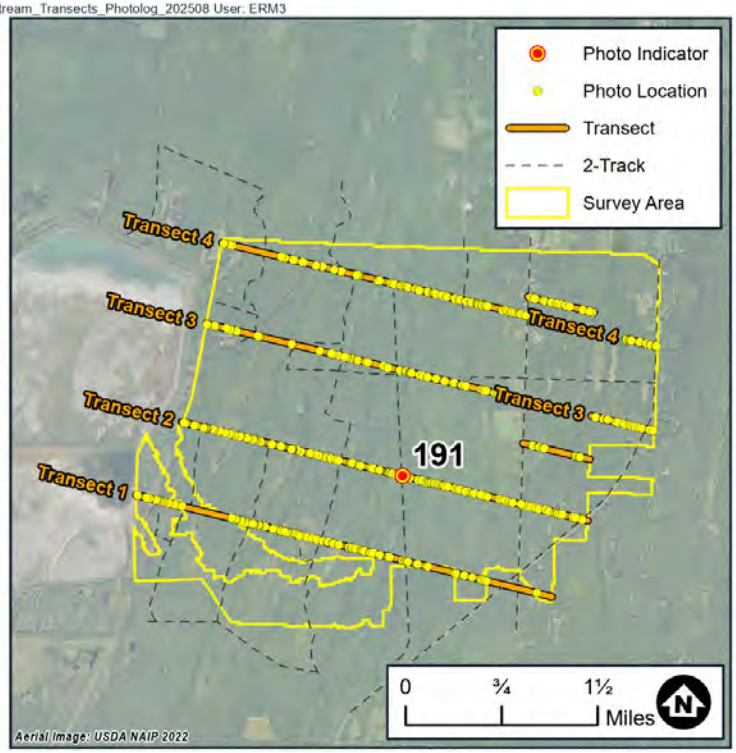

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP12-B, Wetland
**Photo 2 Caption:** T2E-BP12-B, Upland

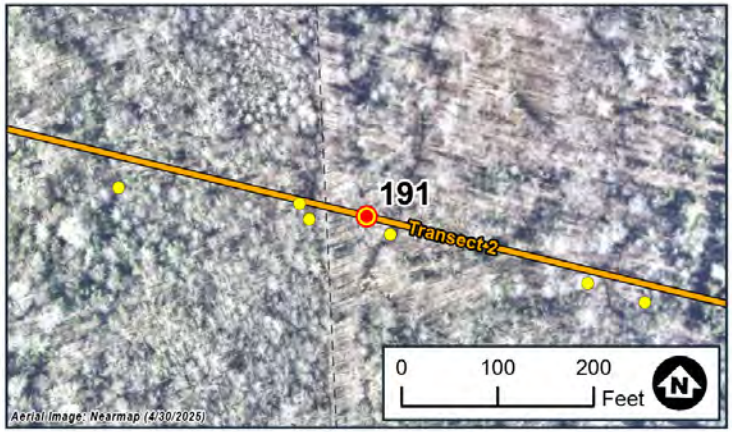
*Note: Photo locations are approximate*










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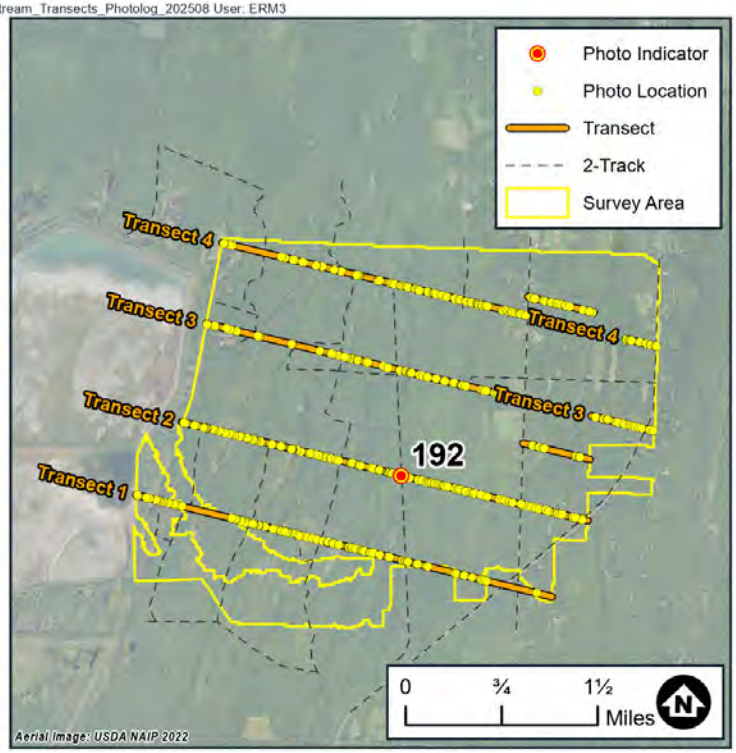
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP12-A, Wetland
**Photo 2 Caption:** T2E-BP12-A, Upland

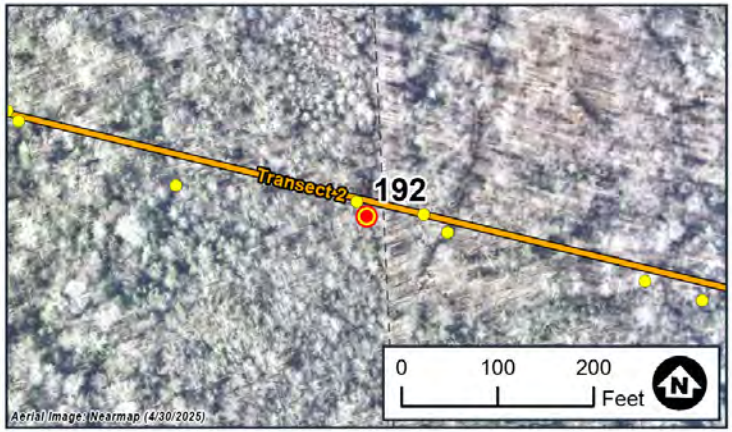
*Note: Photo locations are approximate*











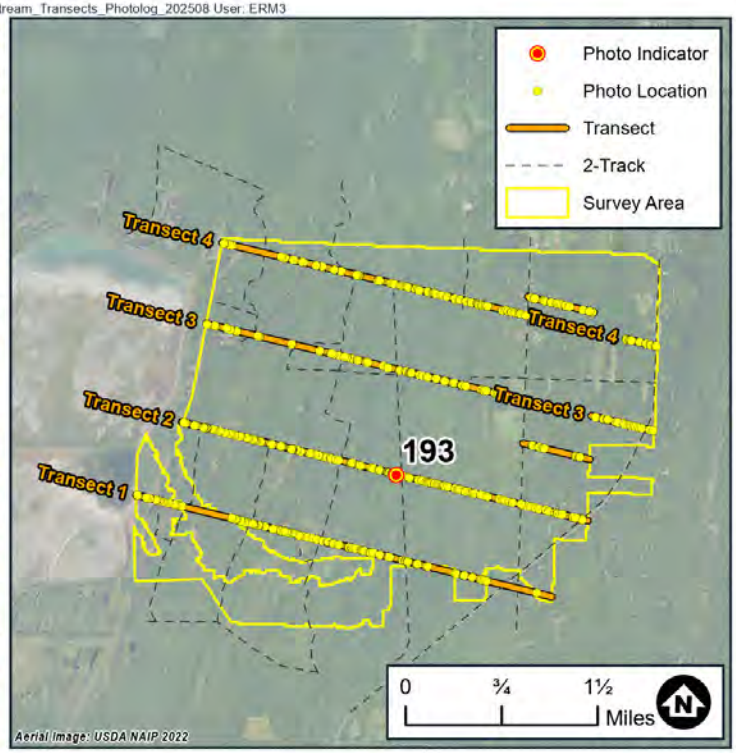

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP11-B, Wetland
**Photo 2 Caption:** T2E-BP11-B, Upland

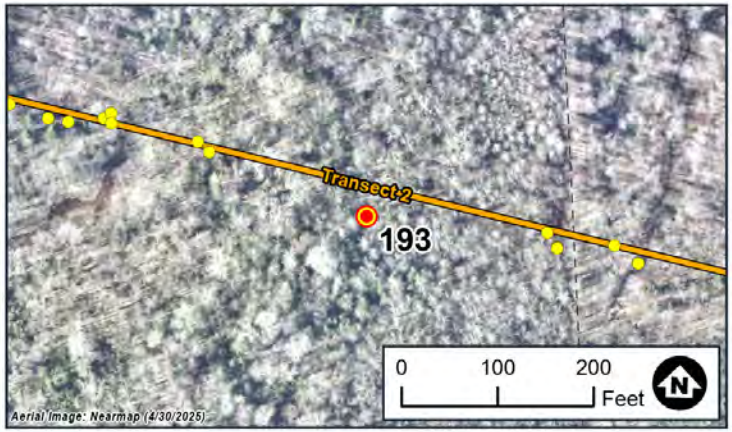
*Note: Photo locations are approximate*











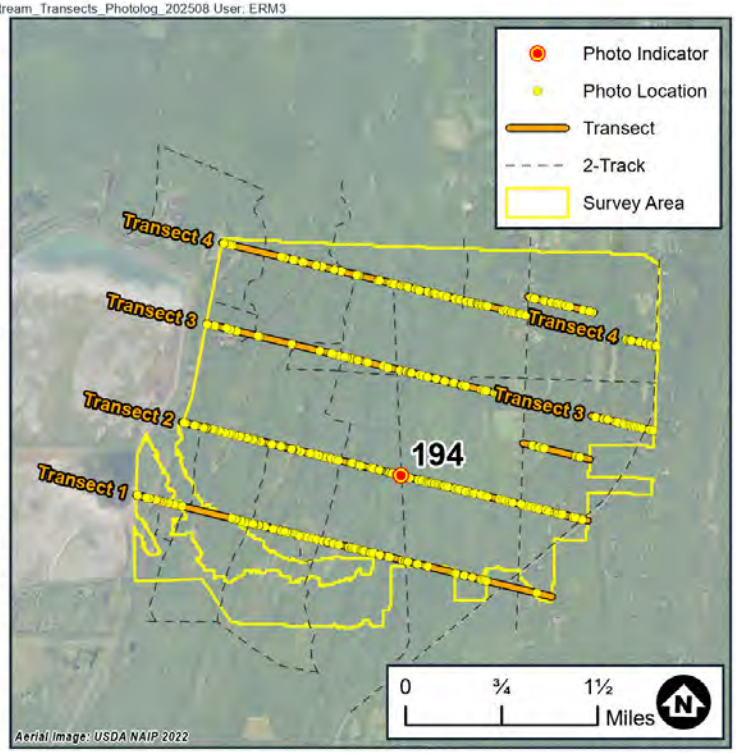

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP11-A, Wetland
**Photo 2 Caption:** T2E-BP11-A, Upland

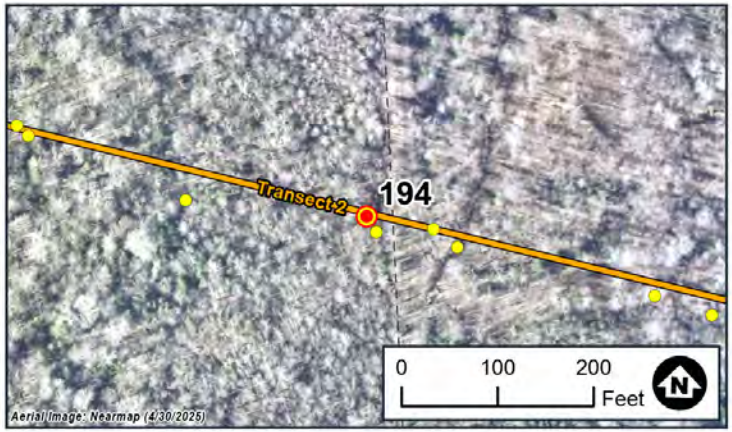
*Note: Photo locations are approximate*









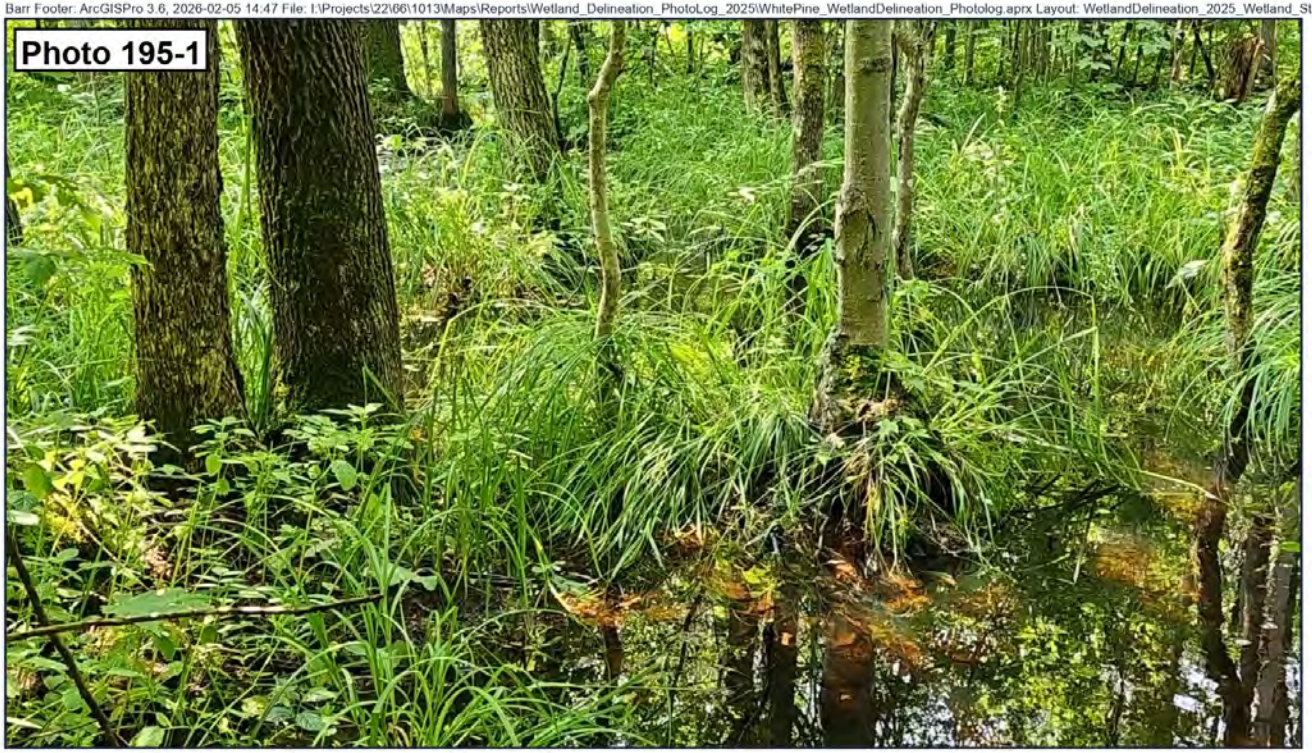


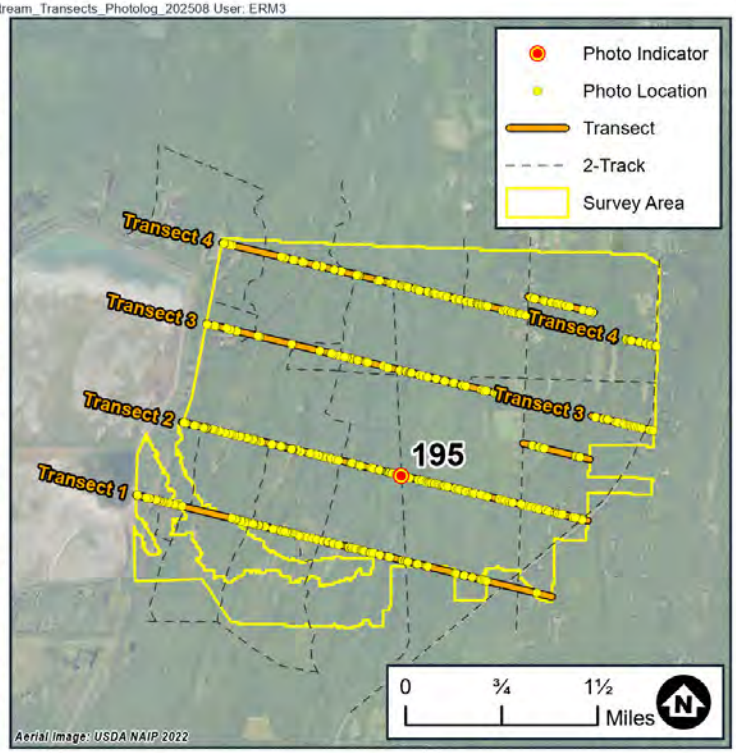

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S04-LB, Upstream
**Photo 2 Caption:** T2E-S04-LB, Downstream

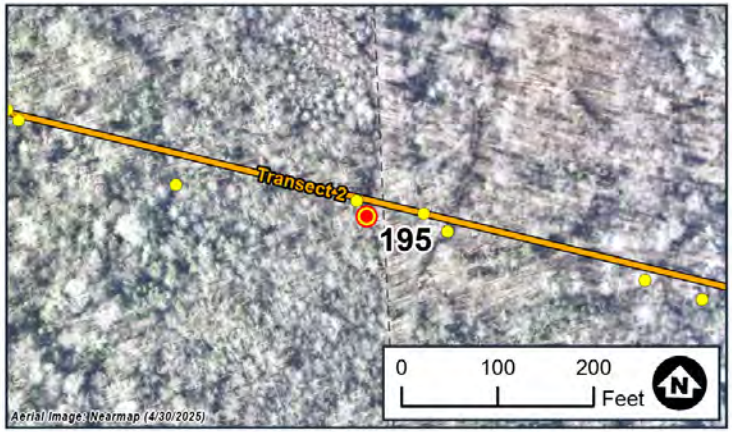
*Note: Photo locations are approximate*











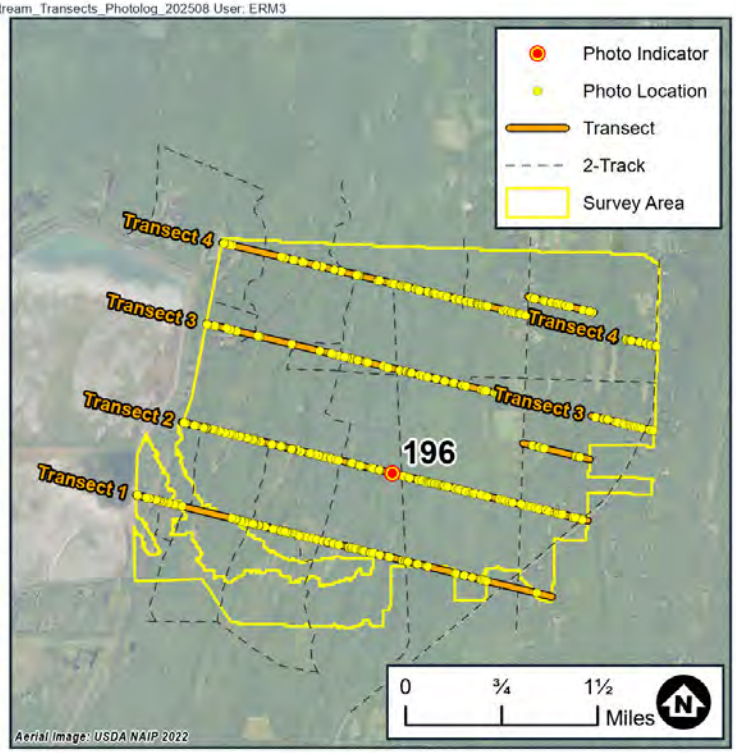

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S04-RB, Upstream
**Photo 2 Caption:** T2E-S04-RB, Downstream

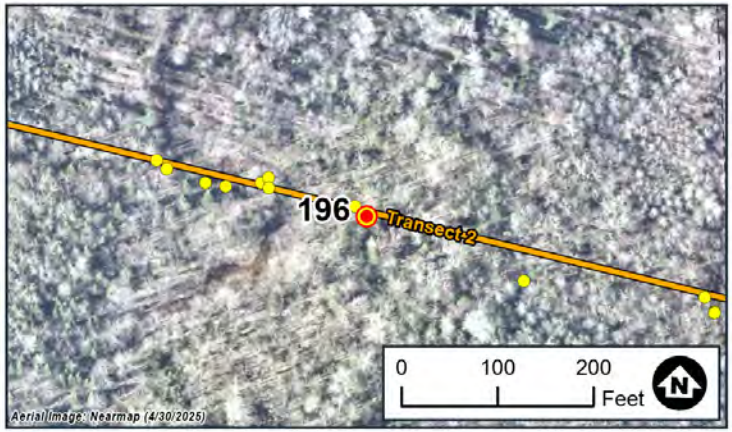
*Note: Photo locations are approximate*











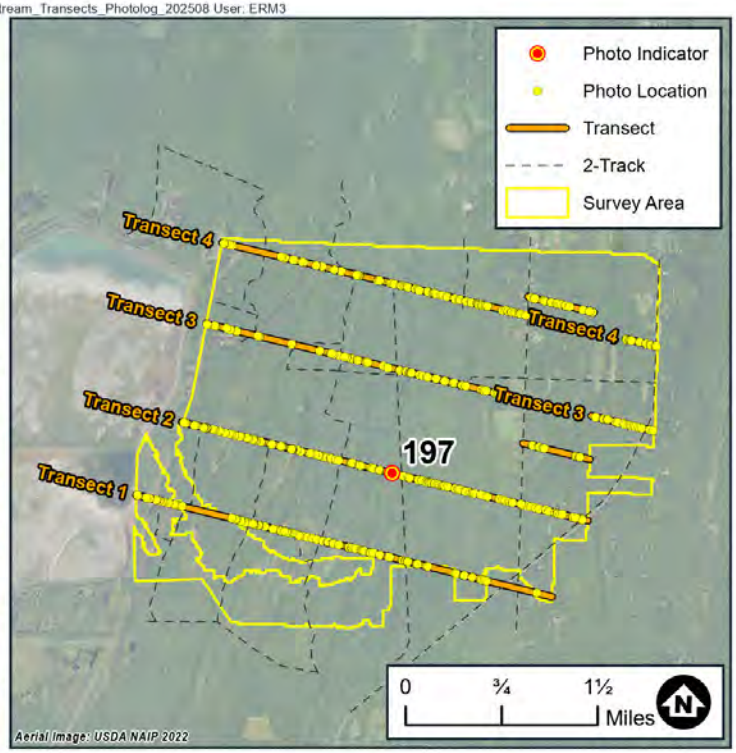

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP10-B, Wetland
**Photo 2 Caption:** T2E-BP10-B, Upland

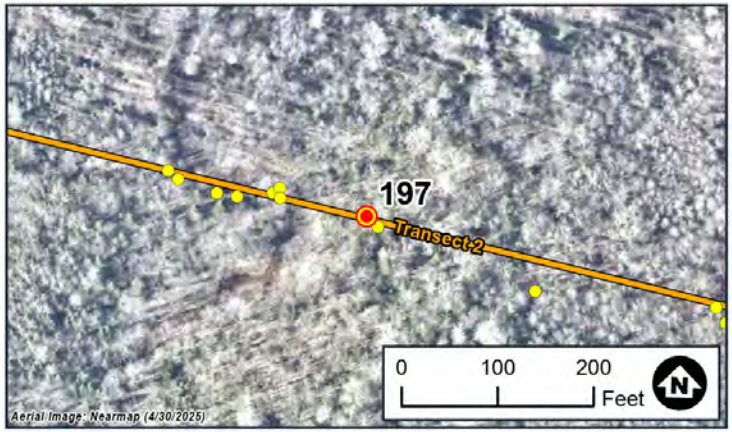
*Note: Photo locations are approximate*











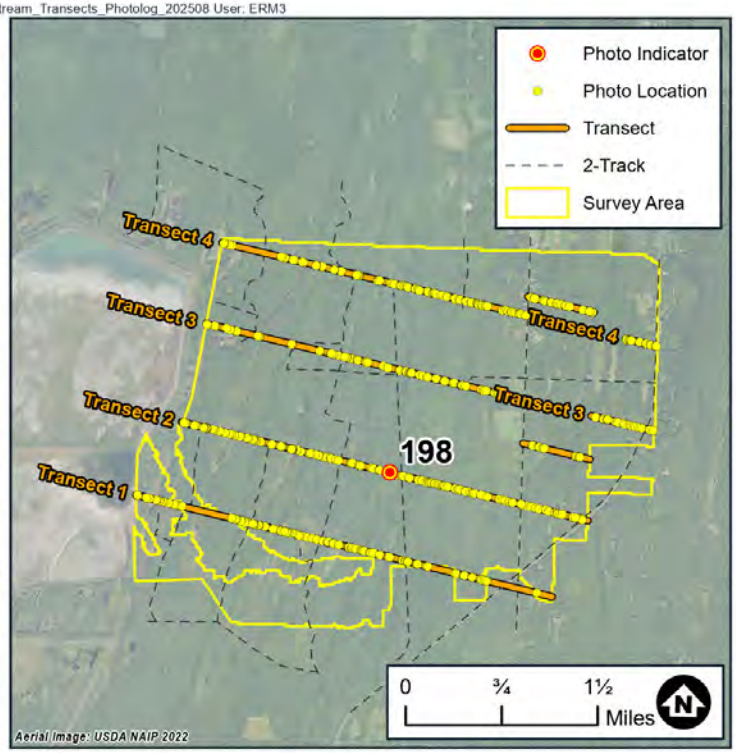

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP10-A, Wetland
**Photo 2 Caption:** T2E-BP10-A, Upland

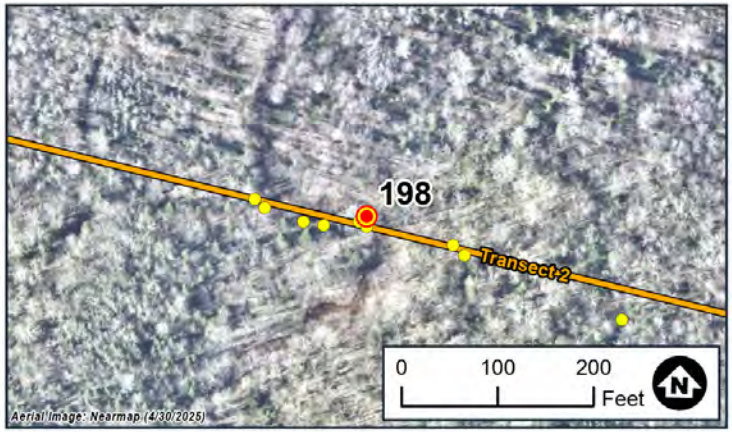
*Note: Photo locations are approximate*











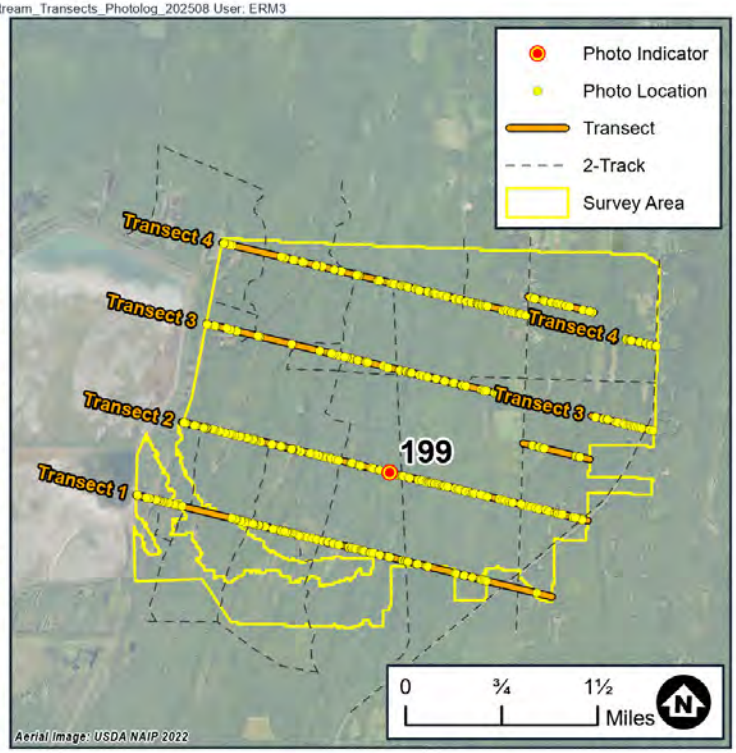

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP09-A, Wetland
**Photo 2 Caption:** T2E-BP09-A, Upland

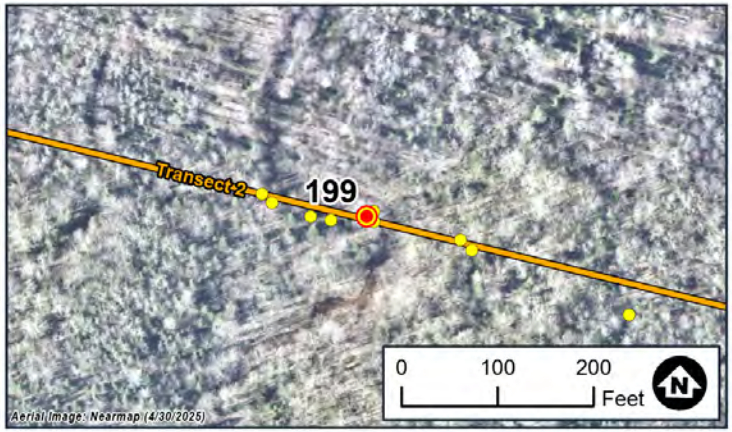
*Note: Photo locations are approximate*











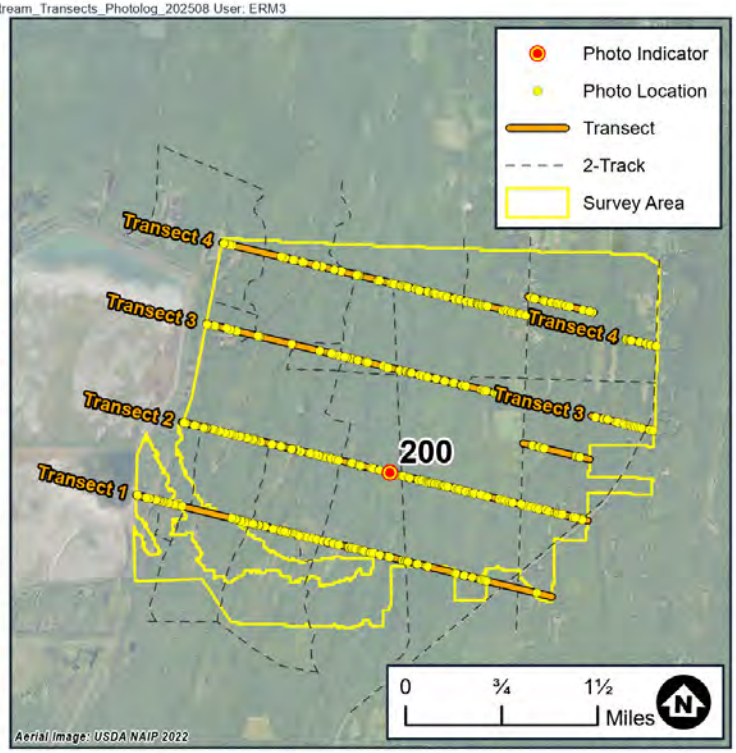

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S03-LB, Upstream
**Photo 2 Caption:** T2E-S03-LB, Downstream

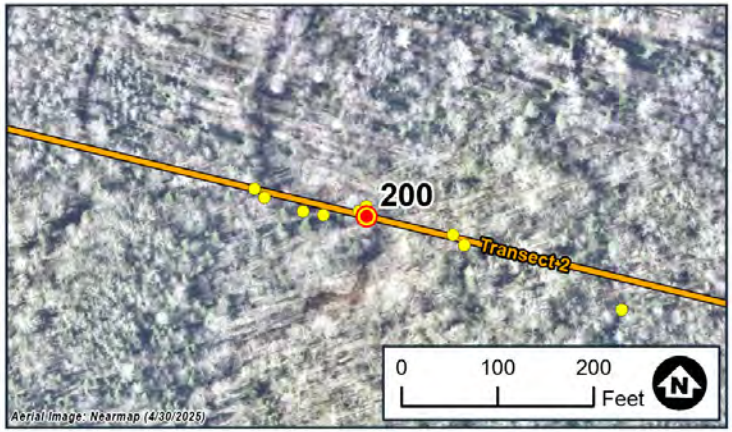
*Note: Photo locations are approximate*











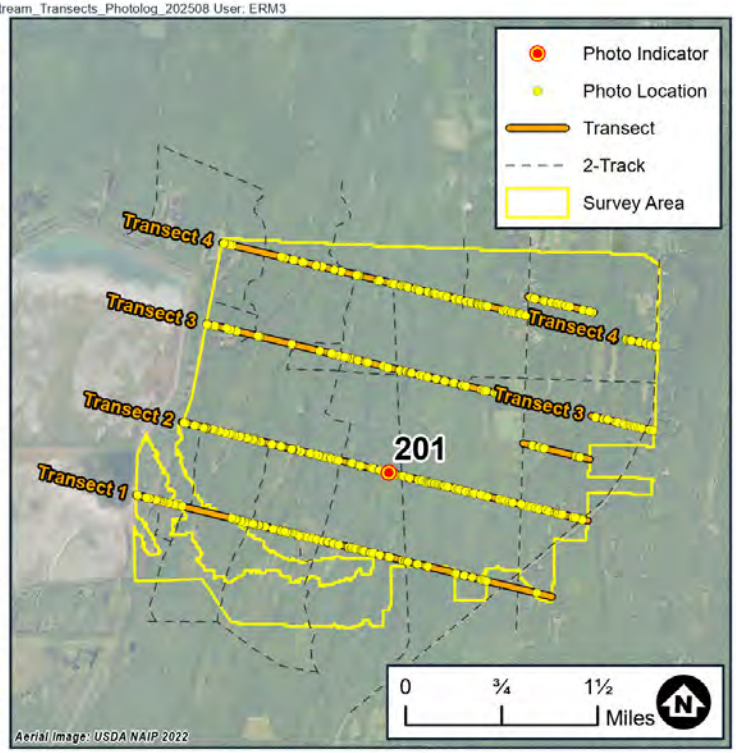

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S03-RB, Upstream
**Photo 2 Caption:** T2E-S03-RB, Downstream

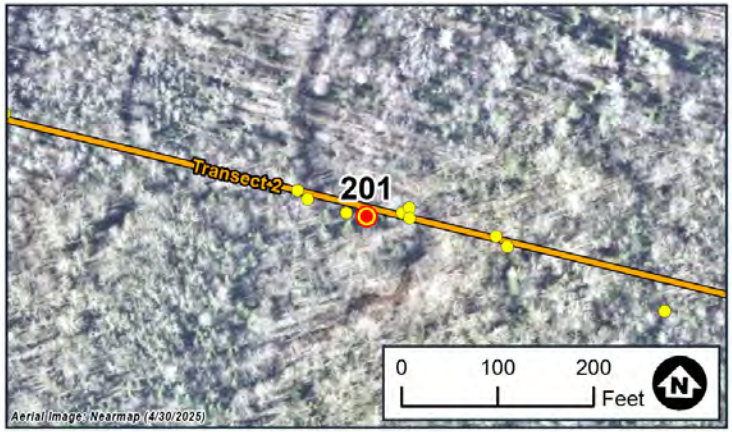
*Note: Photo locations are approximate*











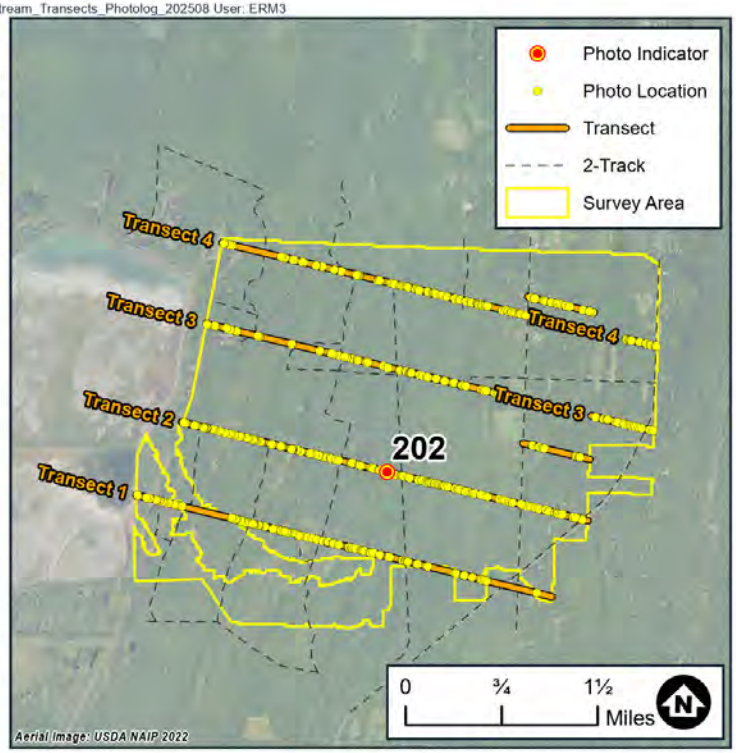

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP08-B, Wetland
**Photo 2 Caption:** T2E-BP08-B, Upland

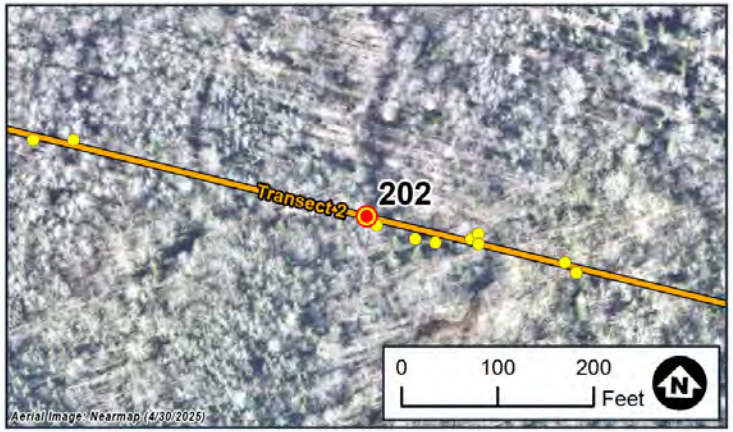
*Note: Photo locations are approximate*










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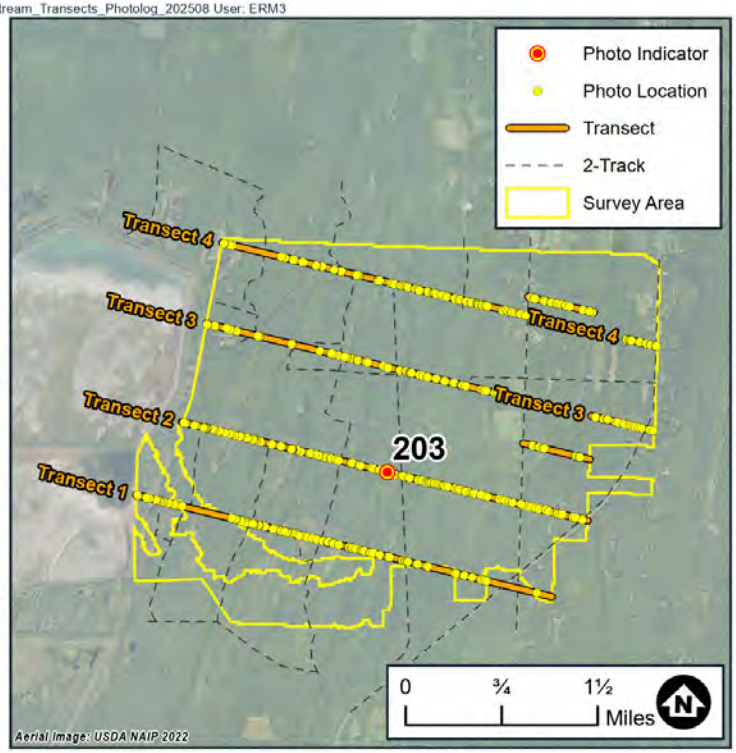
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP08-A, Wetland
**Photo 2 Caption:** T2E-BP08-A, Upland

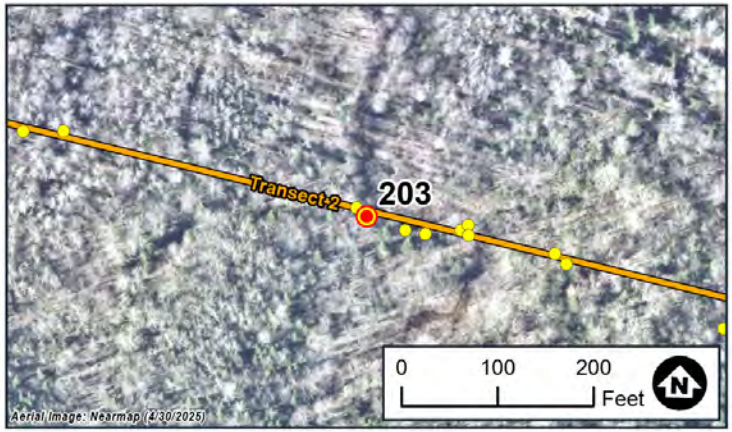
*Note: Photo locations are approximate*











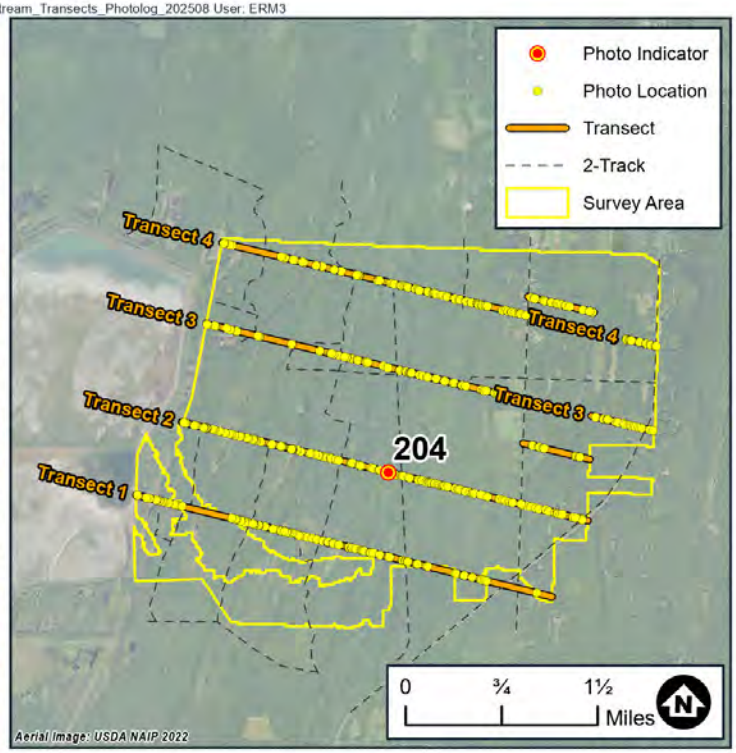

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S03-LB, Upstream
**Photo 2 Caption:** T2E-S03-LB, Downstream

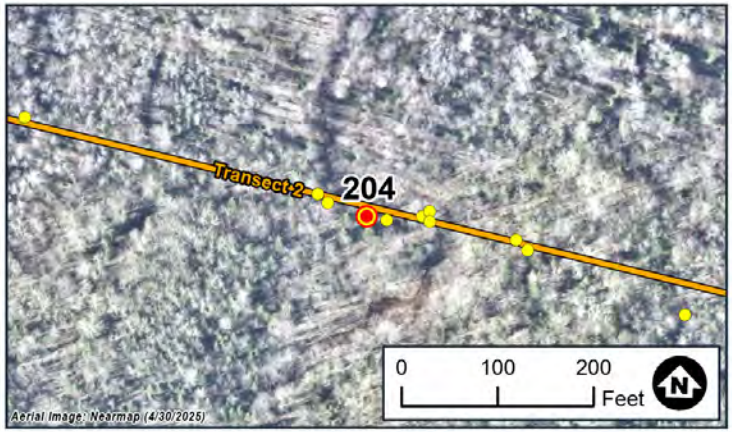
*Note: Photo locations are approximate*









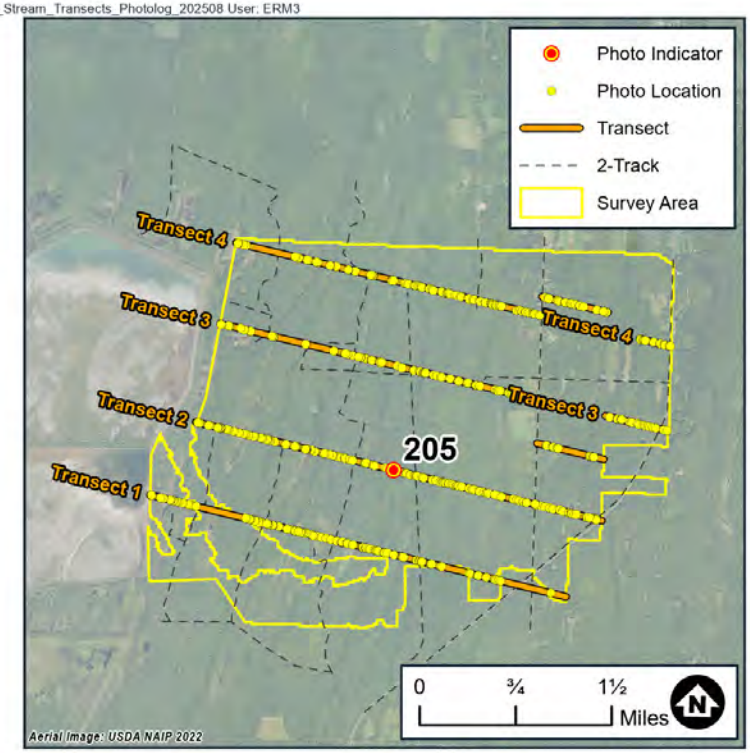

Page 204 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

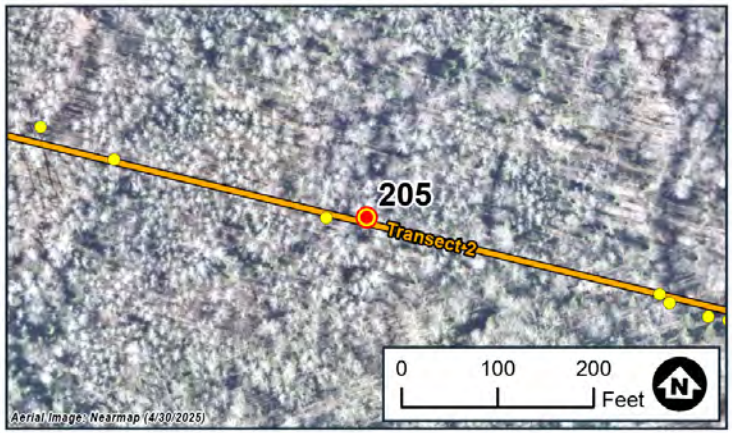
**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S03-RB, Upstream
**Photo 2 Caption:** T2E-S03-RB, Downstream

*Note: Photo locations are approximate*

## Photo 205-1




## Photo 205-2




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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP07-B, Wetland
**Photo 2 Caption:** T2E-BP07-B, Upland

*Note: Photo locations are approximate*

**Photo 206-1**



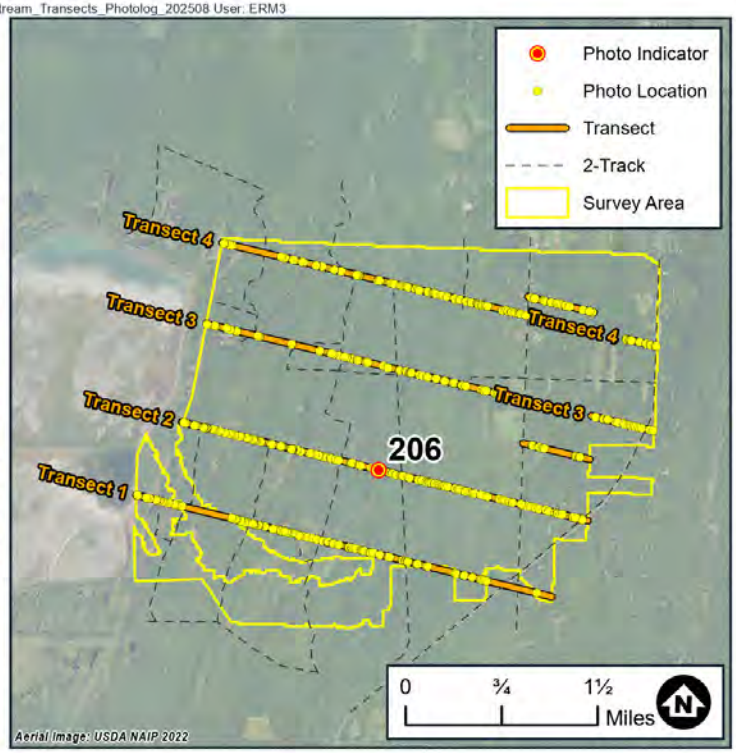
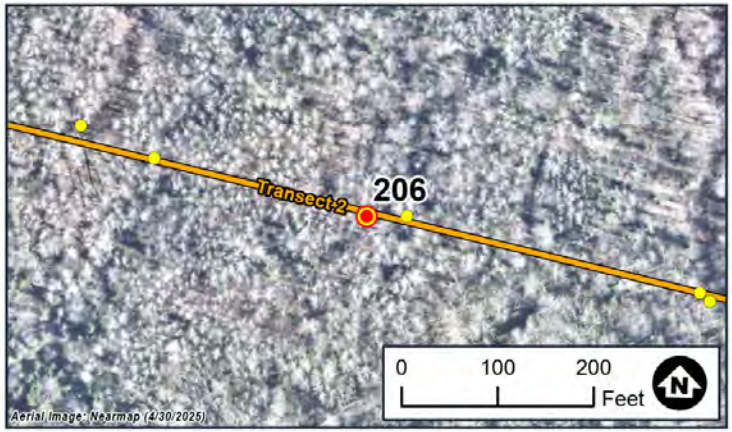



**Photo 206-2**






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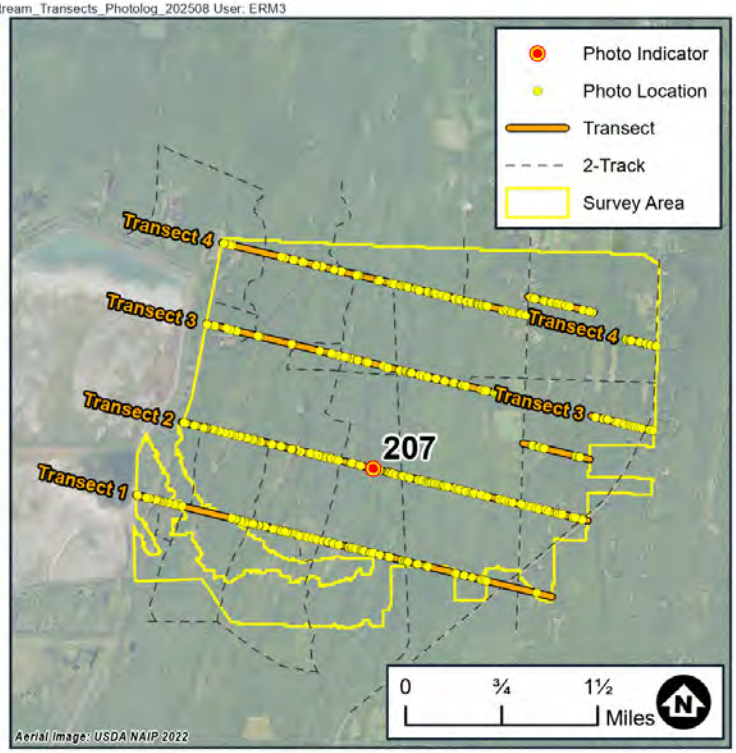
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP07-A, Wetland
**Photo 2 Caption:** T2E-BP07-A, Upland

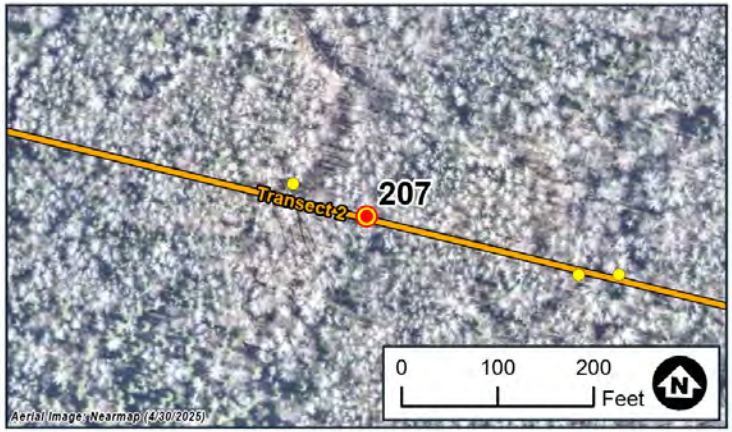
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP06-B, Wetland
**Photo 2 Caption:** T2E-BP06-B, Upland

*Note: Photo locations are approximate*

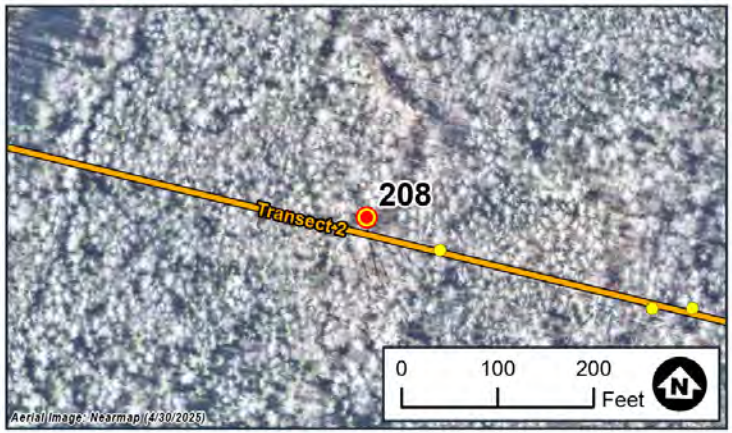
## Photo 208-1






## Photo 208-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

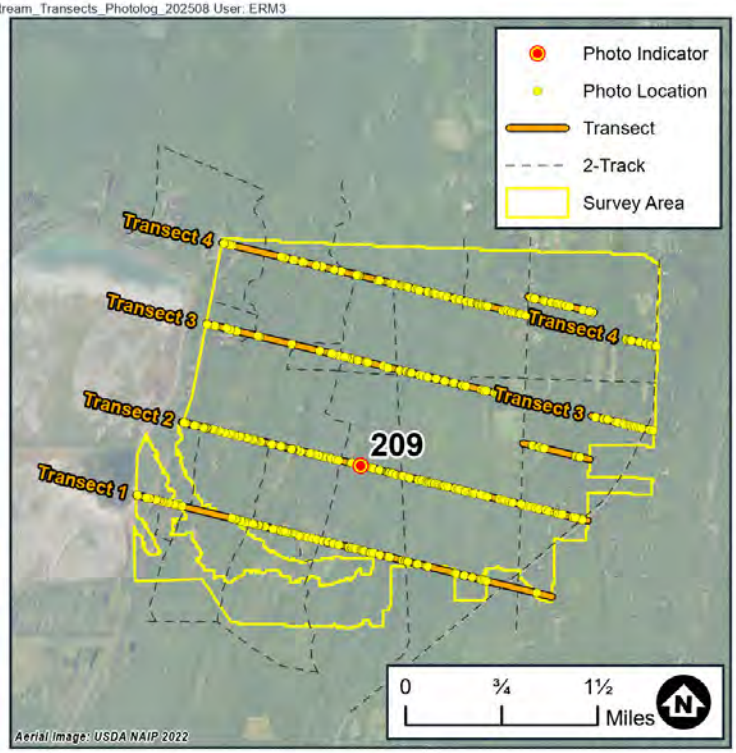
**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP06-A, Wetland
**Photo 2 Caption:** T2E-BP06-A, Upland

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3

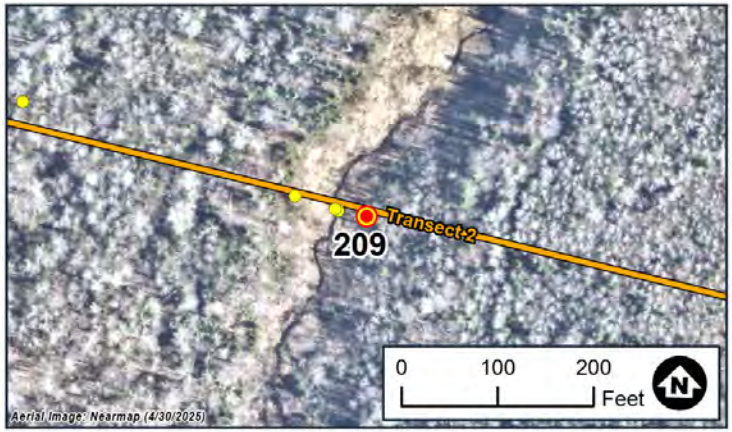
## Photo 209-1






## Photo 209-2







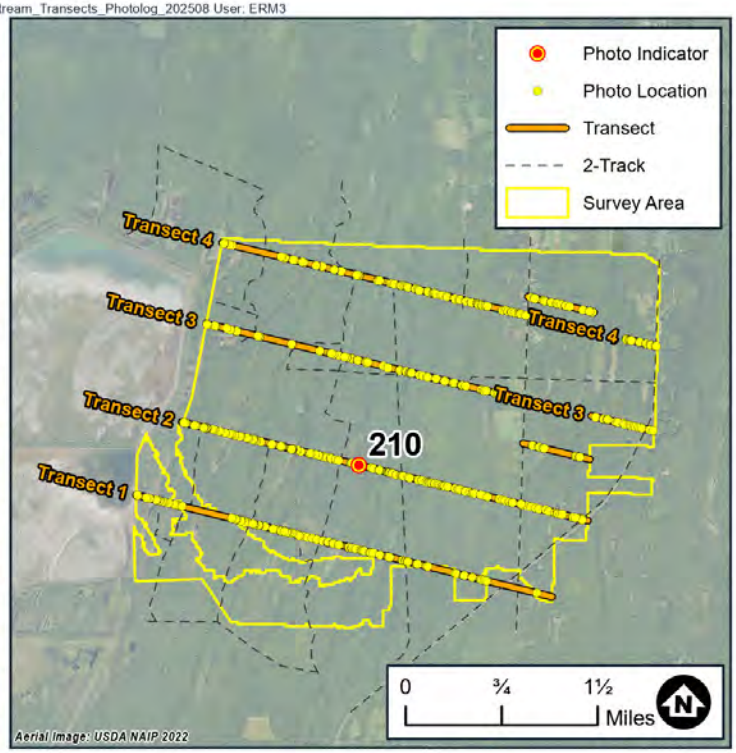

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP05-B, Wetland
**Photo 2 Caption:** T2E-BP05-B, Upland

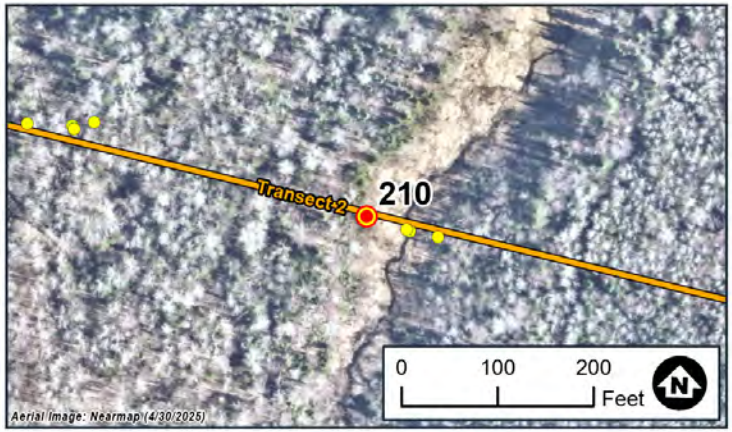
*Note: Photo locations are approximate*











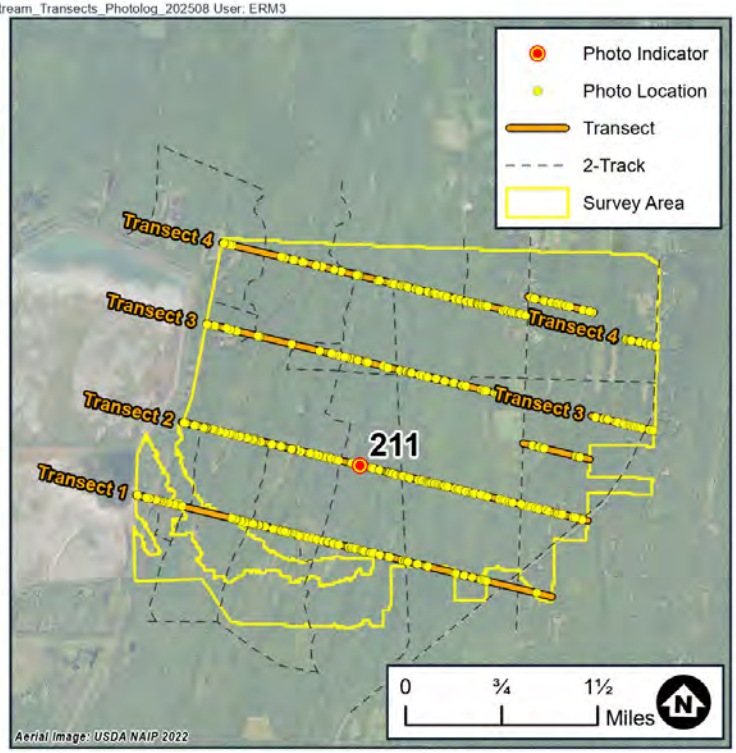

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP05-A, Wetland
**Photo 2 Caption:** T2E-BP05-A, Upland

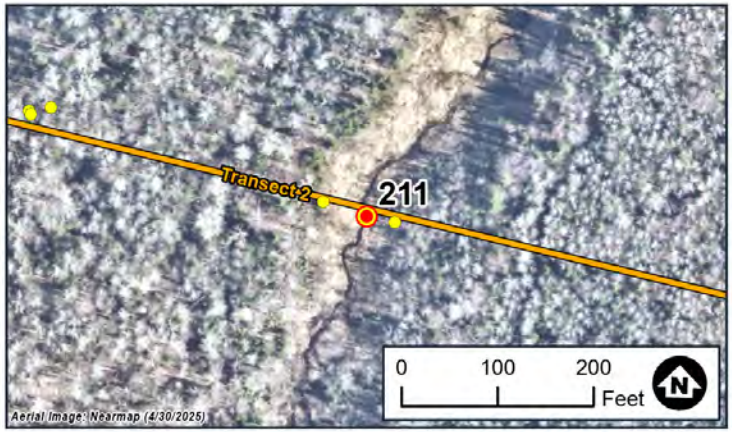
*Note: Photo locations are approximate*











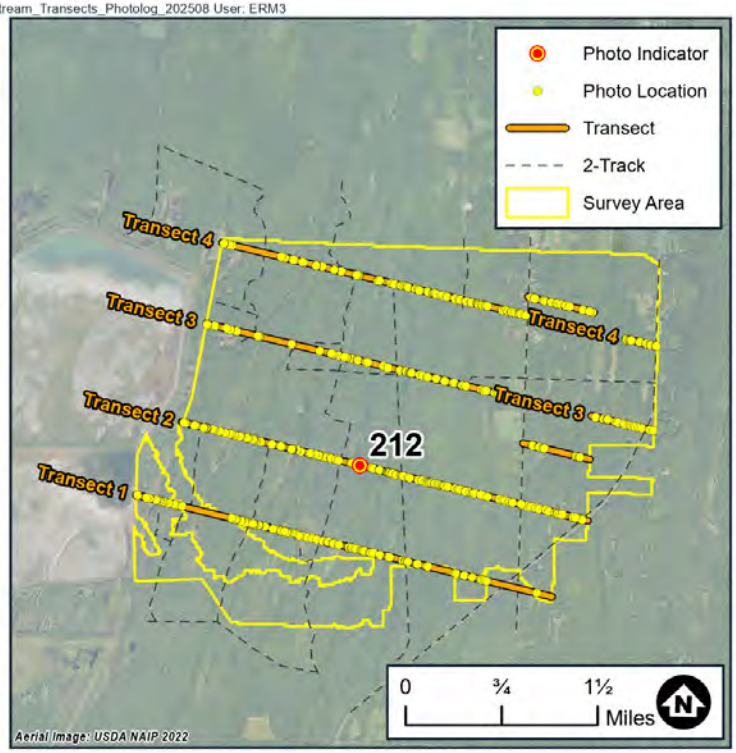

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S02-LB, Upstream
**Photo 2 Caption:** T2E-S02-LB, Downstream

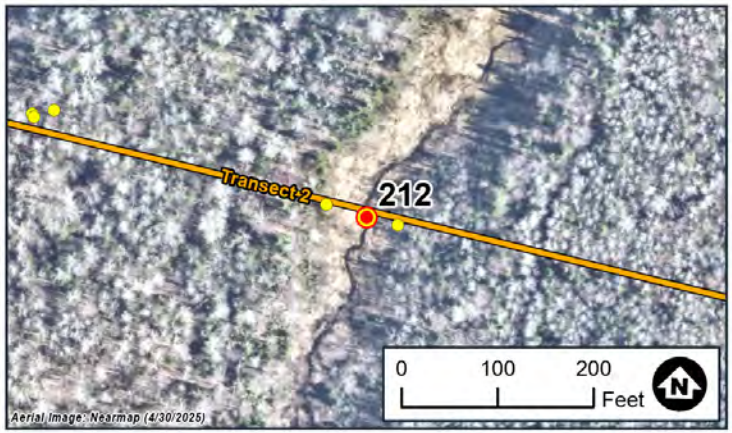
*Note: Photo locations are approximate*











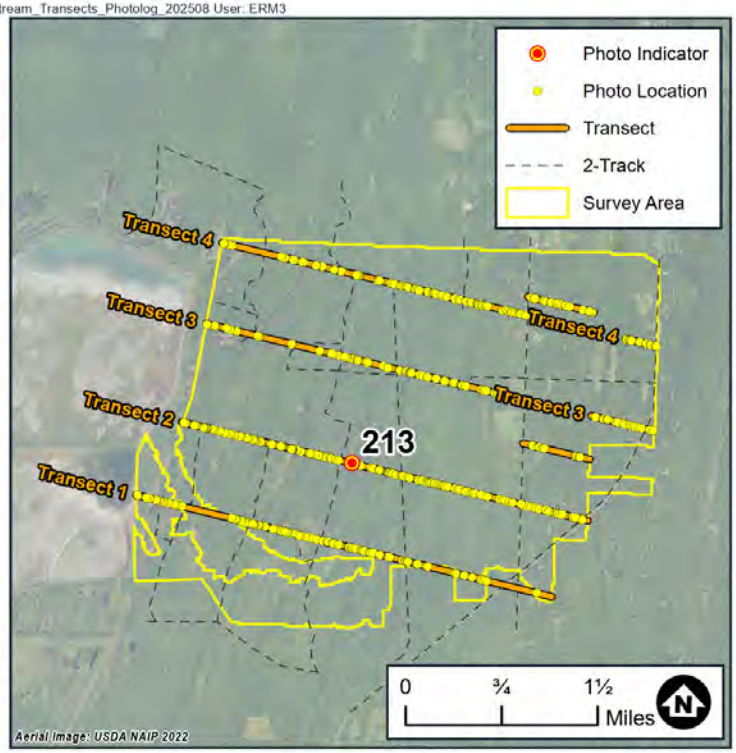

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S02-RB, Upstream
**Photo 2 Caption:** T2E-S02-RB, Downstream

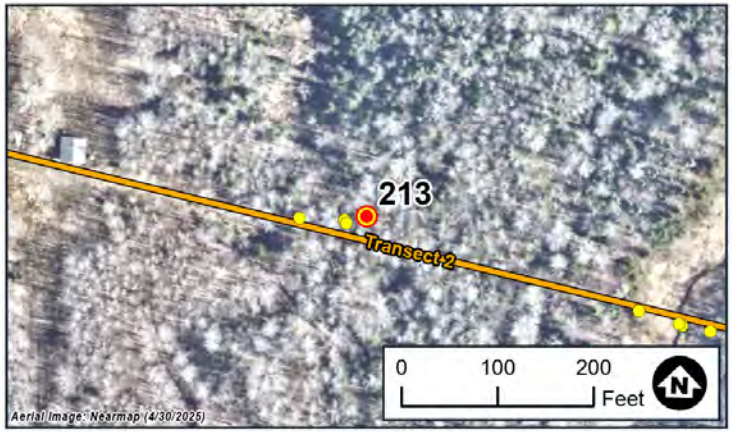
*Note: Photo locations are approximate*











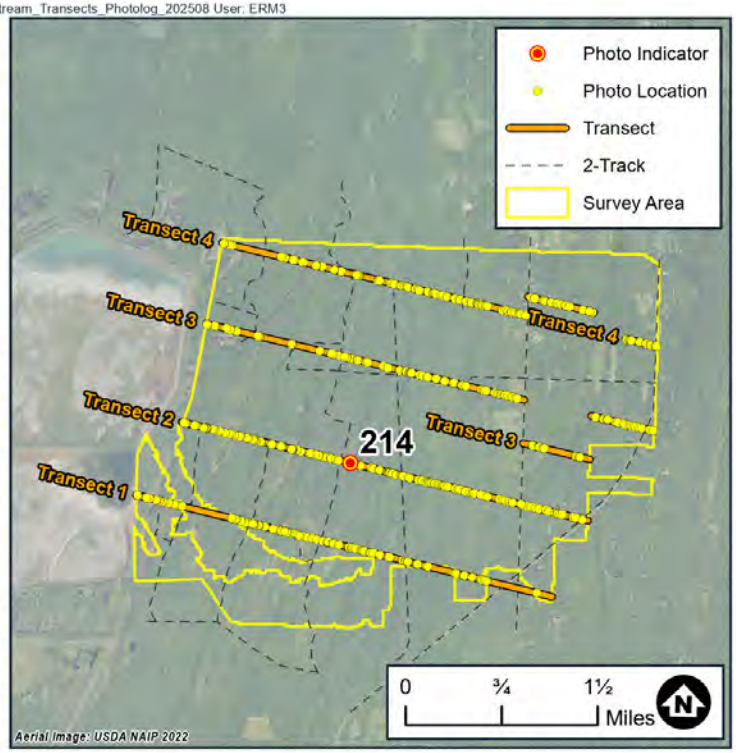

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP04-B, Wetland
**Photo 2 Caption:** T2E-BP04-B, Upland

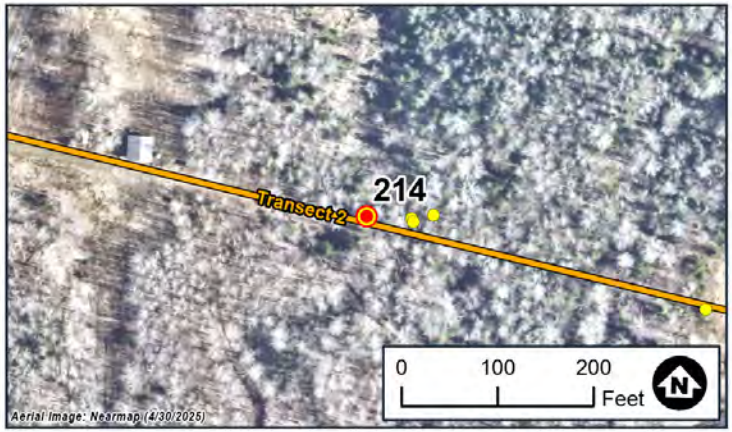
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

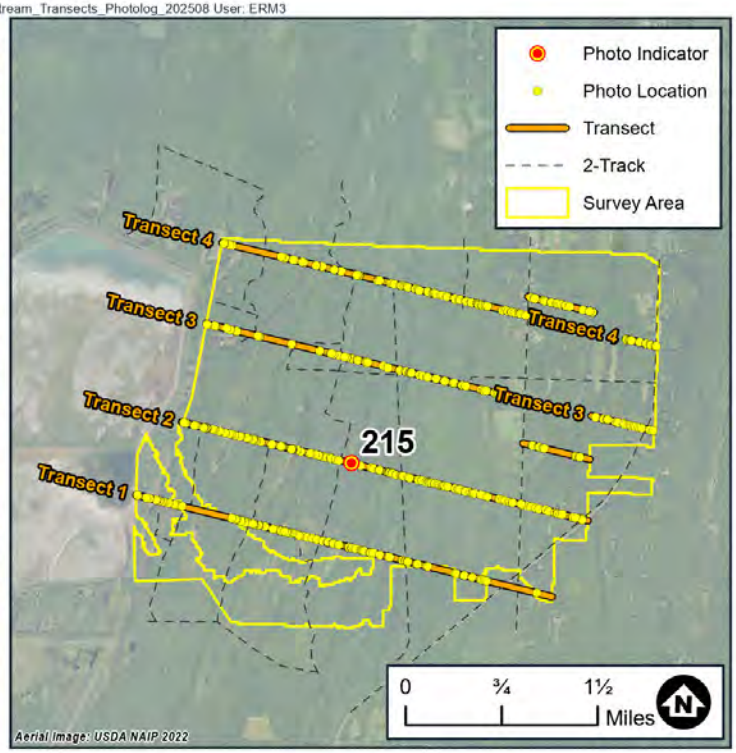
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP04-A, Wetland
**Photo 2 Caption:** T2E-BP04-A, Upland

*Note: Photo locations are approximate*

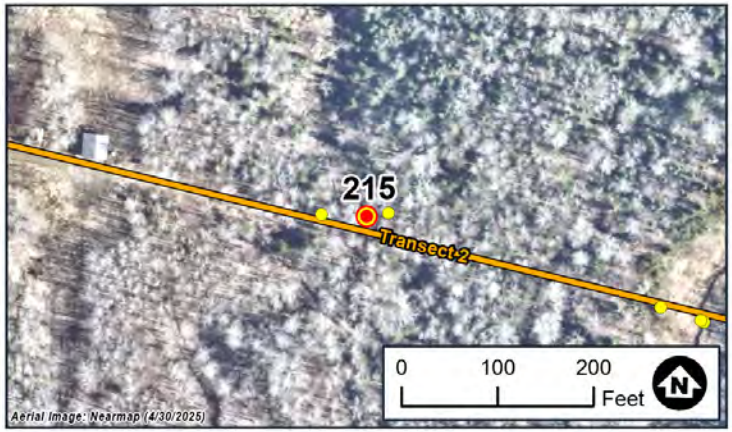
## Photo 215-1






## Photo 215-2






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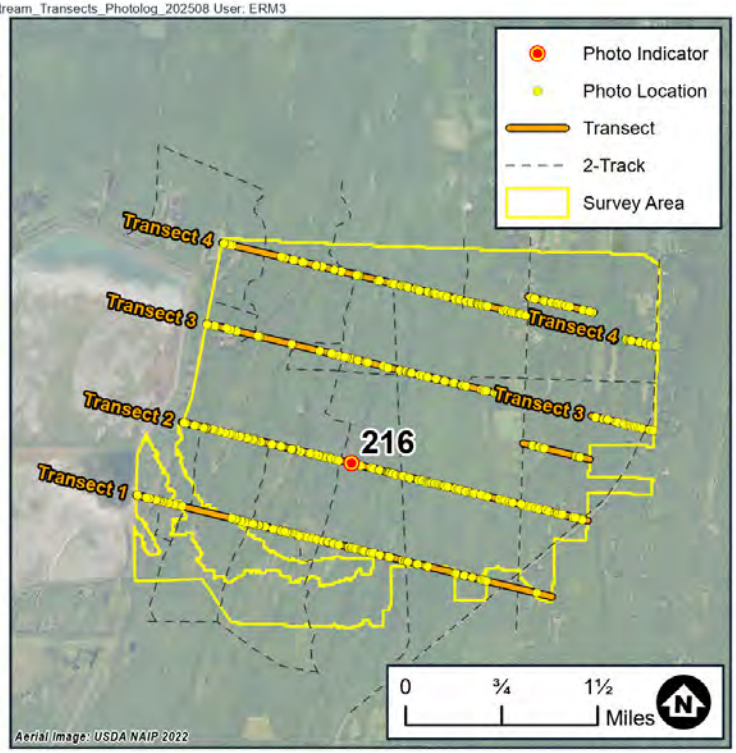
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S01-LB, Upstream
**Photo 2 Caption:** T2E-S01-LB, Downstream

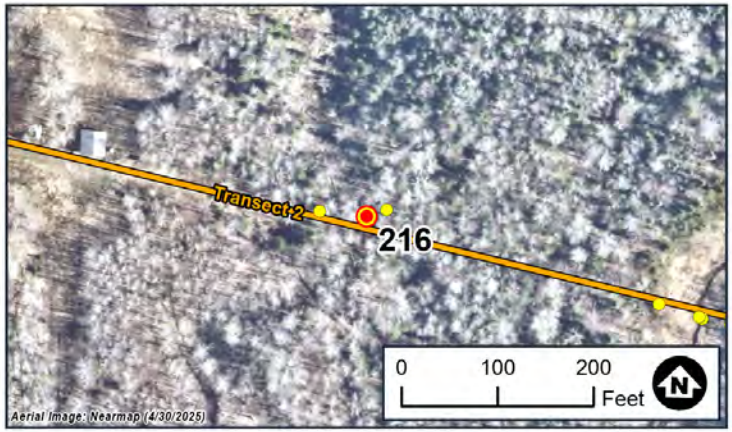
*Note: Photo locations are approximate*











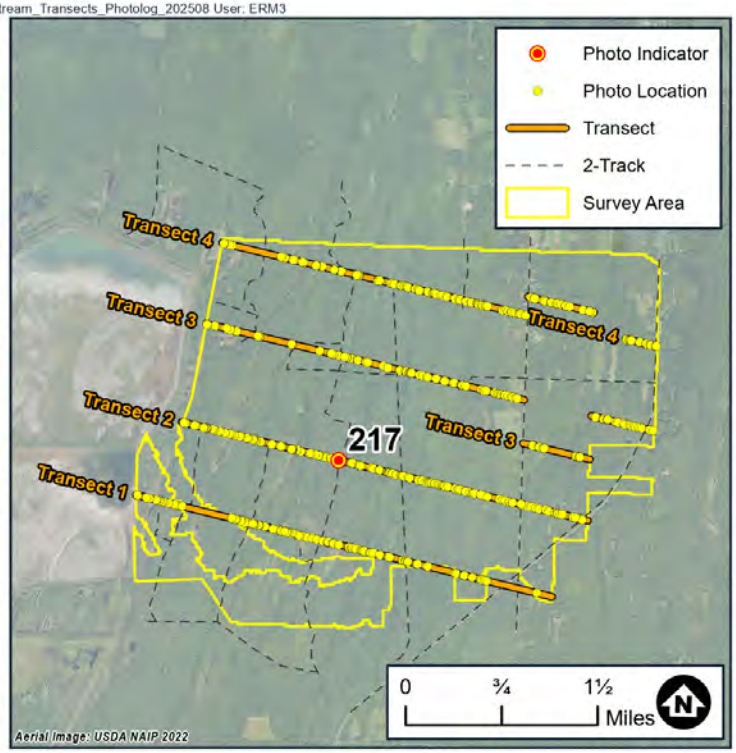

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-S01-RB, Upstream
**Photo 2 Caption:** T2E-S01-RB, Downstream

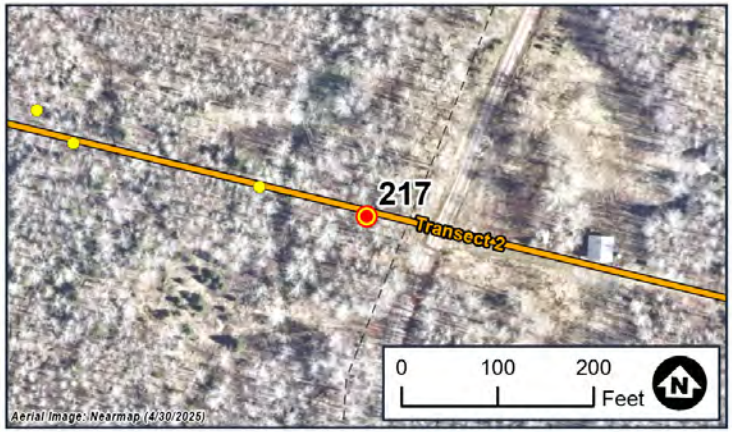
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

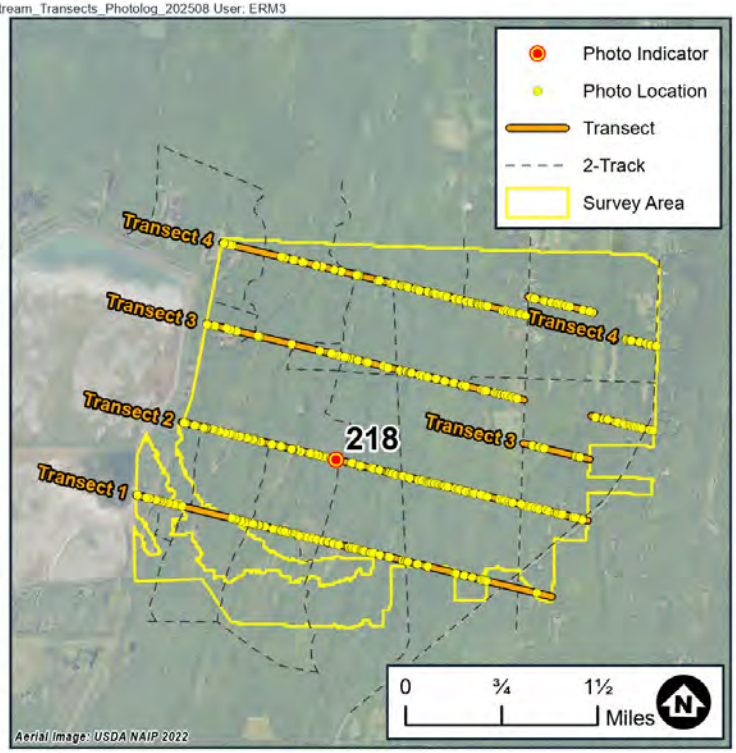
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP03-B, Wetland
**Photo 2 Caption:** T2E-BP03-B, Upland

*Note: Photo locations are approximate*

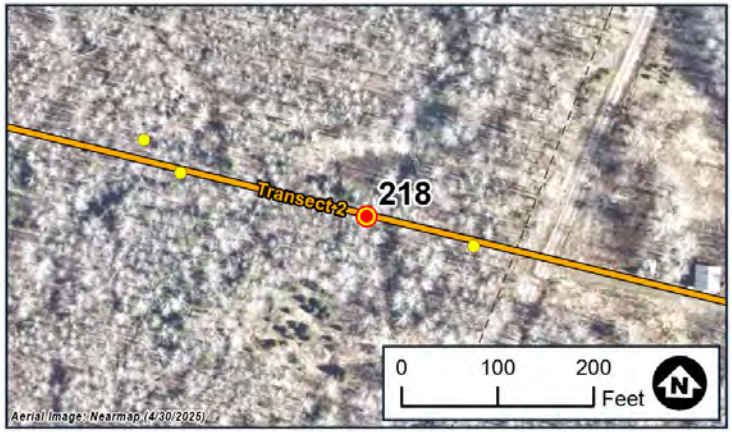
## Photo 218-1






## Photo 218-2







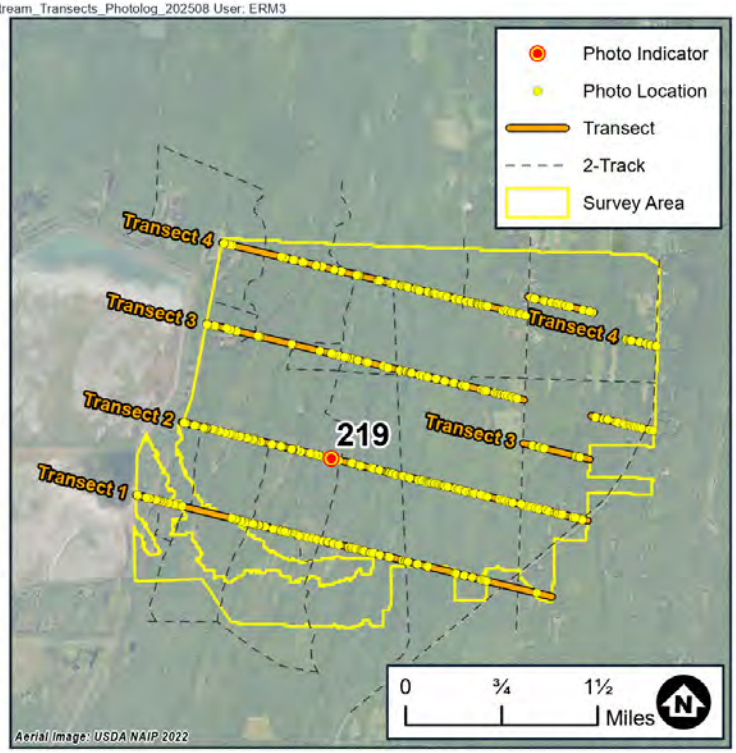

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP03-A, Wetland
**Photo 2 Caption:** T2E-BP03-A, Upland

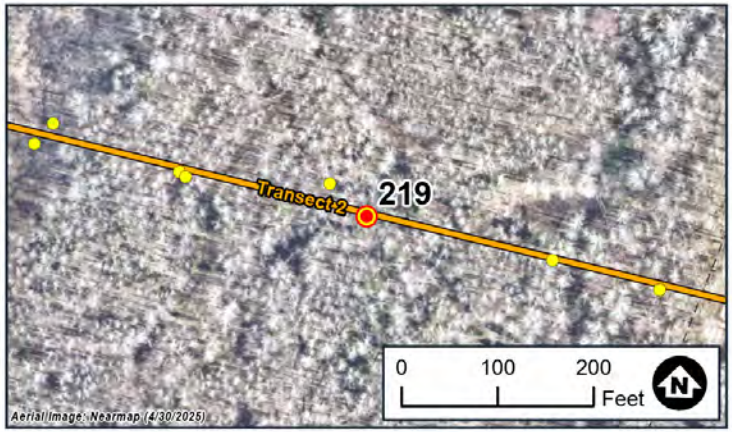
*Note: Photo locations are approximate*











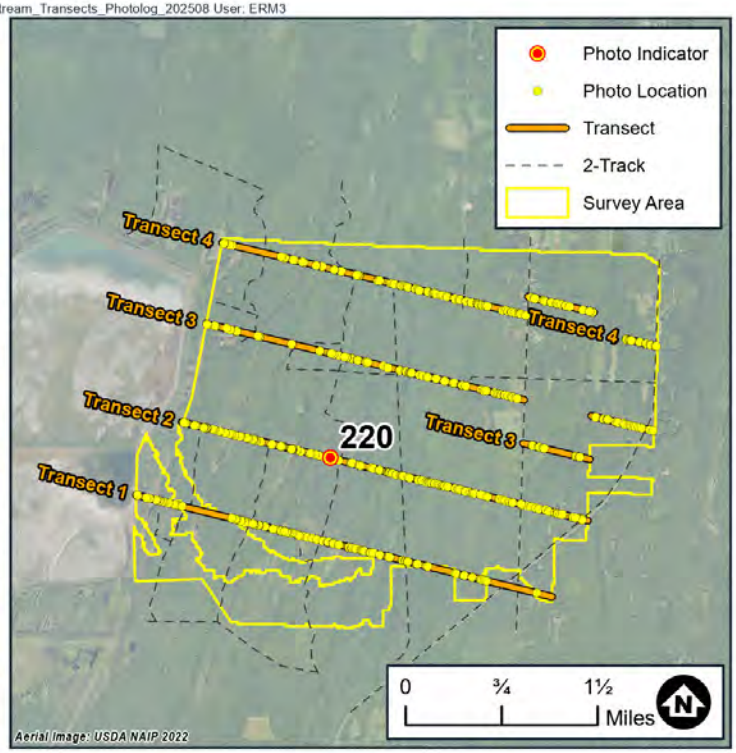

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP02-B, Wetland
**Photo 2 Caption:** T2E-BP02-B, Upland

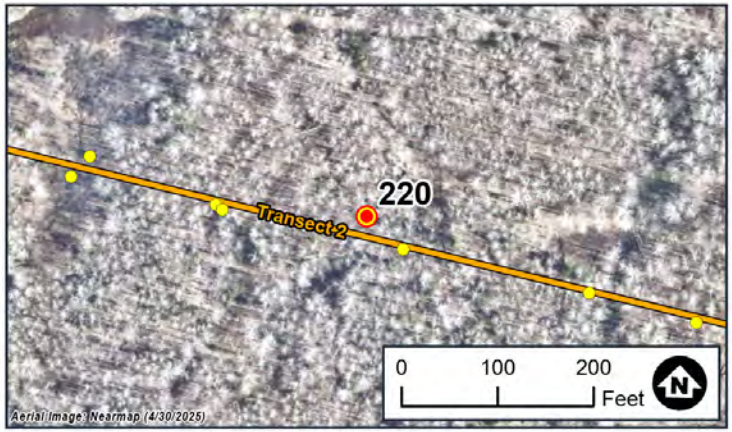
*Note: Photo locations are approximate*











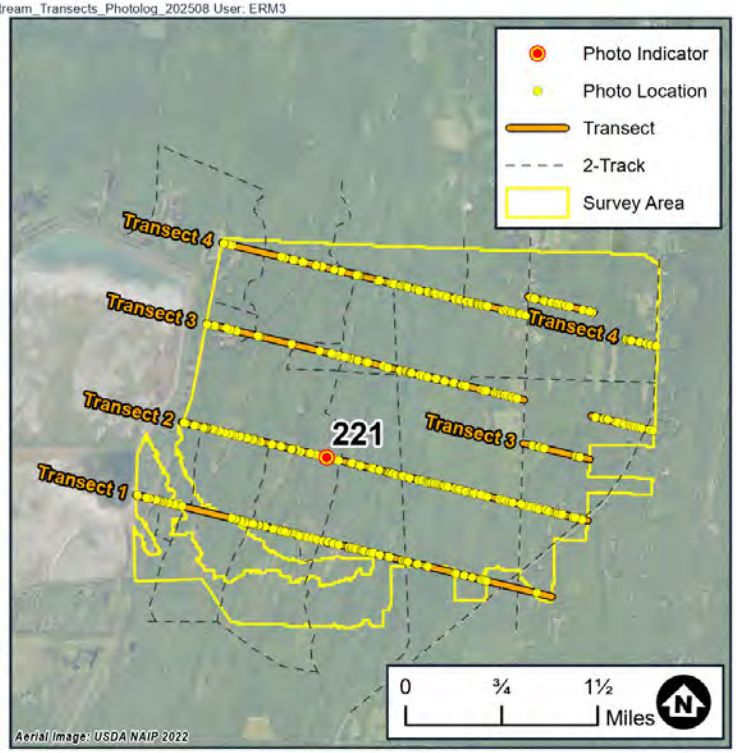

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP02-A, Wetland
**Photo 2 Caption:** T2E-BP02-A, Upland

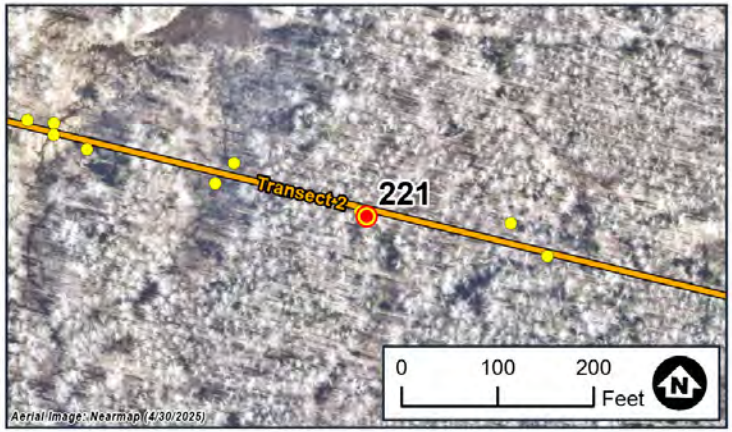
*Note: Photo locations are approximate*










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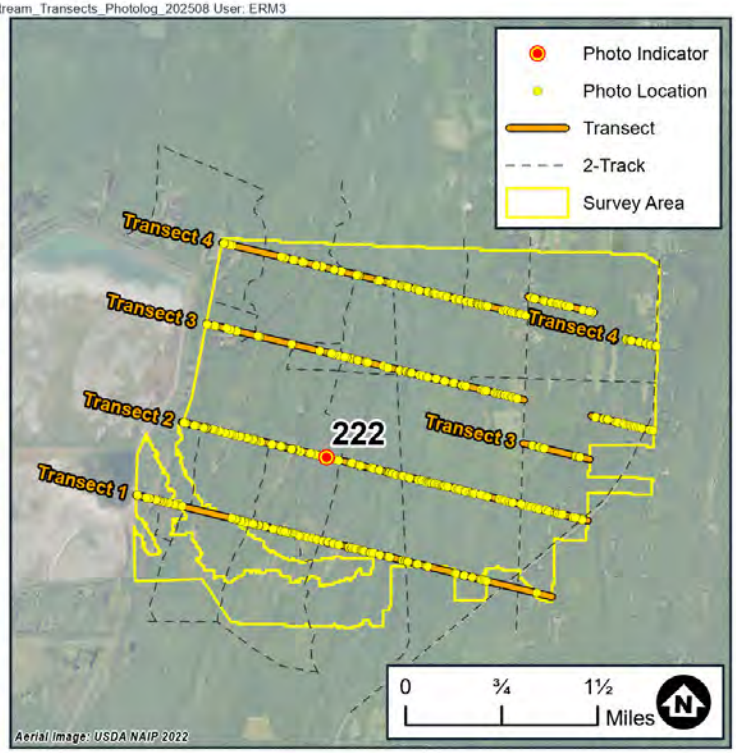
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP01-B Wetland
**Photo 2 Caption:** T2E-BP01-B, Upland

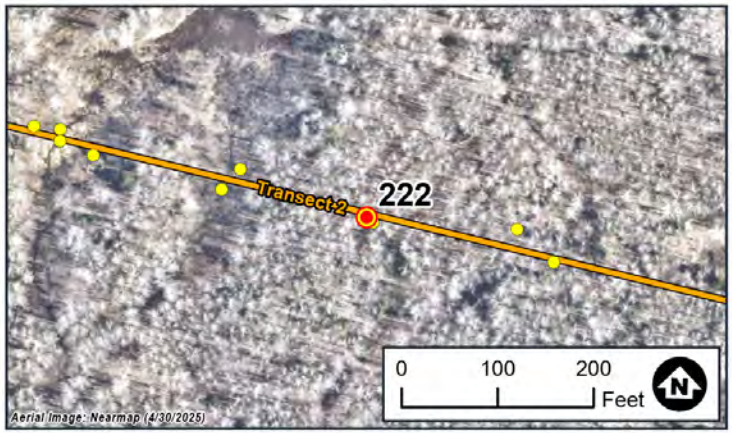
*Note: Photo locations are approximate*









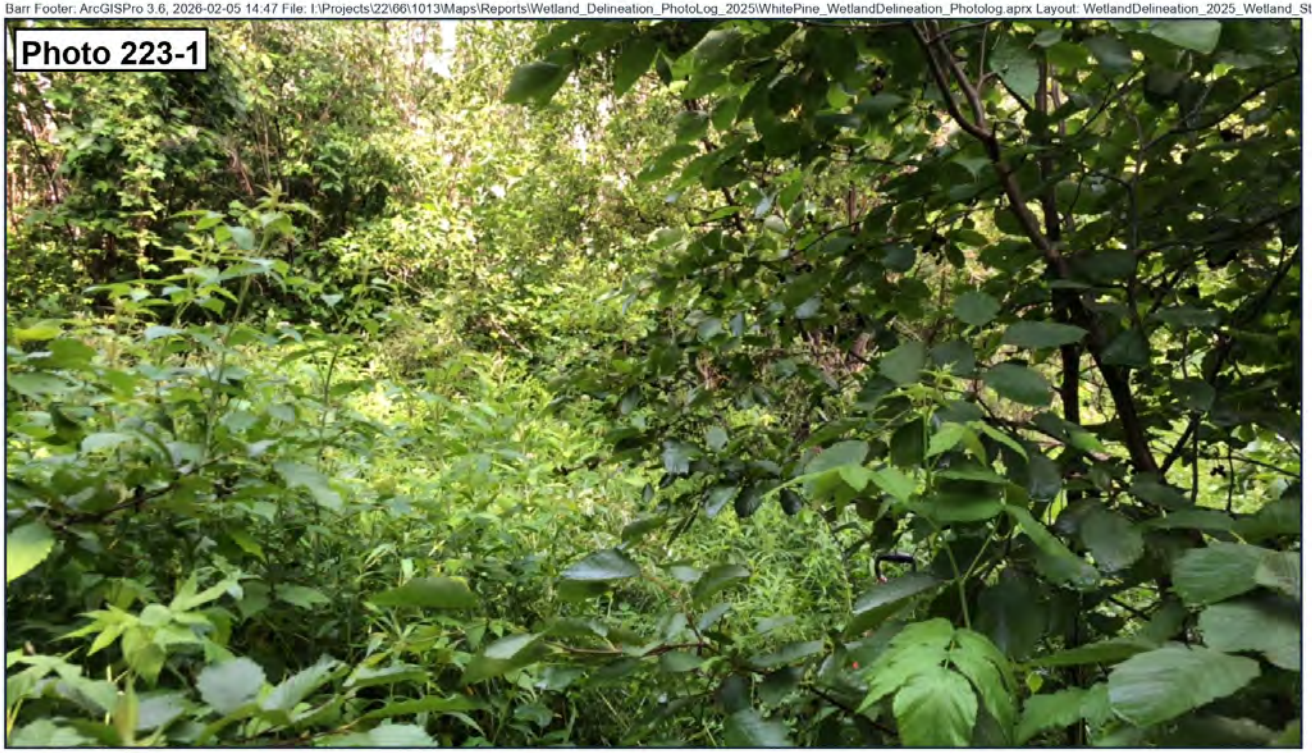


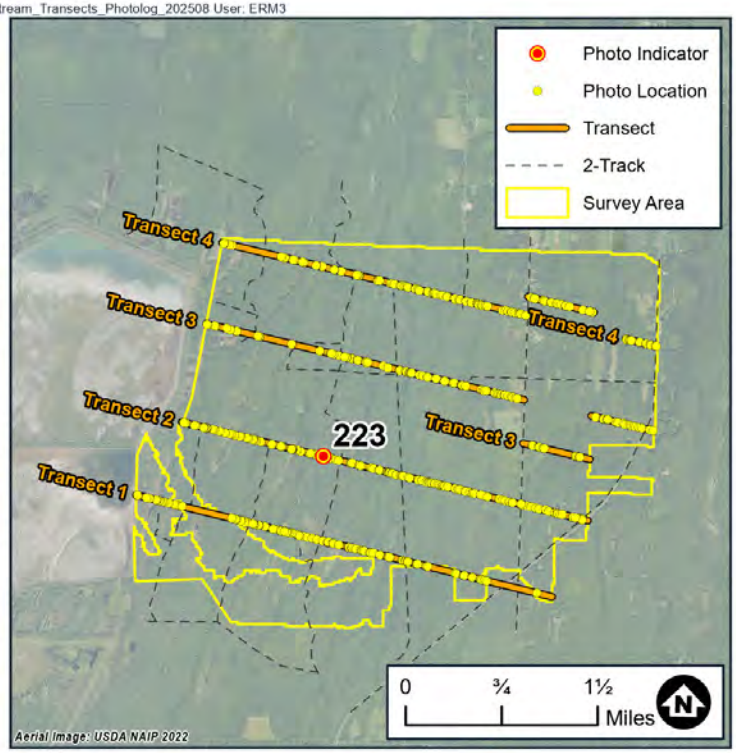

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2E-BP01-A, Wetland
**Photo 2 Caption:** T2E-BP01-A, Upland

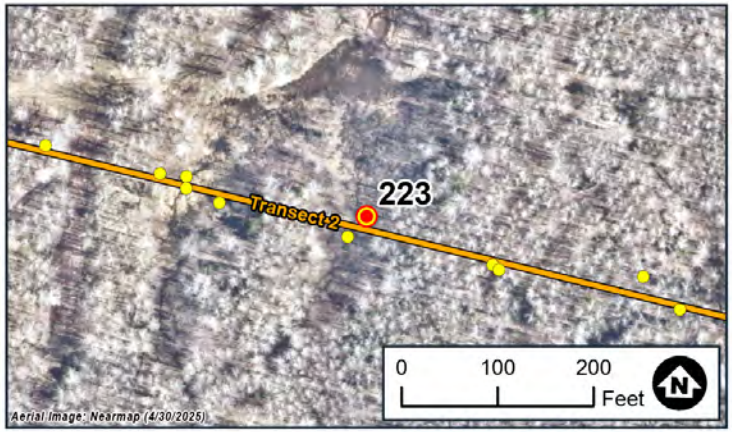
*Note: Photo locations are approximate*










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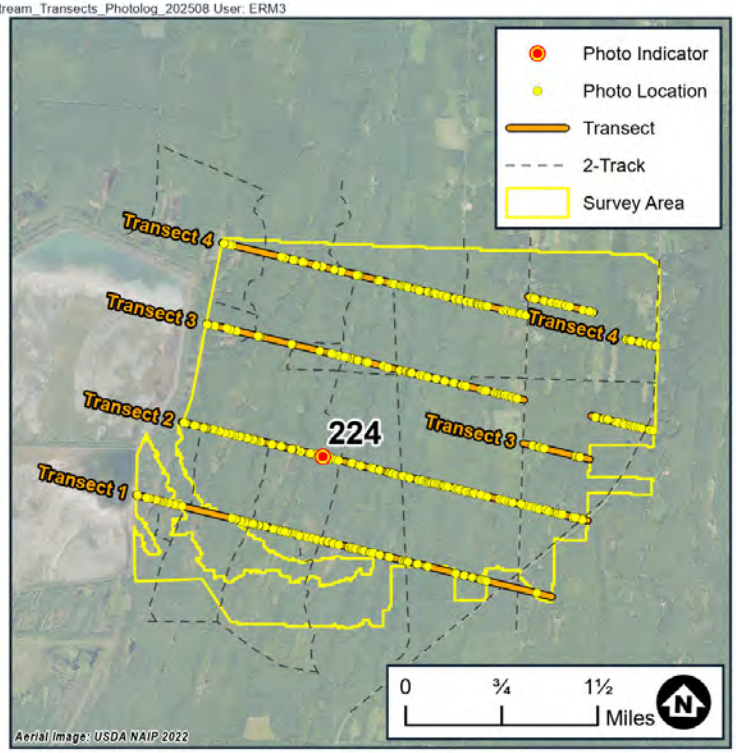
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP01-A, Wetland
**Photo 2 Caption:** T2W-BP01-A, Upland

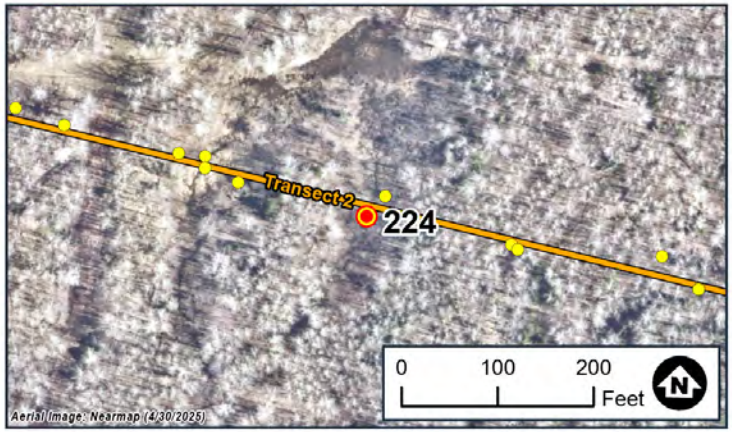
*Note: Photo locations are approximate*










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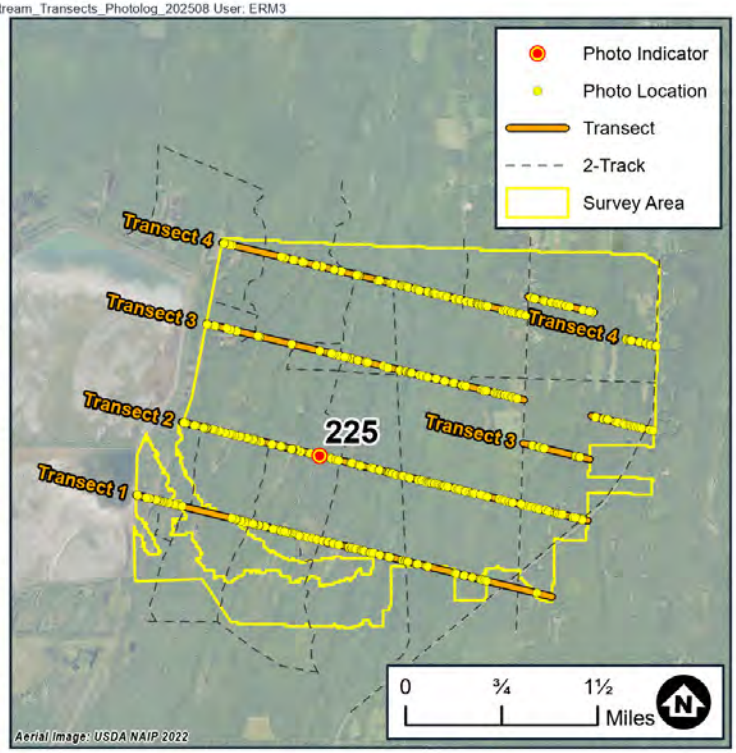
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP01-B, Wetland
**Photo 2 Caption:** T2W-BP01-B, Upland

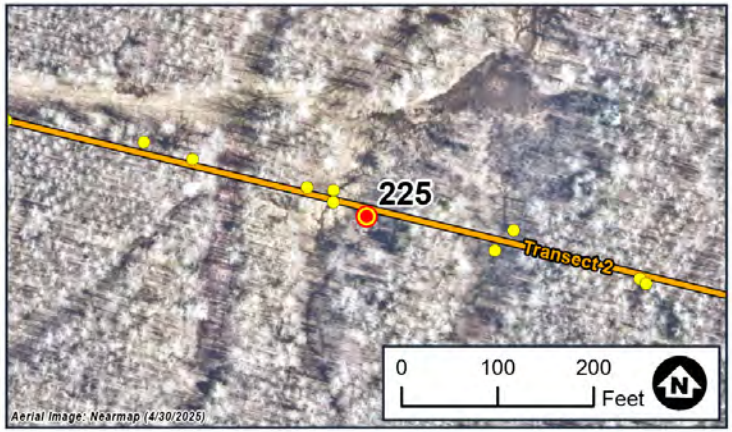
*Note: Photo locations are approximate*











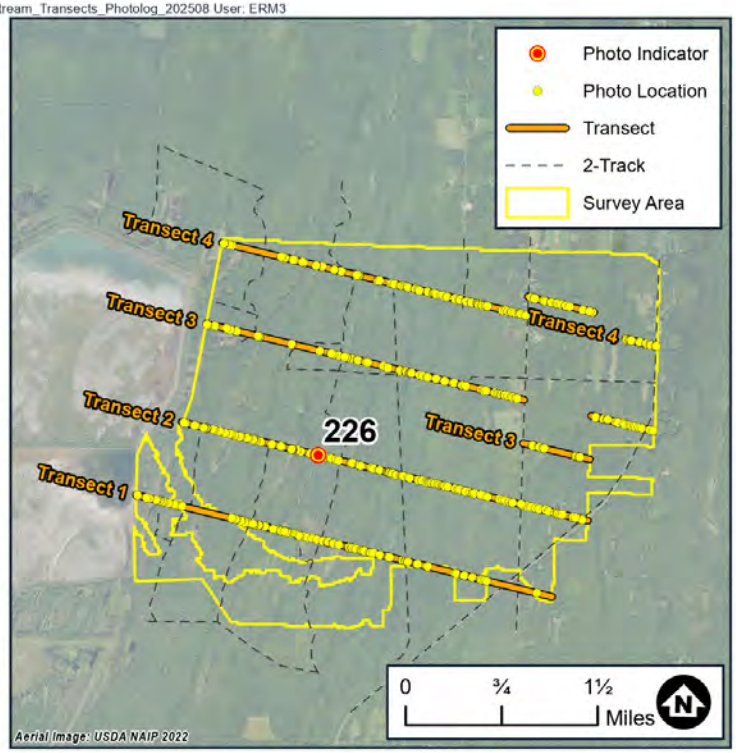

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP02-A, Wetland
**Photo 2 Caption:** T2W-BP02-A, Upland

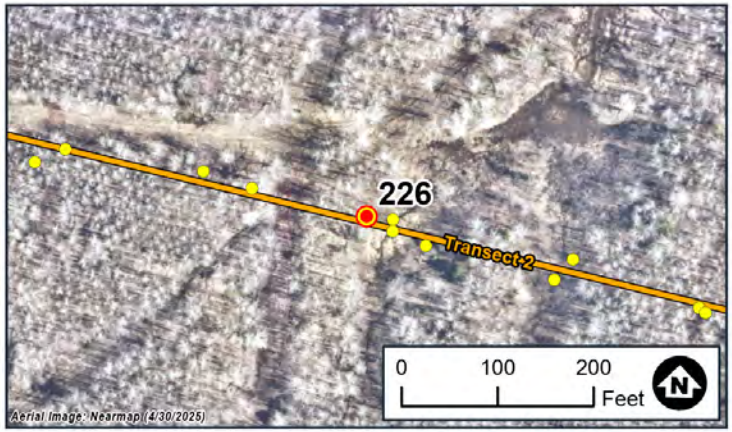
*Note: Photo locations are approximate*











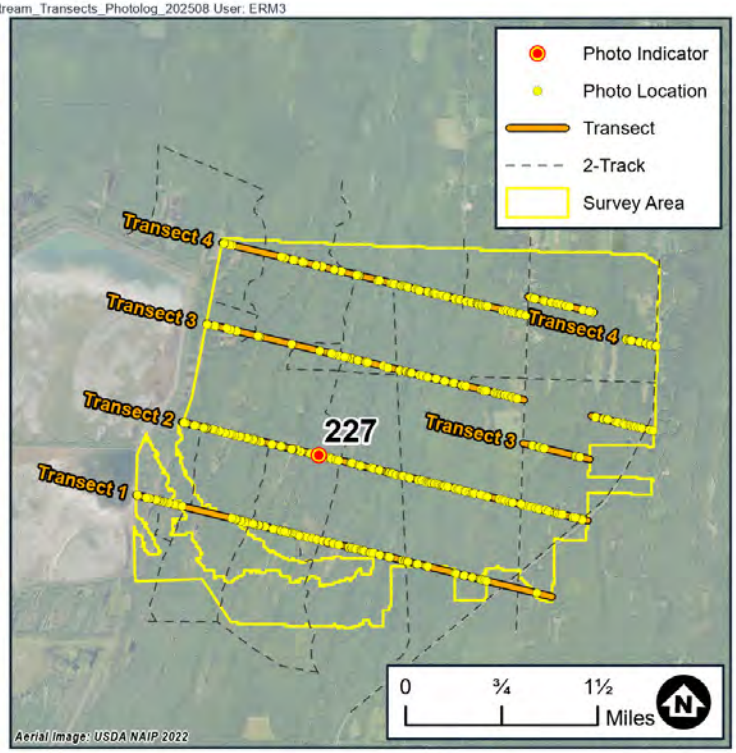

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP02-B, Wetland
**Photo 2 Caption:** T2W-BP02-B, Upland

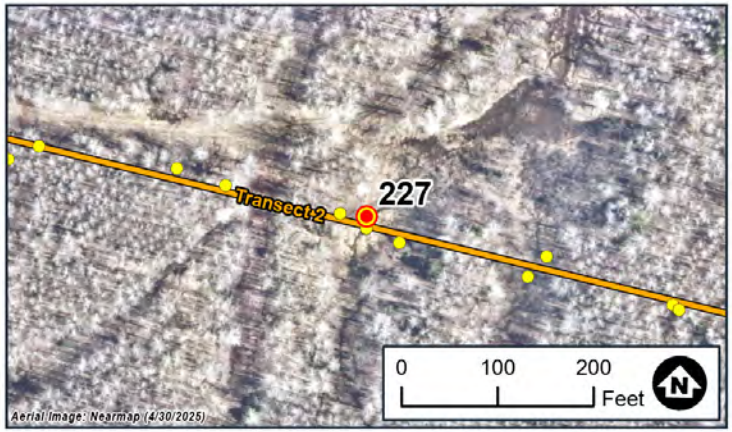
*Note: Photo locations are approximate*











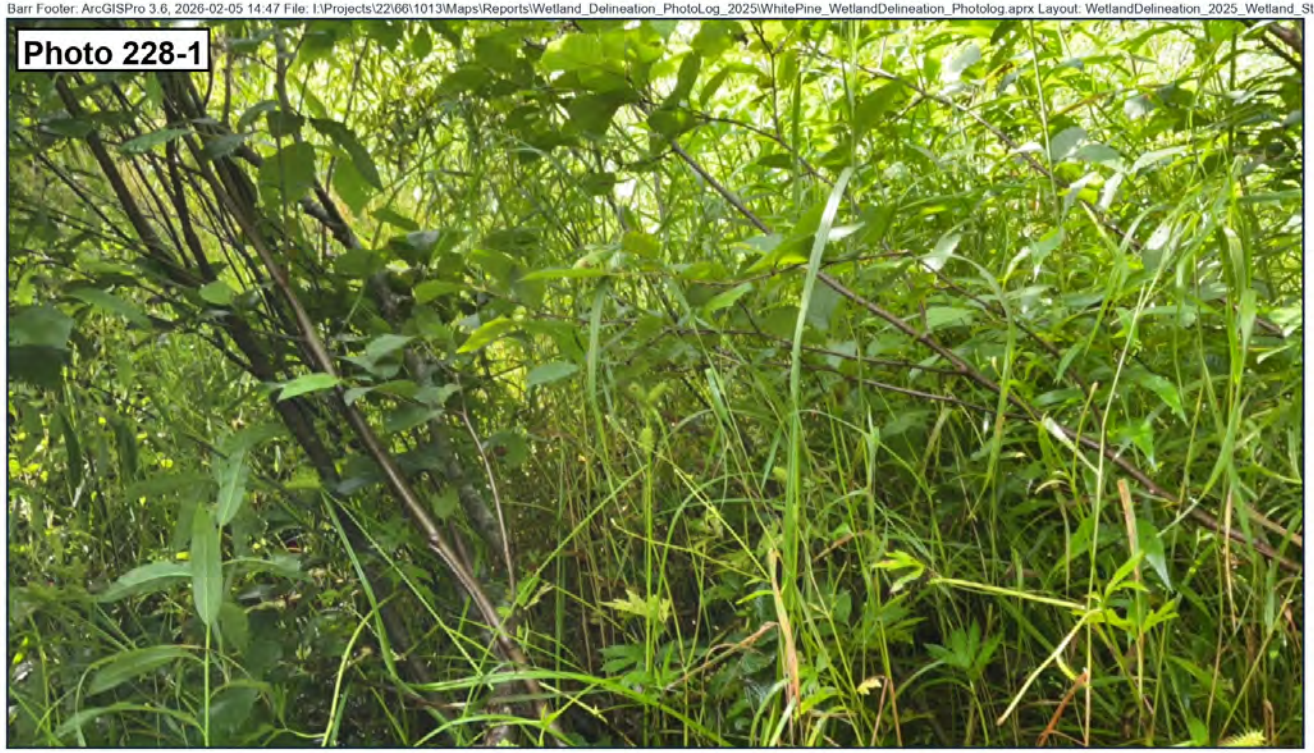

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S01-RB, Upstream
**Photo 2 Caption:** T2W-S01-RB, Downstream

*Note: Photo locations are approximate*

**Photo 228-1**



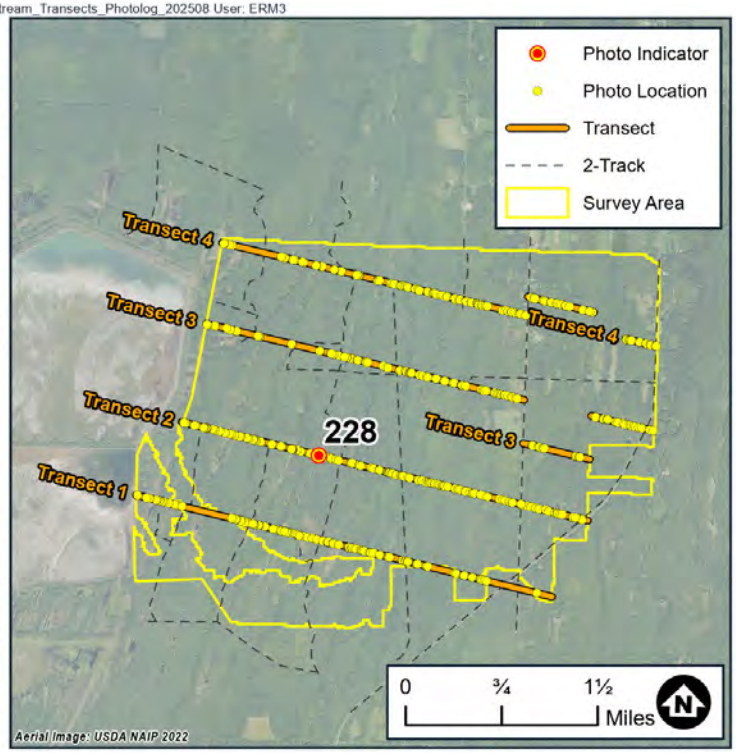
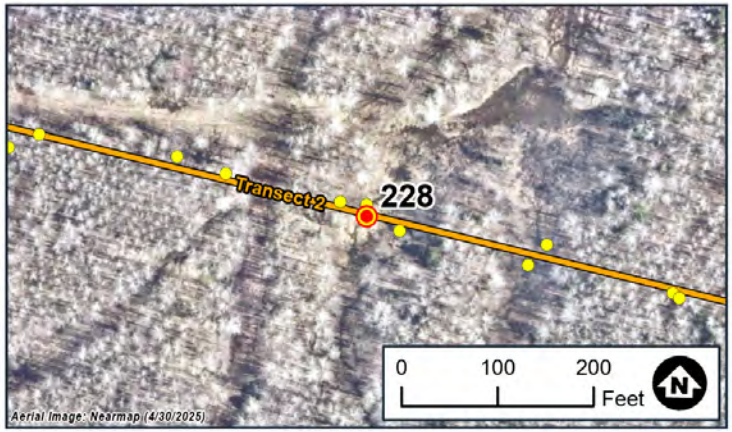



**Photo 228-2**







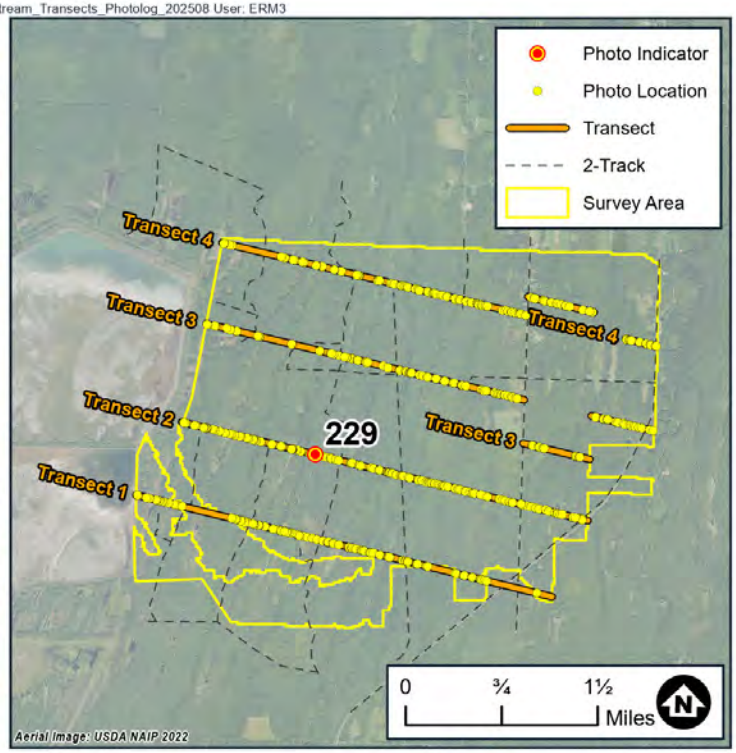

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S01-LB, Upstream
**Photo 2 Caption:** T2W-S01-LB, Downstream

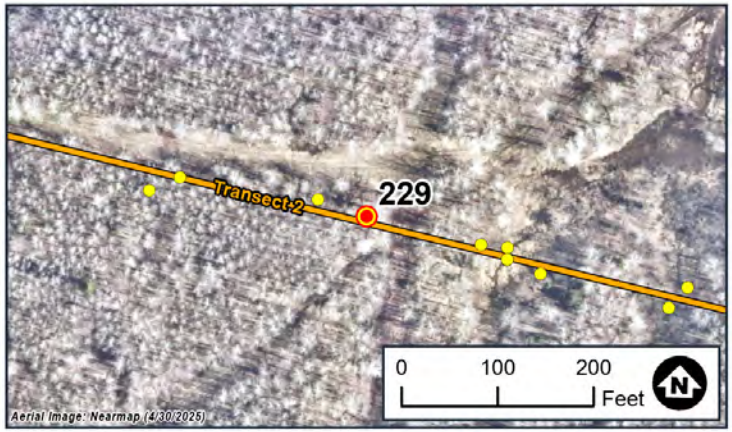
*Note: Photo locations are approximate*











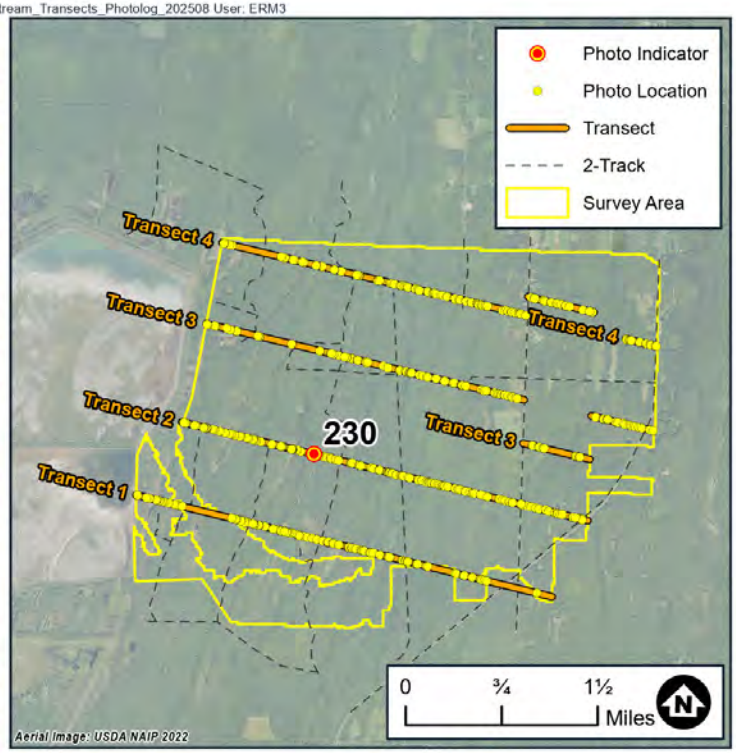

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP03-A, Wetland
**Photo 2 Caption:** T2W-BP03-A, Upland

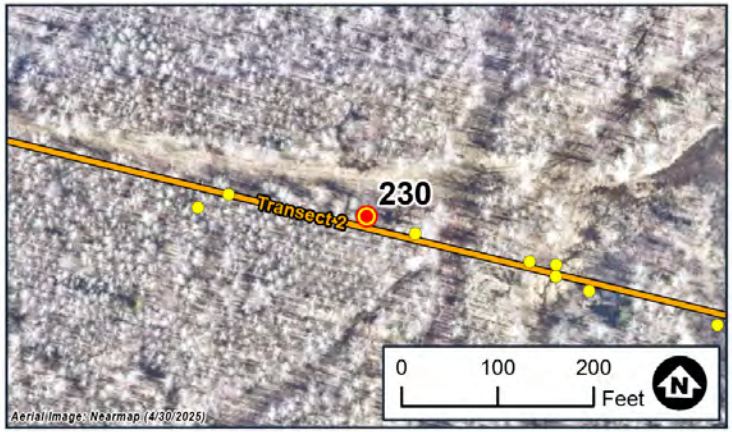
*Note: Photo locations are approximate*











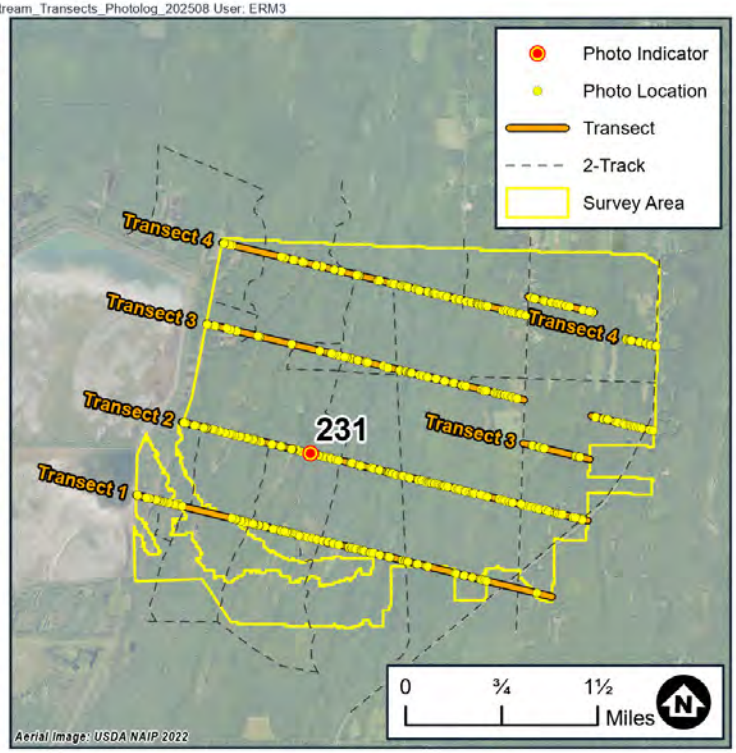

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T1W-BP03-B, Wetland
**Photo 2 Caption:** T1W-BP03-B, Upland

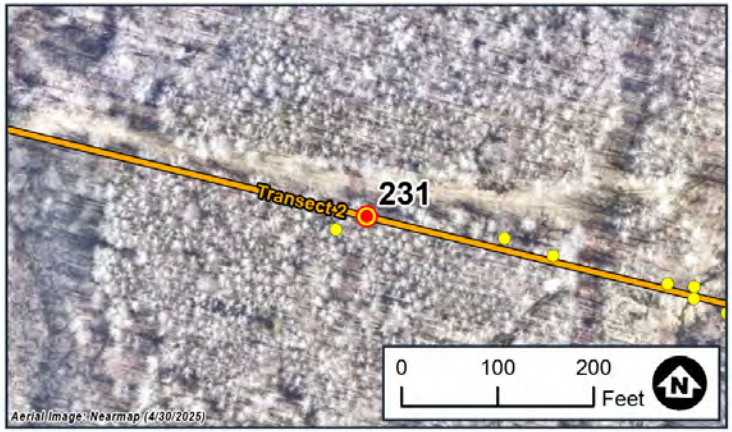
*Note: Photo locations are approximate*











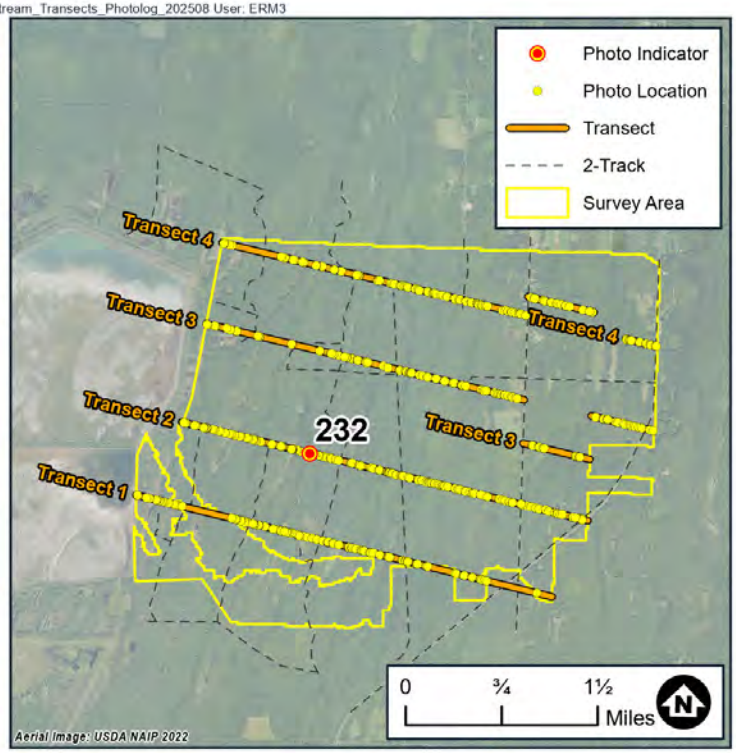

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP04-A, Wetland
**Photo 2 Caption:** T2W-BP04-A, Upland

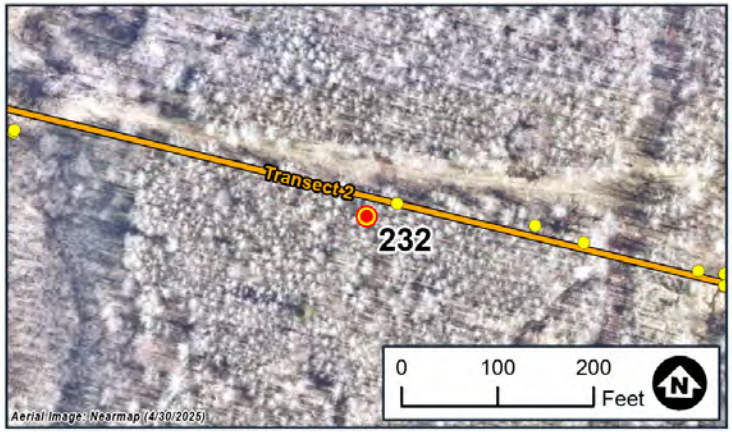
*Note: Photo locations are approximate*










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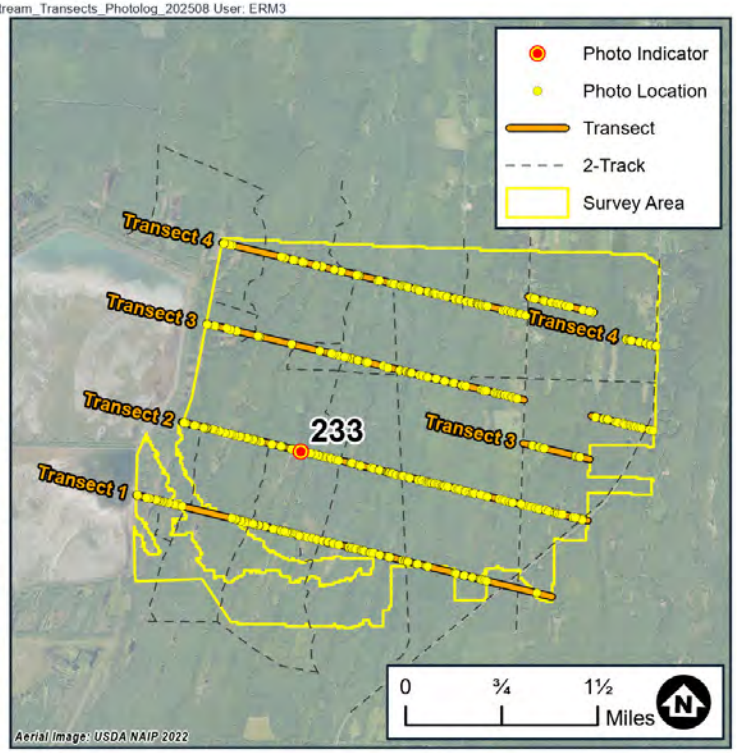
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP04-B, Wetland
**Photo 2 Caption:** T2W-BP04-B, Upland

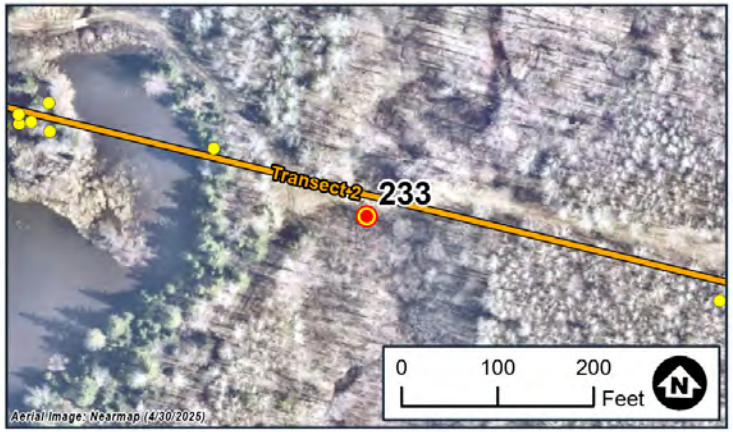
*Note: Photo locations are approximate*











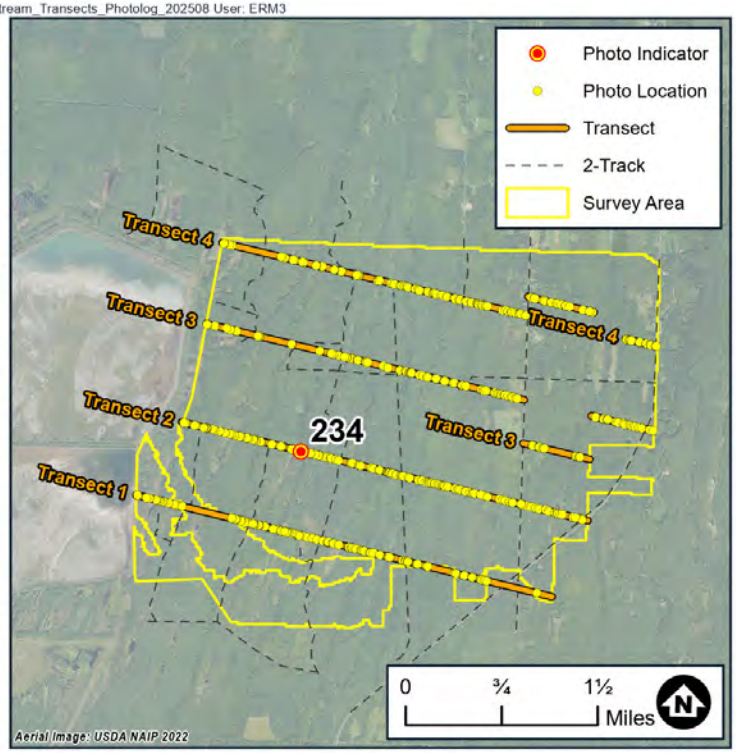

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S02-RB, Upstream
**Photo 2 Caption:** T2W-S02-RB, Downstream

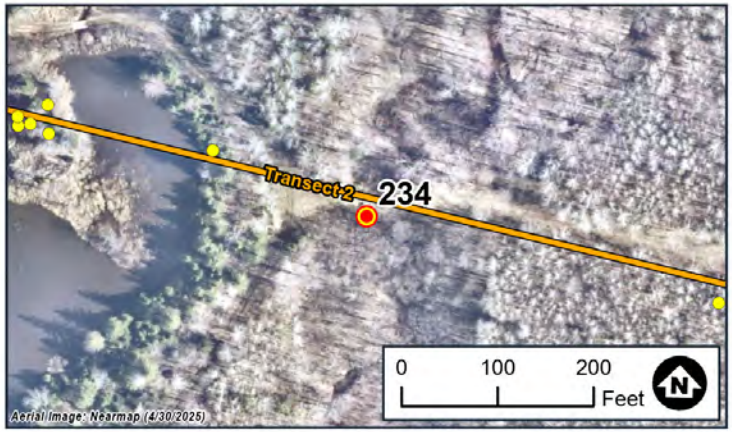
*Note: Photo locations are approximate*










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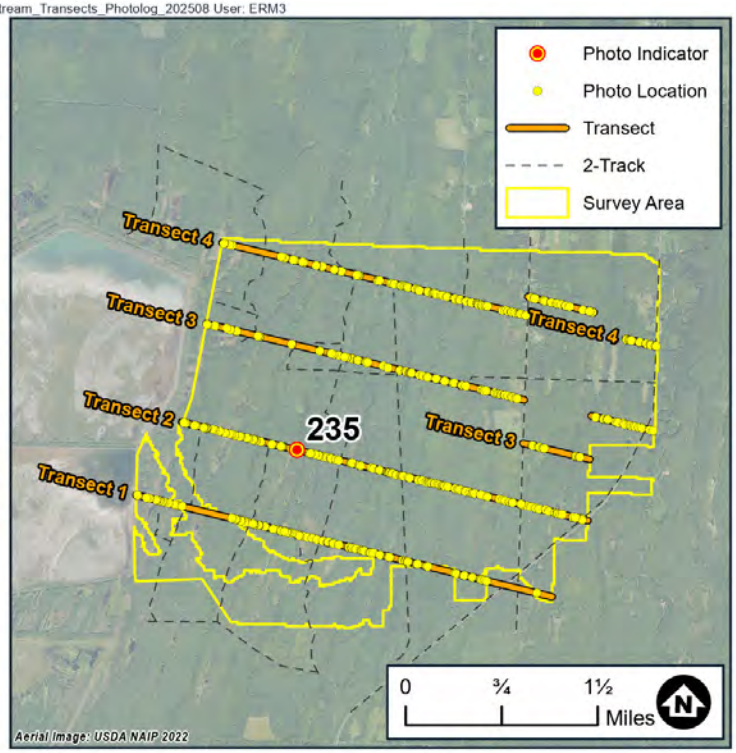
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S03-LB, Upstream
**Photo 2 Caption:** T2W-S03-LB, Downstream

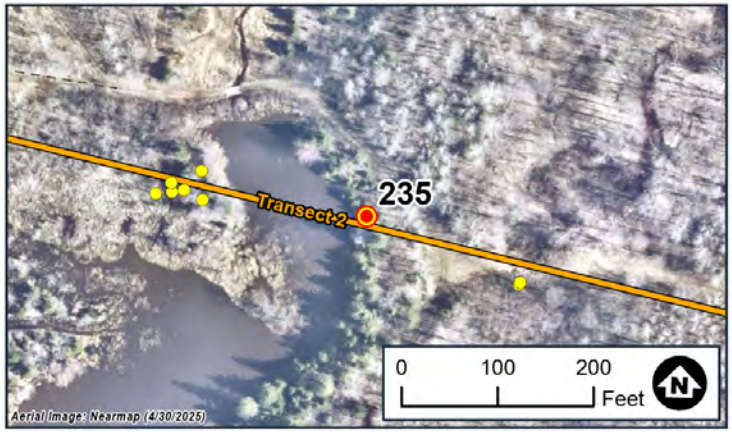
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

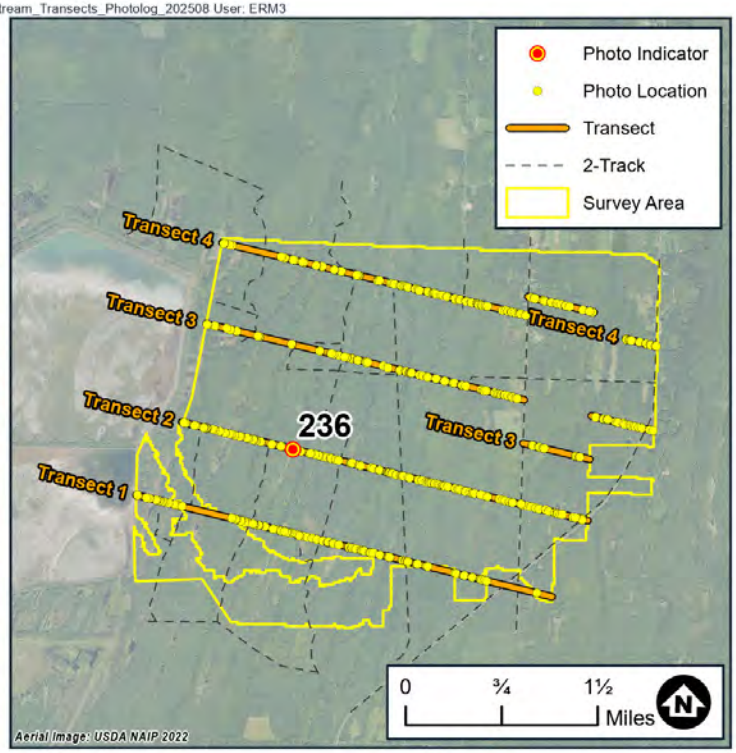
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S04-RB, Upstream
**Photo 2 Caption:** T2W-S04-RB, Downstream

*Note: Photo locations are approximate*

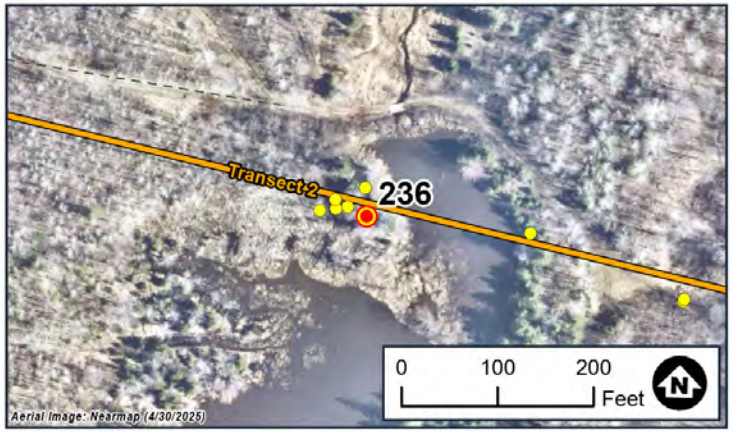
## Photo 236-1






## Photo 236-2






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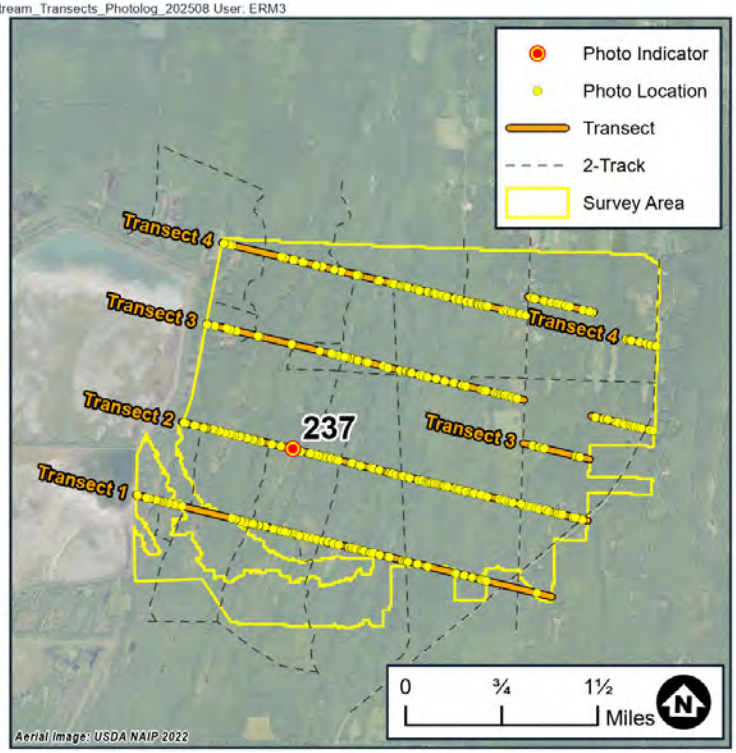
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S04-LB, Upstream
**Photo 2 Caption:** T2W-S04-LB, Downstream

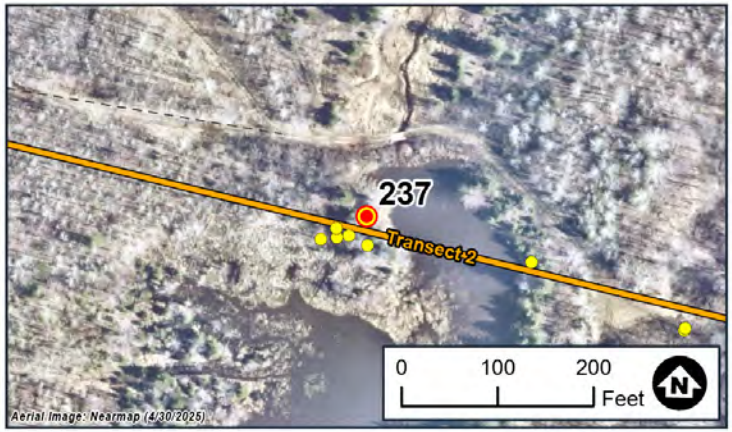
*Note: Photo locations are approximate*









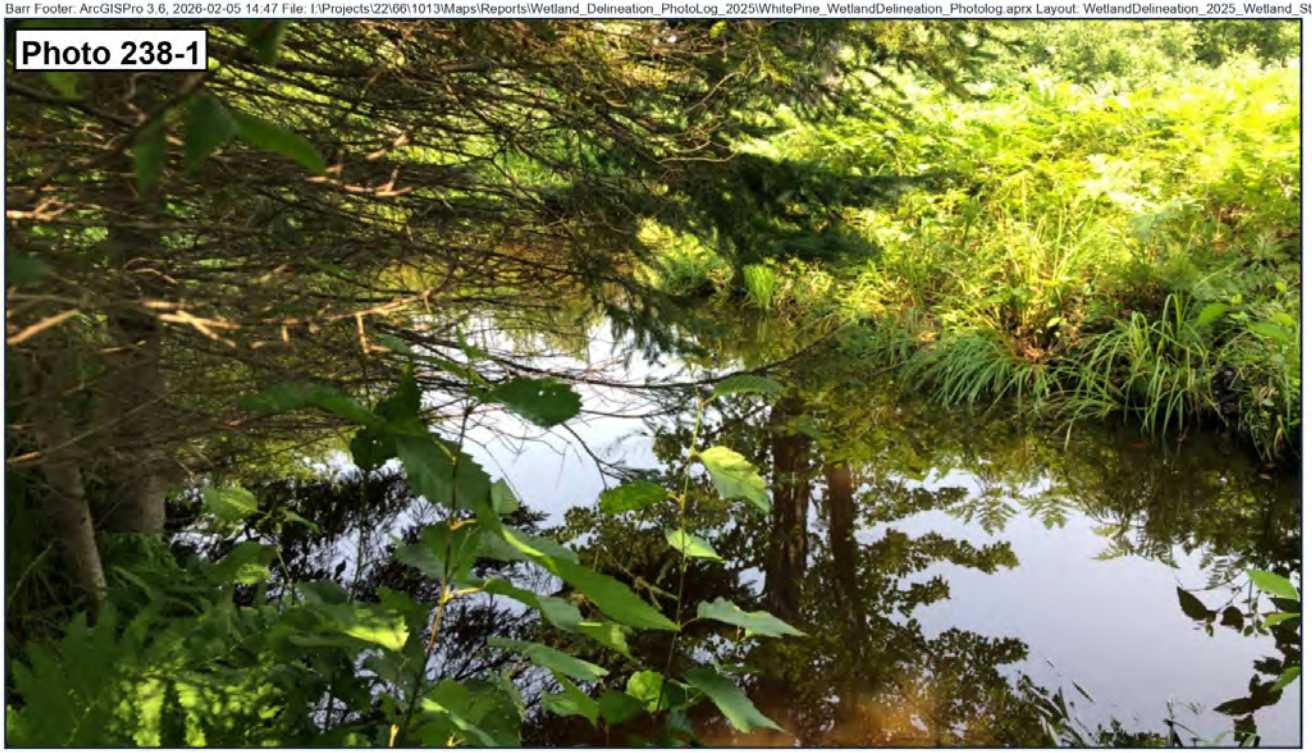


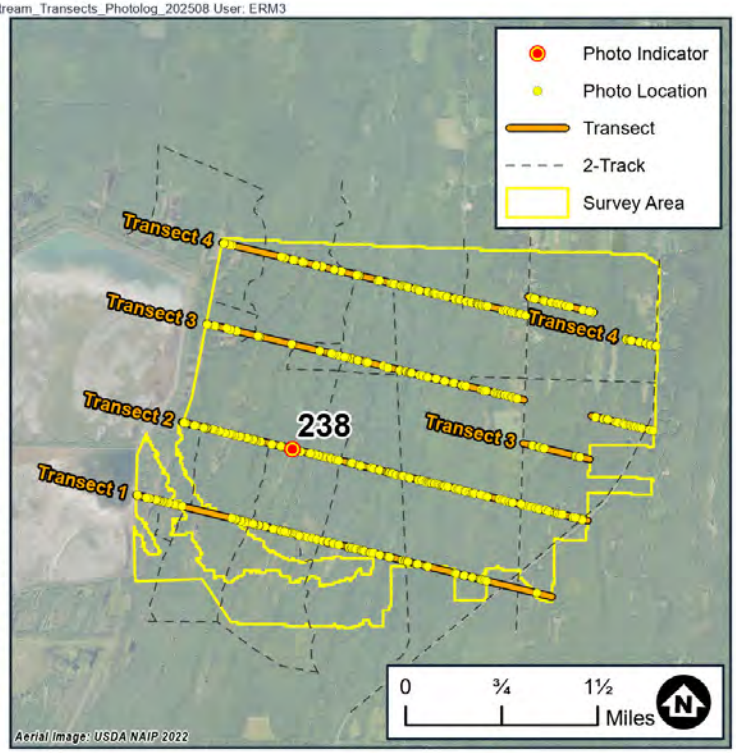

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S05-RB, Upstream
**Photo 2 Caption:** T2W-S05-RB, Downstream

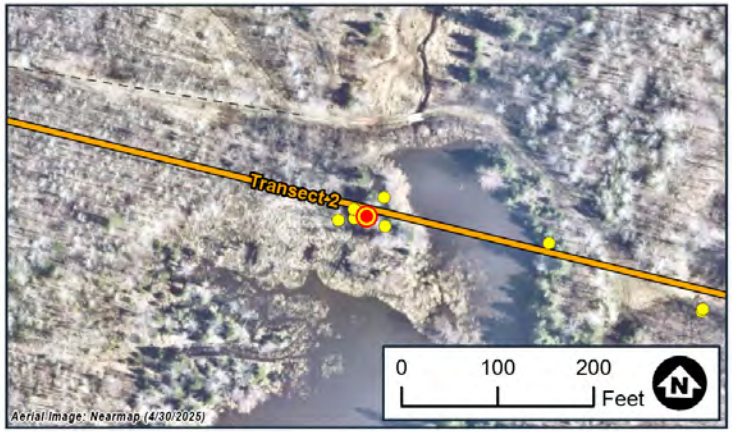
*Note: Photo locations are approximate*











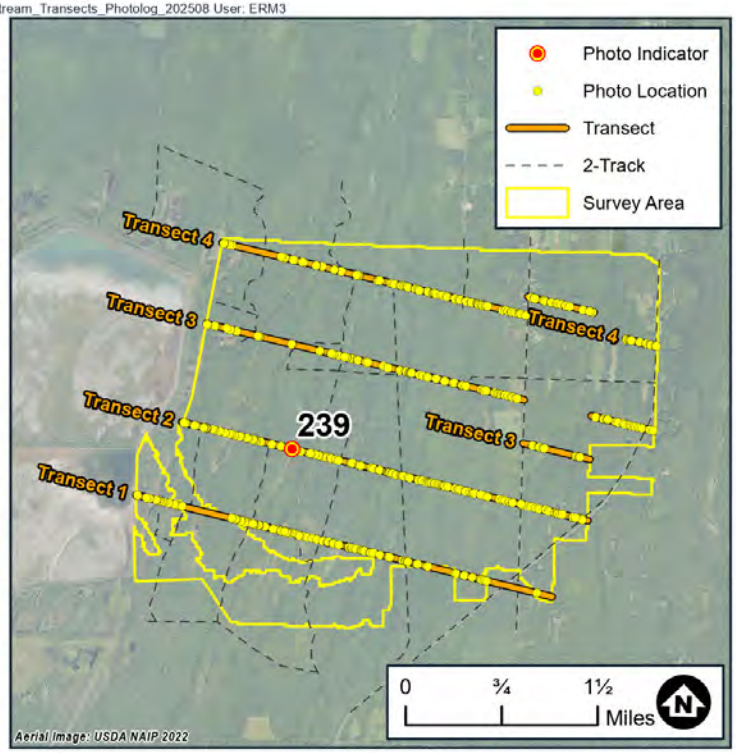

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S05-LB, Upstream
**Photo 2 Caption:** T2W-S05-LB, Upstream

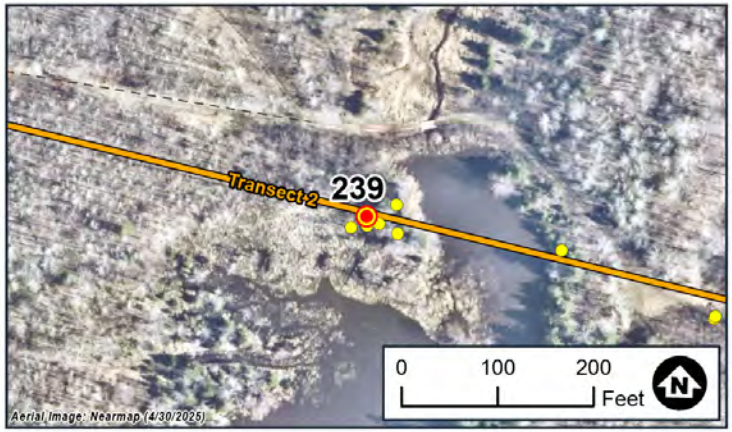
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

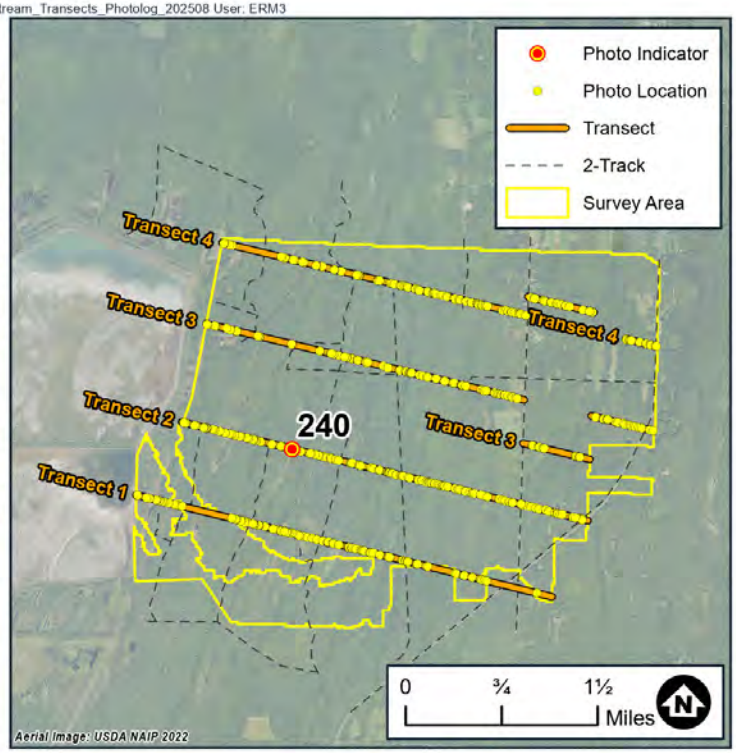
BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP05-A, Wetland
**Photo 2 Caption:** T2W-BP05-A, Upland

*Note: Photo locations are approximate*

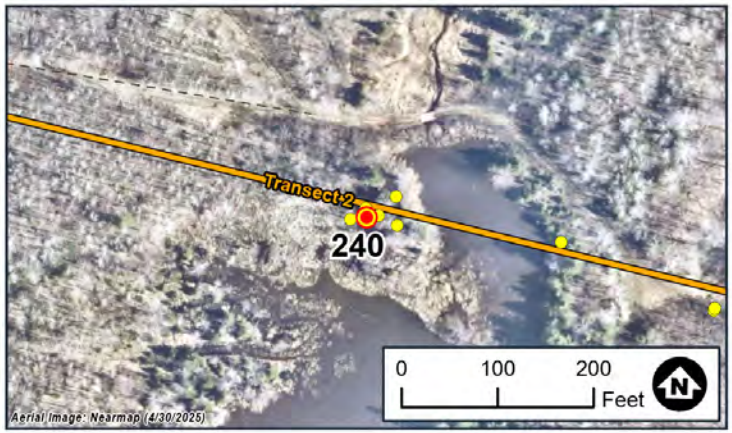
## Photo 240-1






## Photo 240-2






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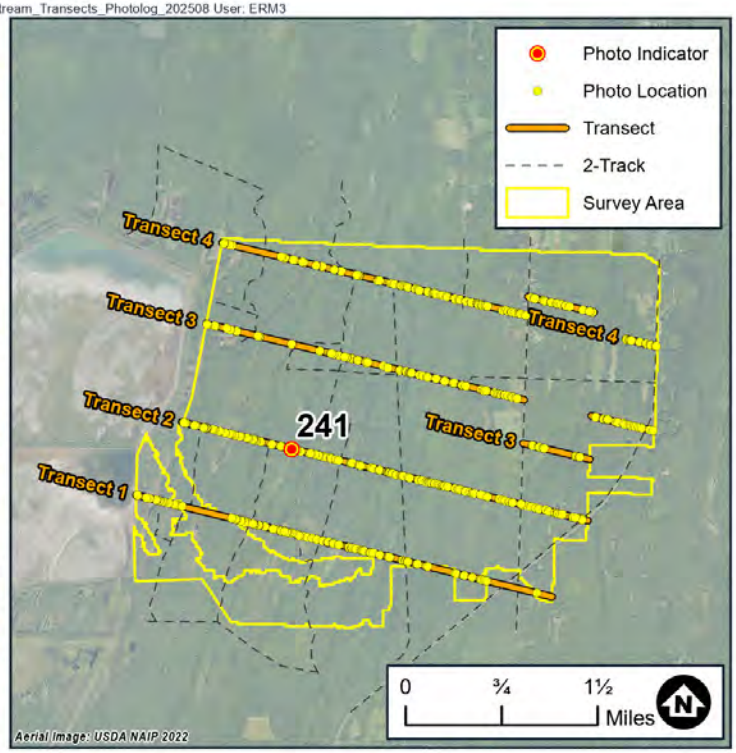
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S06-RB, Upstream
**Photo 2 Caption:** T2W-S06-RB, Downstream

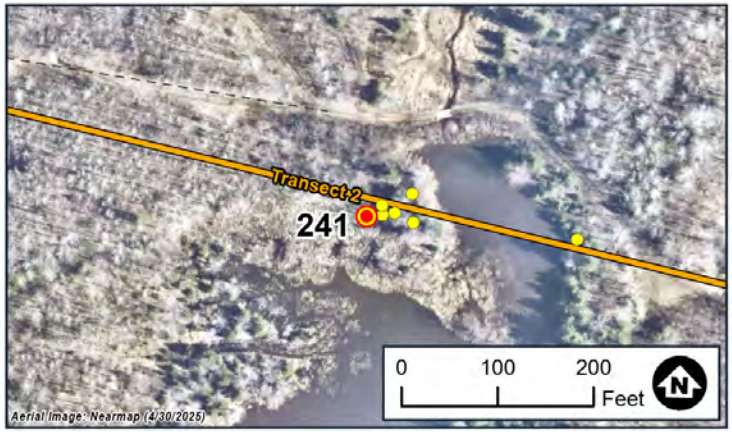
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-S06-LB, Upstream
**Photo 2 Caption:** T2W-S06-LB, Downstream

*Note: Photo locations are approximate*

**Photo 242-1**



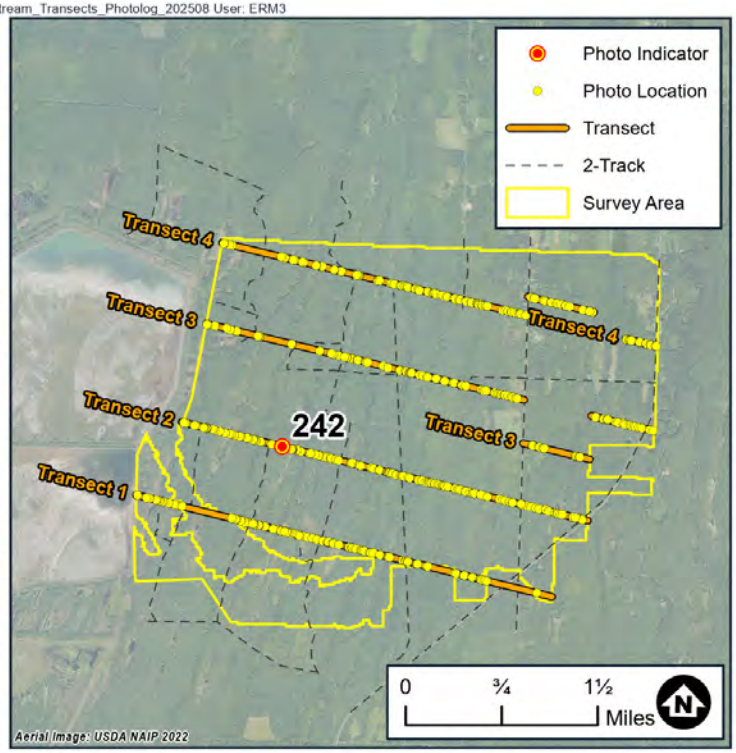
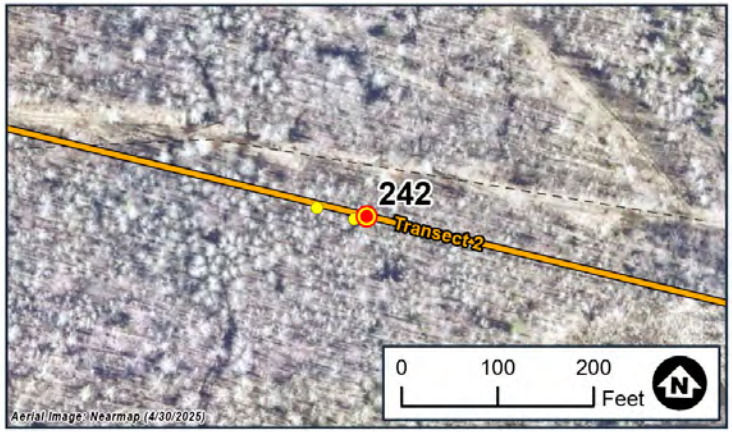



**Photo 242-2**






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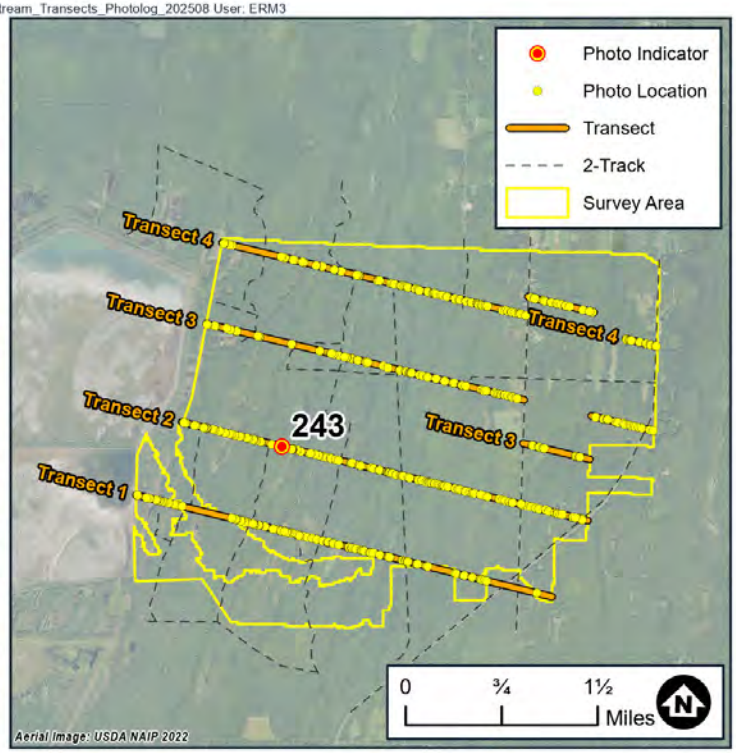
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP06-A, Wetland
**Photo 2 Caption:** T2W-BP06-A, Upland

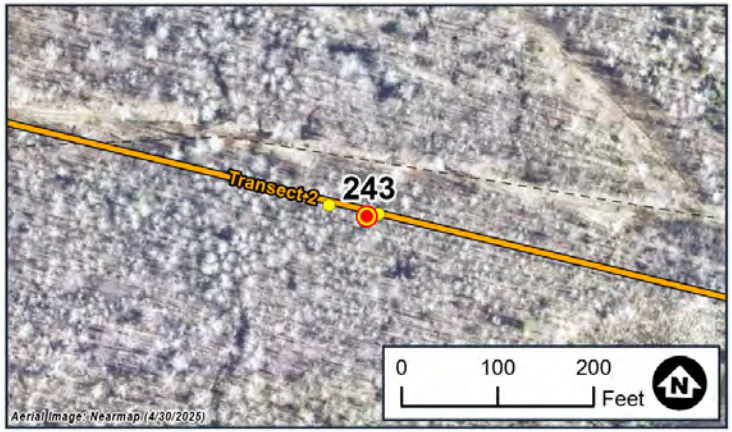
*Note: Photo locations are approximate*











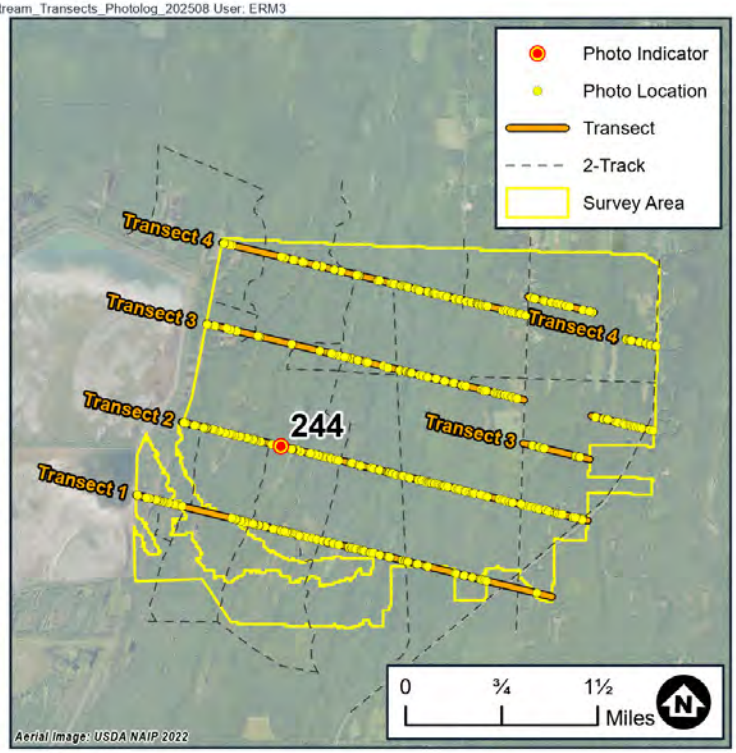

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP06-B, Wetland
**Photo 2 Caption:** T2W-BP06-B, Upland

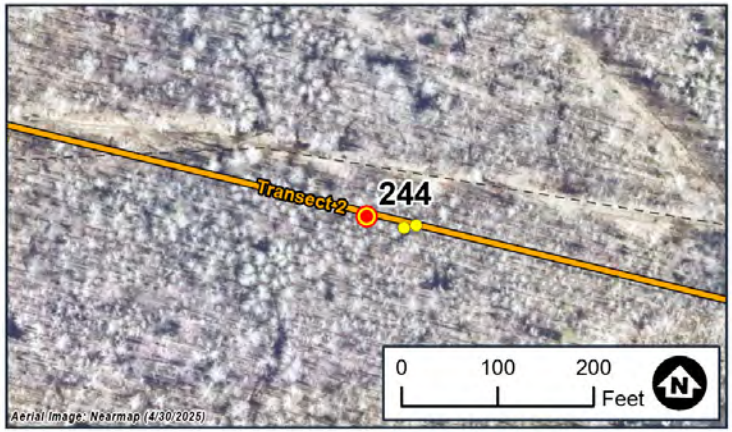
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP07-A, Wetland
**Photo 2 Caption:** T2W-BP07-A, Upland

*Note: Photo locations are approximate*

**Photo 245-1**



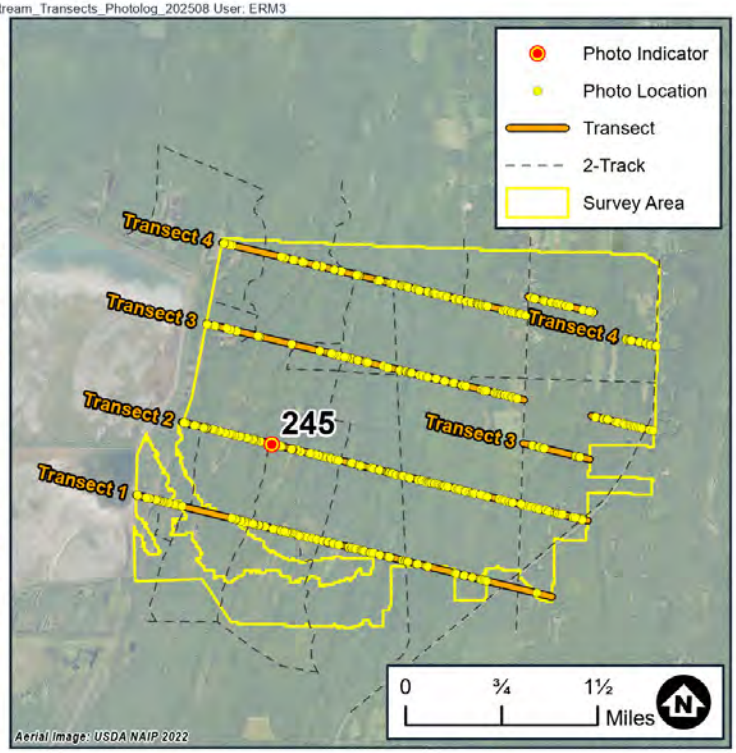
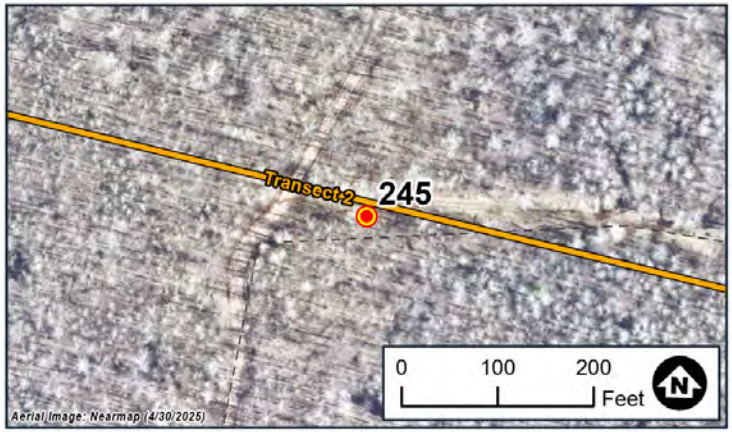



**Photo 245-2**






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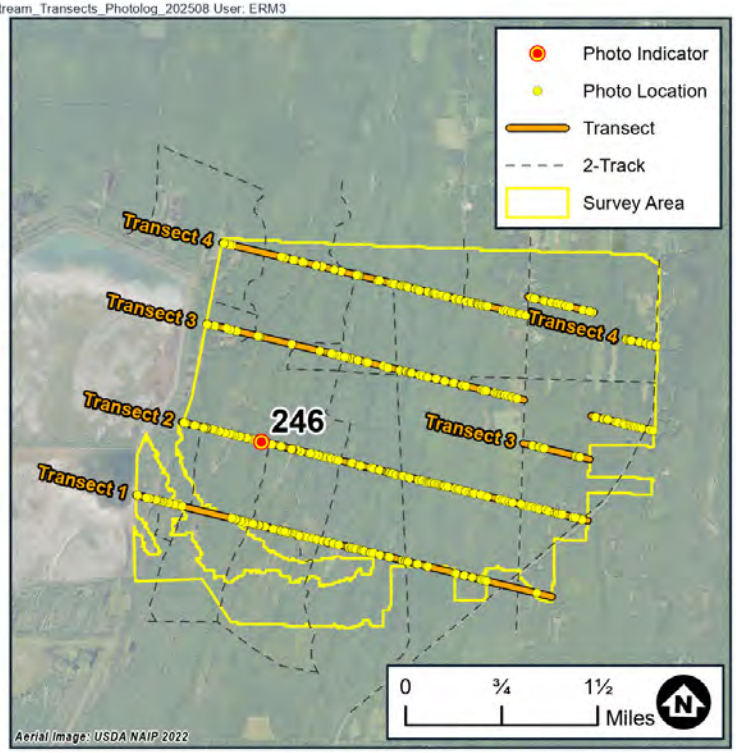
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/24/2025
**Photo 1 Caption:** T2W-BP07-B, Wetland
**Photo 2 Caption:** T2W-BP07-B, Upland

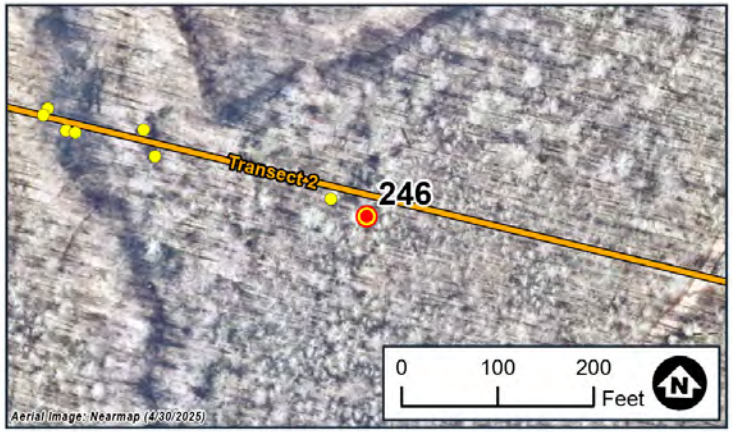
*Note: Photo locations are approximate*











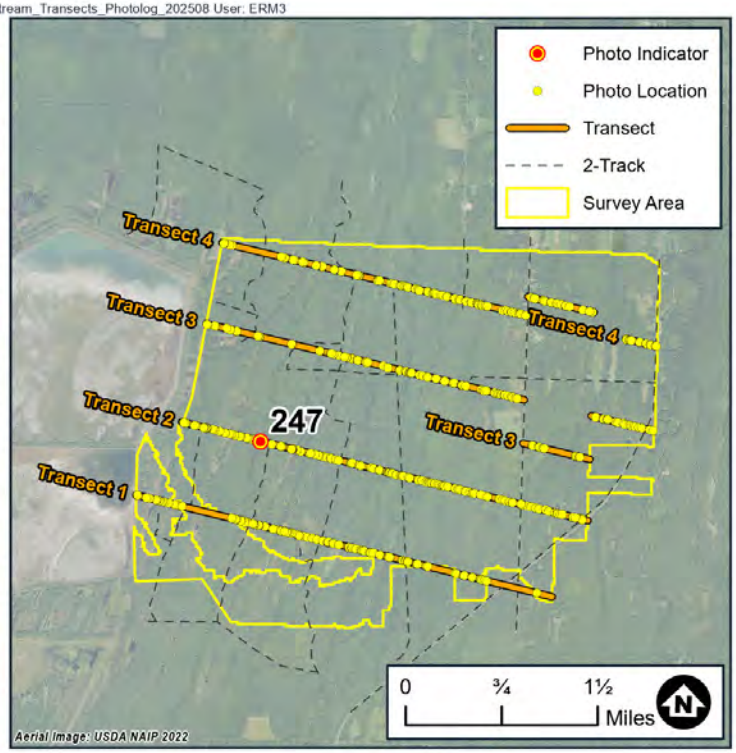

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP08-A, Wetland
**Photo 2 Caption:** T2W-BP08-A, Upland

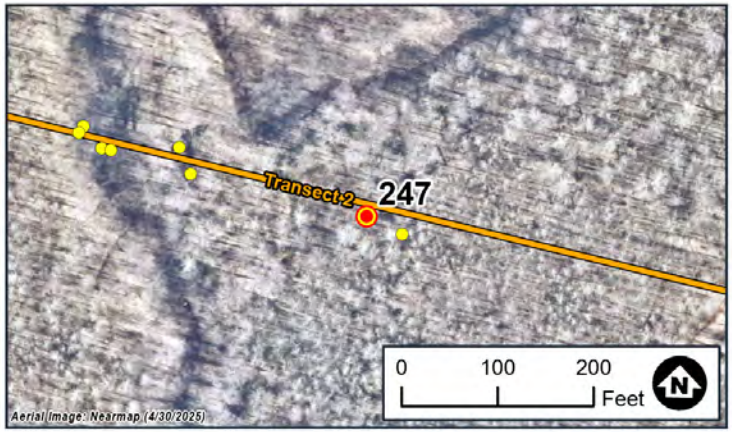
*Note: Photo locations are approximate*











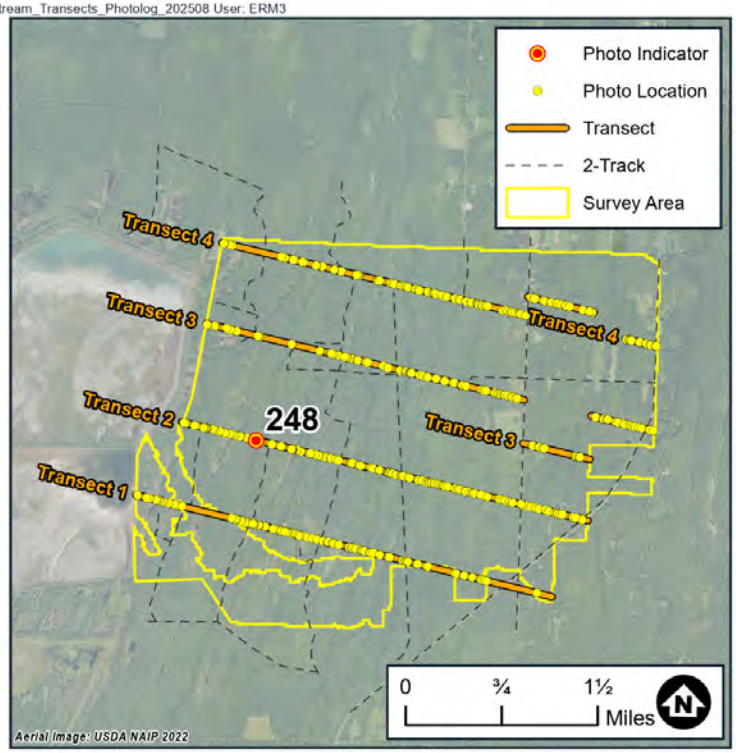

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP08-B, Wetland
**Photo 2 Caption:** T2W-BP08-B, Upland

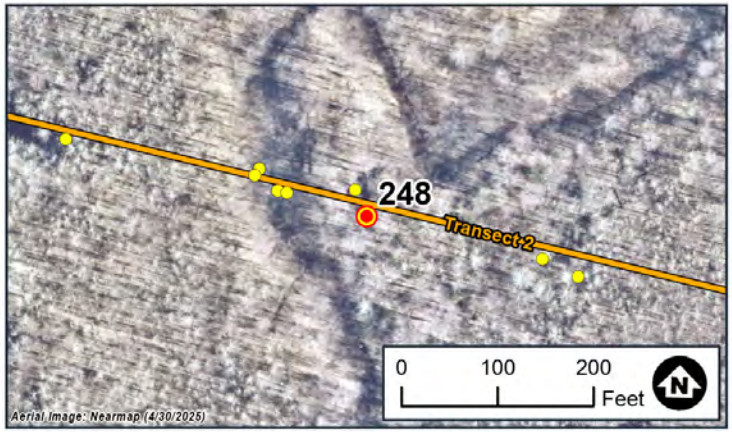
*Note: Photo locations are approximate*










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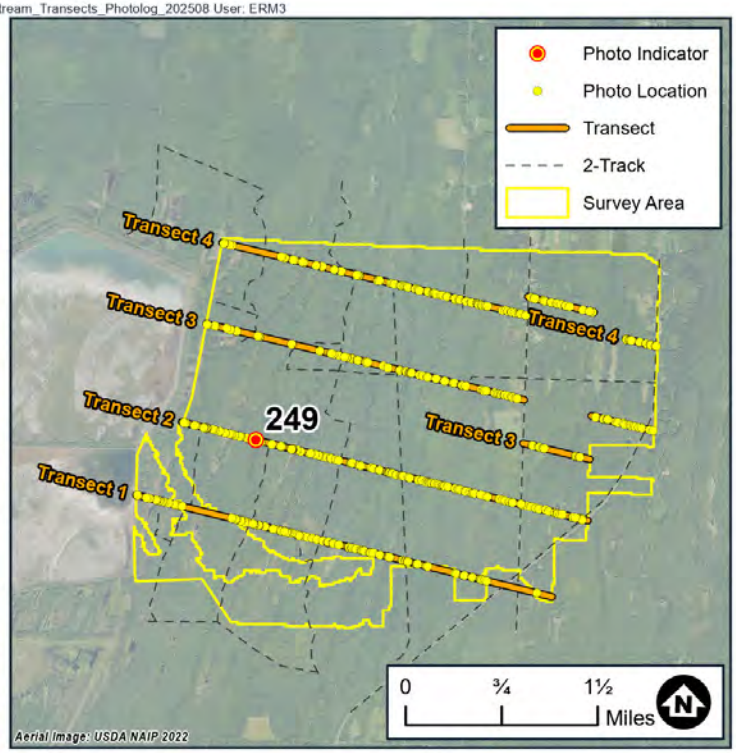
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP09-B, Wetland
**Photo 2 Caption:** T2W-BP09-B, Upland

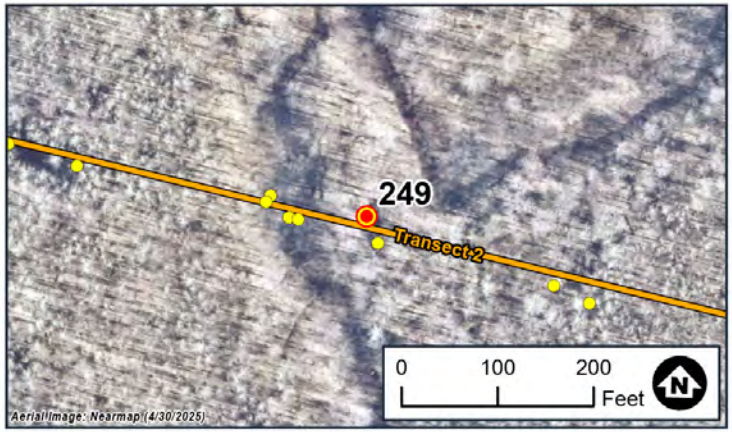
*Note: Photo locations are approximate*











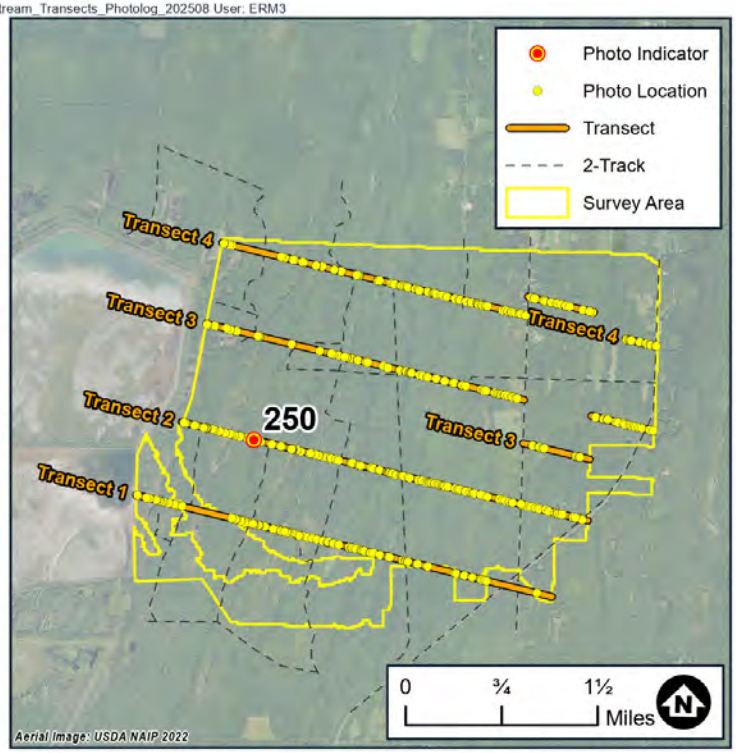

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP09-A, Wetland
**Photo 2 Caption:** T2W-BP09-A, Upland

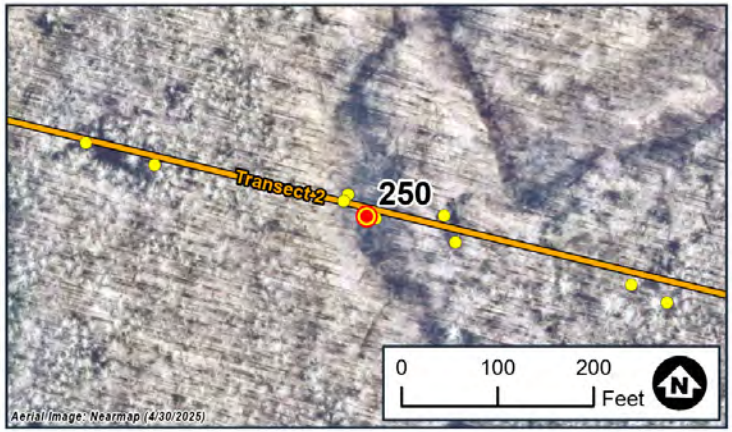
*Note: Photo locations are approximate*









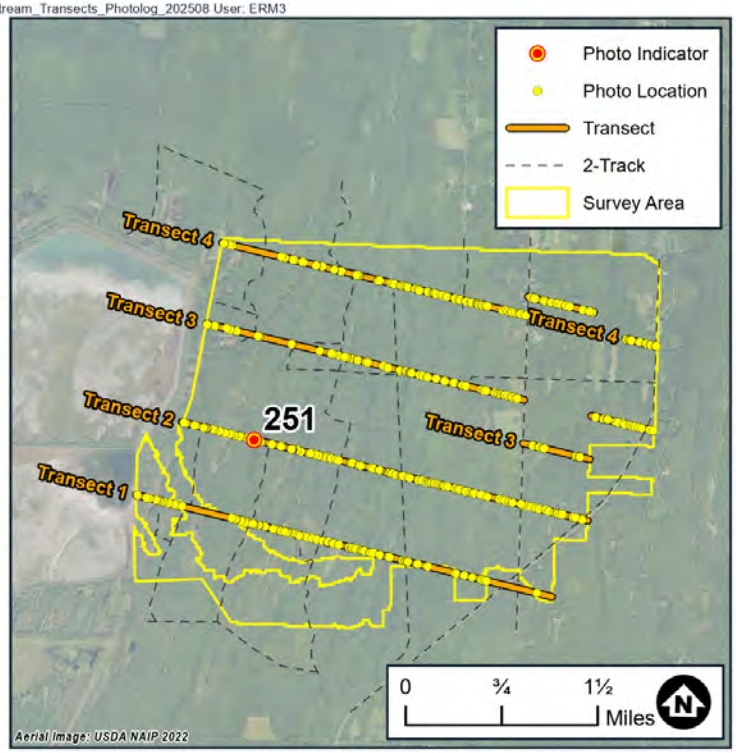

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-S07-RB, Upstream
**Photo 2 Caption:** T2W-S07-RB, Downstream

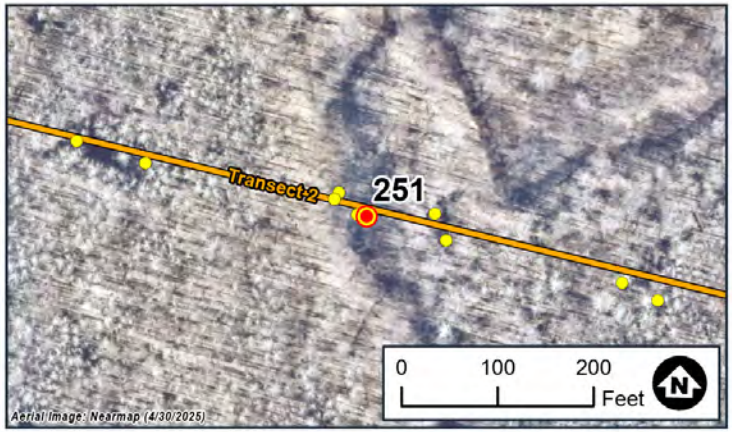
*Note: Photo locations are approximate*











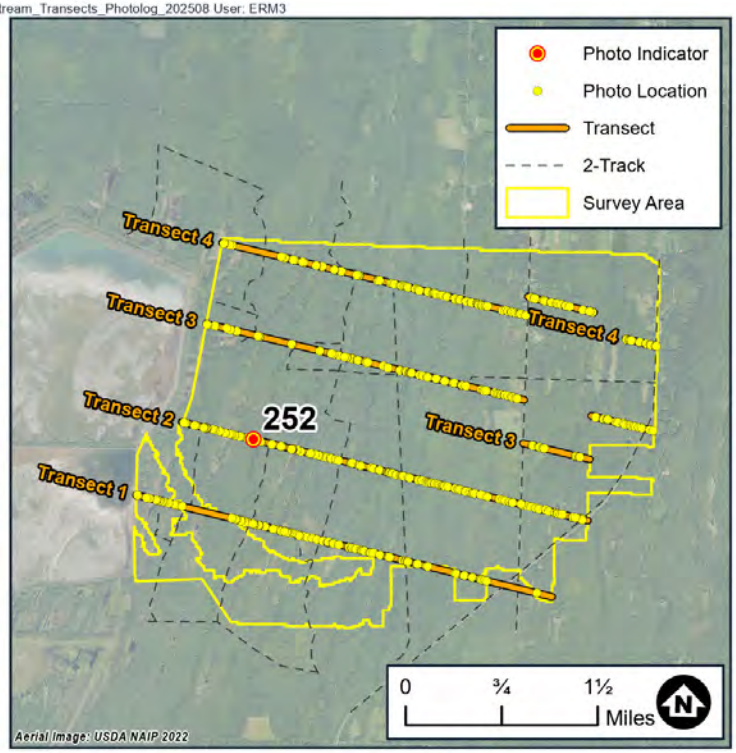

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-S07-LB, Upstream
**Photo 2 Caption:** T2W-S07-LB, Downstream

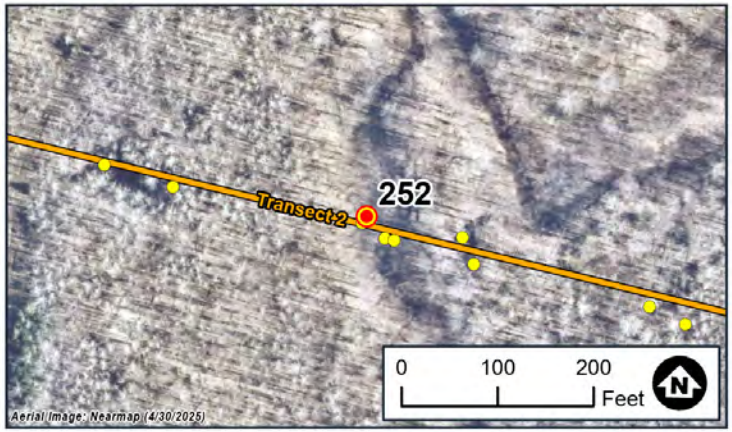
*Note: Photo locations are approximate*











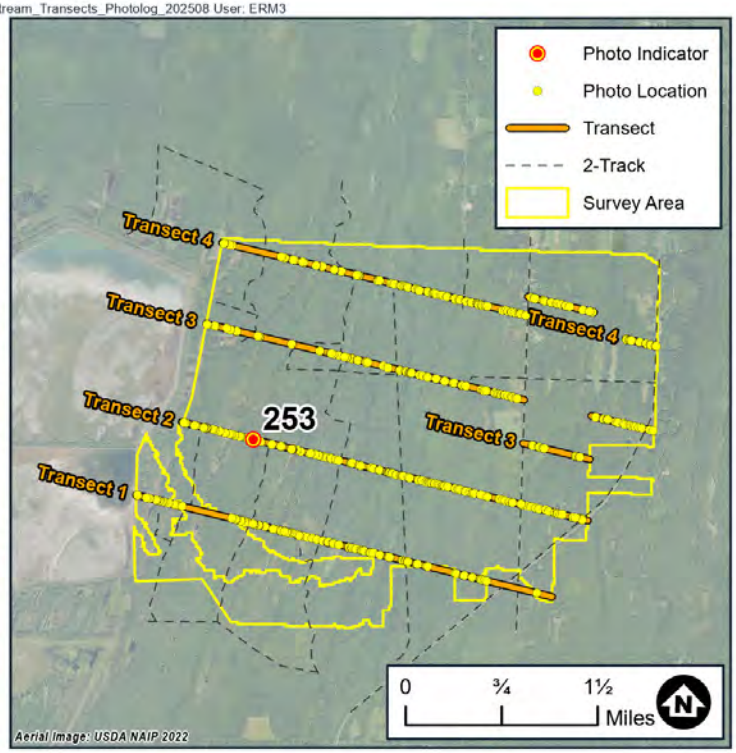

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP10-A, Wetland
**Photo 2 Caption:** T2W-BP10-A, Upland

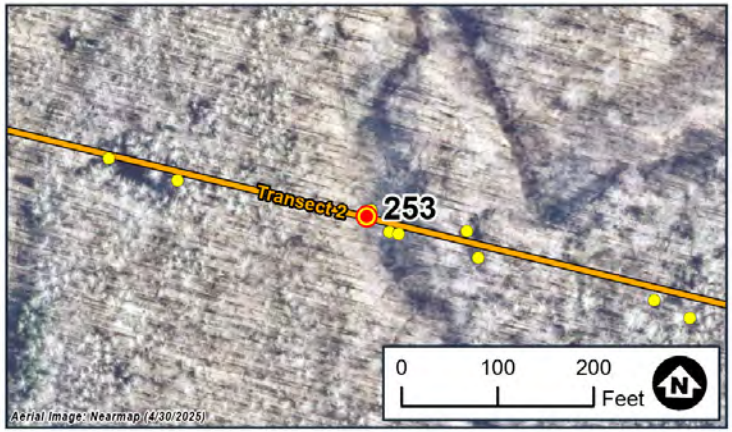
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP10-B, Wetland
**Photo 2 Caption:** T2W-BP10-B, Upland

*Note: Photo locations are approximate*

**Photo 254-1**



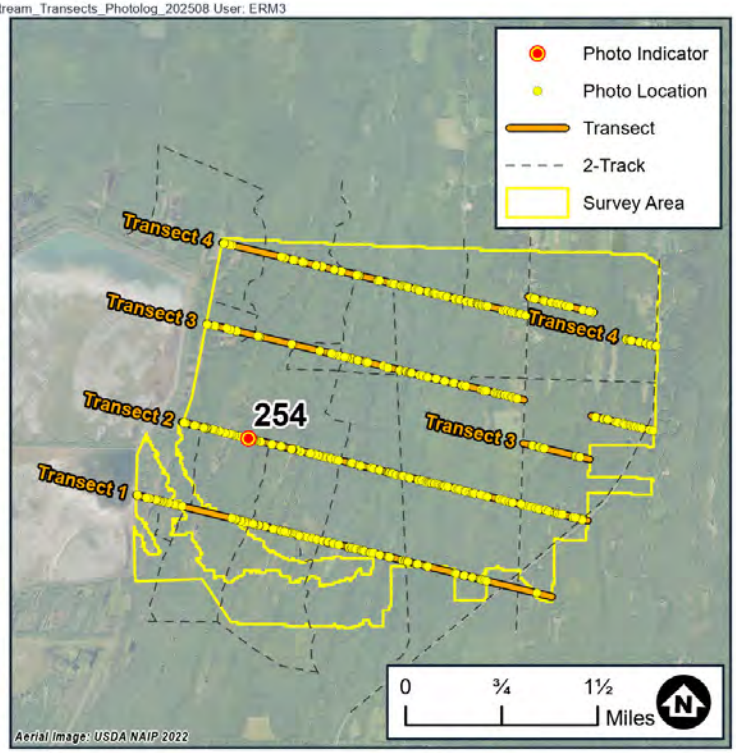
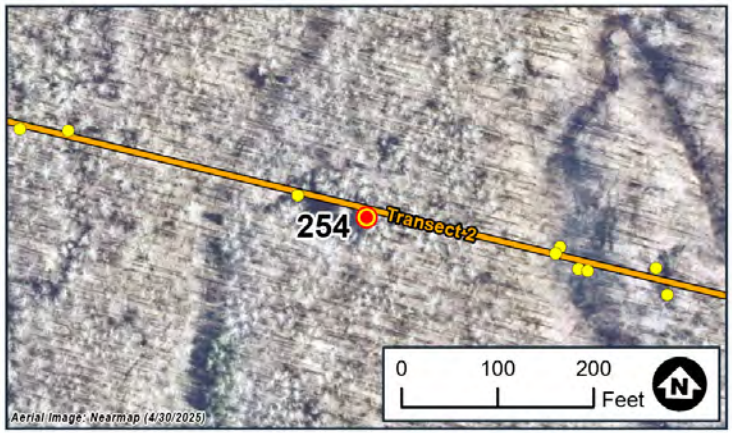



**Photo 254-2**





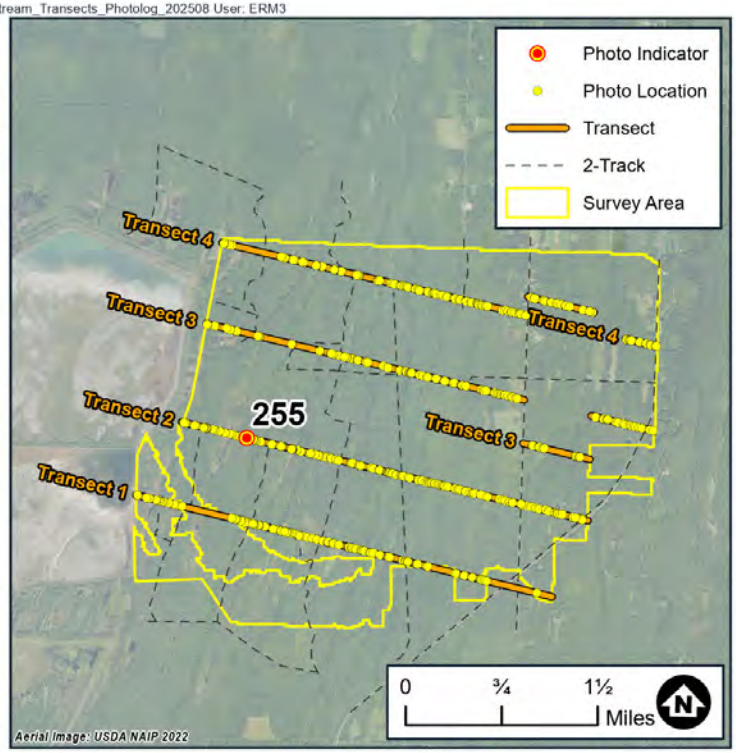

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP11-A, Wetland
**Photo 2 Caption:** T2W-BP11-A, Upland

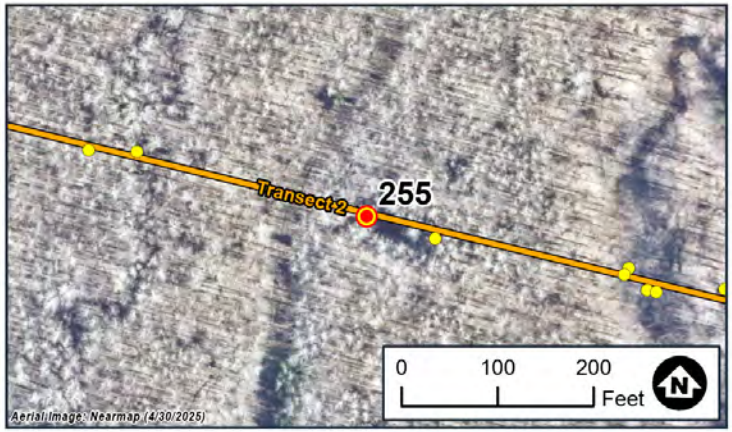
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

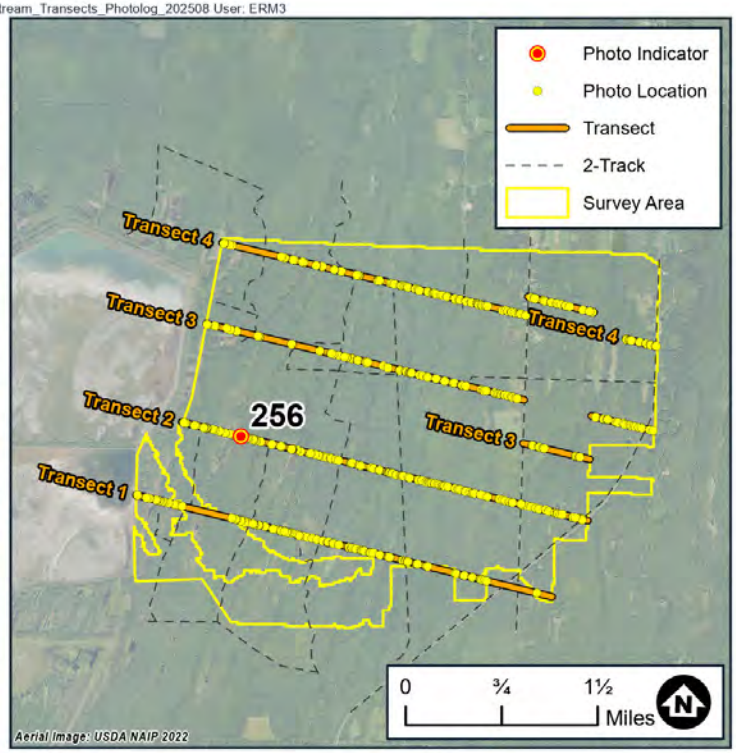
BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP11-B, Wetland
**Photo 2 Caption:** T2W-BP11-B, Upland

*Note: Photo locations are approximate*

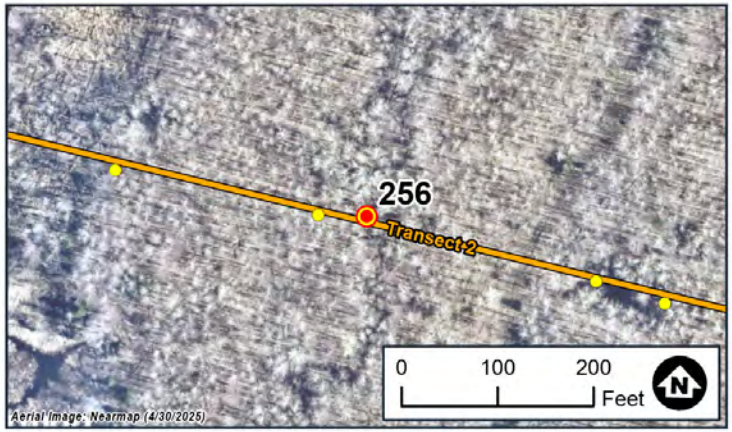
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP12-A, Wetland
**Photo 2 Caption:** T2W-BP12-A, Upland

*Note: Photo locations are approximate*

**Photo 257-1**



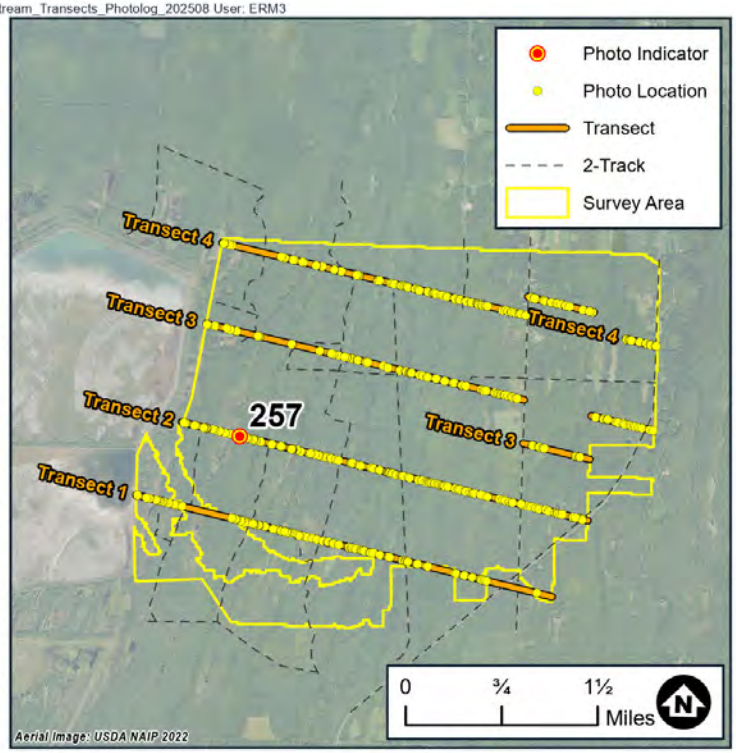
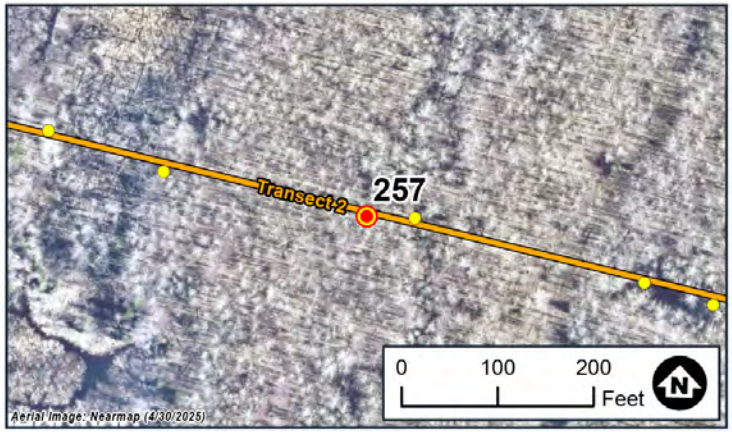



**Photo 257-2**







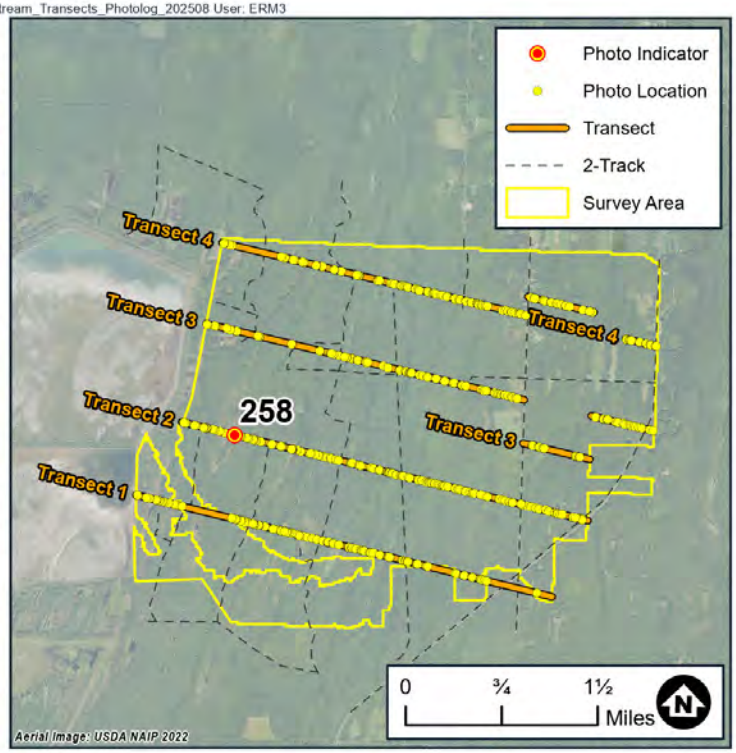

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP12-B, Wetland
**Photo 2 Caption:** T2W-BP12-B, Upland

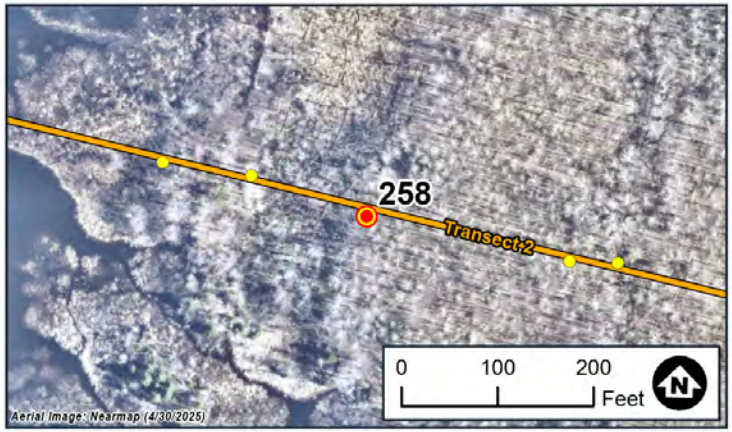
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

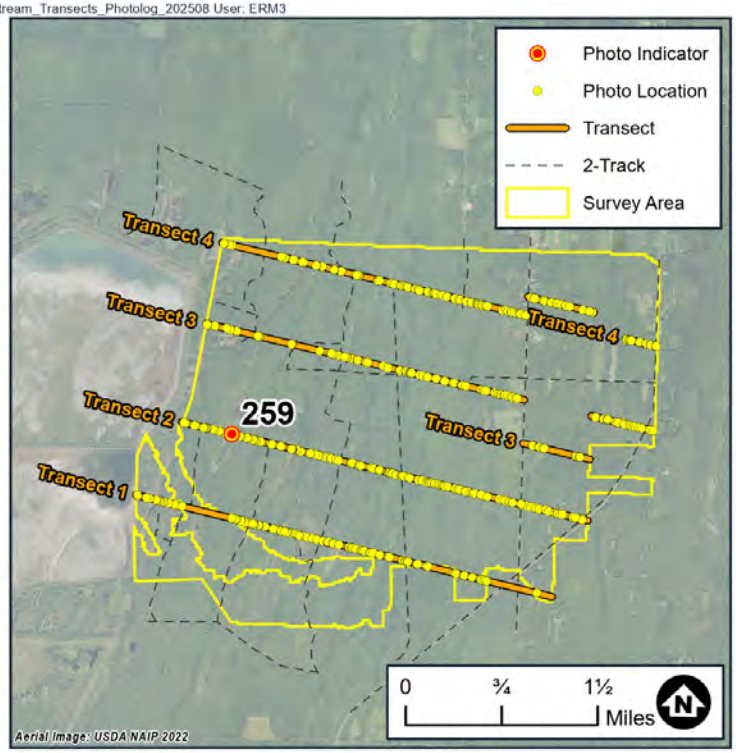
BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP13-A, Wetland
**Photo 2 Caption:** T2W-BP13-A, Upland

*Note: Photo locations are approximate*

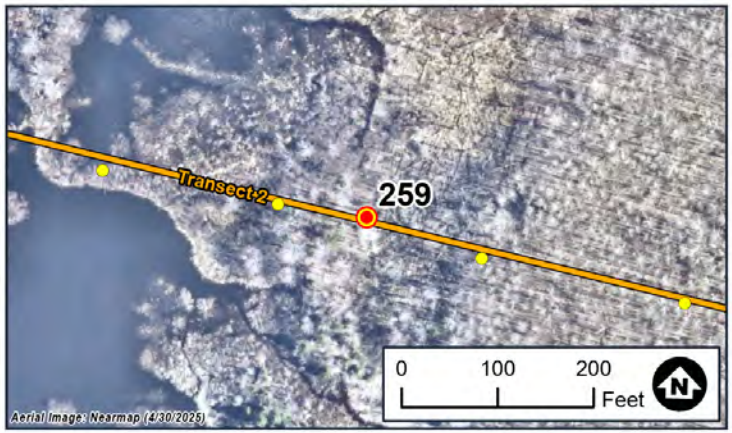
## Photo 259-1






## Photo 259-2







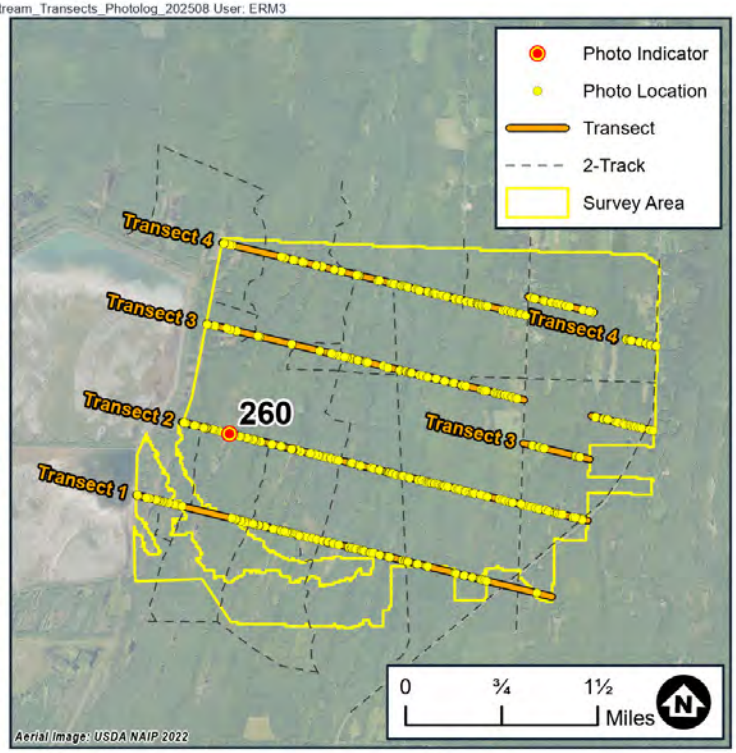

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP13-B, Wetland
**Photo 2 Caption:** T2W-BP13-B, Upland

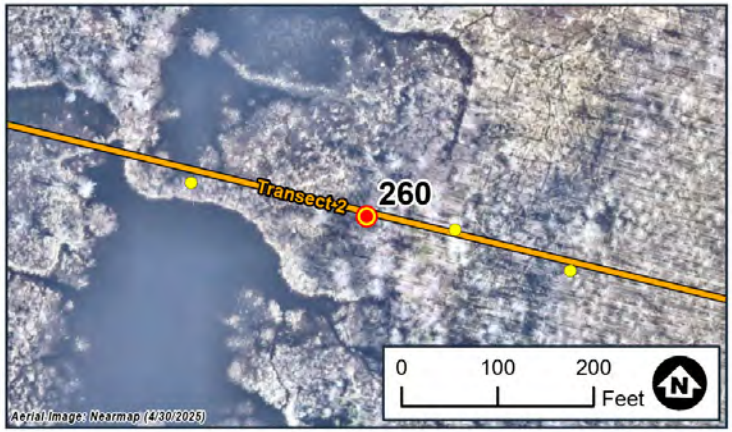
*Note: Photo locations are approximate*









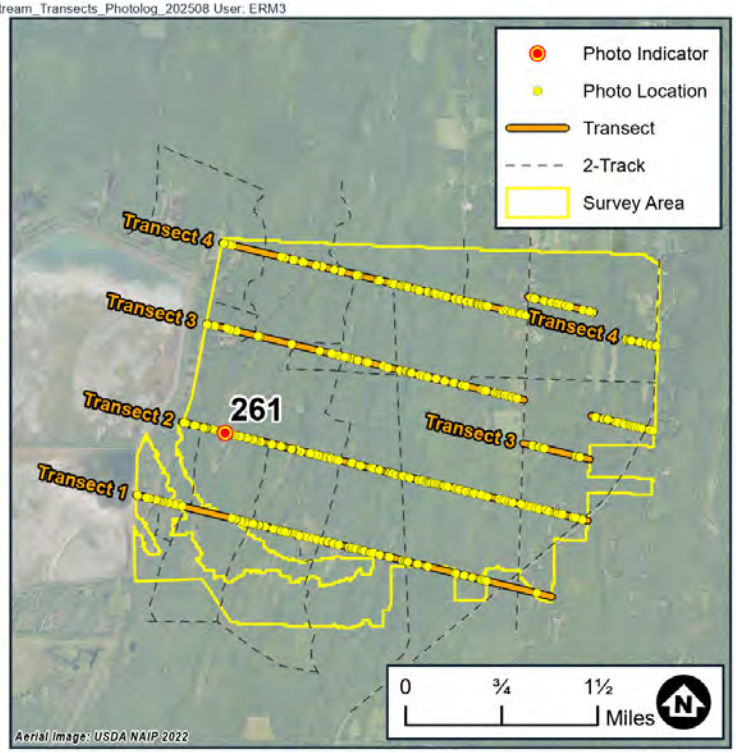

Page 260 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP14-A, Wetland
**Photo 2 Caption:** T2W-BP14-A, Upland

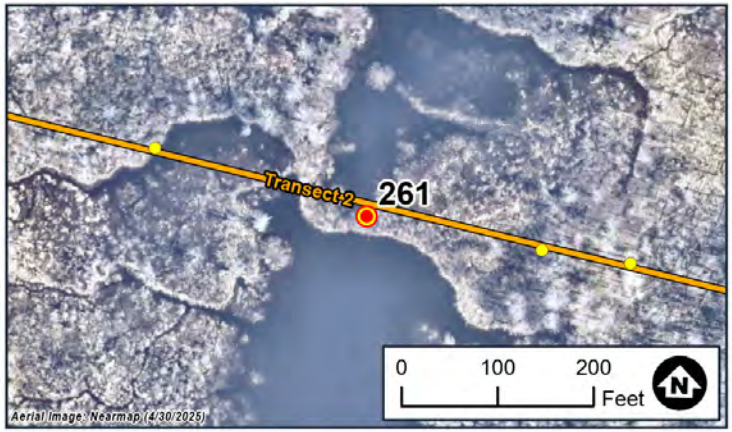
*Note: Photo locations are approximate*









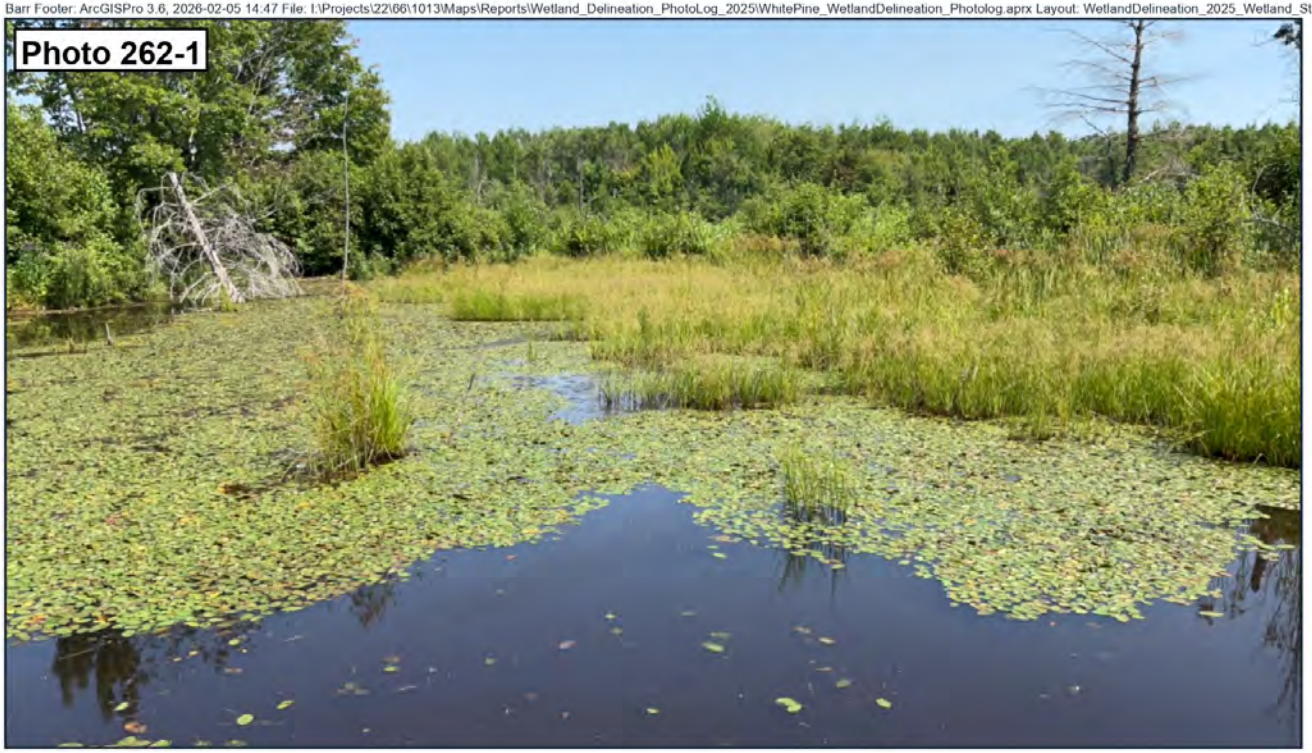

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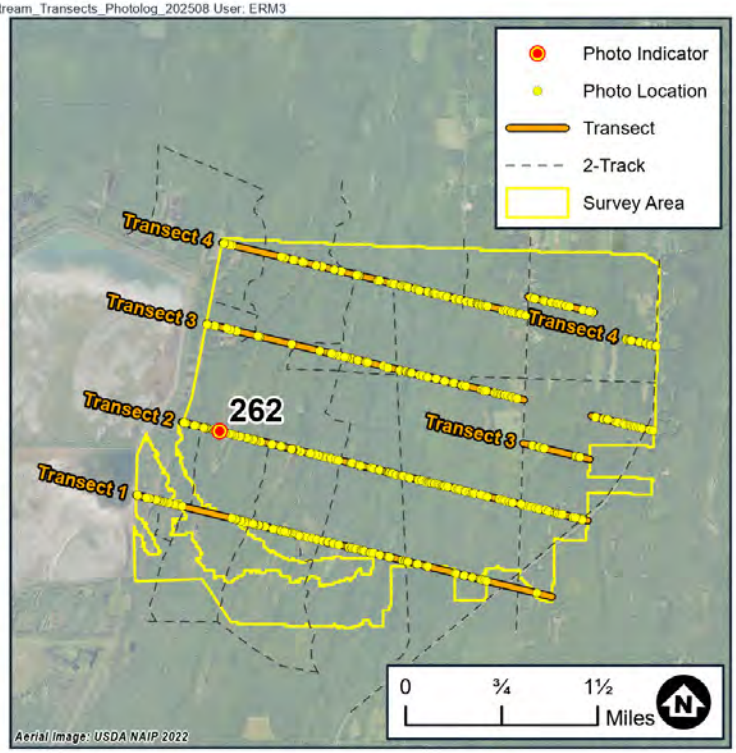
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-S08-RB, Upstream
**Photo 2 Caption:** T2W-S08-RB, Downstream

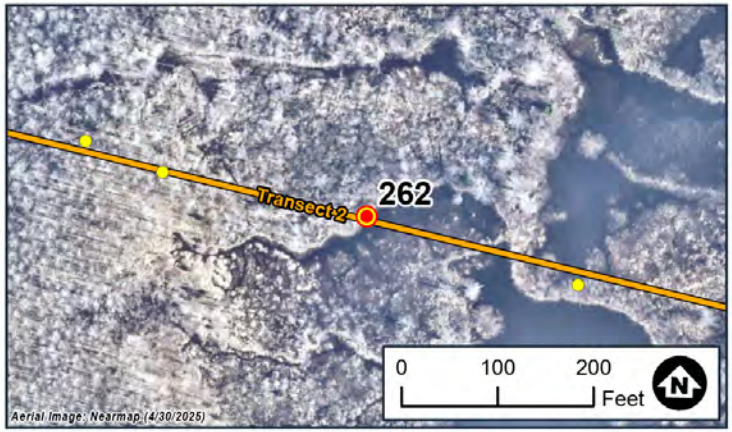
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

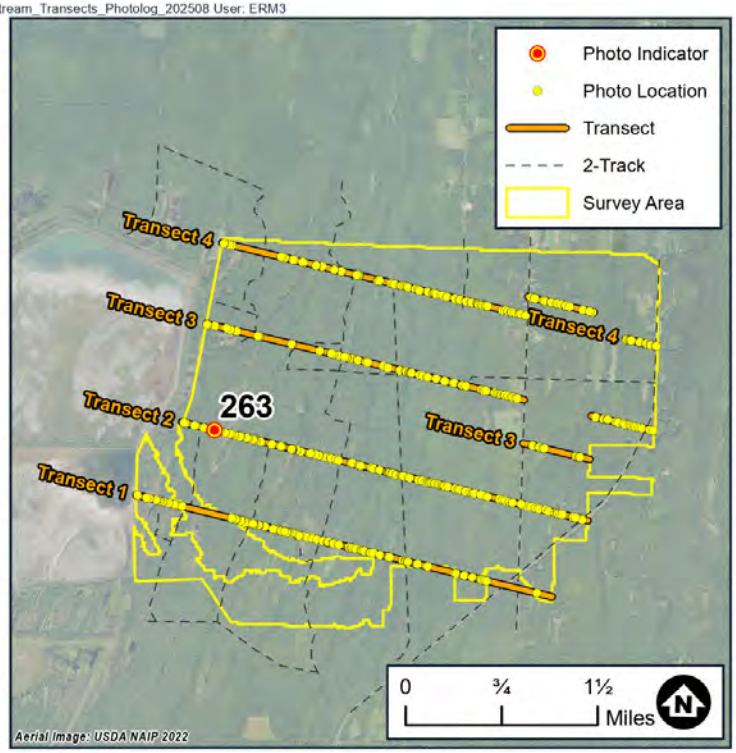
BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-S09-LB, Upstream
**Photo 2 Caption:** T2W-S09-LB, Downstream

*Note: Photo locations are approximate*

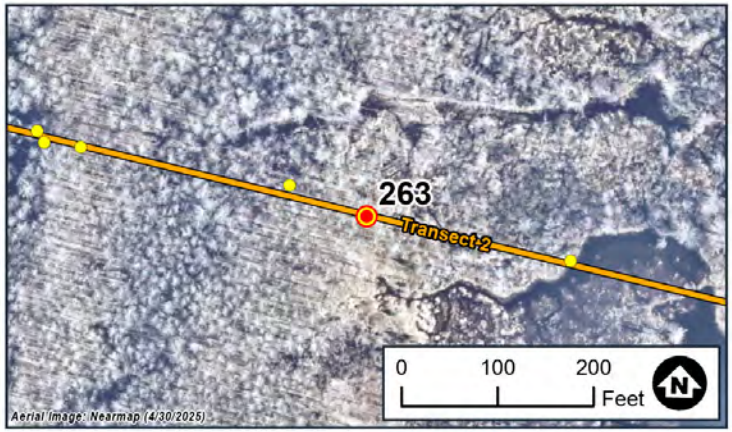
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3










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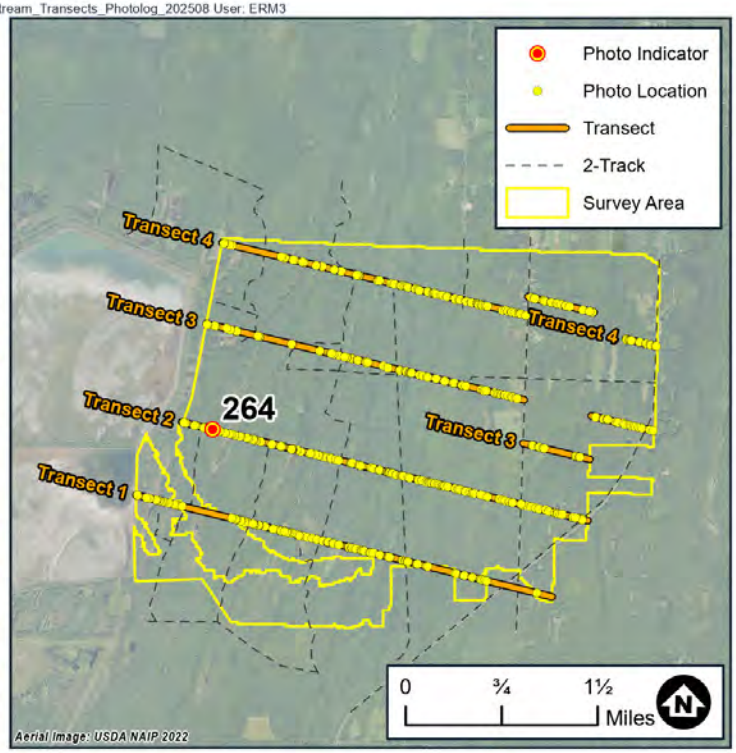
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP14-B, Wetland
**Photo 2 Caption:** T2W-BP14-B, Upland

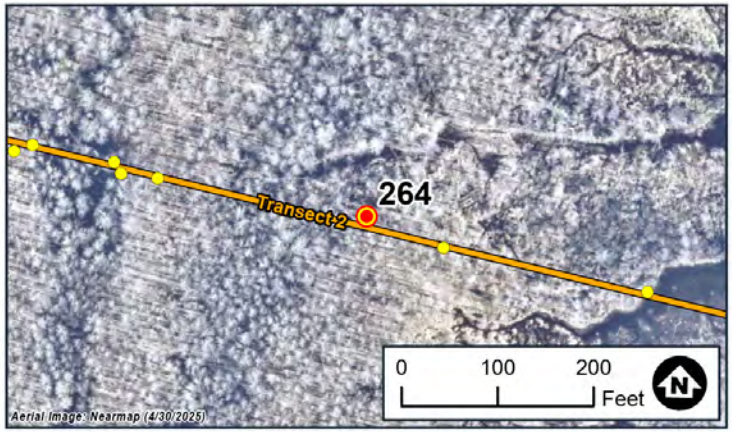
*Note: Photo locations are approximate*









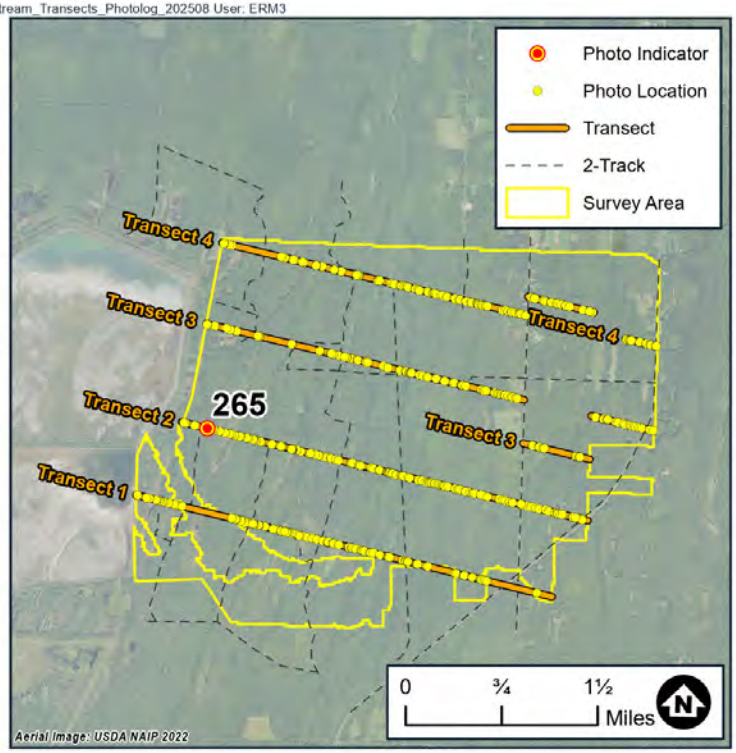

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP15-A Wetland
**Photo 2 Caption:** T2W-BP15-A Upland

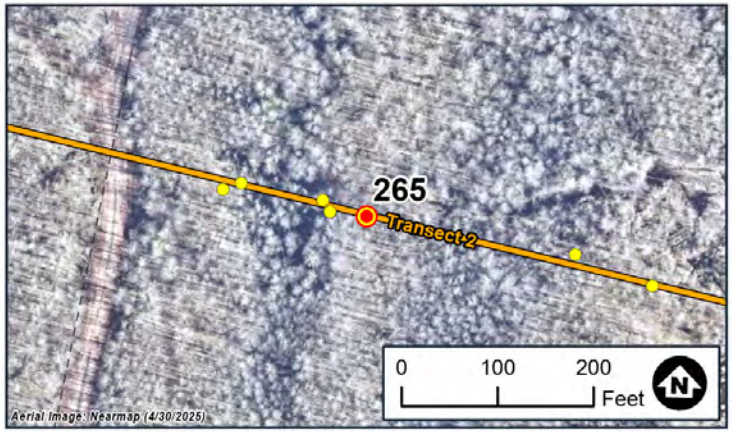
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

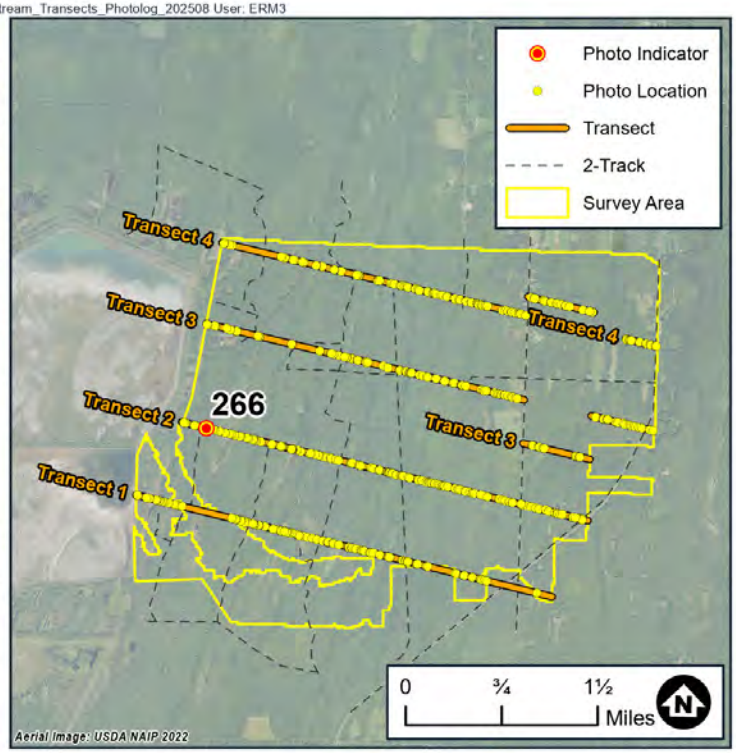
BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP15-B, Wetland
**Photo 2 Caption:** T2W-BP15-B, Upland

*Note: Photo locations are approximate*

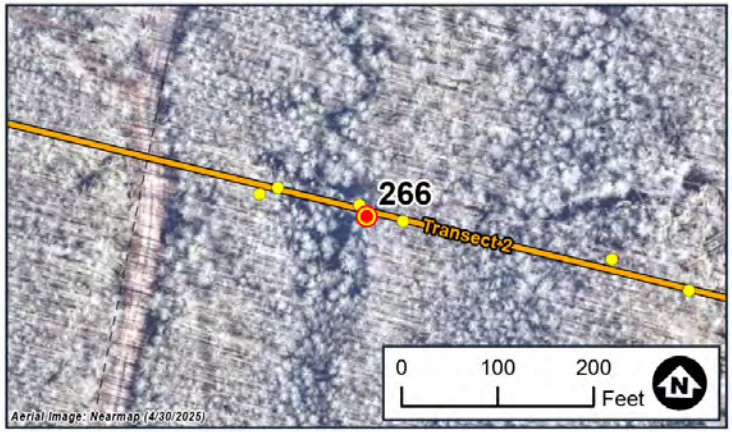
## Photo 266-1






## Photo 266-2







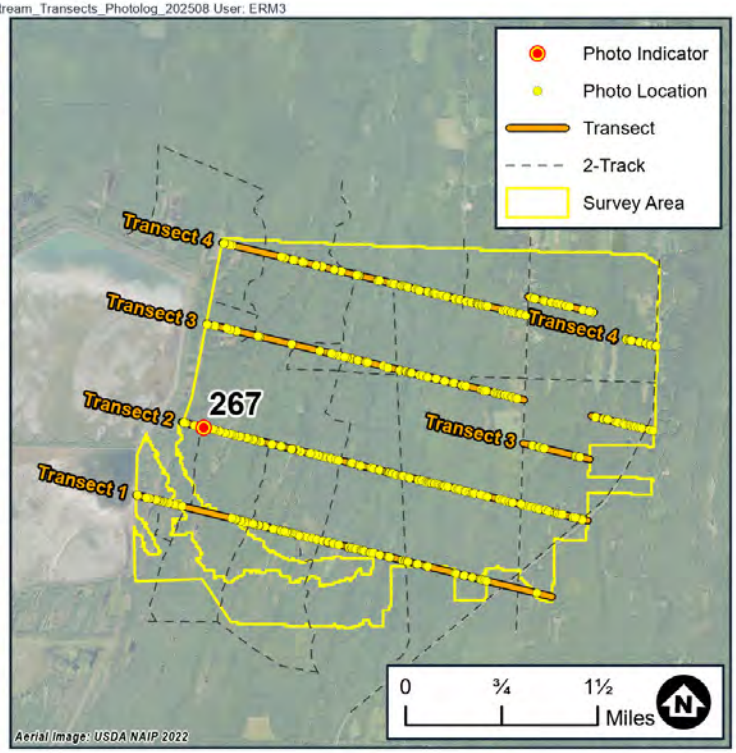

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP16-A, Wetland
**Photo 2 Caption:** T2W-BP16-A, Upland

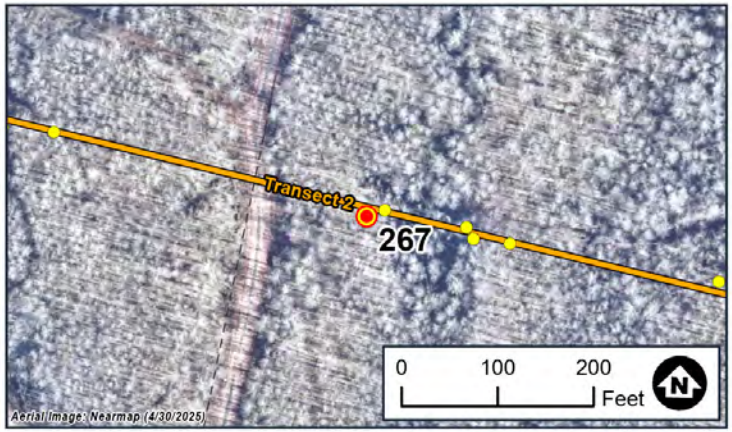
*Note: Photo locations are approximate*











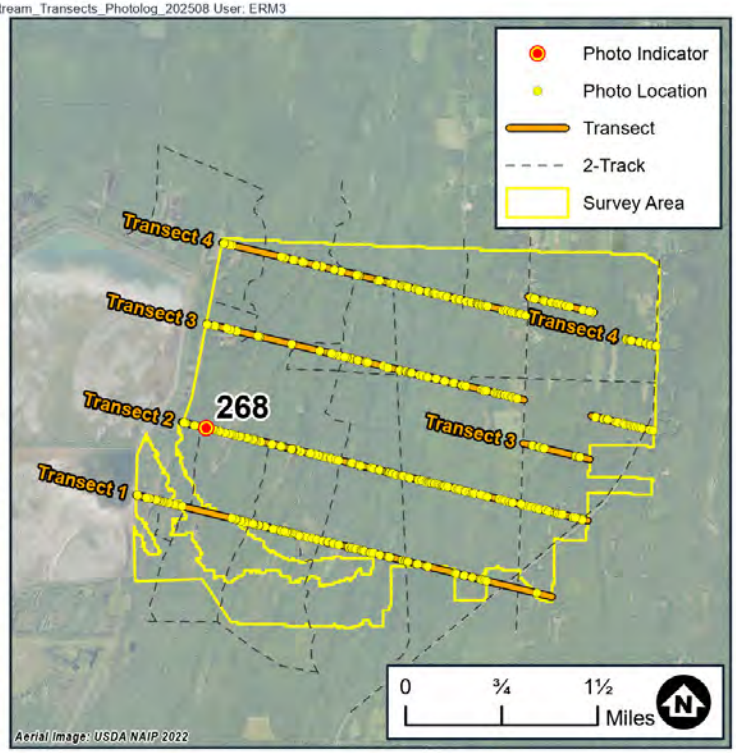

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-BP16-B, Wetland
**Photo 2 Caption:** T2W-BP16-B, Upland

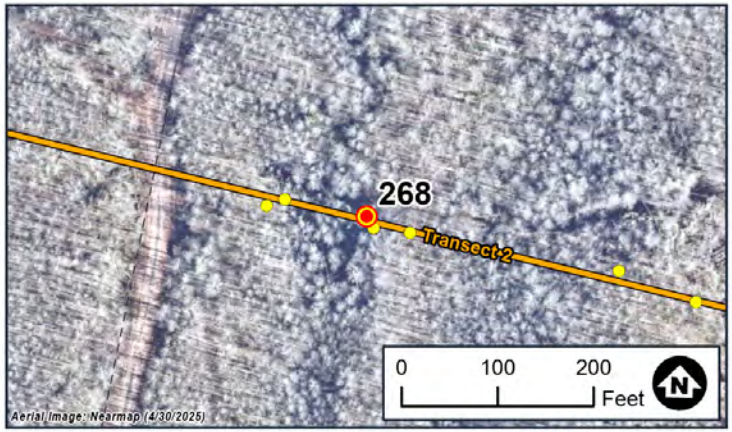
*Note: Photo locations are approximate*










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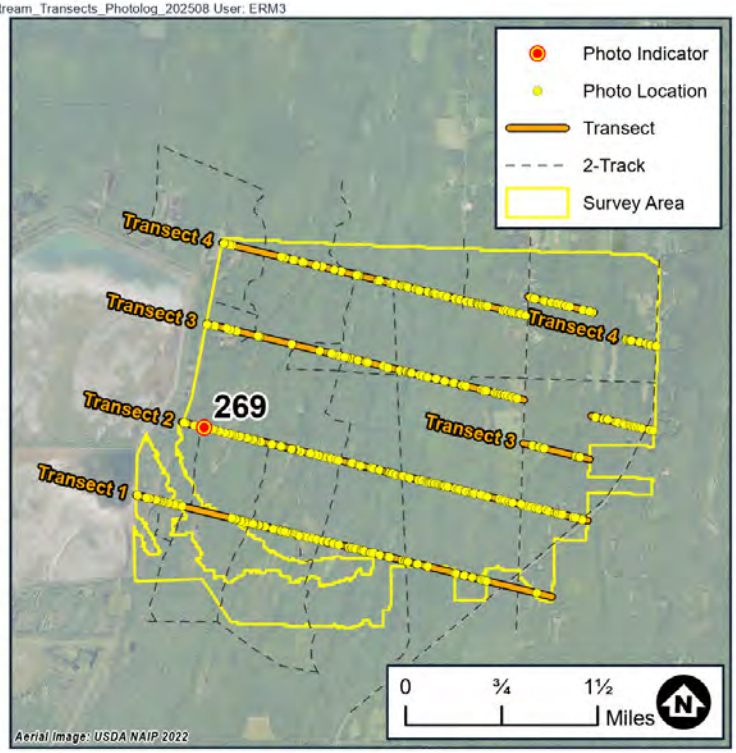
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-S10-RB, Upstream
**Photo 2 Caption:** T2W-S10-RB, Downstream

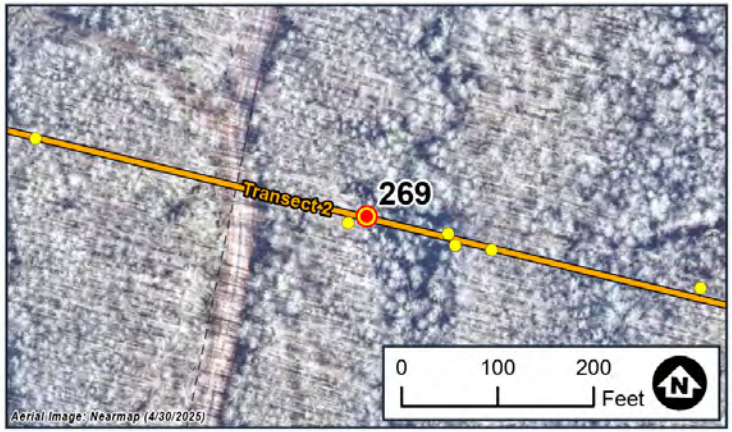
*Note: Photo locations are approximate*











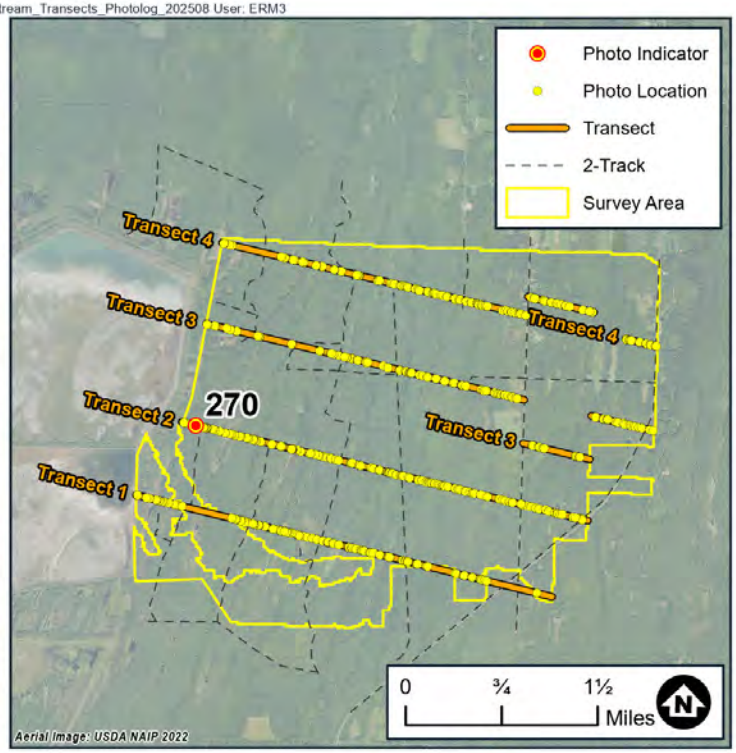

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T2W-S10-LB, Upstream
**Photo 2 Caption:** T2W-S10-LB, Downstream

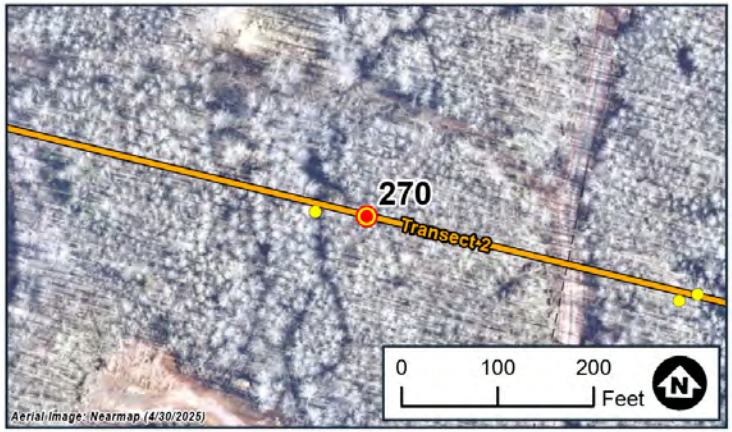
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

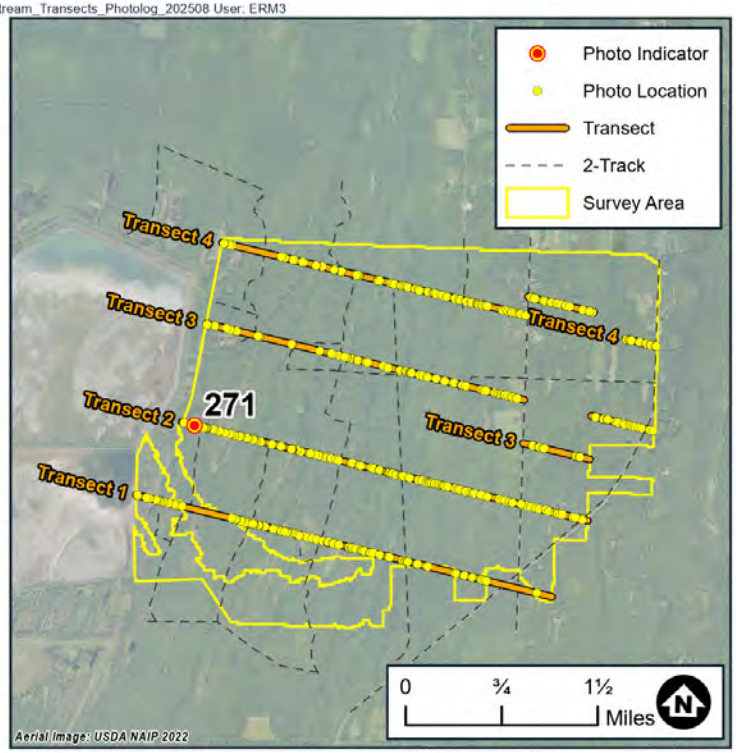
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T2W-BP17-A, Wetland
**Photo 2 Caption:** T2W-BP17-A, Upland

*Note: Photo locations are approximate*

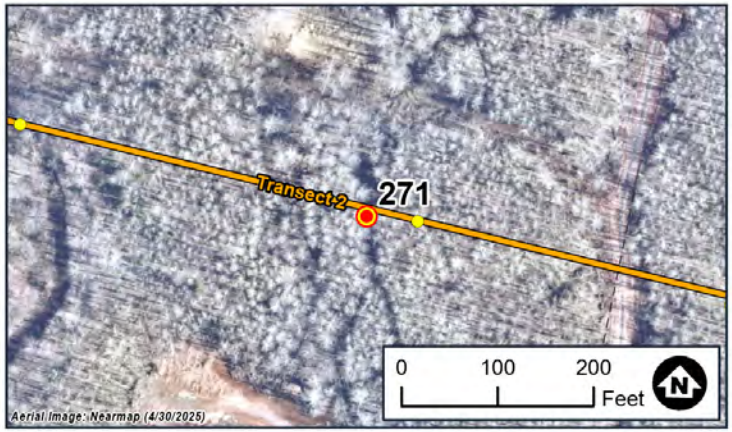
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3











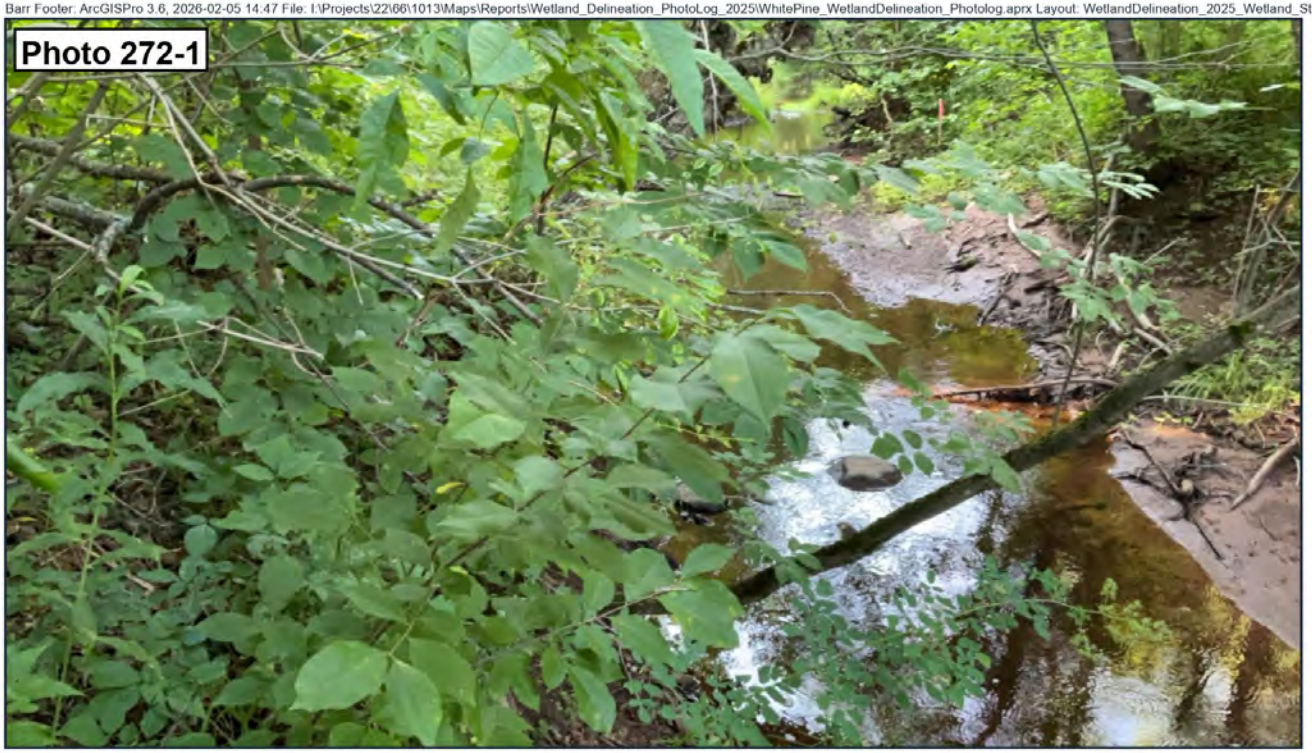

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

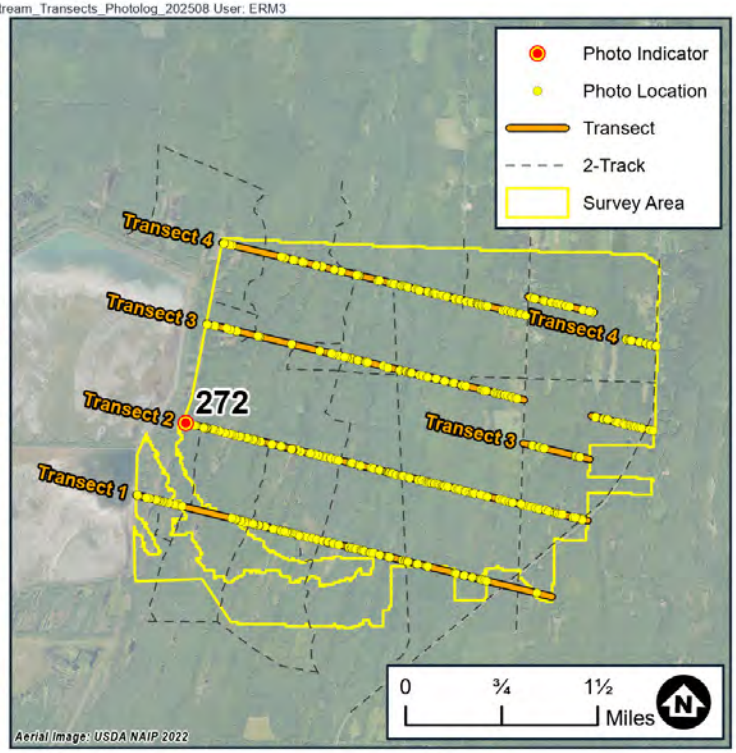
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T2W-BP17-B, Wetland
**Photo 2 Caption:** T2W-BP17-B, Upland

*Note: Photo locations are approximate*

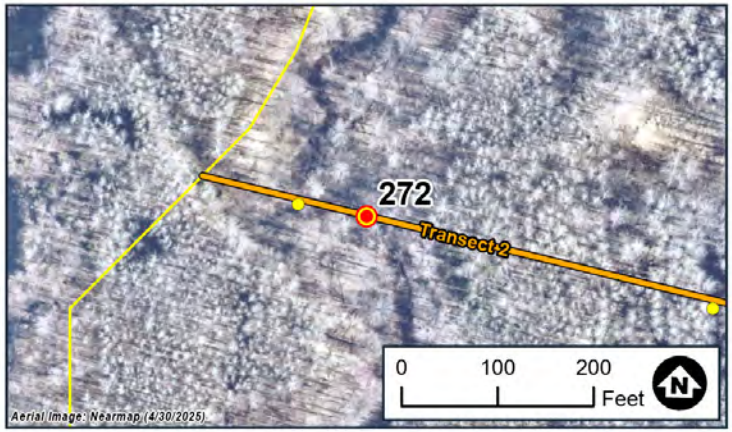
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3











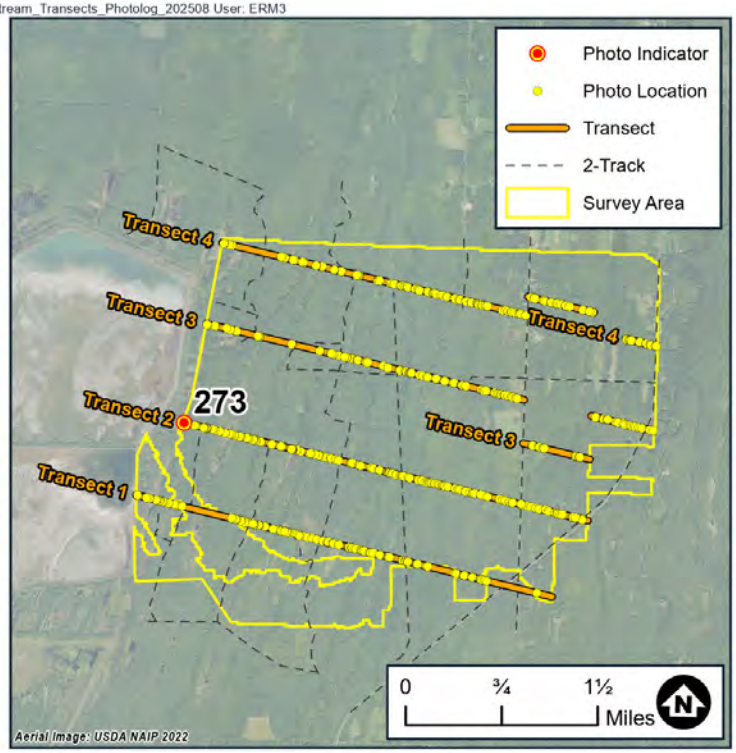

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T2W-S11-RB, Upstream
**Photo 2 Caption:** T2W-S11-RB, Downstream

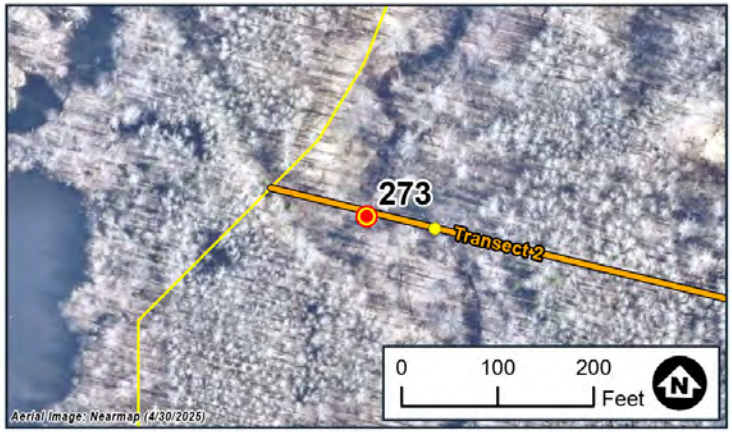
*Note: Photo locations are approximate*









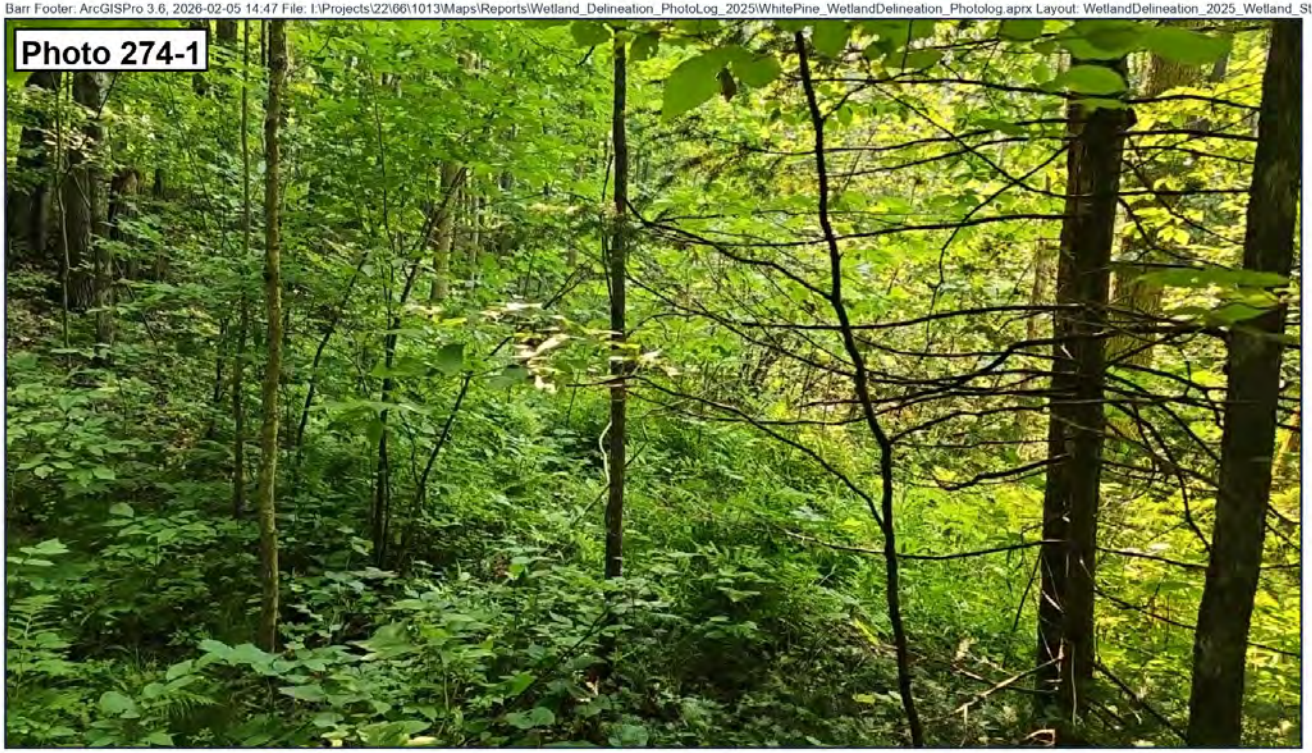

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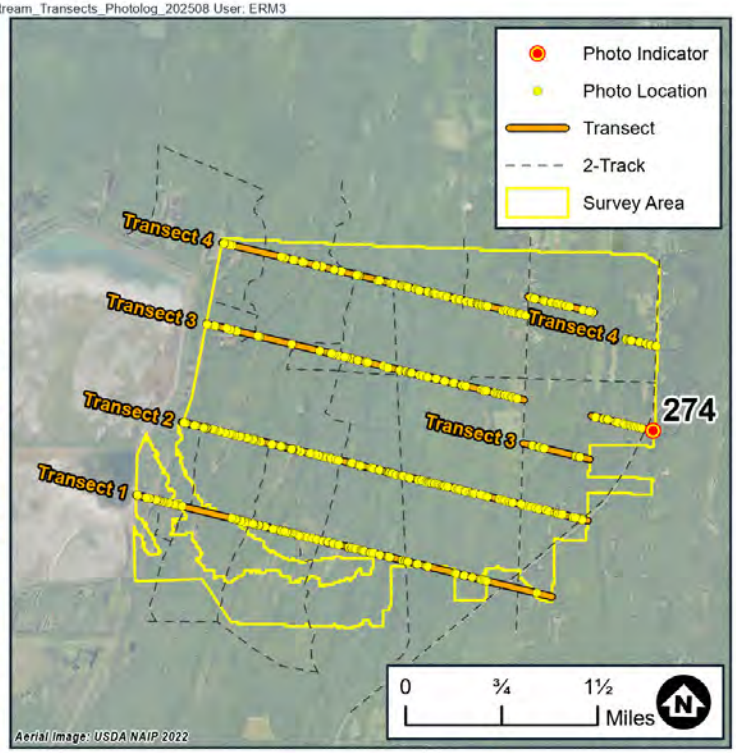
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T2W-S11-LB, Upstream
**Photo 2 Caption:** T2W-S11-LB, Downstream

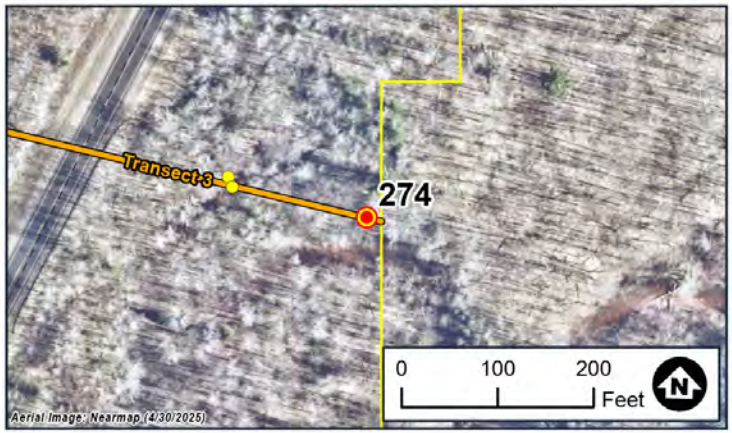
*Note: Photo locations are approximate*











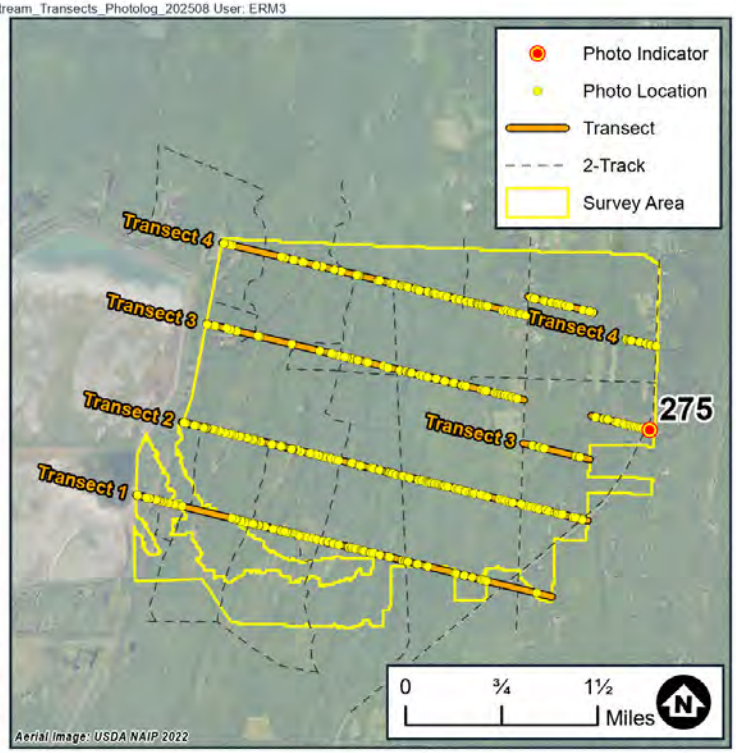

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP29-A, Wetland
**Photo 2 Caption:** T3E-BP29-A, Upland

*Note: Photo locations are approximate*











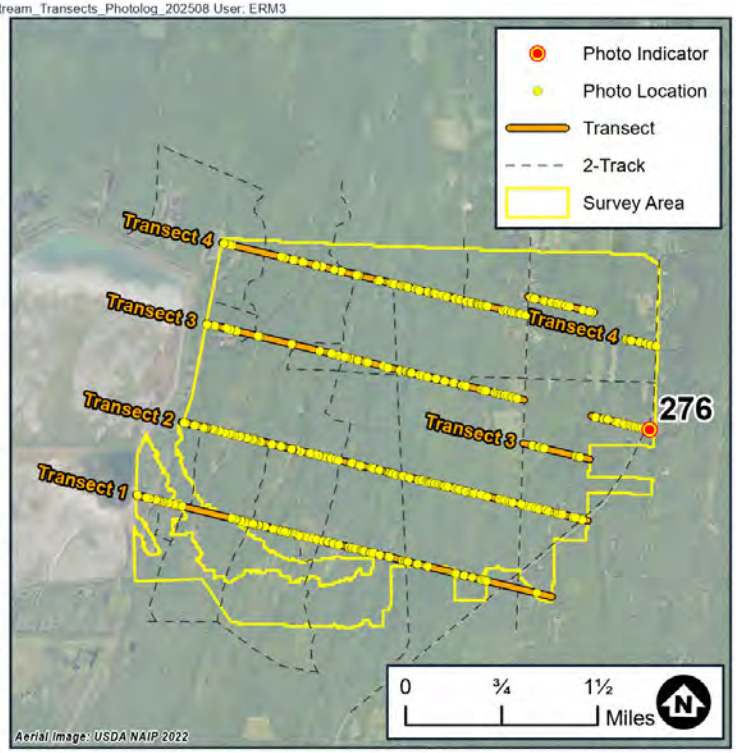

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP28-B, Wetland
**Photo 2 Caption:** T3E-BP28-B, Upland

*Note: Photo locations are approximate*











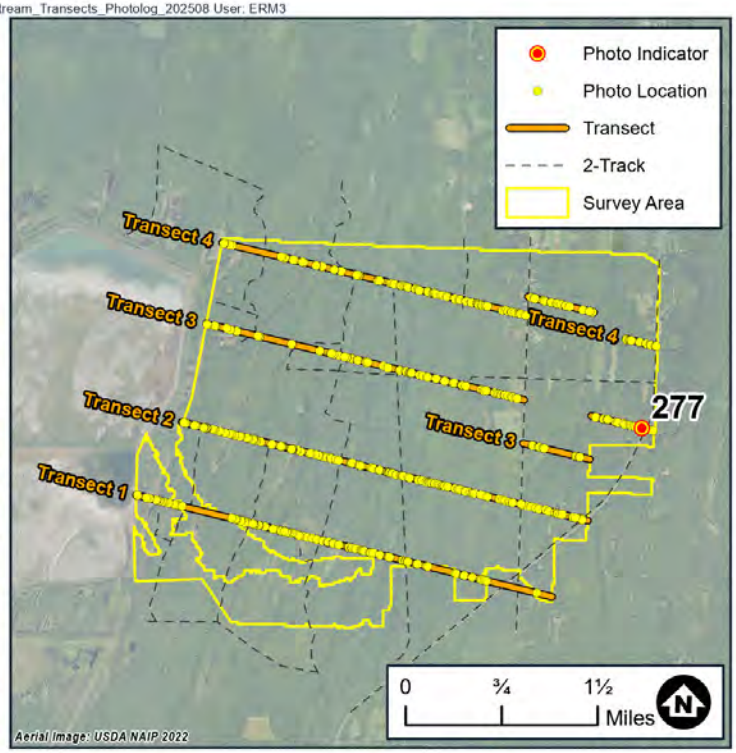

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP28-A, Wetland
**Photo 2 Caption:** T3E-BP28-A, Upland

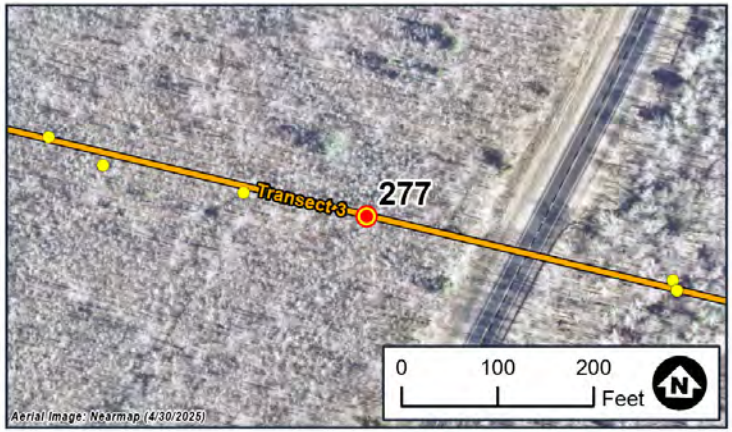
*Note: Photo locations are approximate*










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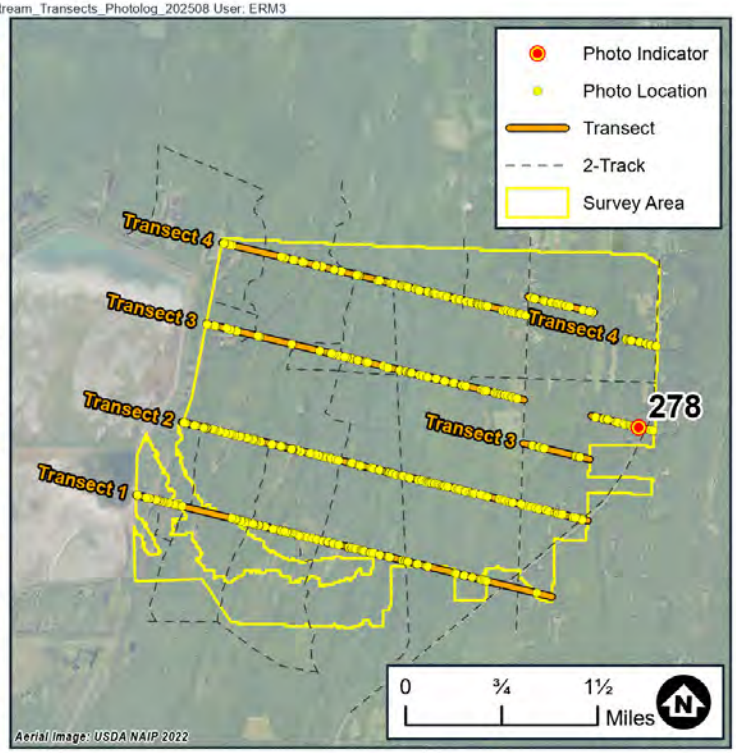
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP27-B, Wetland
**Photo 2 Caption:** T3E-BP27-B, Upland

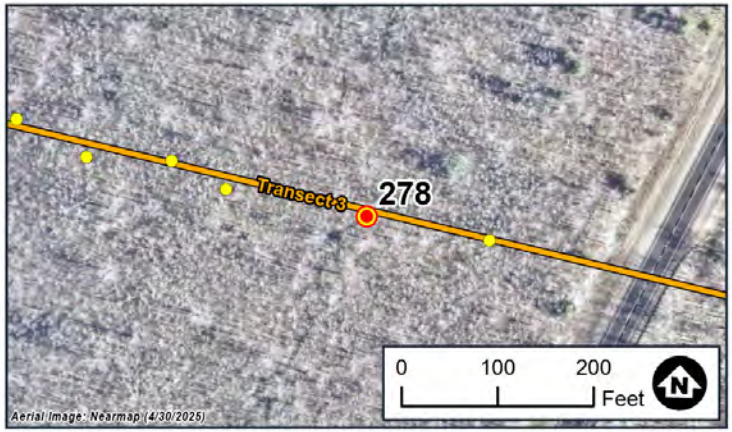
*Note: Photo locations are approximate*









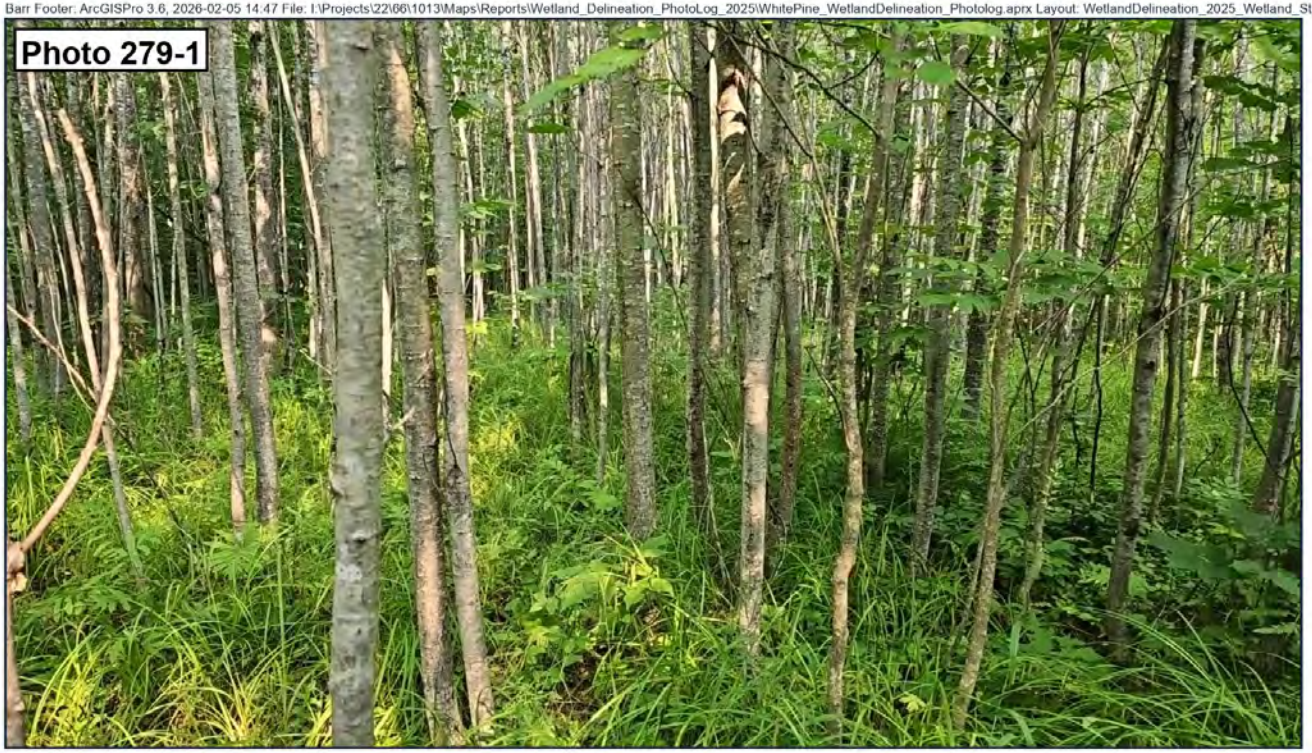

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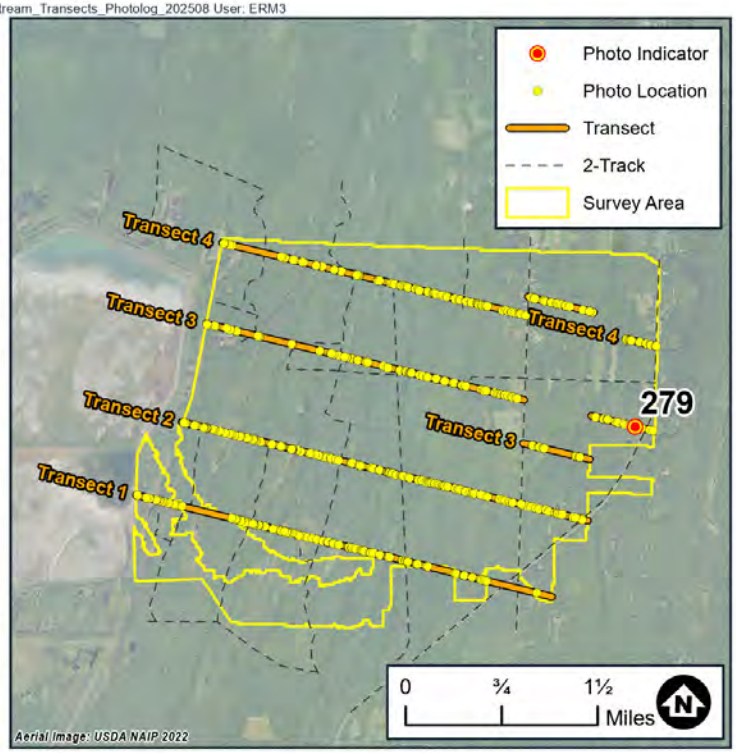
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP27-A, Wetland
**Photo 2 Caption:** T3E-BP27-A, Upland

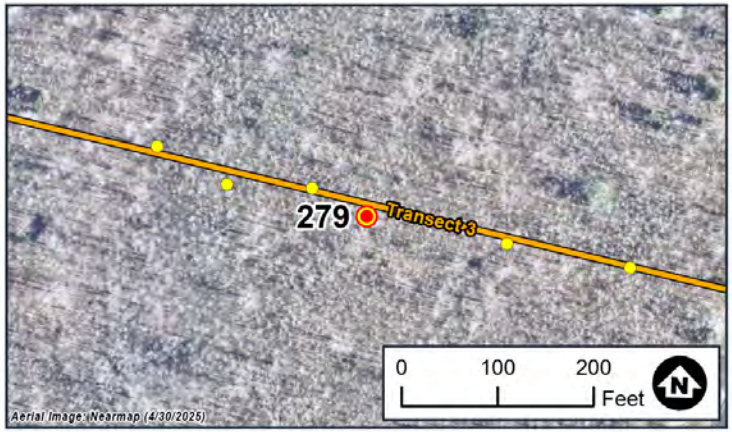
*Note: Photo locations are approximate*










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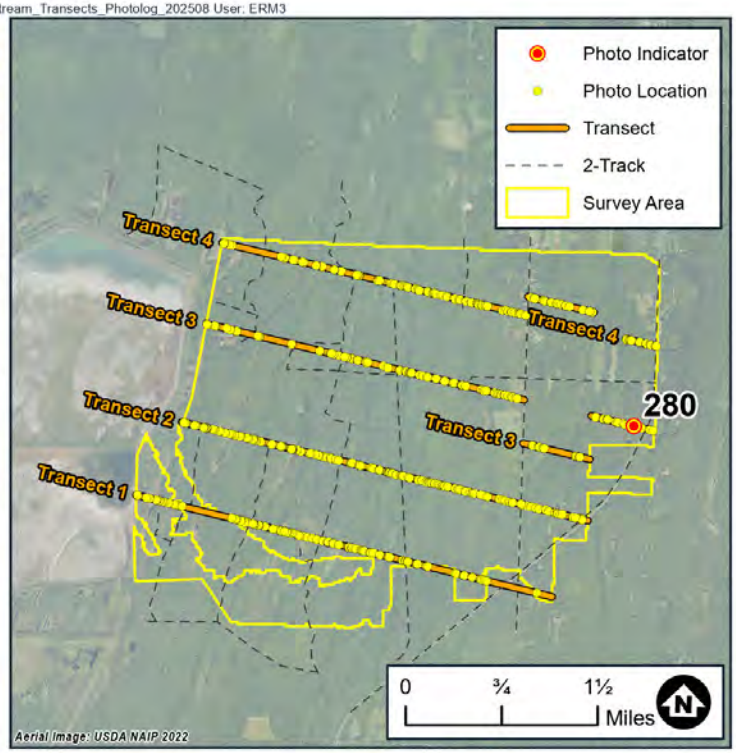
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP26-B, Wetland
**Photo 2 Caption:** T3E-BP26-B, Upland

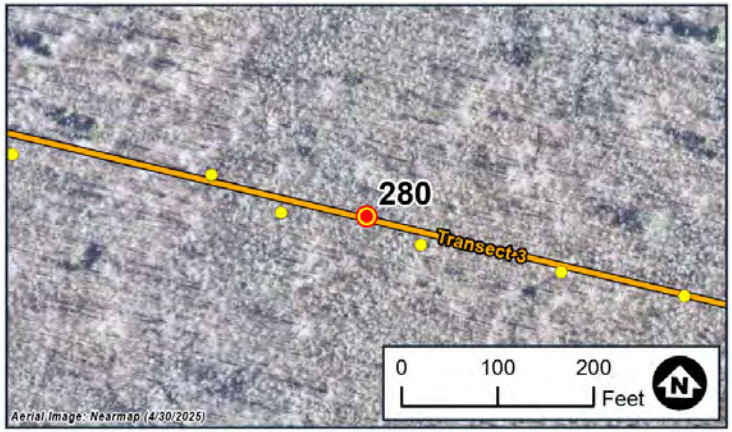
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

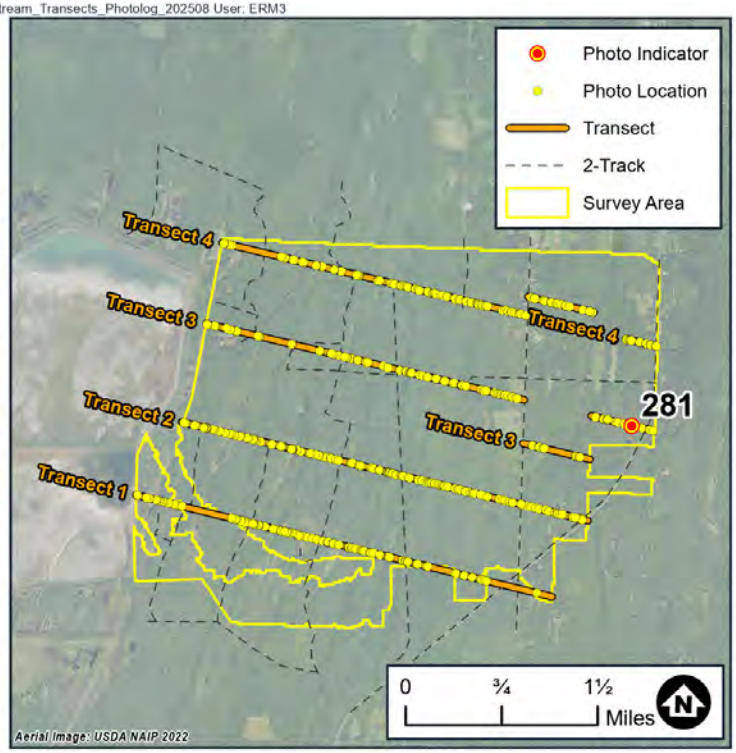
**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP26-A, Wetland
**Photo 2 Caption:** T3E-BP26-A, Upland

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3

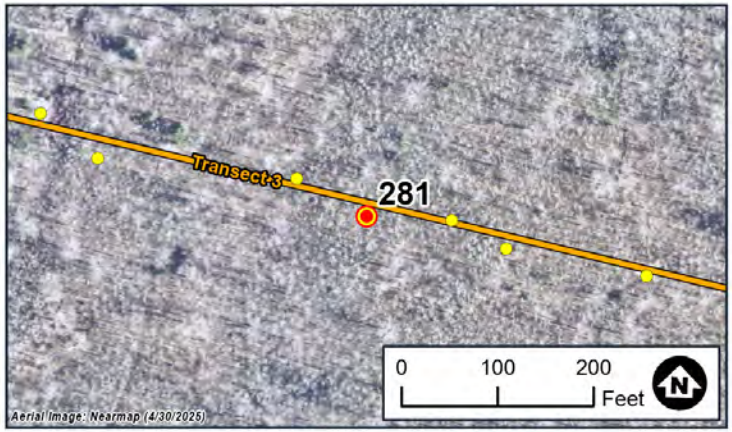
## Photo 281-1






## Photo 281-2







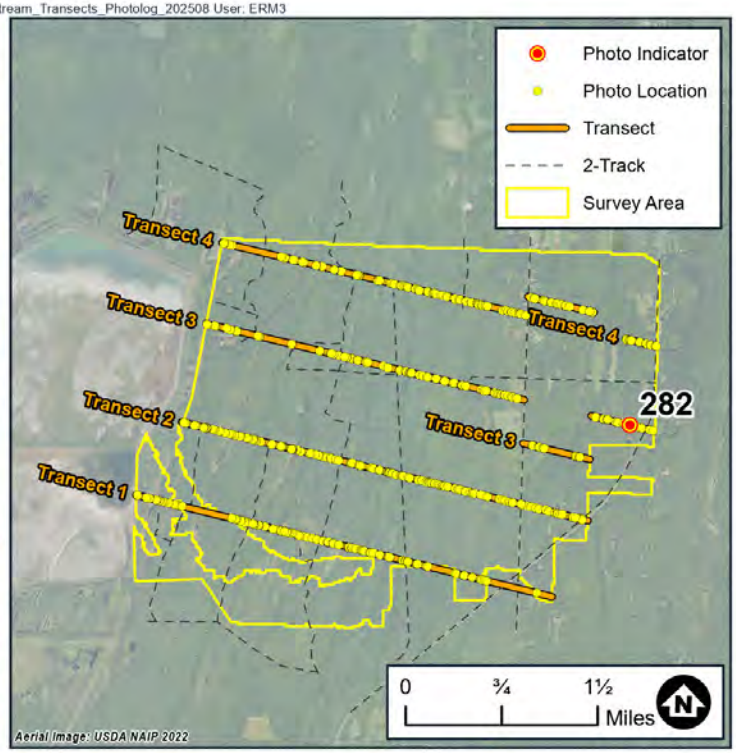

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP25-B, Wetland
**Photo 2 Caption:** T3E-BP25-B, Upland

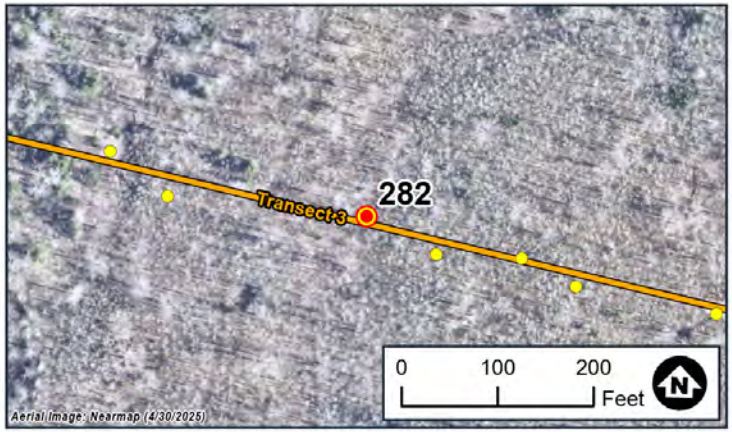
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

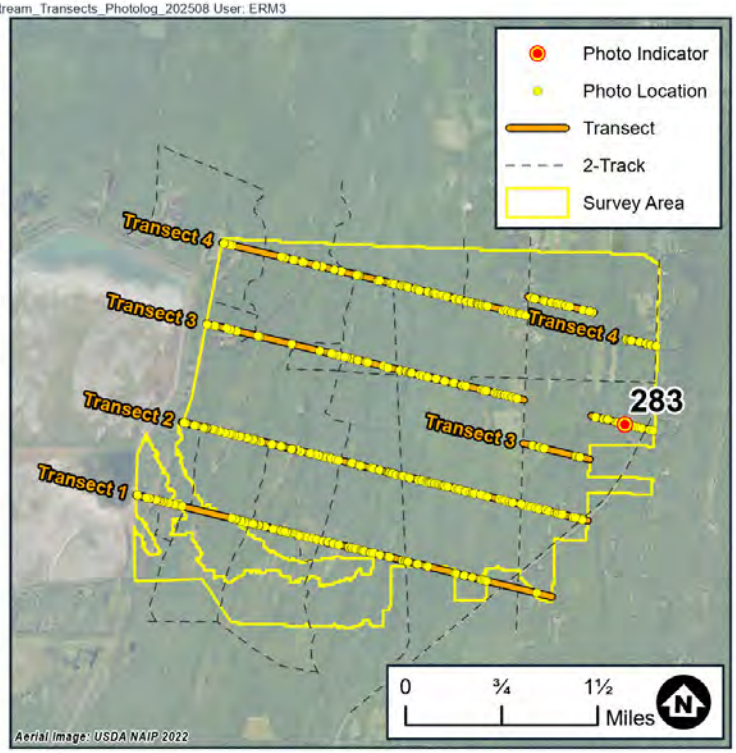
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP25-A, Wetland
**Photo 2 Caption:** T3E-BP25-A, Upland

*Note: Photo locations are approximate*

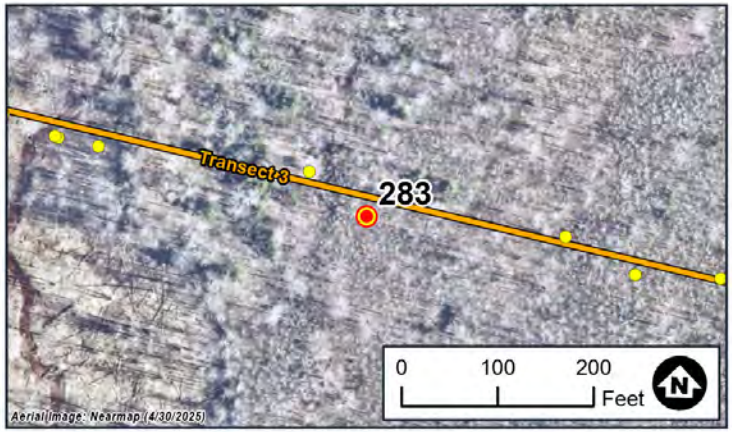
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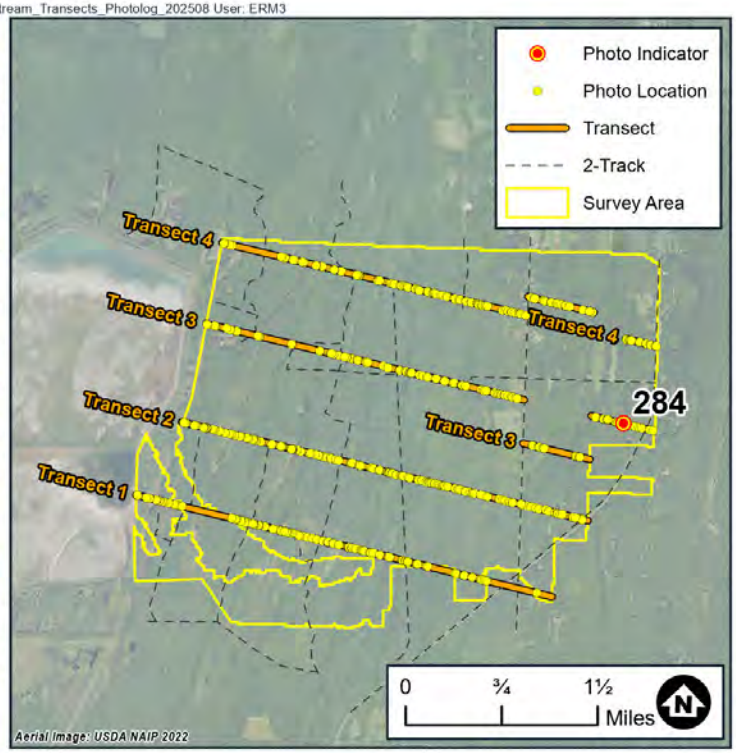

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP24-B, Wetland
**Photo 2 Caption:** T3E-BP24-B, Upland

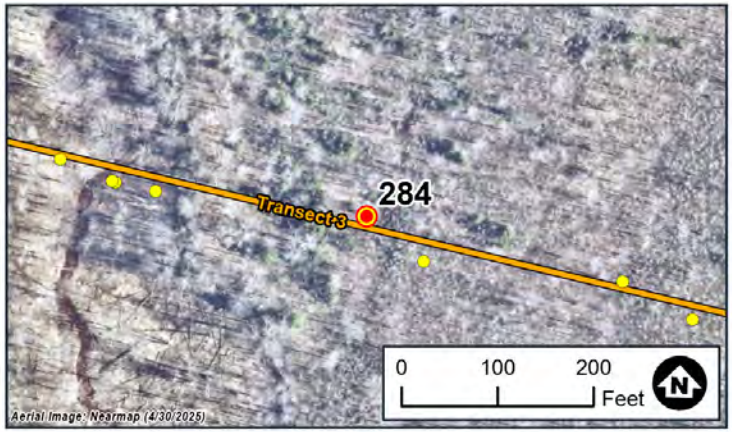
*Note: Photo locations are approximate*









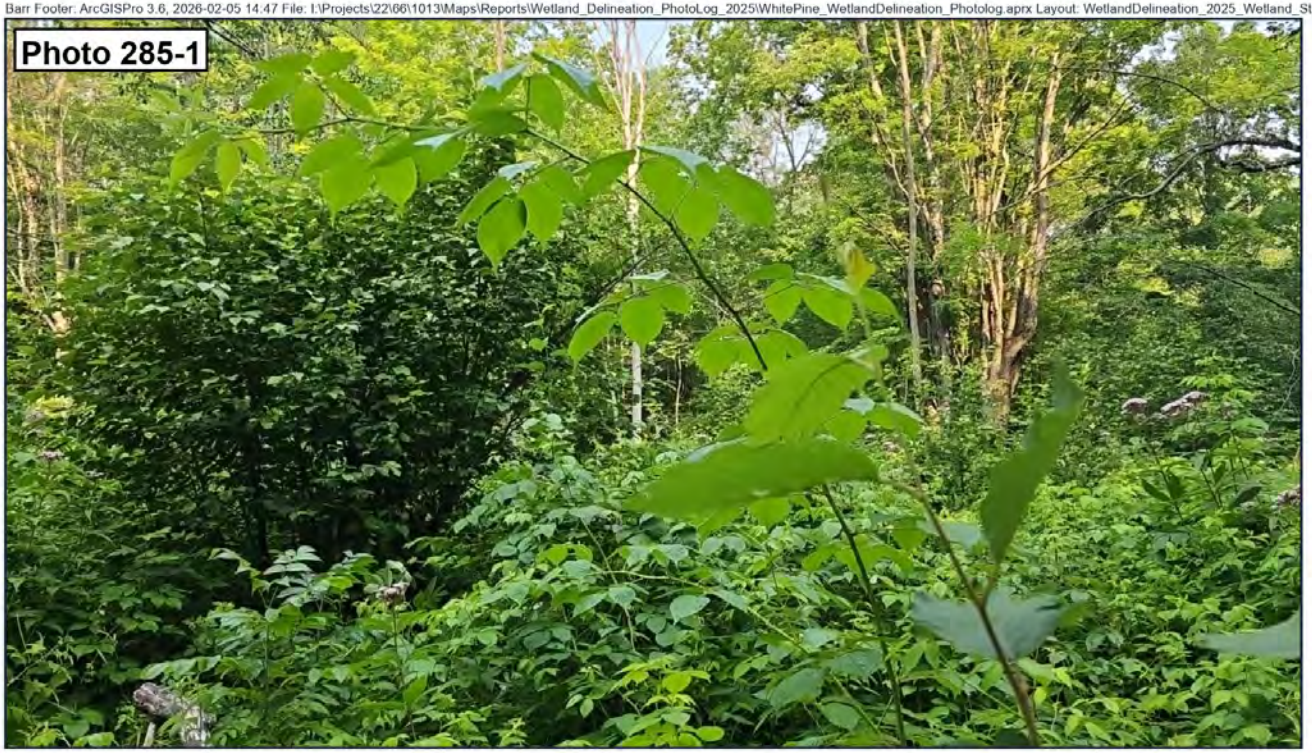

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

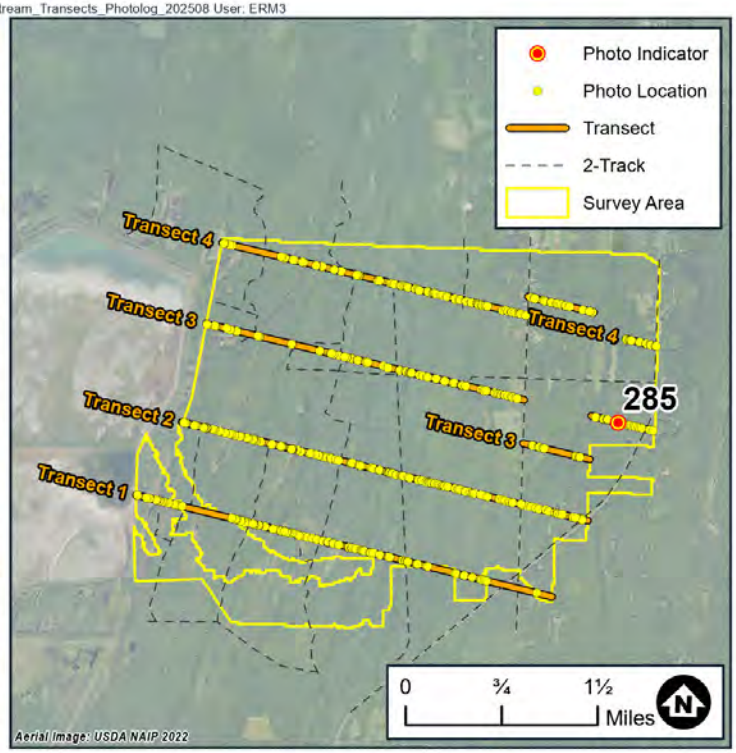
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP24-A, Wetland
**Photo 2 Caption:** T3E-BP24-A, Upland

*Note: Photo locations are approximate*

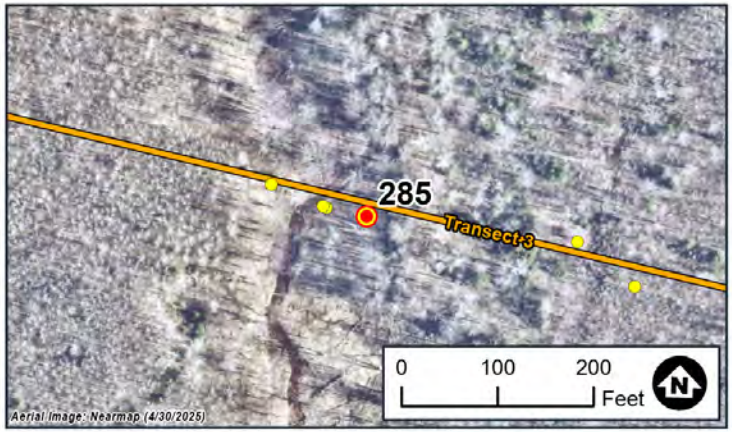
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3









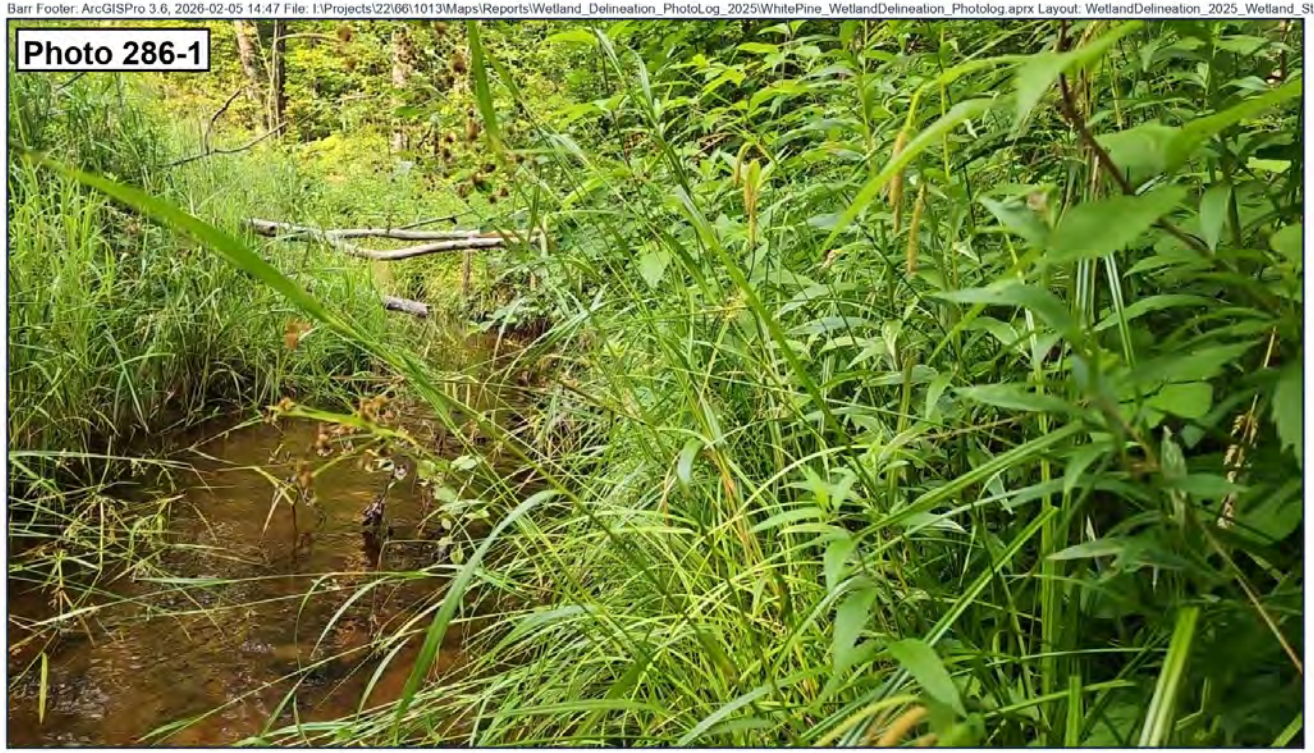


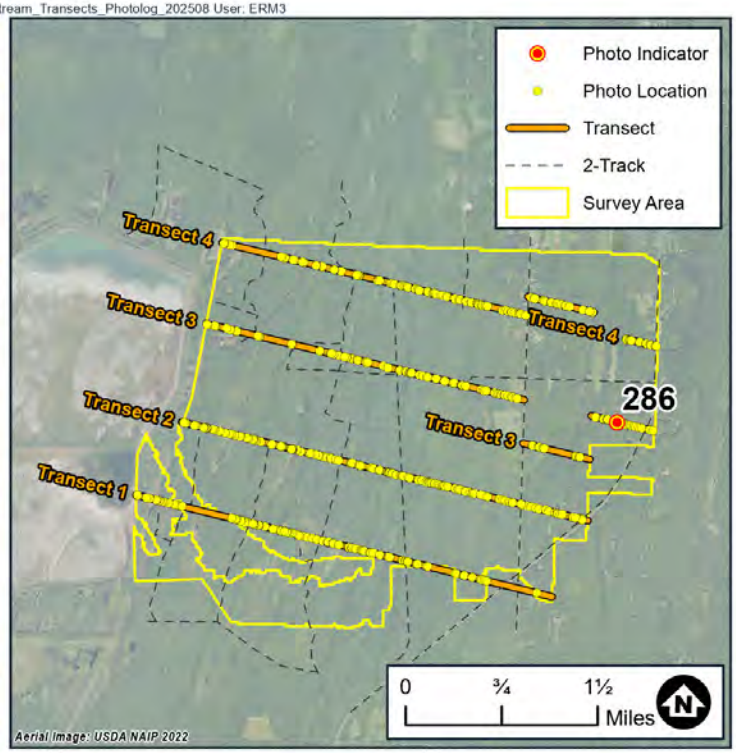

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP23-B, Wetland
**Photo 2 Caption:** T3E-BP23-B, Upland

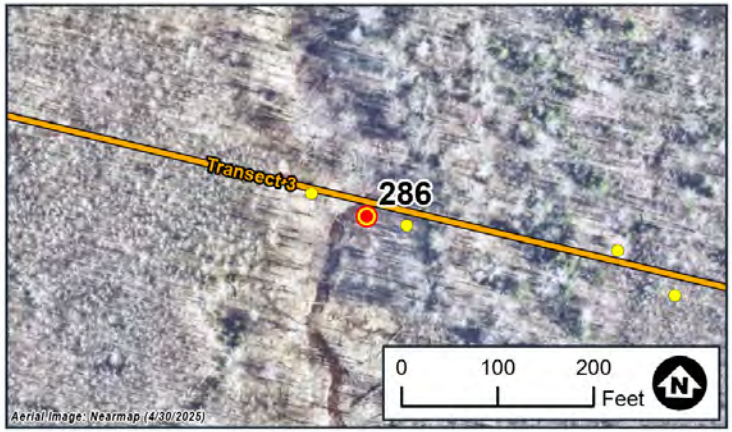
*Note: Photo locations are approximate*











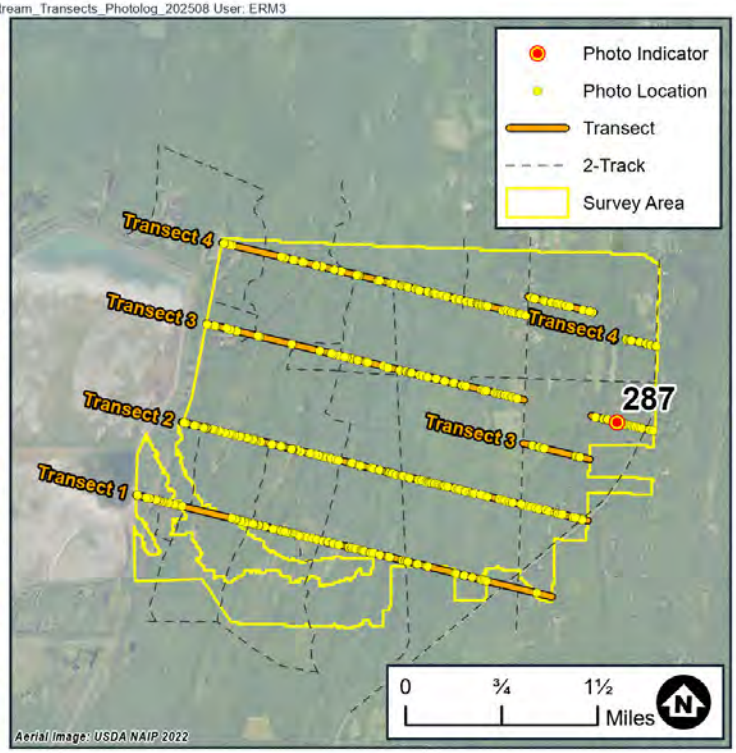

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S07-LB, Upstream
**Photo 2 Caption:** T3E-S07-LB, Downstream

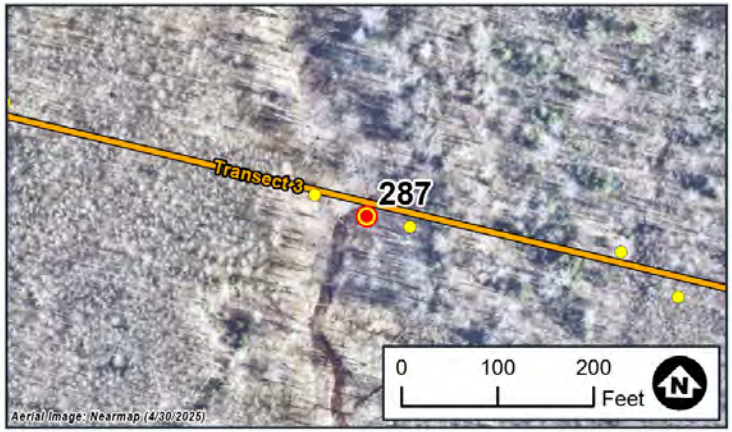
*Note: Photo locations are approximate*









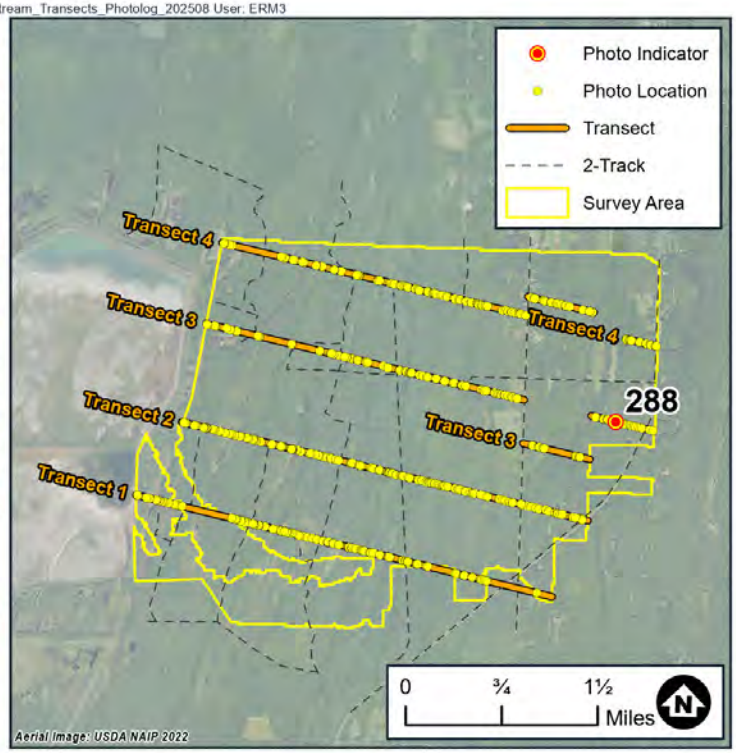

Page 287 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S07-RB, Upstream
**Photo 2 Caption:** T3E-S07-RB, Downstream

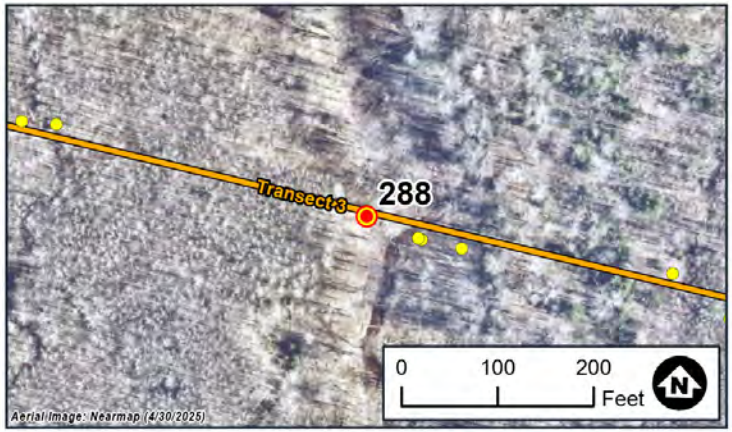
*Note: Photo locations are approximate*











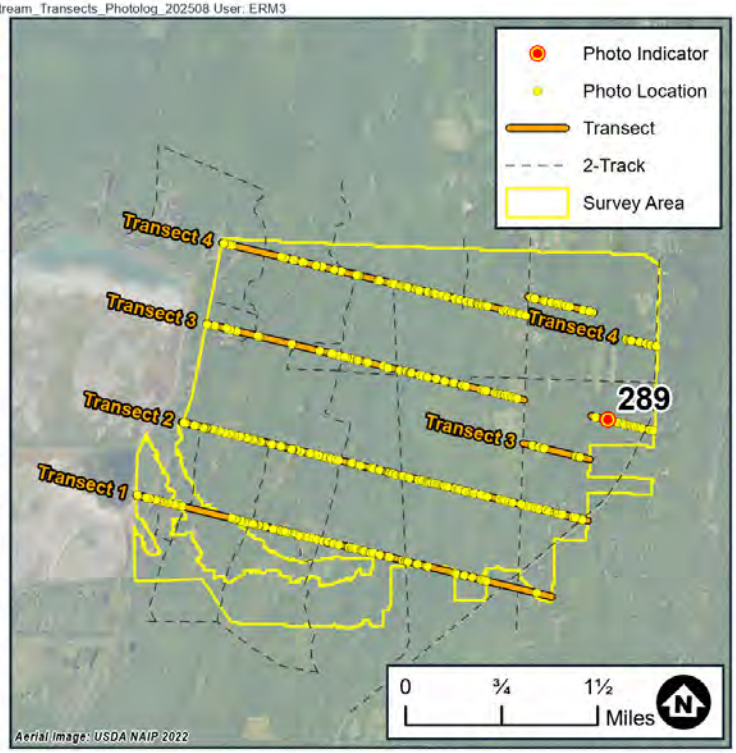

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP23-A, Wetland
**Photo 2 Caption:** T3E-BP23-A, Upland

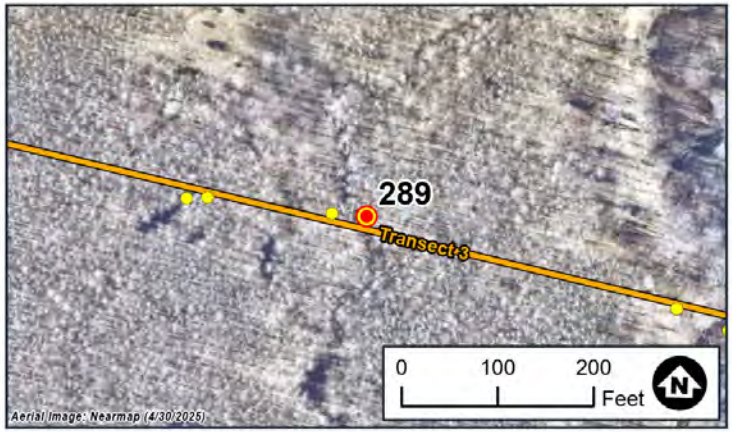
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

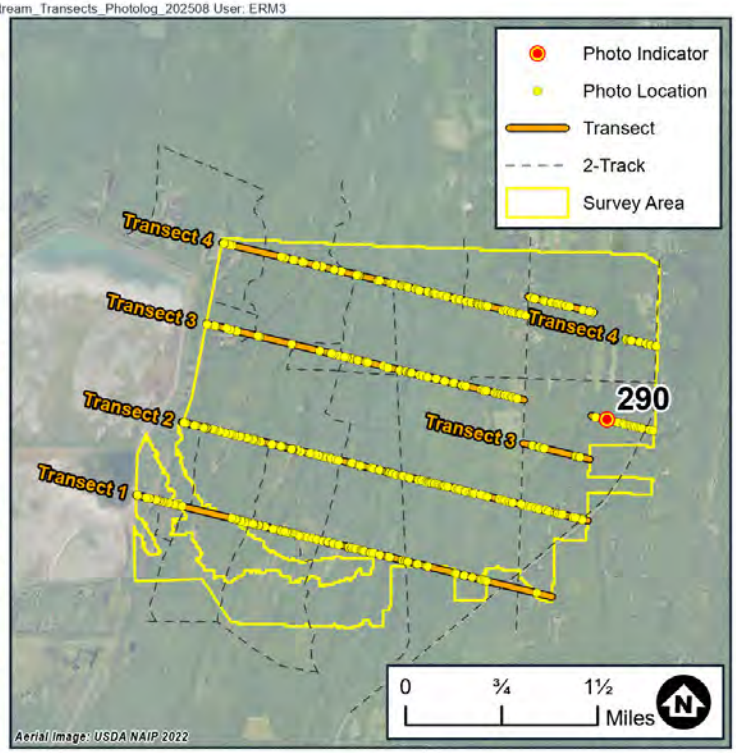
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP22-B, Wetland
**Photo 2 Caption:** T3E-BP22-B Upland

*Note: Photo locations are approximate*

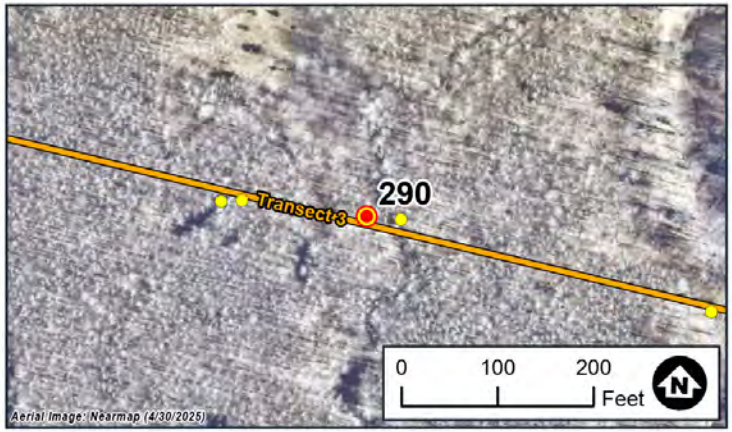
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3











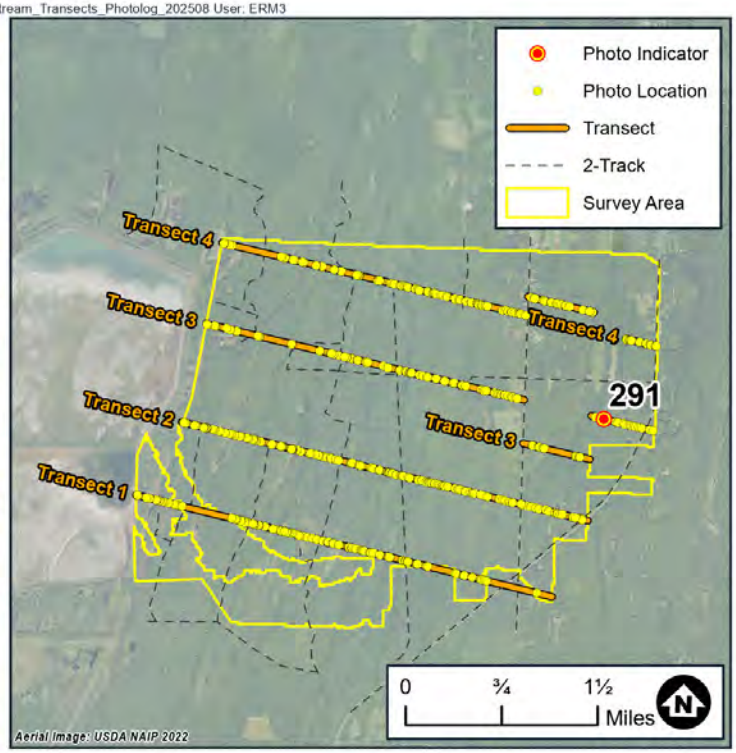

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP22-A, Wetland
**Photo 2 Caption:** T3E-BP22-A, Upland

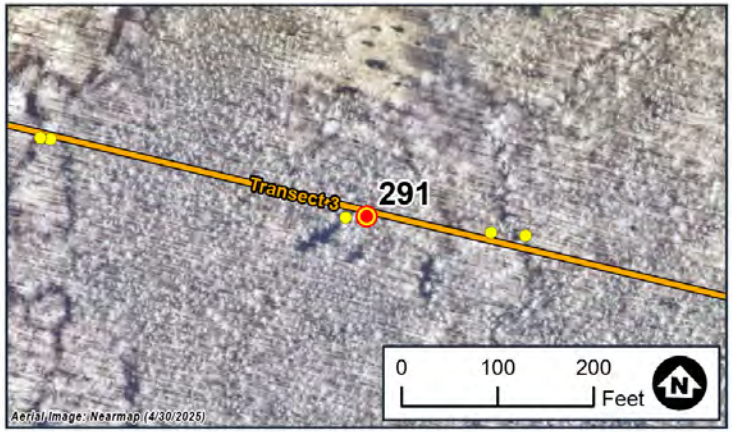
*Note: Photo locations are approximate*











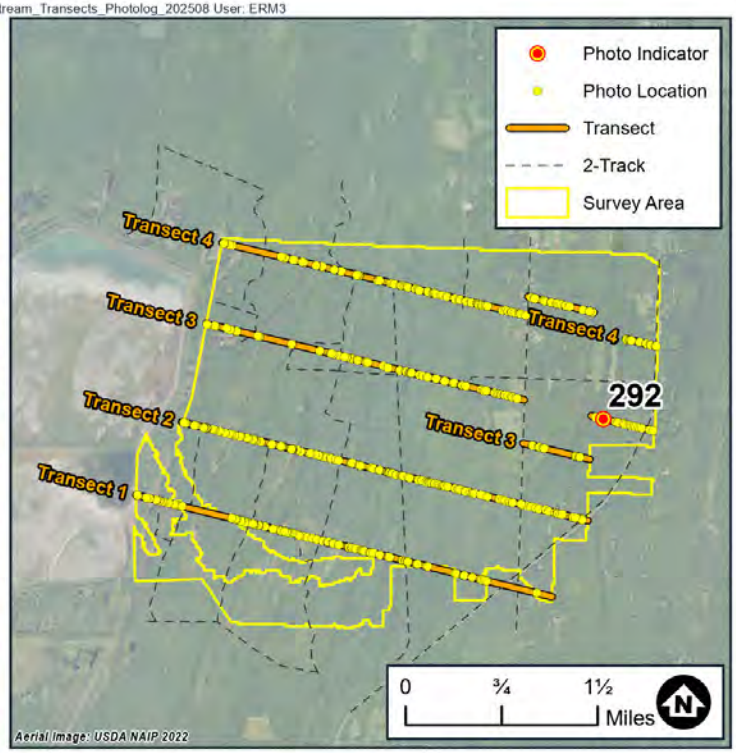

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP21-B, Wetland
**Photo 2 Caption:** T3E-BP21-B, Upland

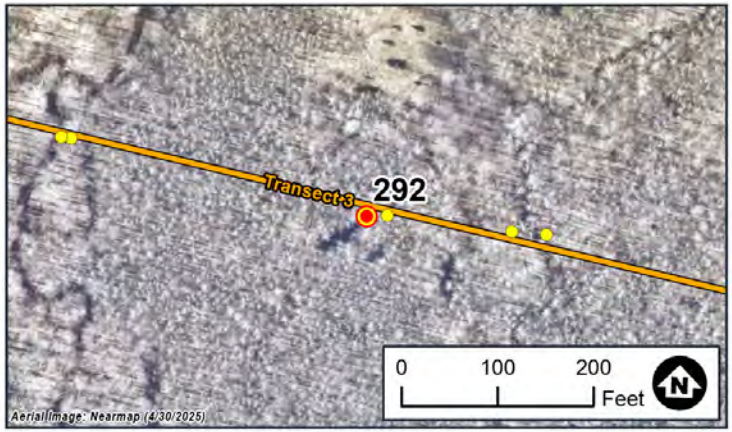
*Note: Photo locations are approximate*











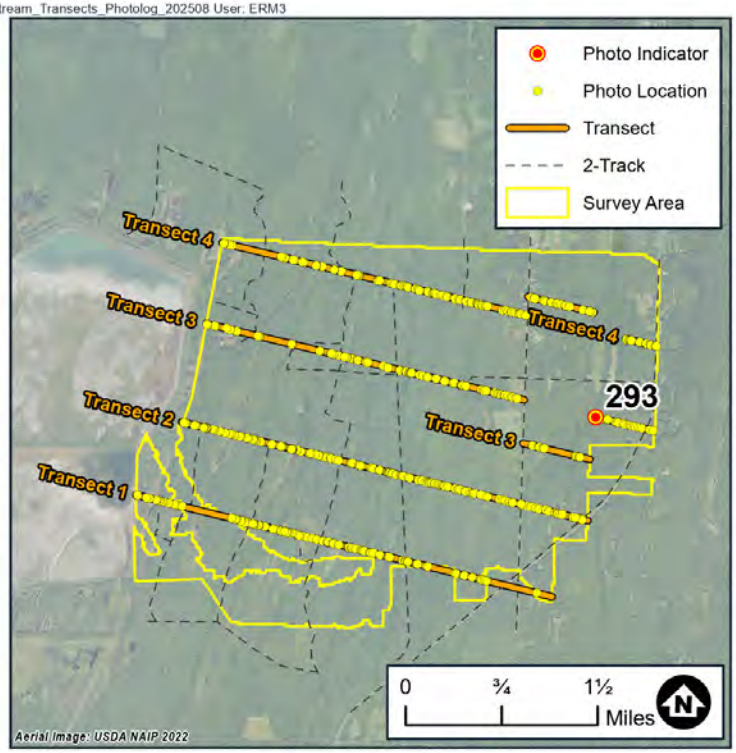

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP21-A, Wetland
**Photo 2 Caption:** T3E-BP21-A, Upland

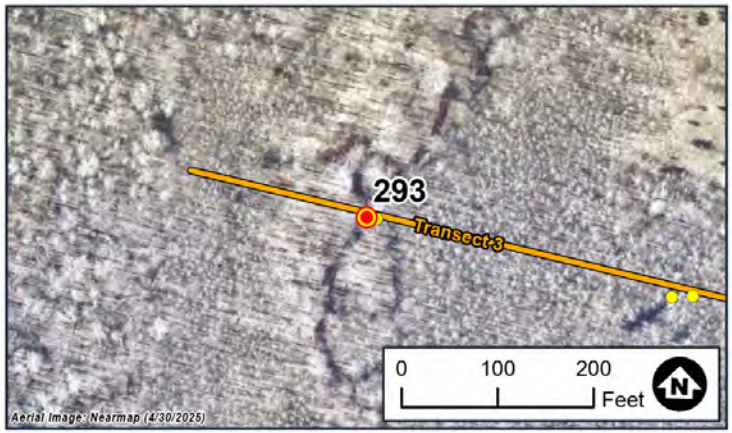
*Note: Photo locations are approximate*










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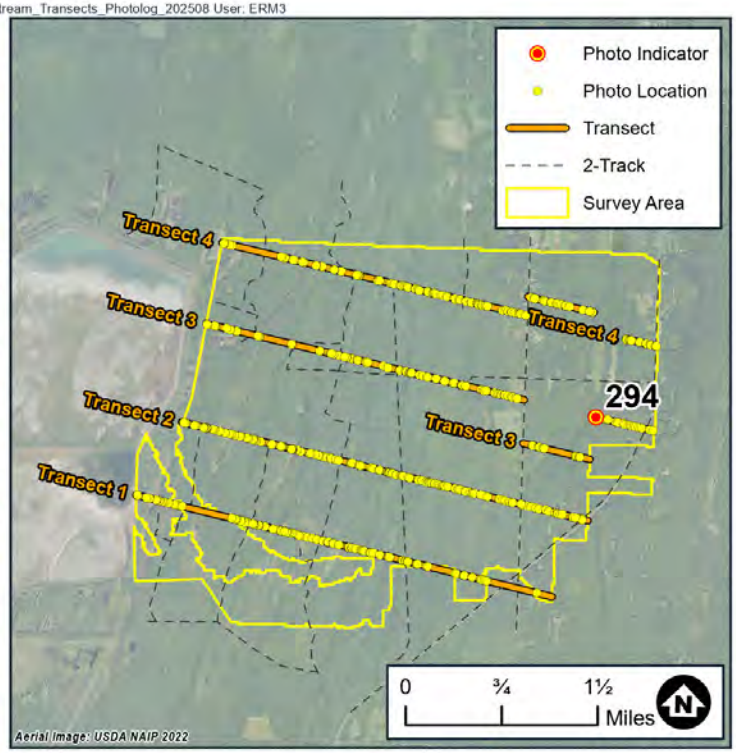
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S06-LB, Upstream
**Photo 2 Caption:** T3E-S06-LB, Downstream

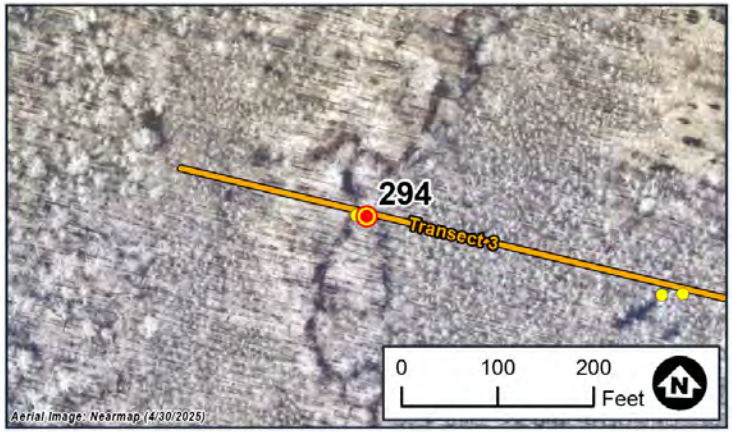
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

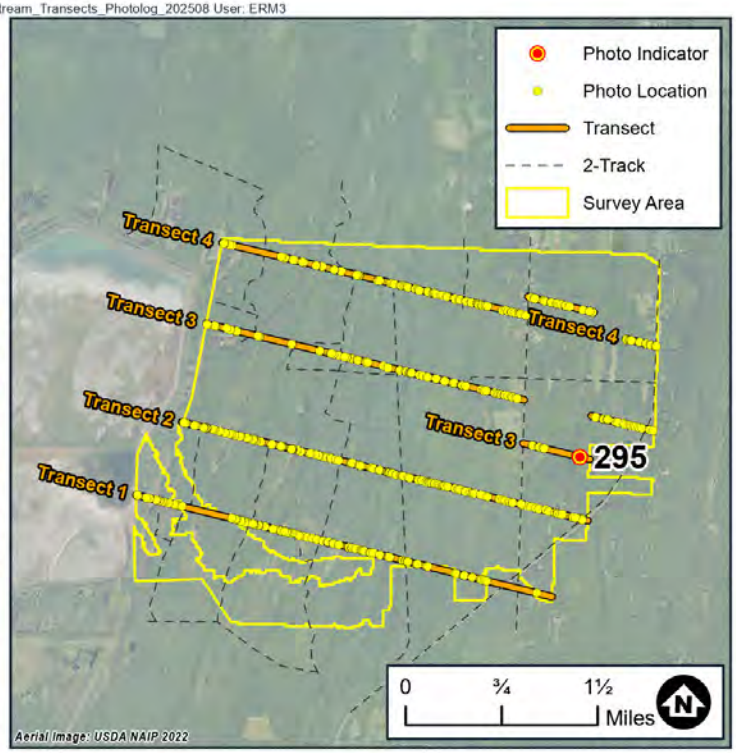
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S06-RB, Upstream
**Photo 2 Caption:** T3E-S06-RB, Downstream

*Note: Photo locations are approximate*

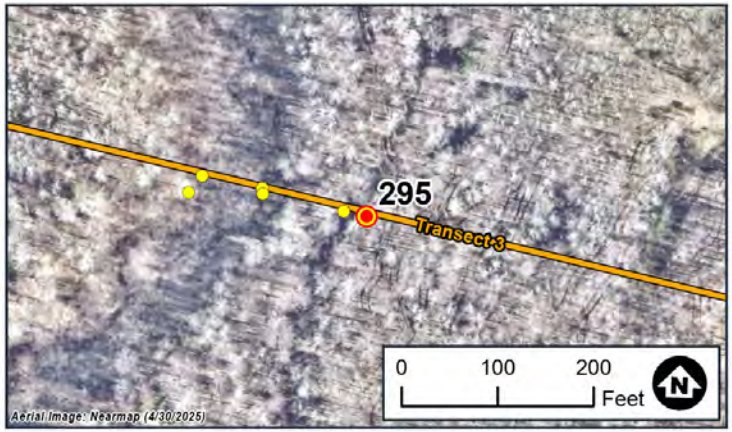
## Photo 295-1






## Photo 295-2







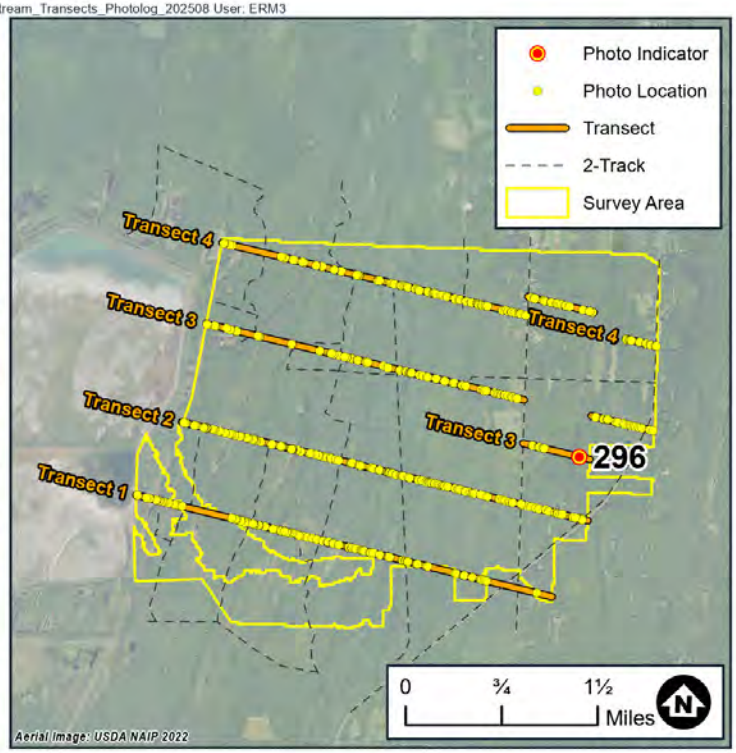

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP005-B, Wetland
**Photo 2 Caption:** T3E-BP005-B, Upland

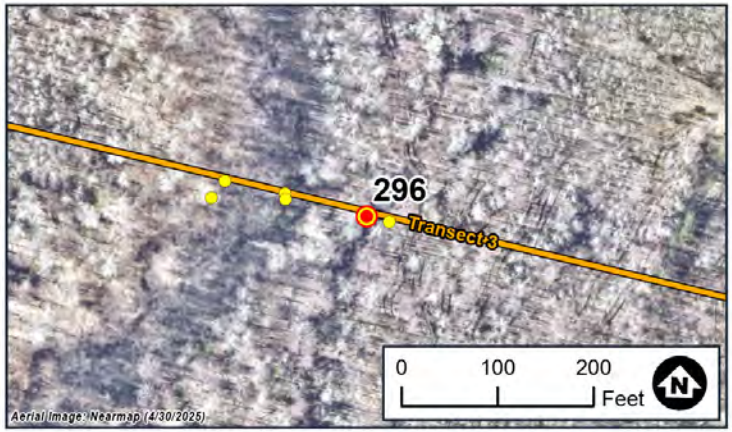
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

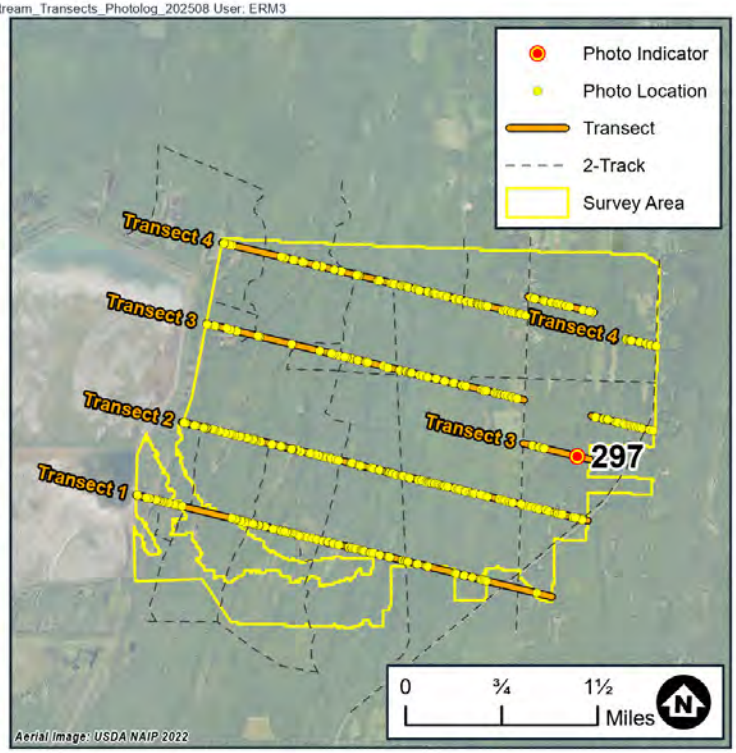
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP005-A, Wetland
**Photo 2 Caption:** T3E-BP005-A, Upland

*Note: Photo locations are approximate*

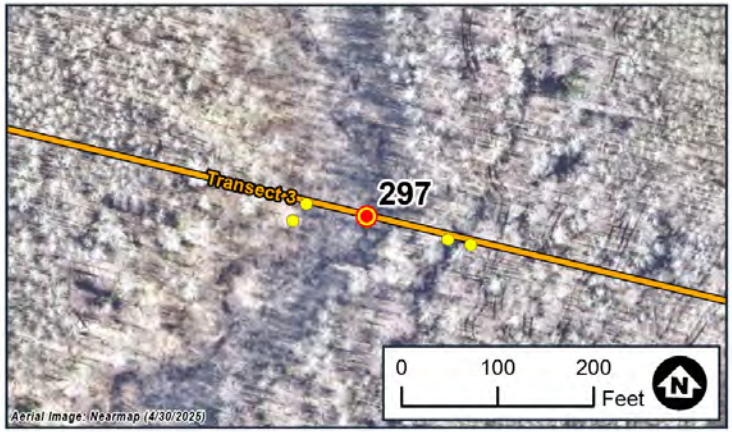
## Photo 297-1






## Photo 297-2





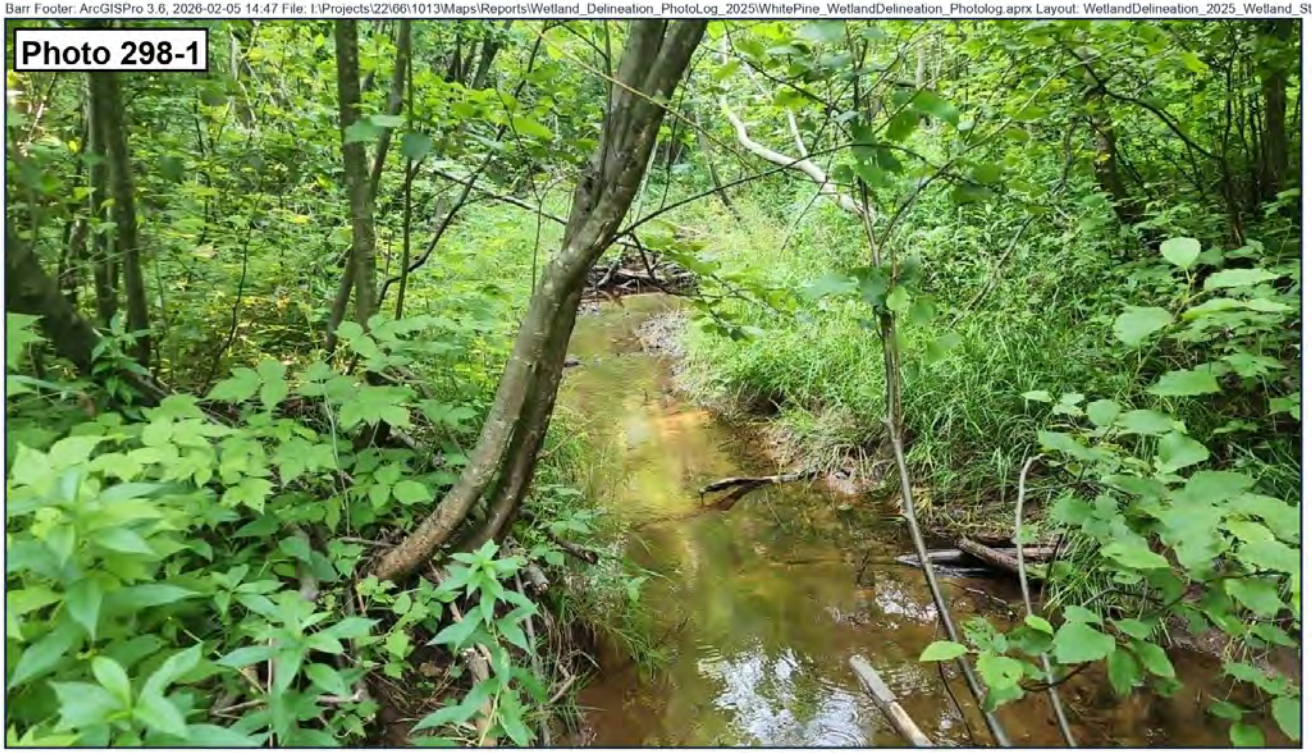


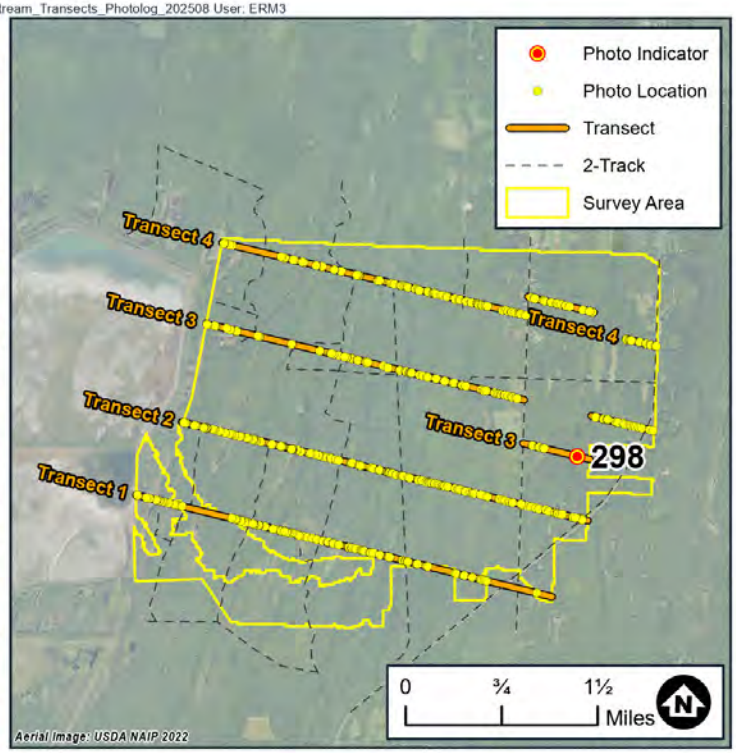

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S002-LB, Upstream
**Photo 2 Caption:** T3E-S002-LB, Downstream

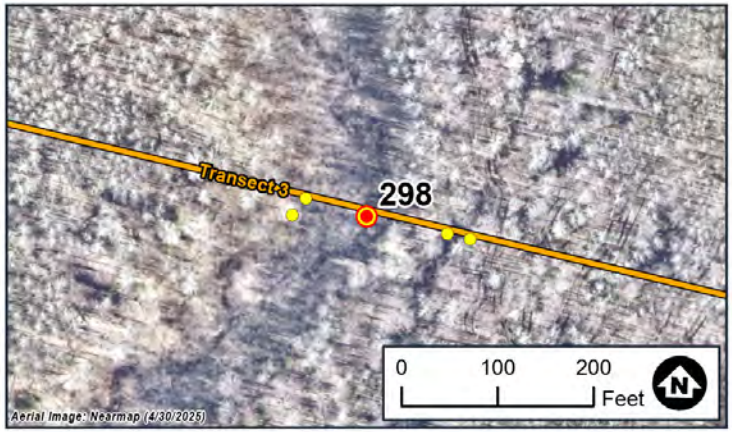
*Note: Photo locations are approximate*









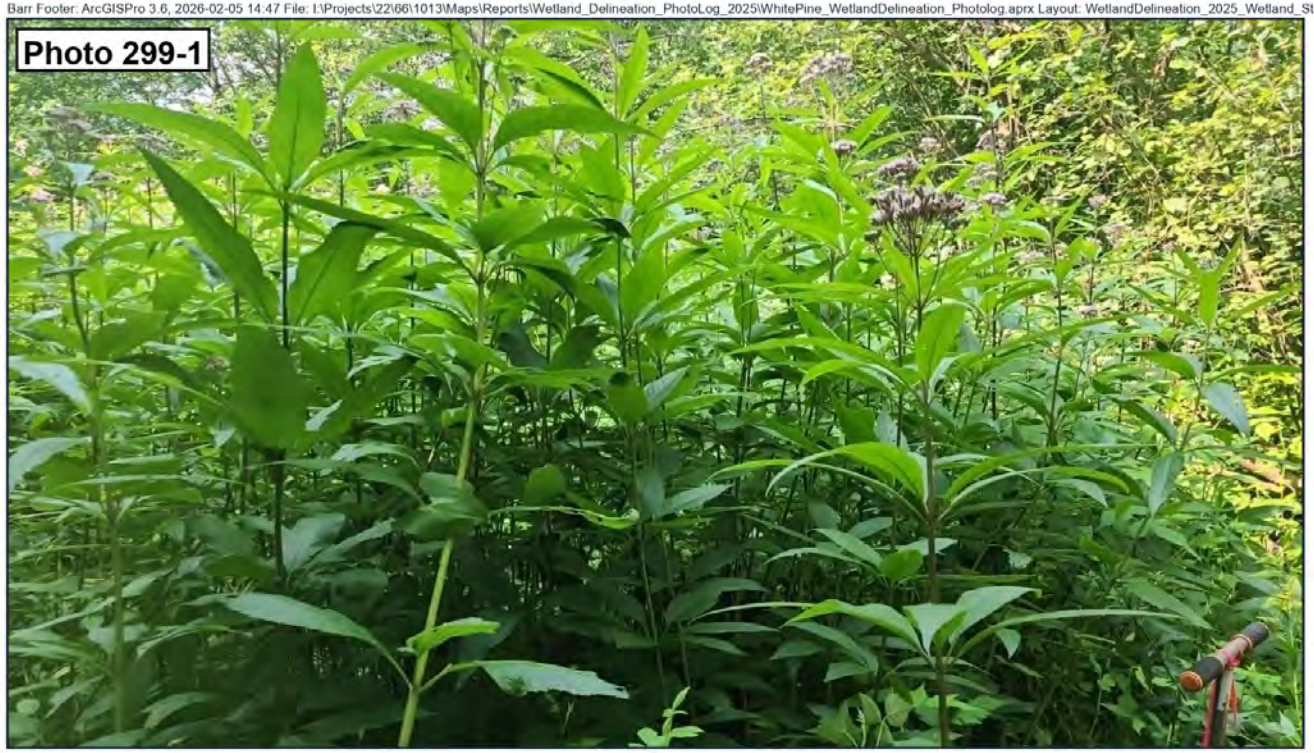

Page 298 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S002-RB, Upstream
**Photo 2 Caption:** T3E-S002-RB, Downstream

*Note: Photo locations are approximate*

**Photo 299-1**



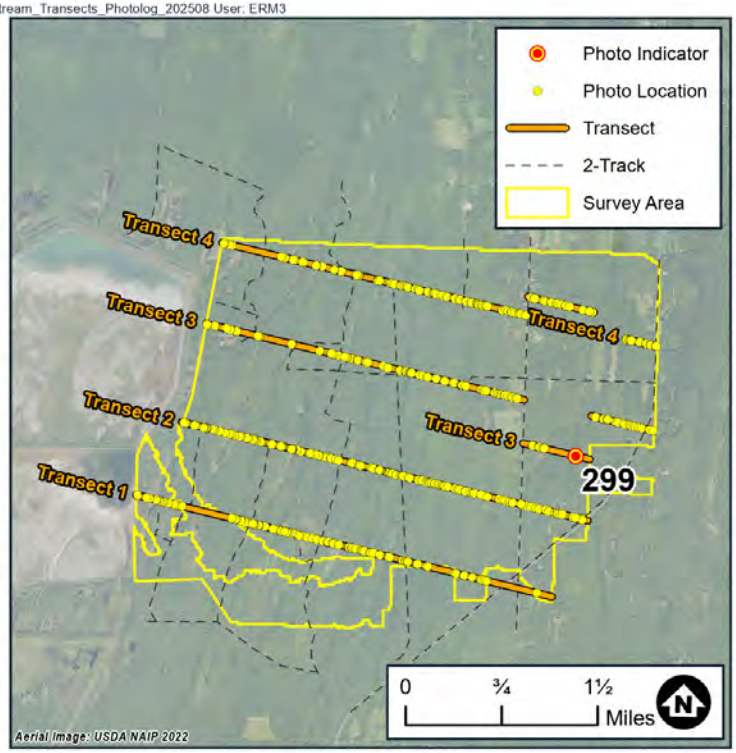
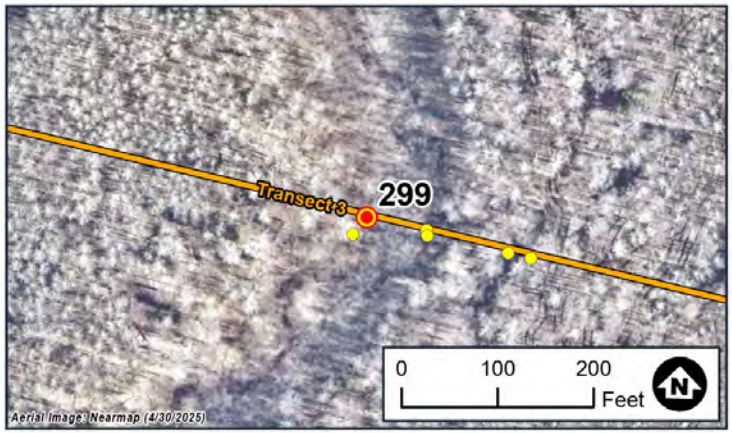



**Photo 299-2**





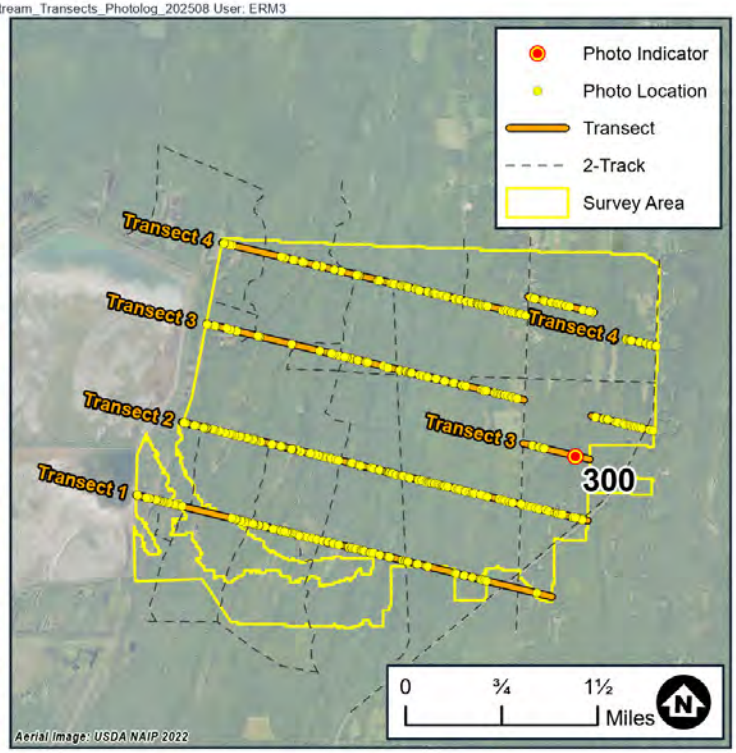

Page 299 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP004-B, Wetland
**Photo 2 Caption:** T3E-BP004-B, Upland

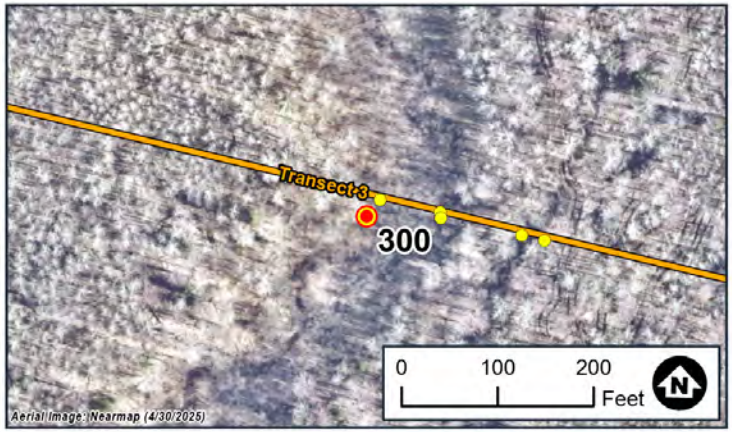
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

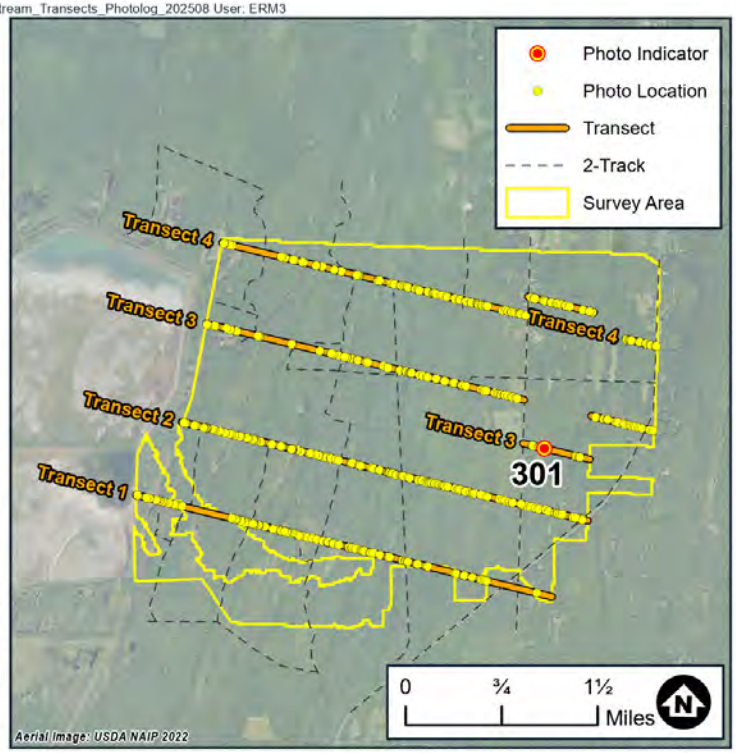
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP004-A, Wetland
**Photo 2 Caption:** T3E-BP004-A, Upland

*Note: Photo locations are approximate*

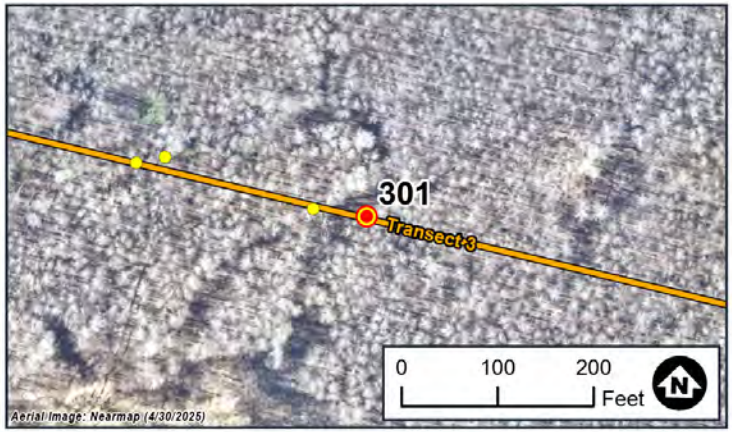
## Photo 301-1






## Photo 301-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

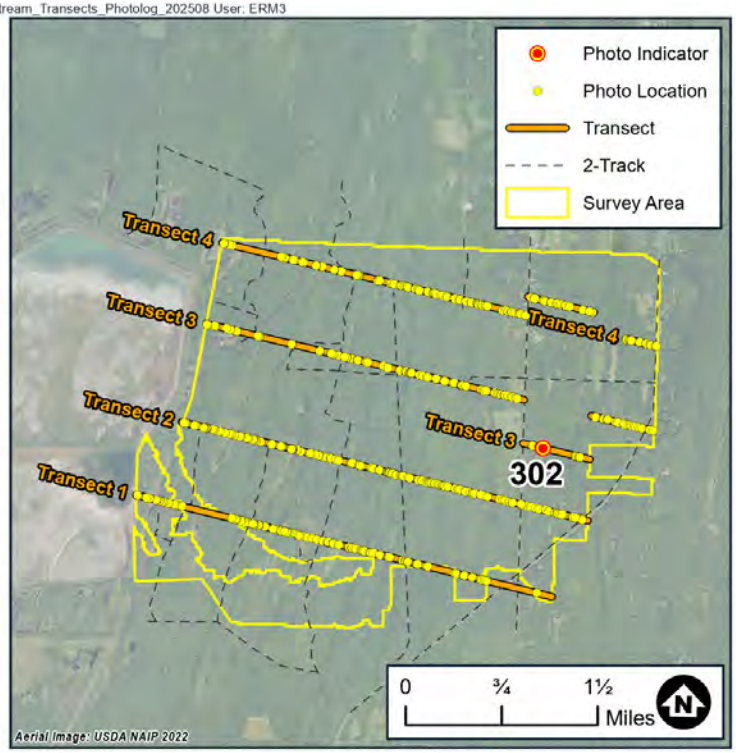
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP003-B, Wetland
**Photo 2 Caption:** T3E-BP003-B, Upland

*Note: Photo locations are approximate*

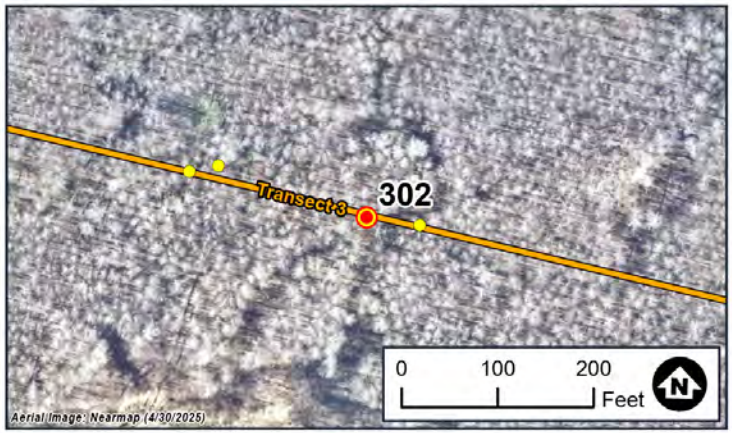
## Photo 302-1






## Photo 302-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

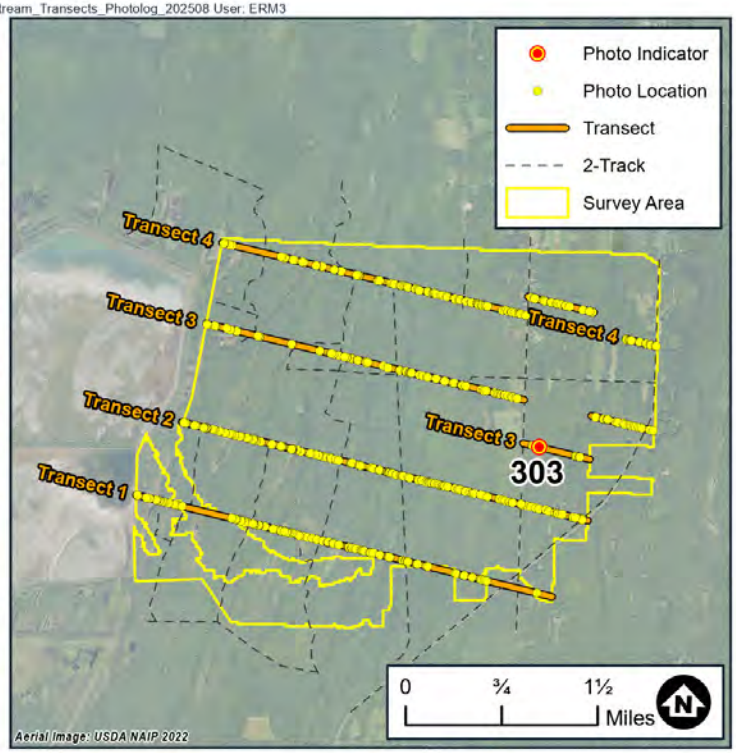
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP003-A, Wetland
**Photo 2 Caption:** T3E-BP003-A, Upland

*Note: Photo locations are approximate*

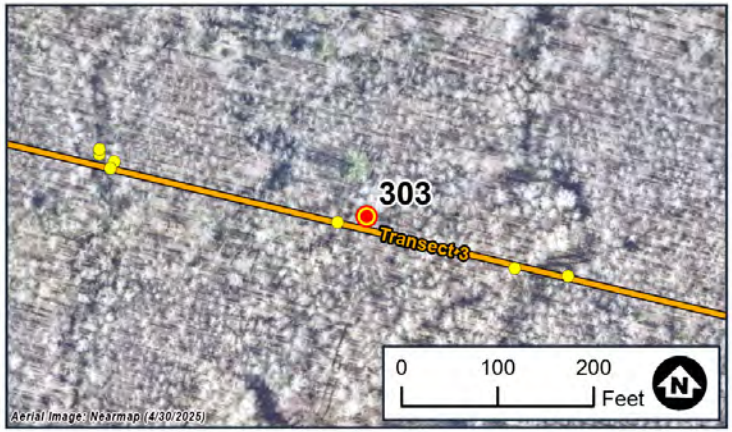
## Photo 303-1






## Photo 303-2







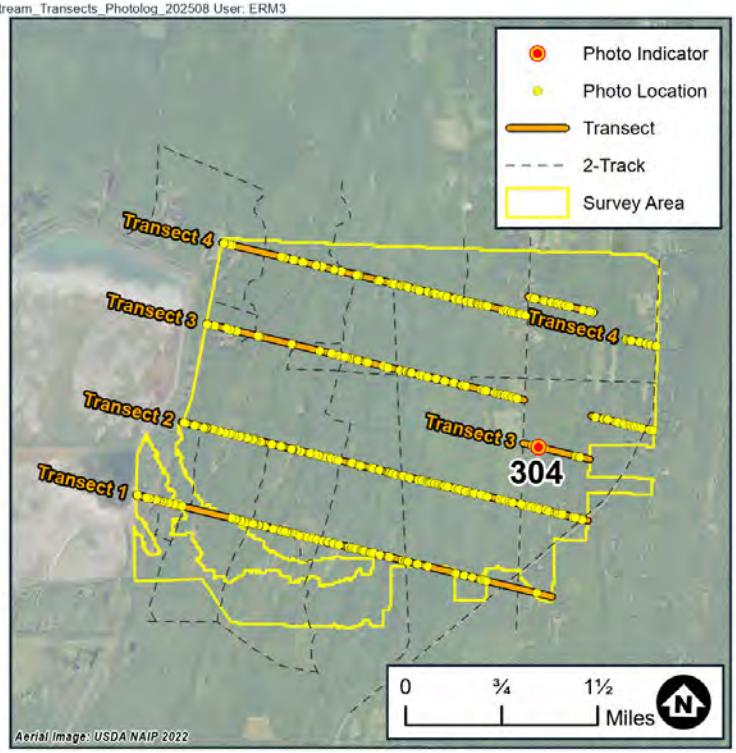

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP002-B, Wetland
**Photo 2 Caption:** T3E-BP002-B, Upland

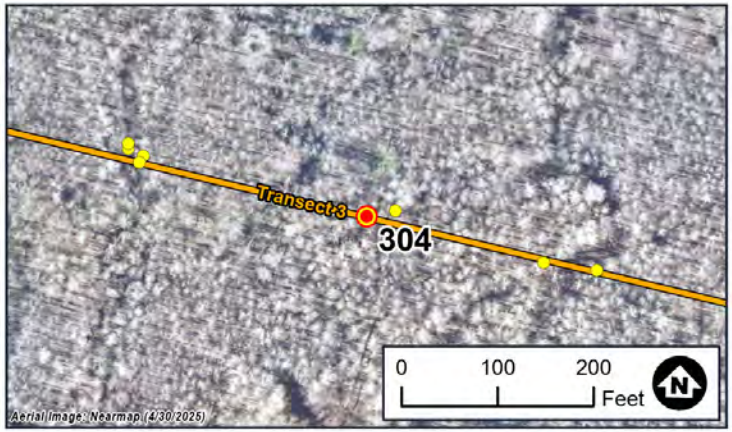
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP002-A, Wetland
**Photo 2 Caption:** T3E-BP002-A, Upland

*Note: Photo locations are approximate*

**Photo 305-1**



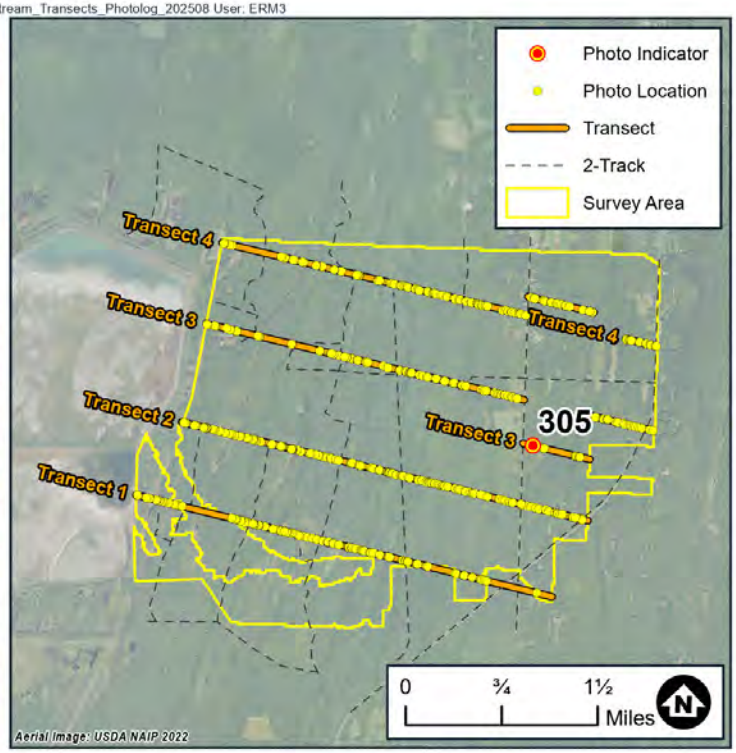
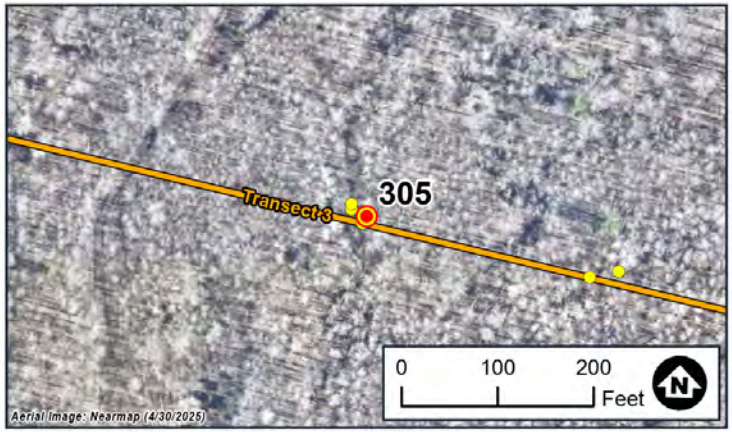



**Photo 305-2**






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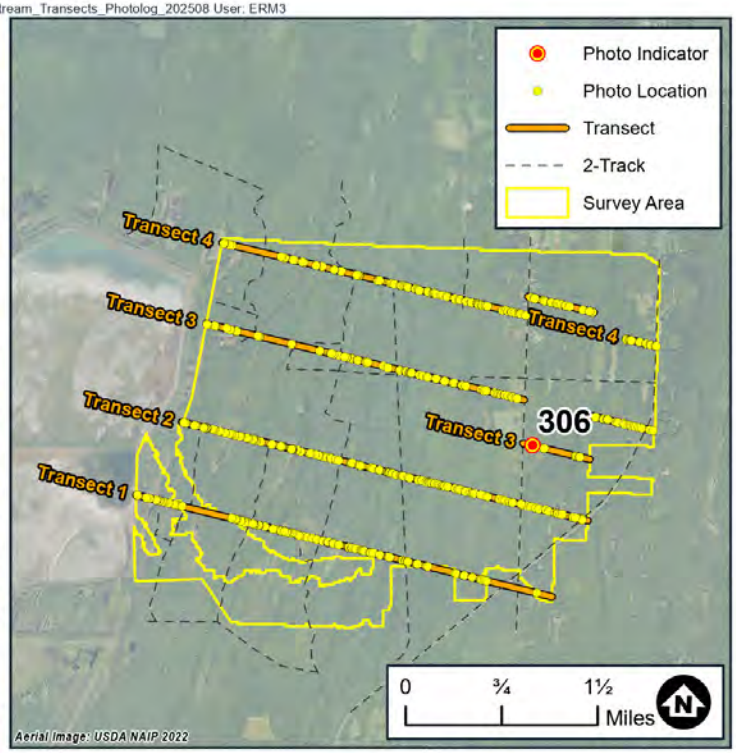
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP001-B, Wetland
**Photo 2 Caption:** T3E-BP001-B, Upland

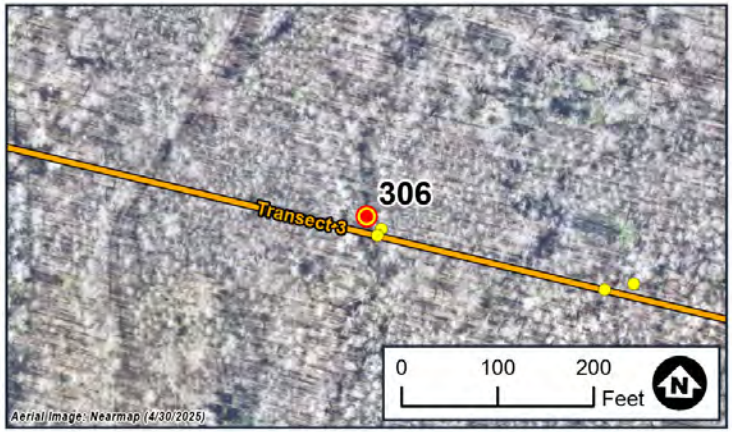
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

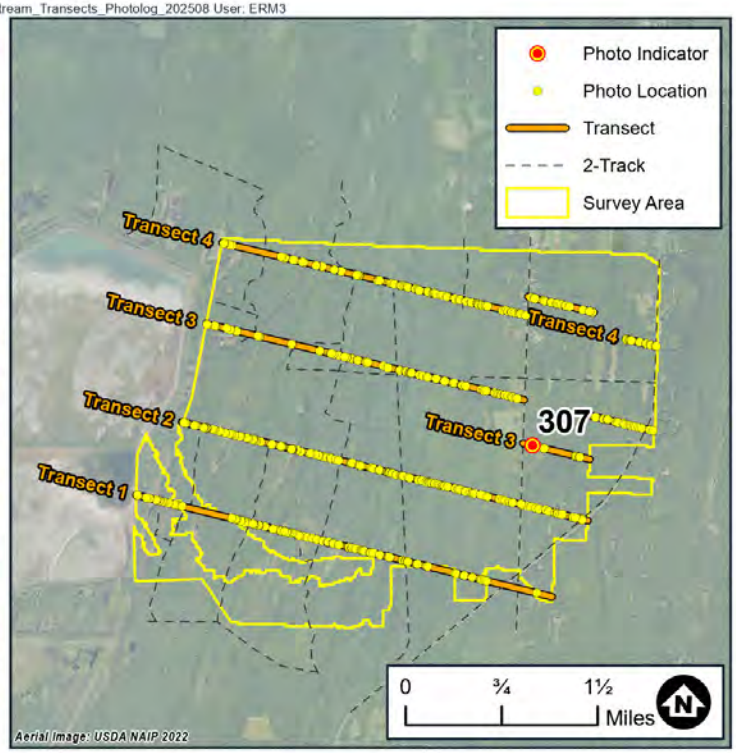
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-BP001-A, Wetland
**Photo 2 Caption:** T3E-BP001-A, Upland

*Note: Photo locations are approximate*

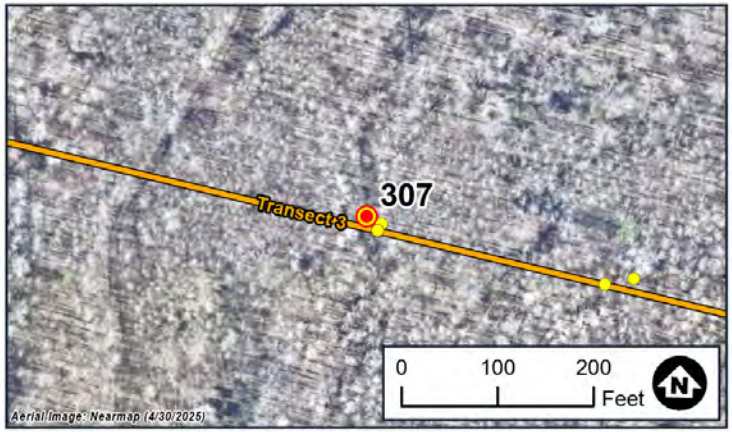
## Photo 307-1






## Photo 307-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

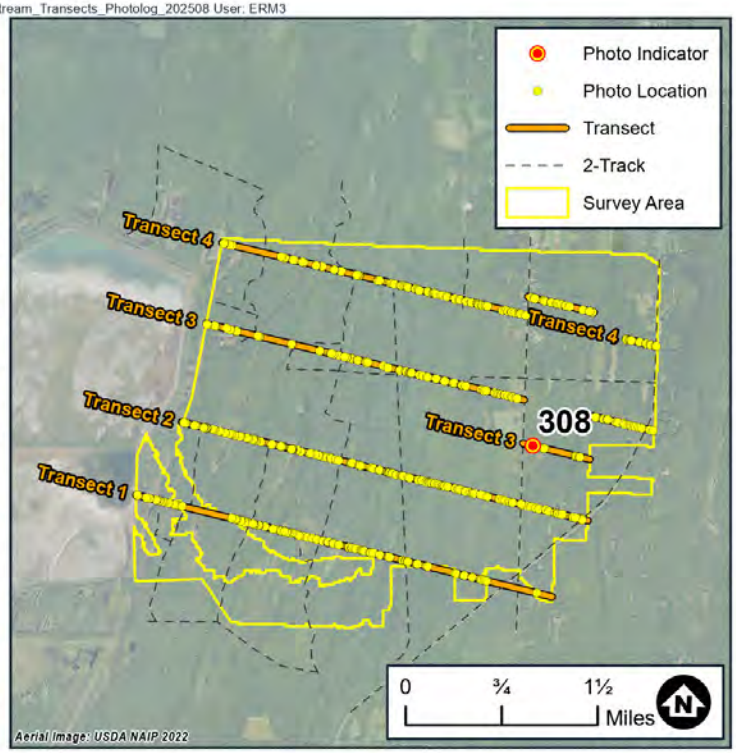
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S001-LB, Upstream
**Photo 2 Caption:** T3E-S001-LB, Downstream

*Note: Photo locations are approximate*

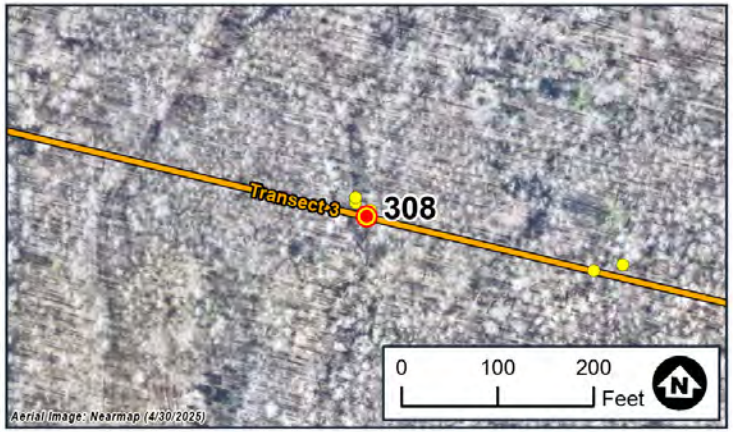
## Photo 308-1






## Photo 308-2







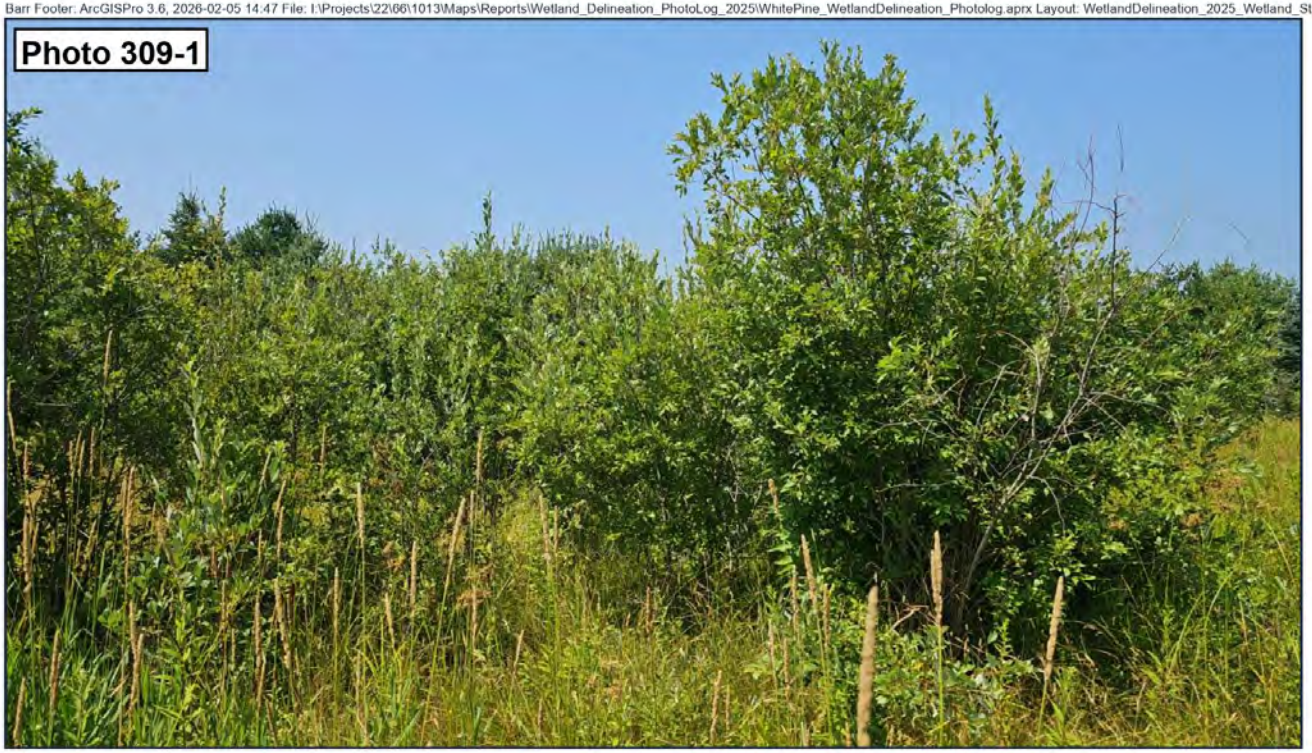

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

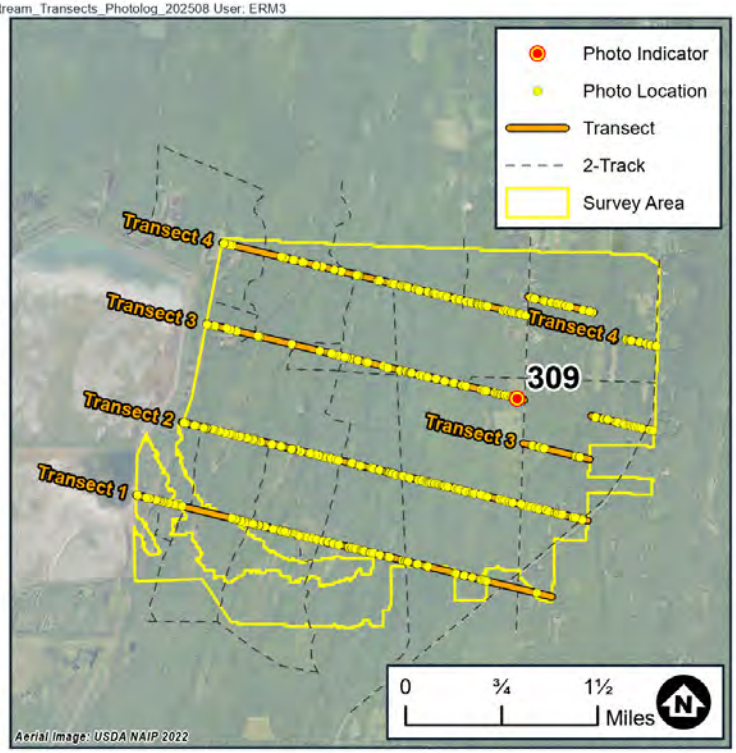
BARR

**Date:** 7/31/2025
**Photo 1 Caption:** T3E-S001-RB, Upstream
**Photo 2 Caption:** T3E-S001-RB, Downstream

*Note: Photo locations are approximate*

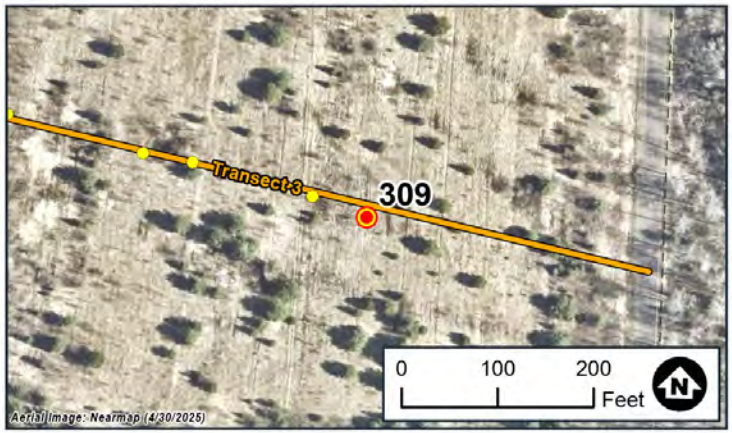
## Photo 309-1






## Photo 309-2







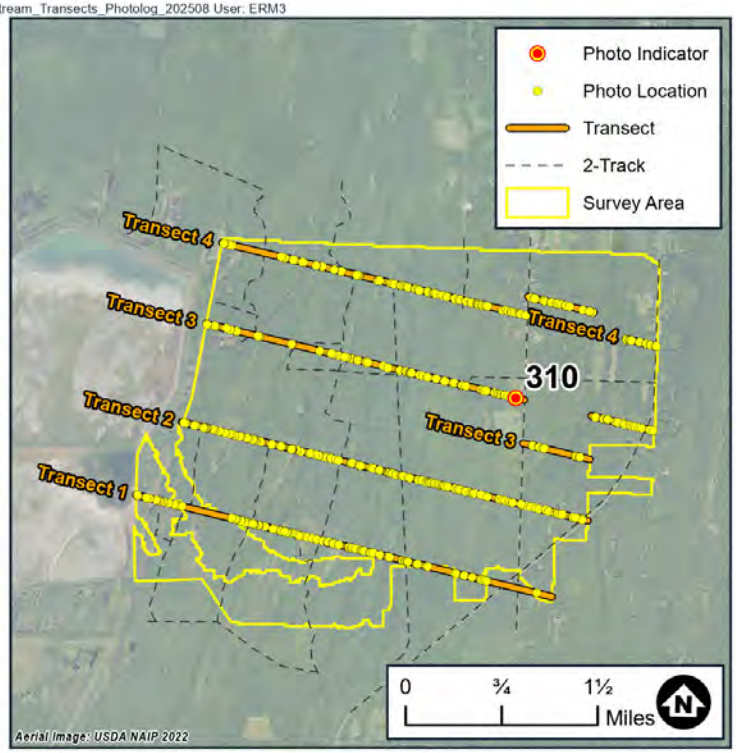

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP20-B, Wetland
**Photo 2 Caption:** T3E-BP20-B, Upland

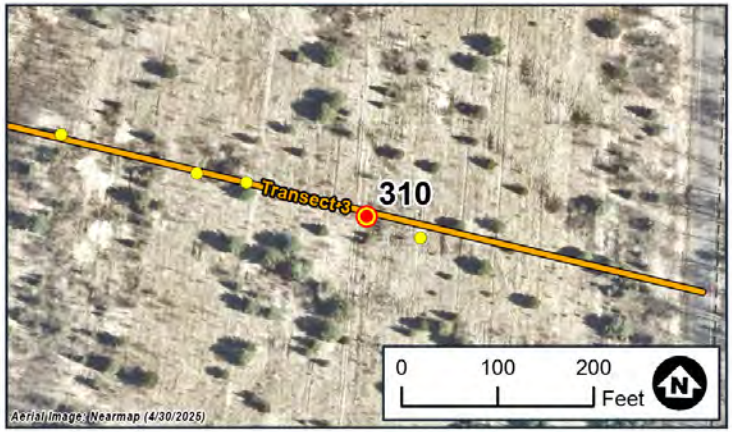
*Note: Photo locations are approximate*










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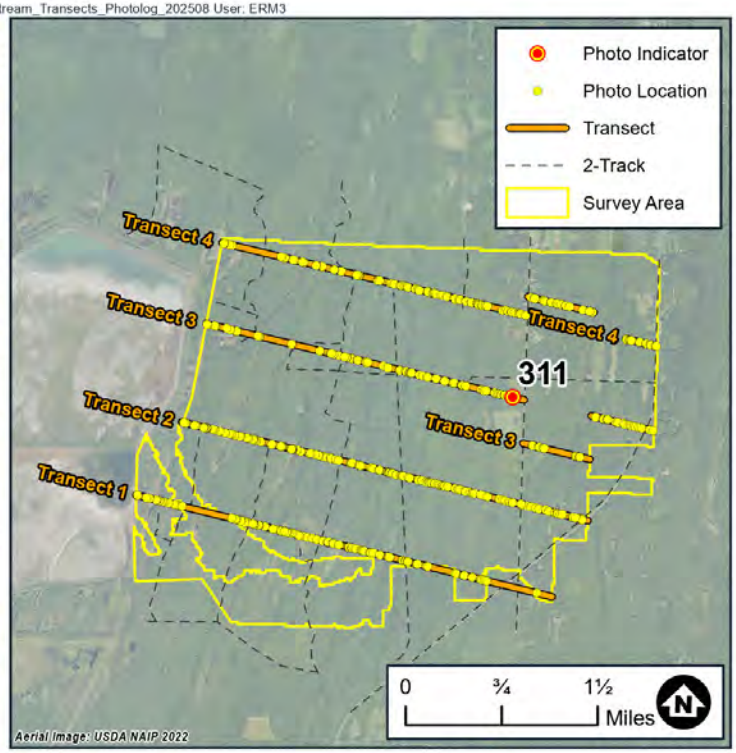
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP20-A, Wetland
**Photo 2 Caption:** T3E-BP20-A, Upland

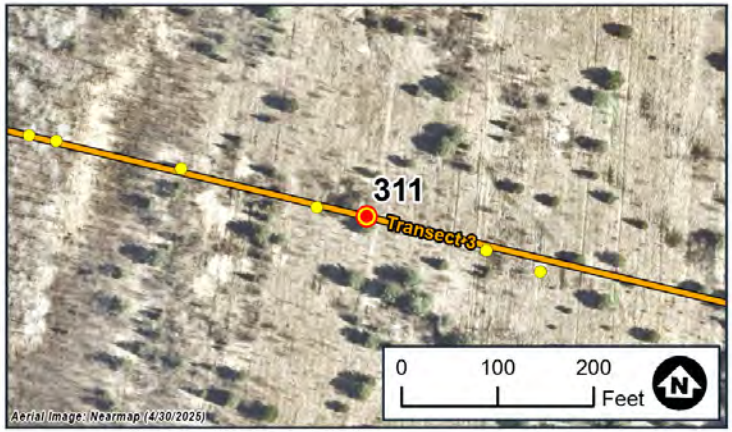
*Note: Photo locations are approximate*











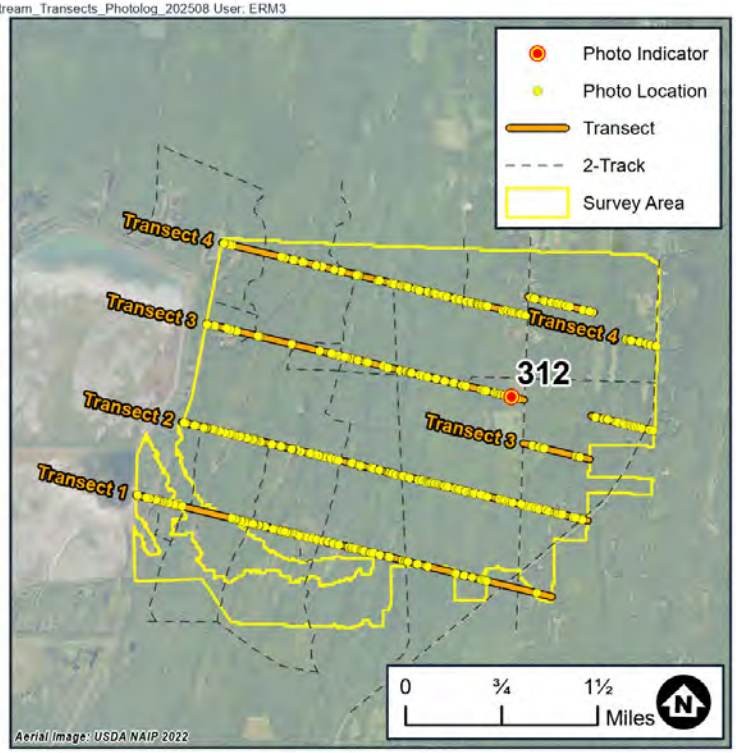

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP19-B, Wetland
**Photo 2 Caption:** T3E-BP19-B, Upland

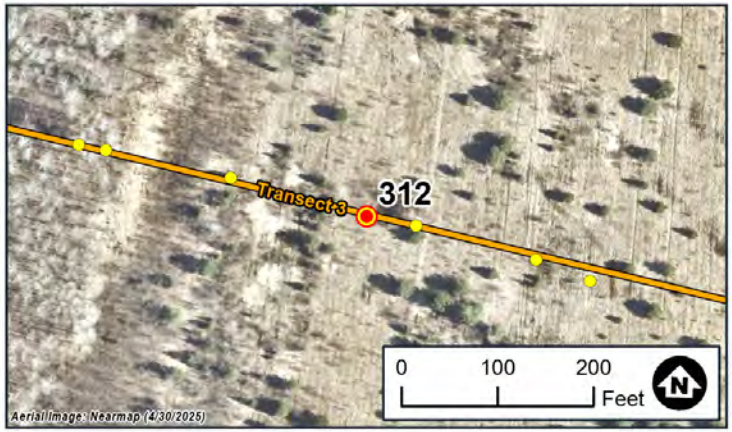
*Note: Photo locations are approximate*











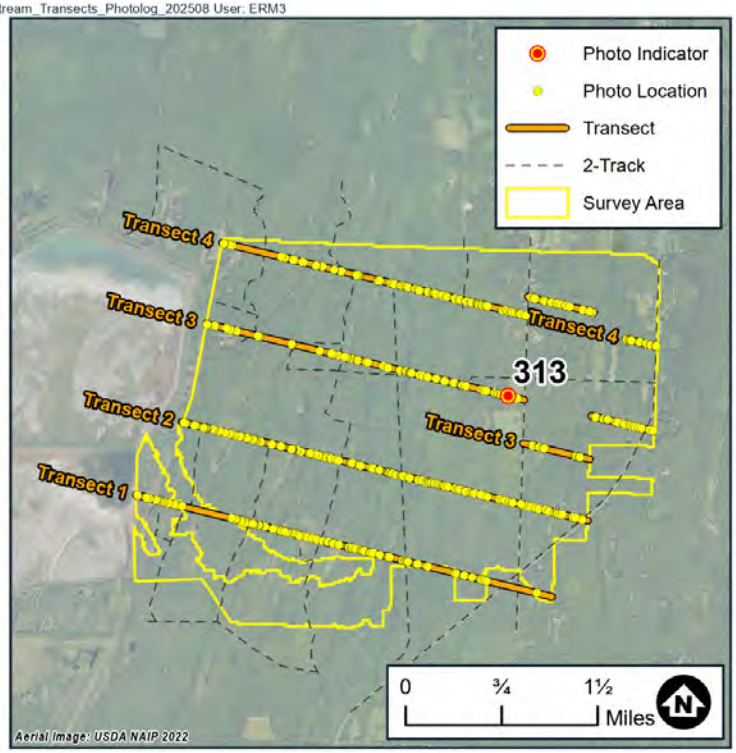

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP19-A, Wetland
**Photo 2 Caption:** T3E-BP19-A, Upland

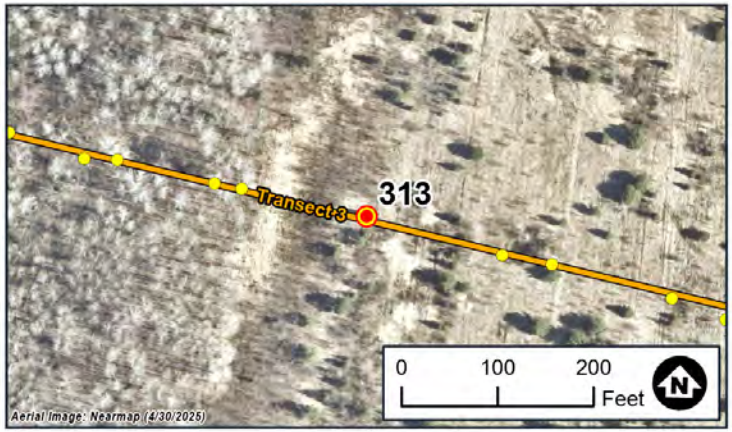
*Note: Photo locations are approximate*









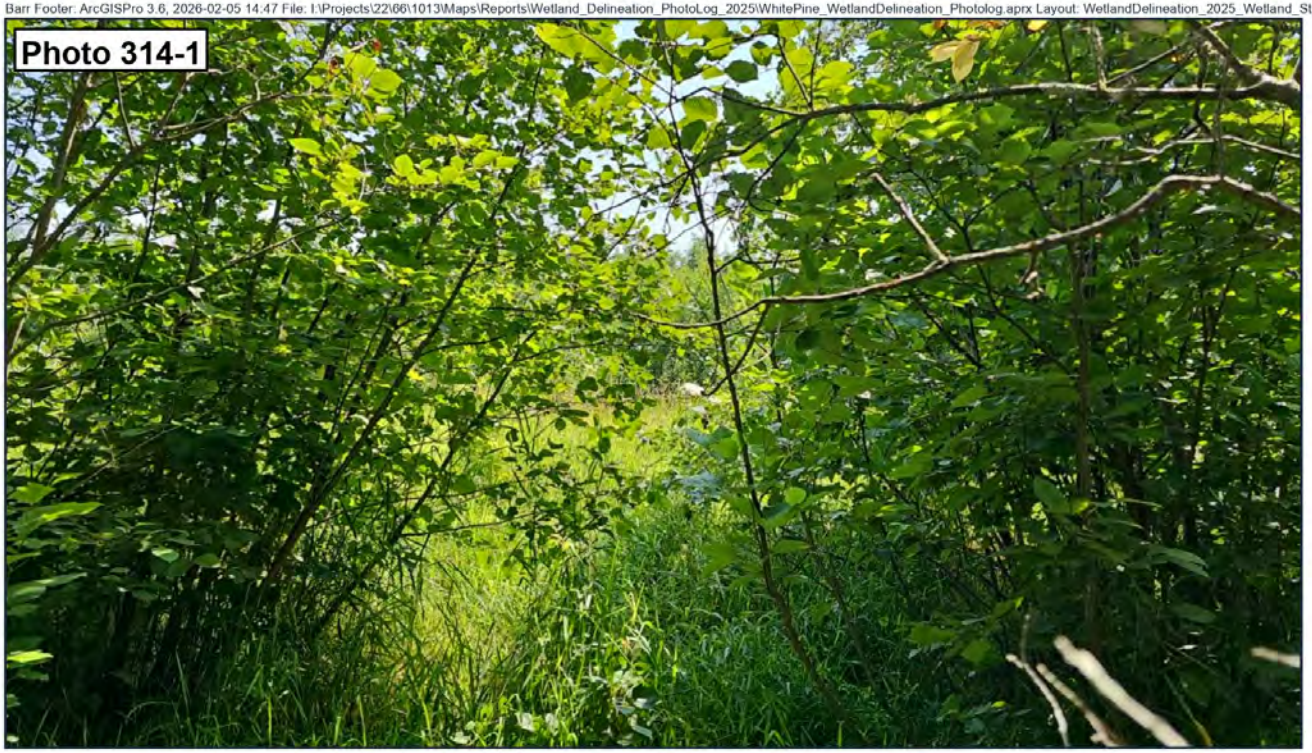

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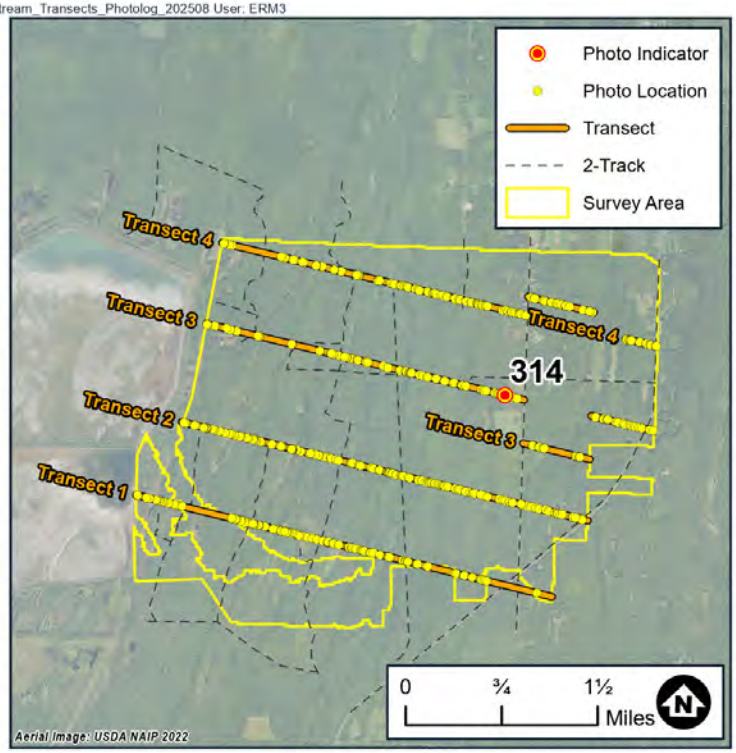
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP18-B, Wetland
**Photo 2 Caption:** T3E-BP18-B, Upland

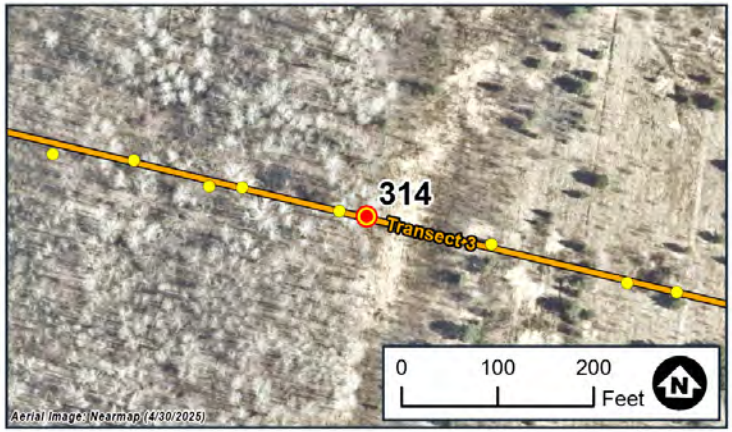
*Note: Photo locations are approximate*









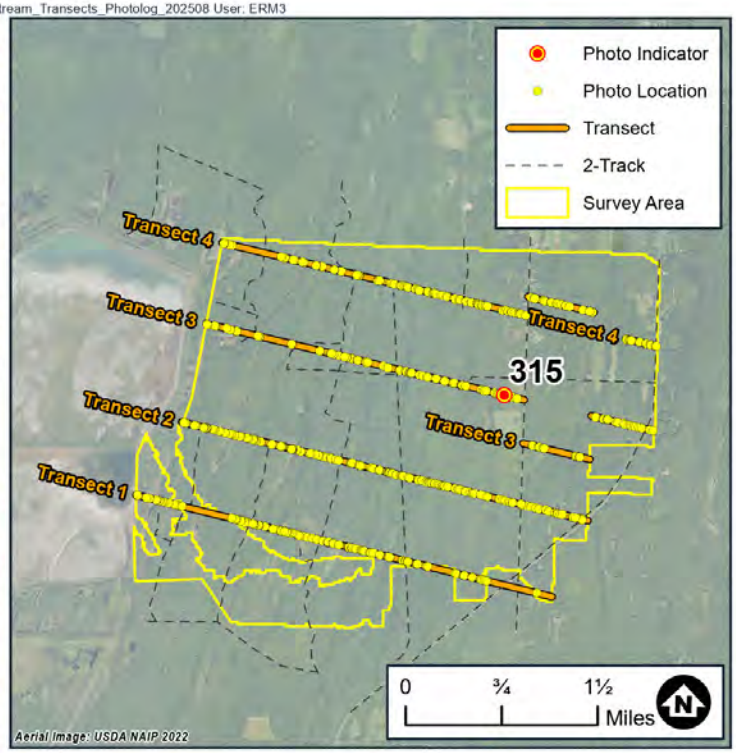

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP18-A, Wetland
**Photo 2 Caption:** T3E-BP18-A, Upland

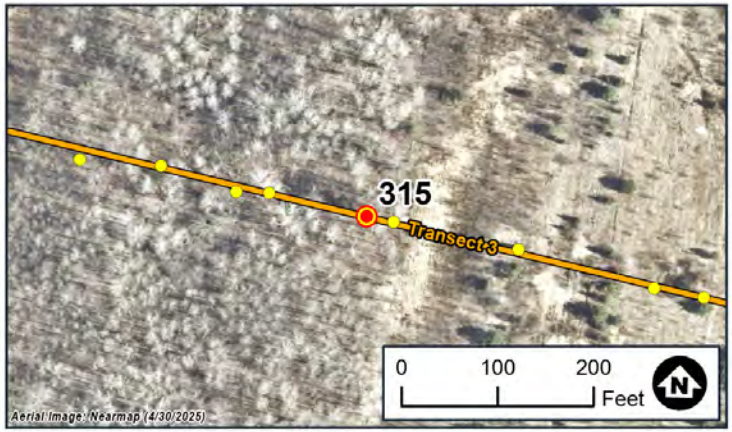
*Note: Photo locations are approximate*









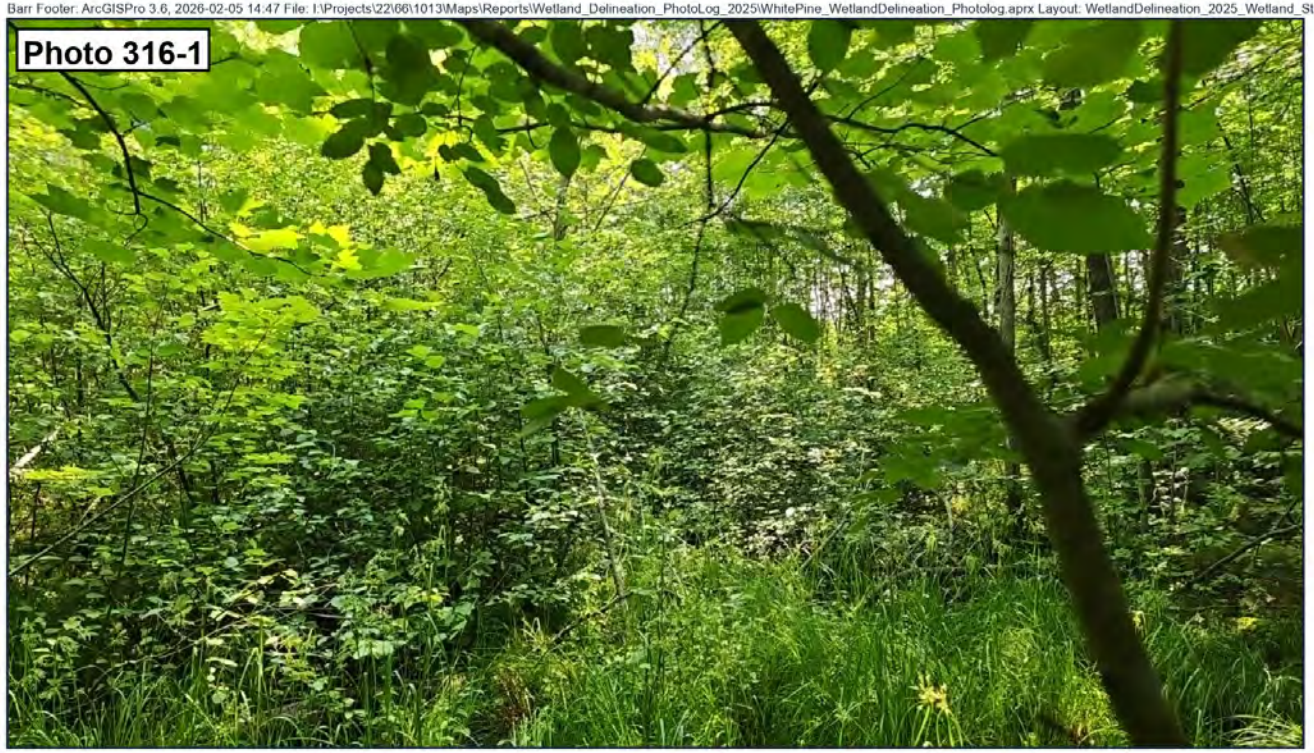


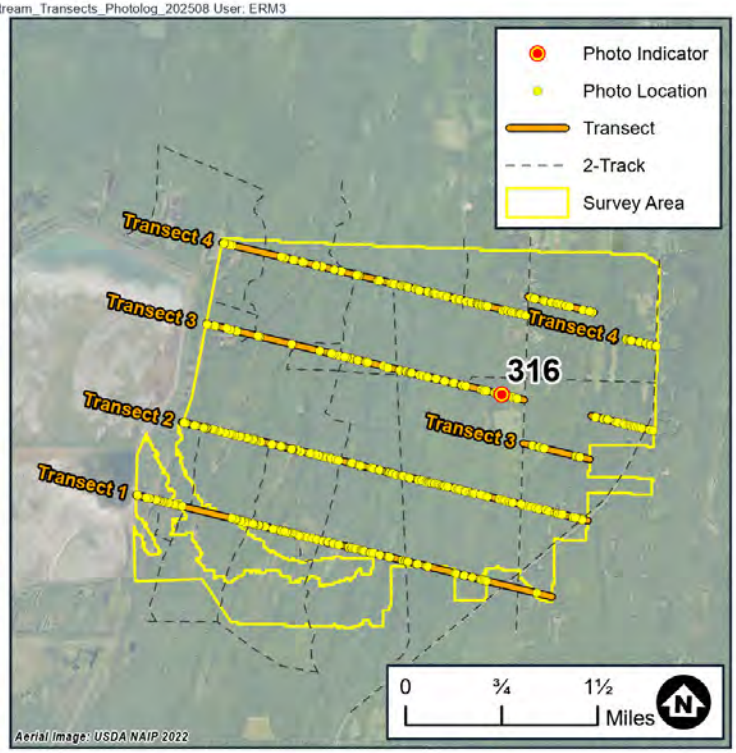

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP17-B, Wetland
**Photo 2 Caption:** T3E-BP17-B, Upland

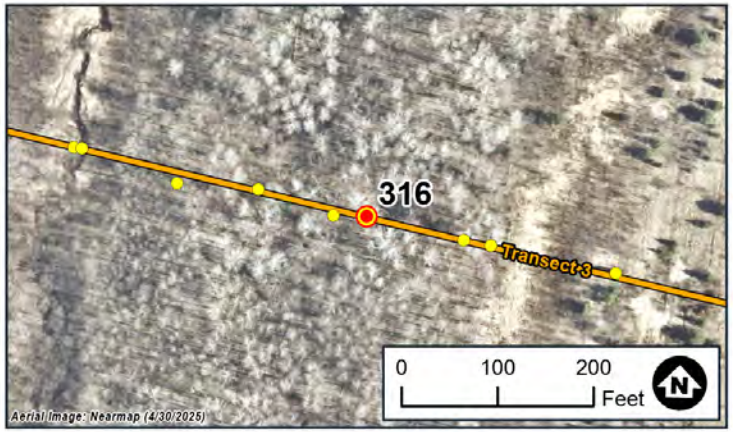
*Note: Photo locations are approximate*











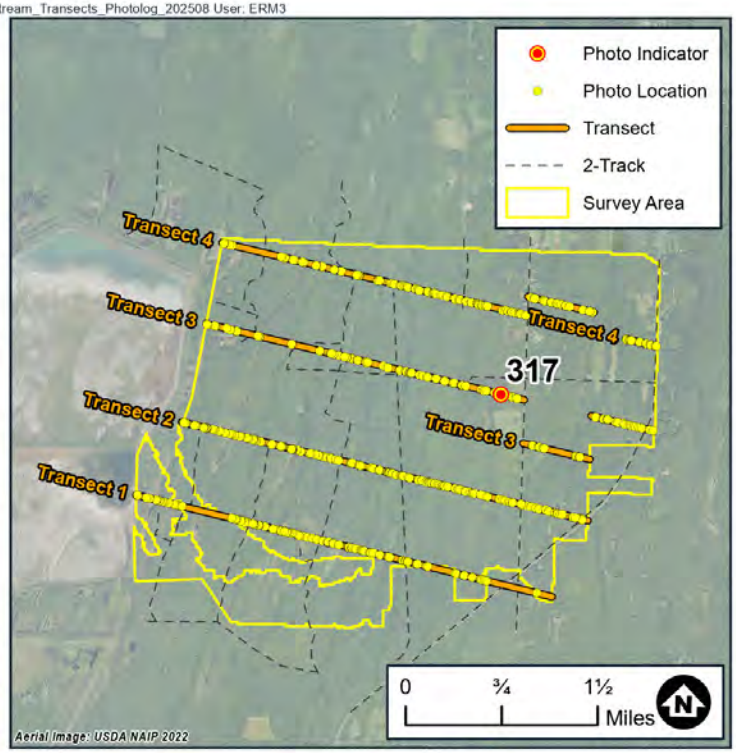

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP17-A, Wetland
**Photo 2 Caption:** T3E-BP17-A, Upland

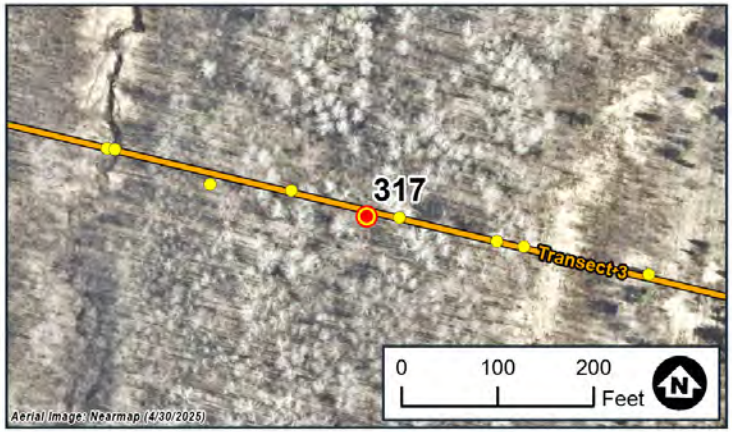
*Note: Photo locations are approximate*










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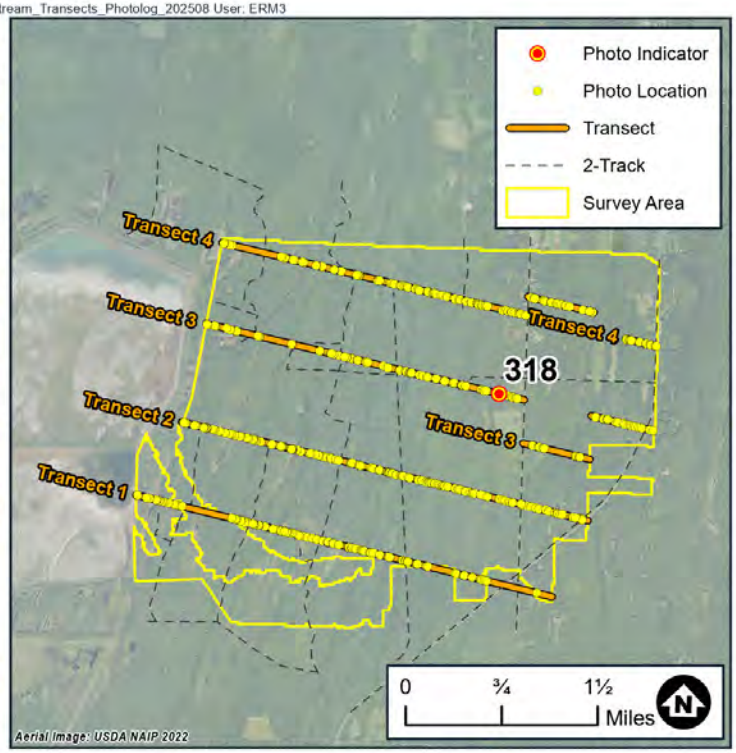
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP16-B, Wetland
**Photo 2 Caption:** T3E-BP16-B, Upland

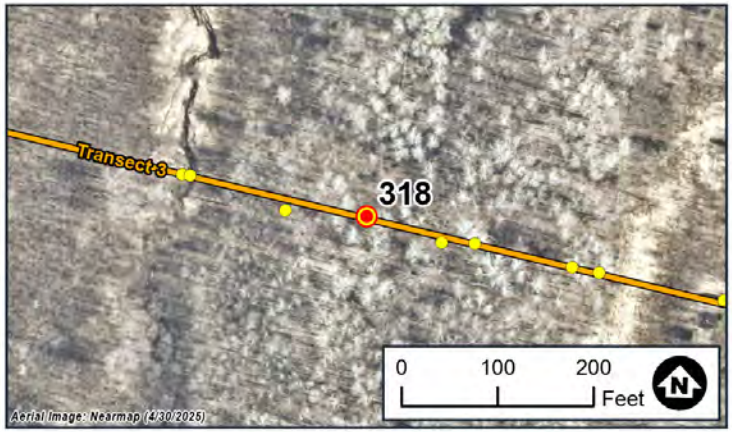
*Note: Photo locations are approximate*











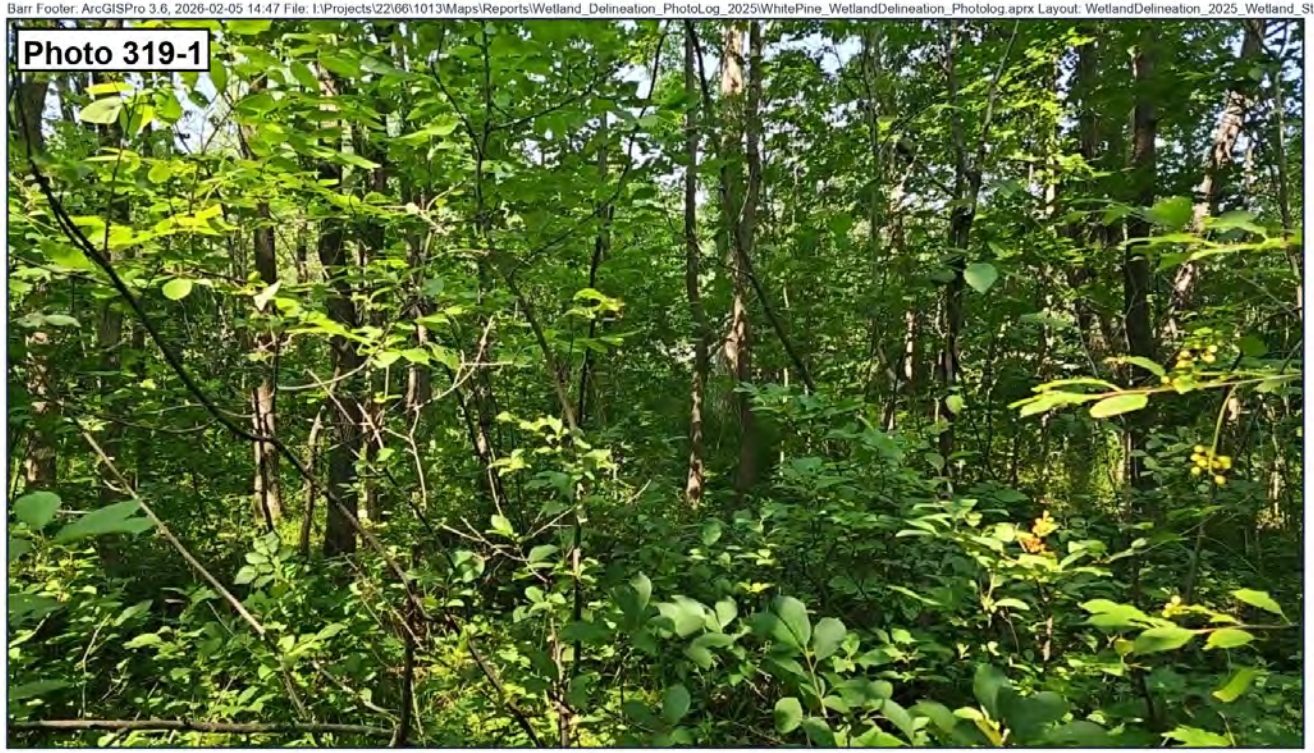

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP16-A, Wetland
**Photo 2 Caption:** T3E-BP16-A, Upland

*Note: Photo locations are approximate*

**Photo 319-1**



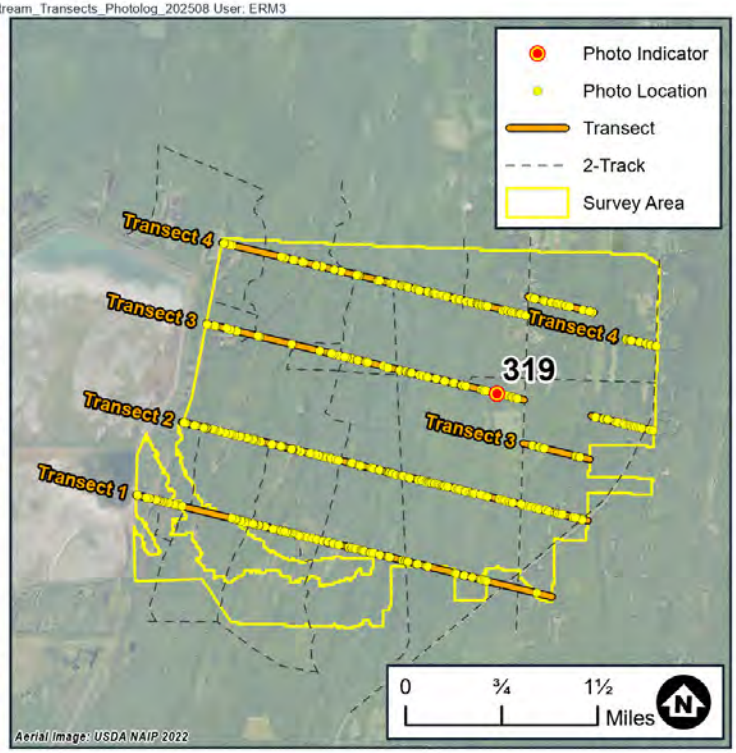
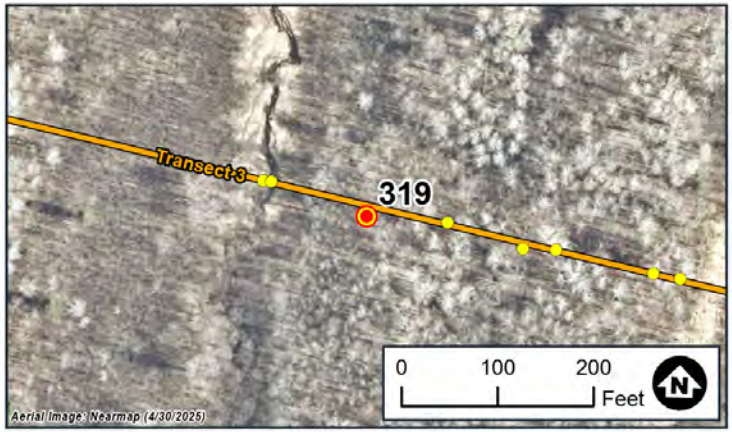



**Photo 319-2**







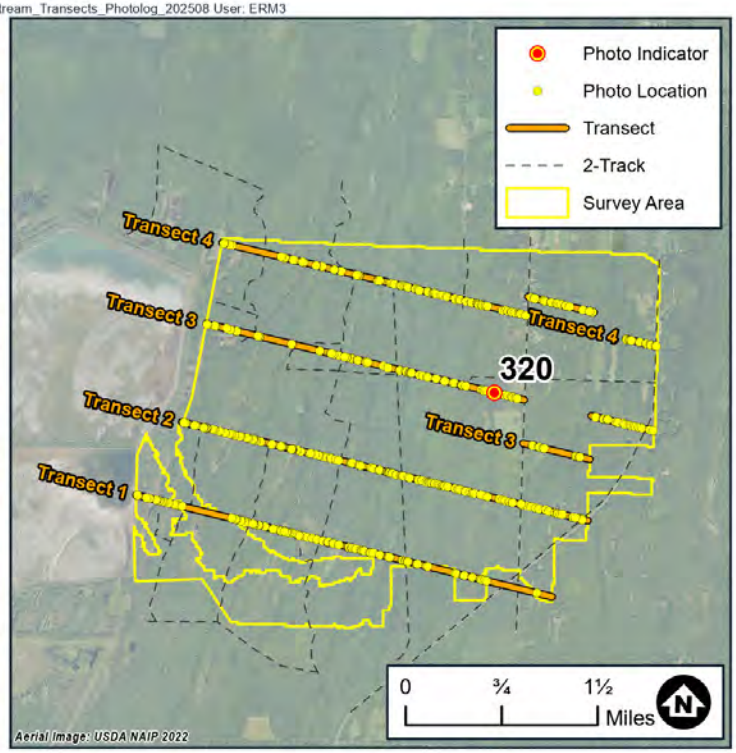

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP15-B Wetland
**Photo 2 Caption:** T3E-BP15-B, Upland

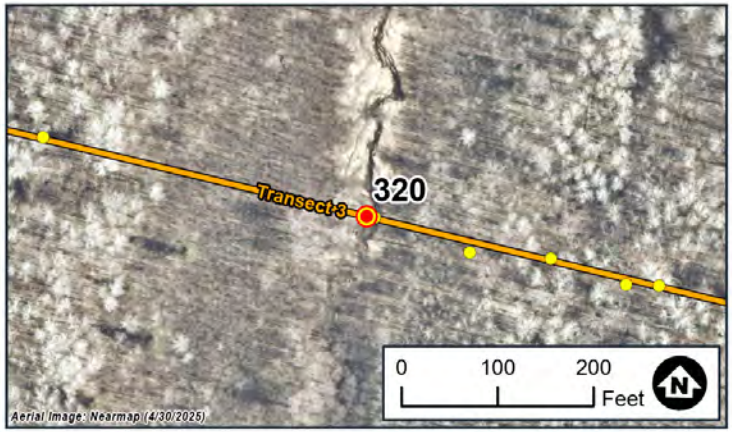
*Note: Photo locations are approximate*







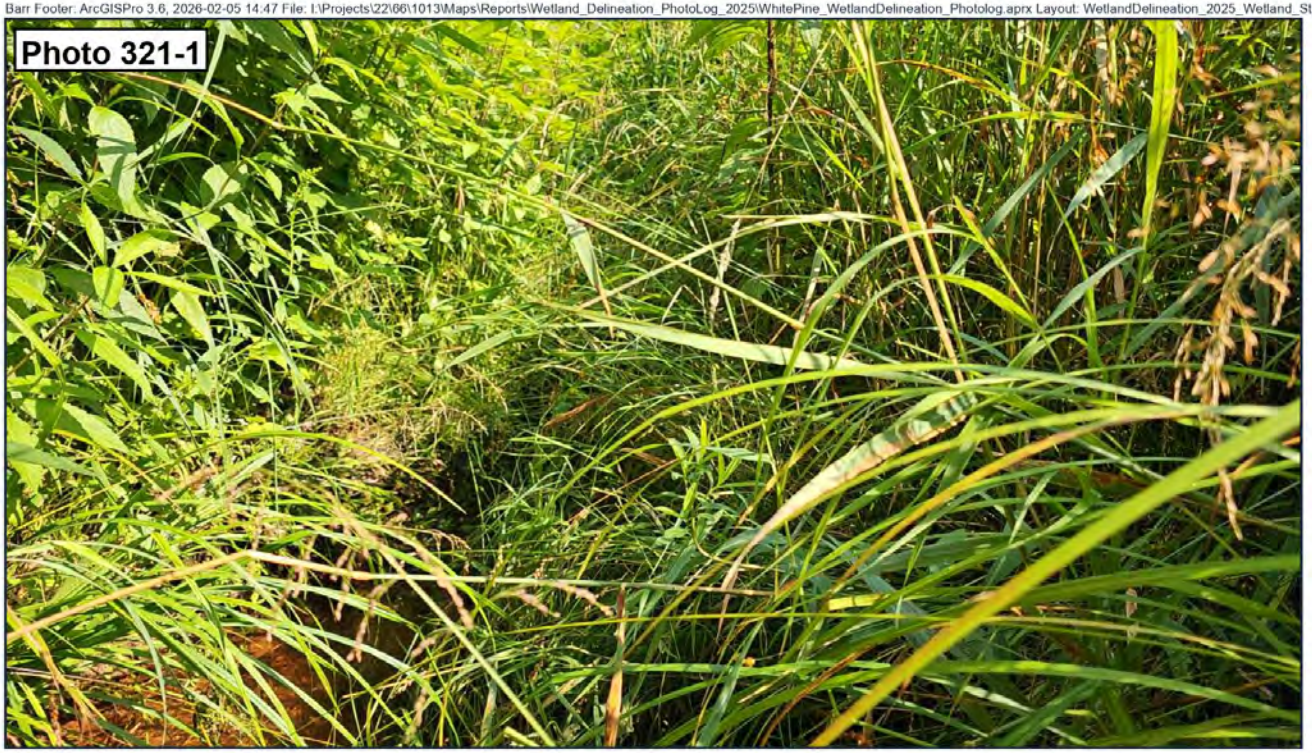


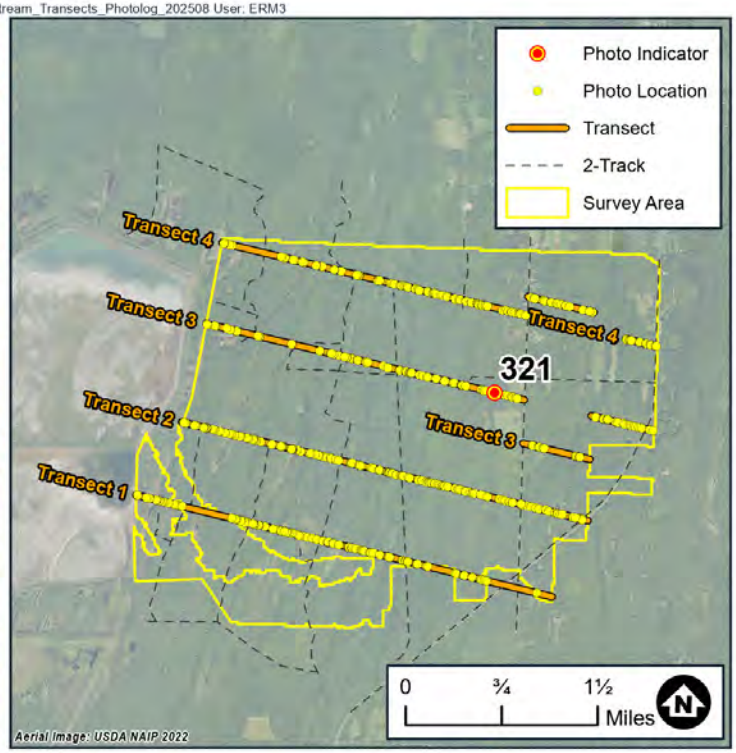

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S05-LB, Upstream
**Photo 2 Caption:** T3E-S05-LB, Downstream

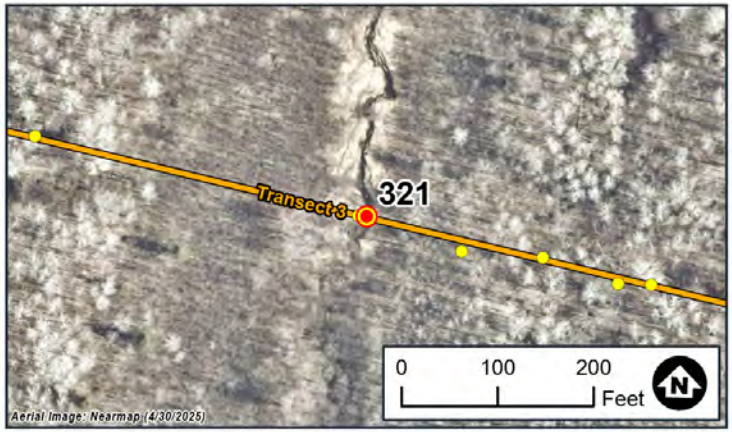
*Note: Photo locations are approximate*










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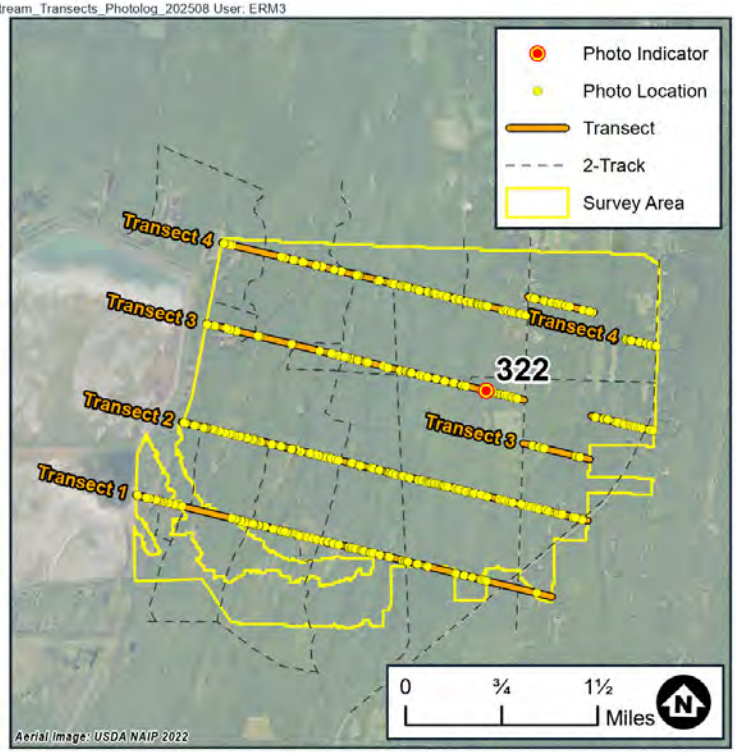
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S05-RB, Upstream
**Photo 2 Caption:** T3E-S05-RB, Downstream

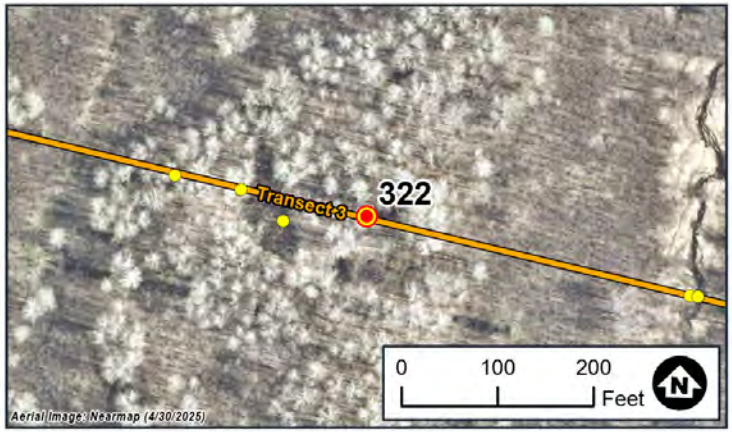
*Note: Photo locations are approximate*










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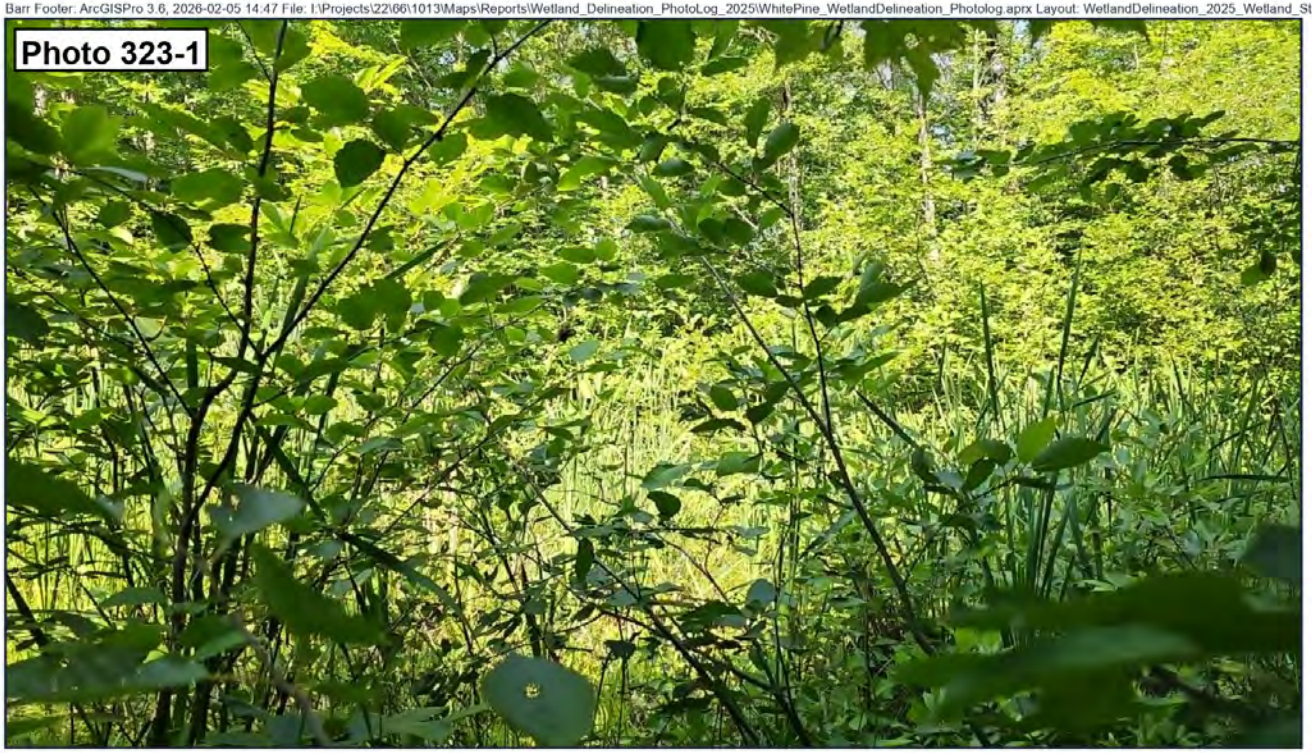
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

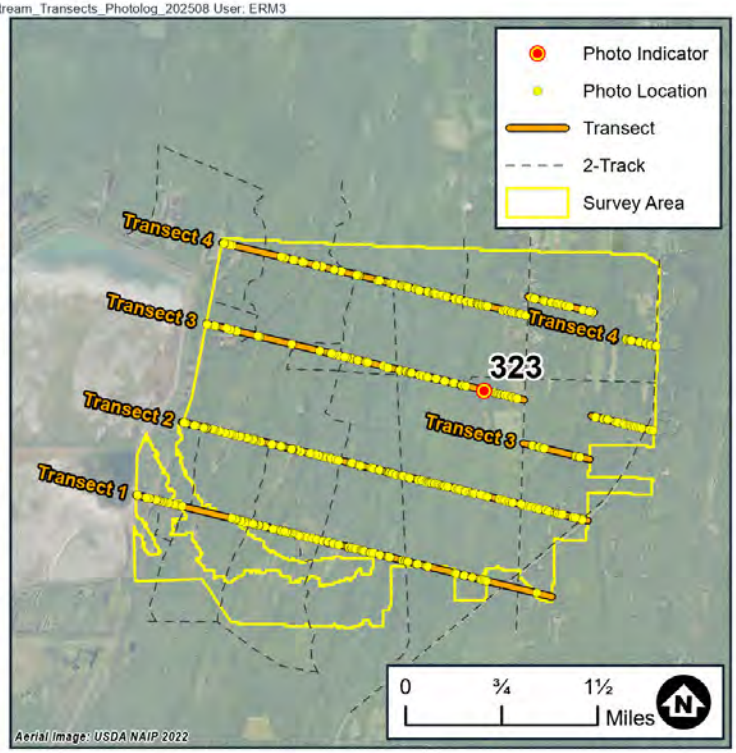
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP15-A, Wetland
**Photo 2 Caption:** T3E-BP15-A, Upland

*Note: Photo locations are approximate*

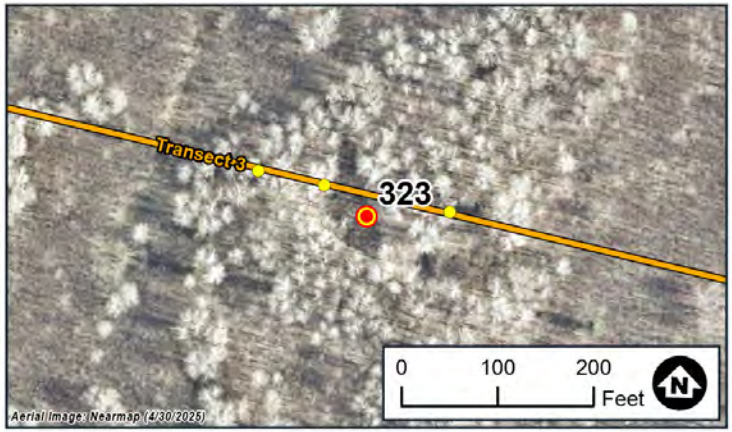
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3











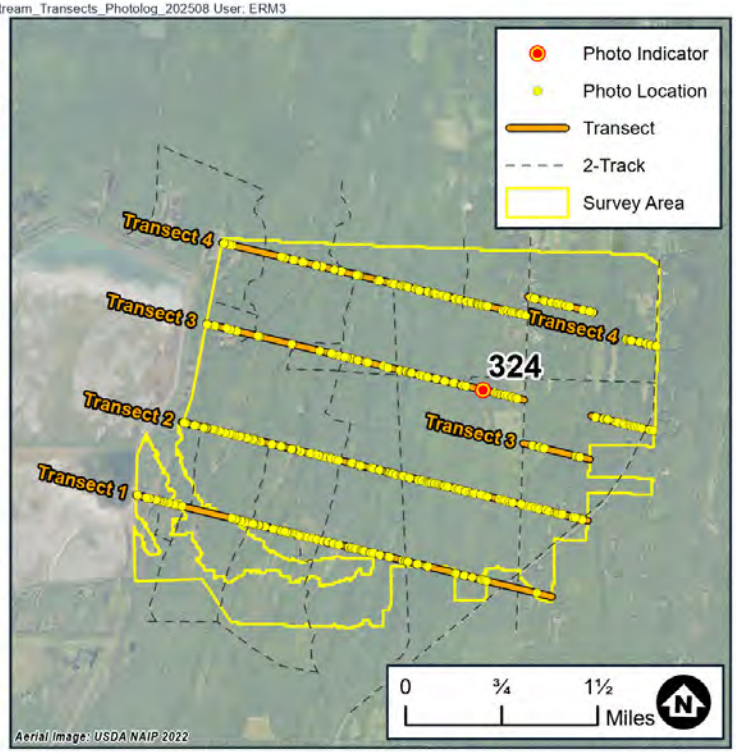

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP14-B, Wetland
**Photo 2 Caption:** T3E-BP14-B, Upland

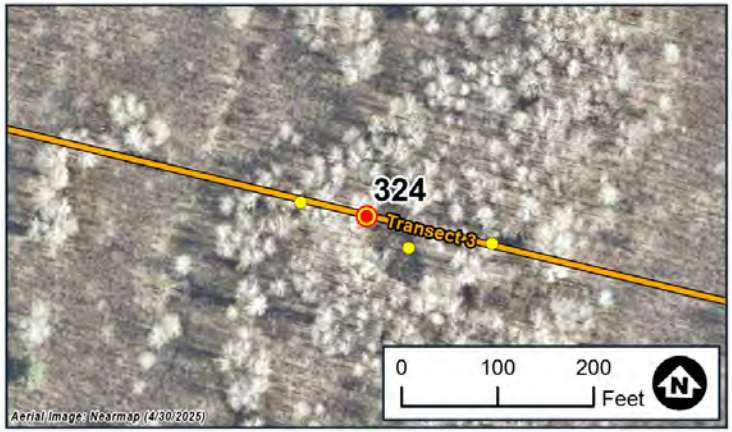
*Note: Photo locations are approximate*











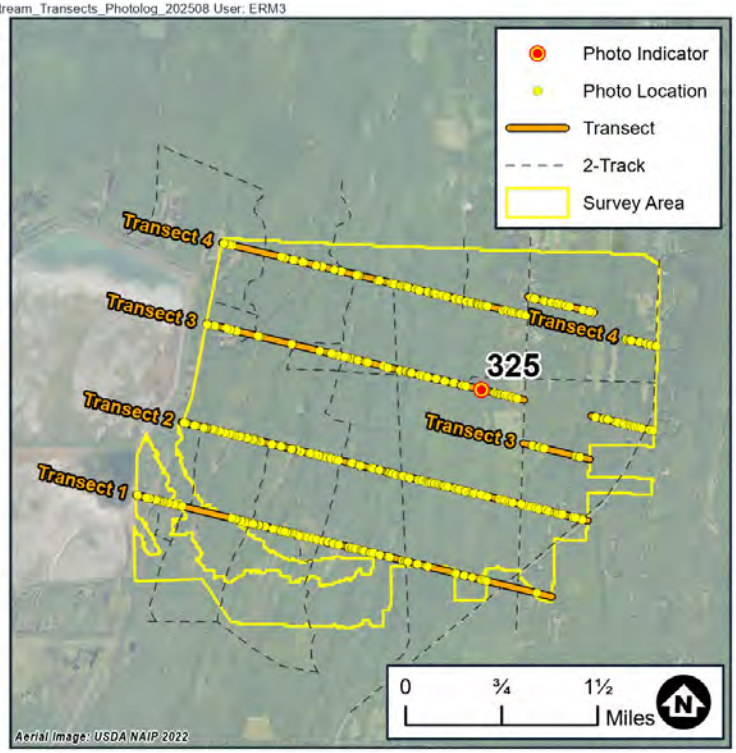

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP14-A, Wetland
**Photo 2 Caption:** T3E-BP14-A, Upland

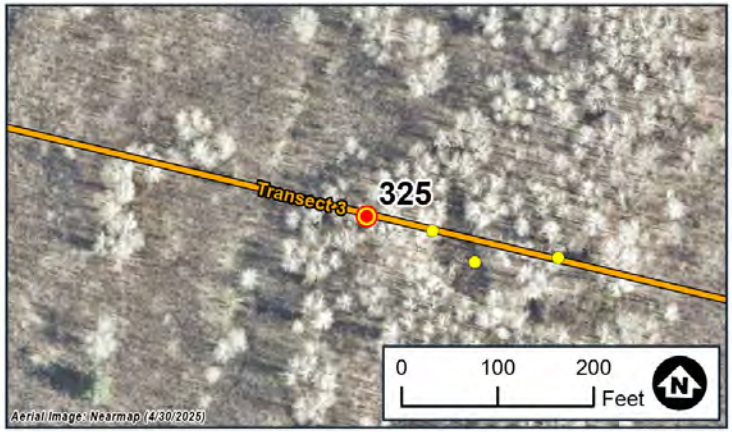
*Note: Photo locations are approximate*










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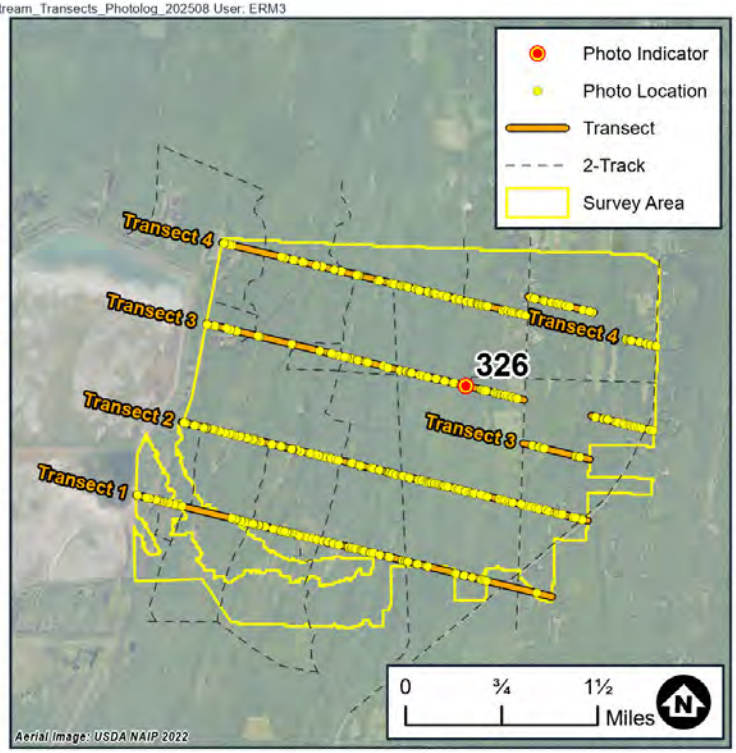
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP13-B, Wetland
**Photo 2 Caption:** T3E-BP13-B, Upland

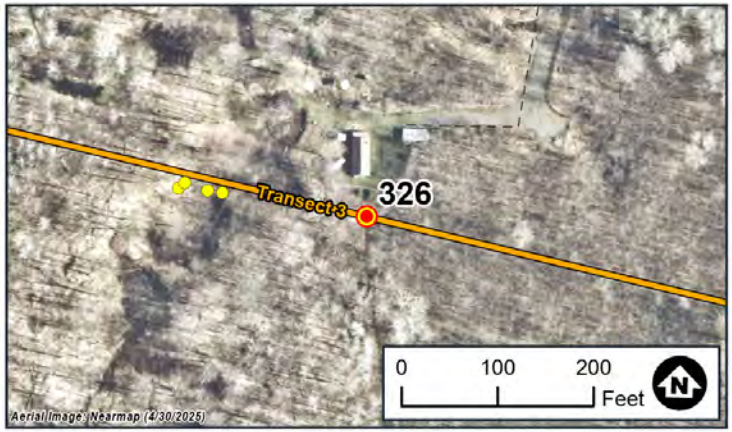
*Note: Photo locations are approximate*











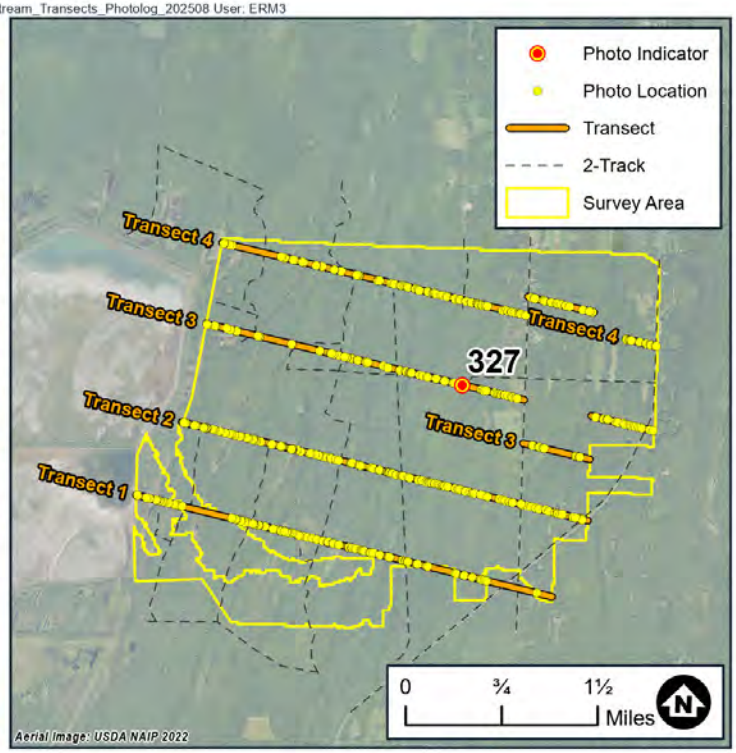

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP13-A, Wetland
**Photo 2 Caption:** T3E-BP13-A, Upland

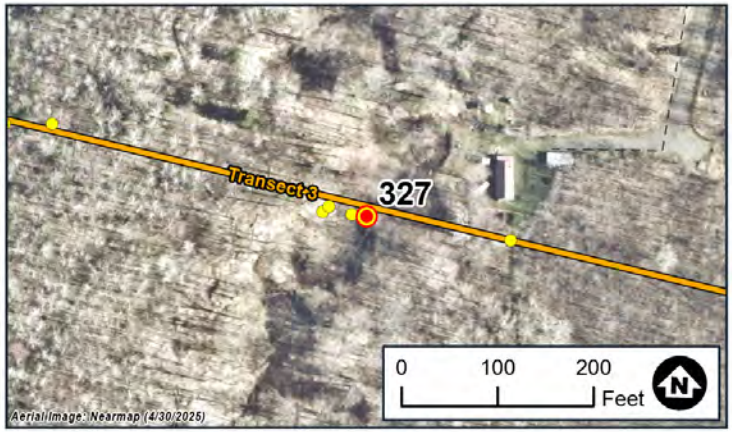
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

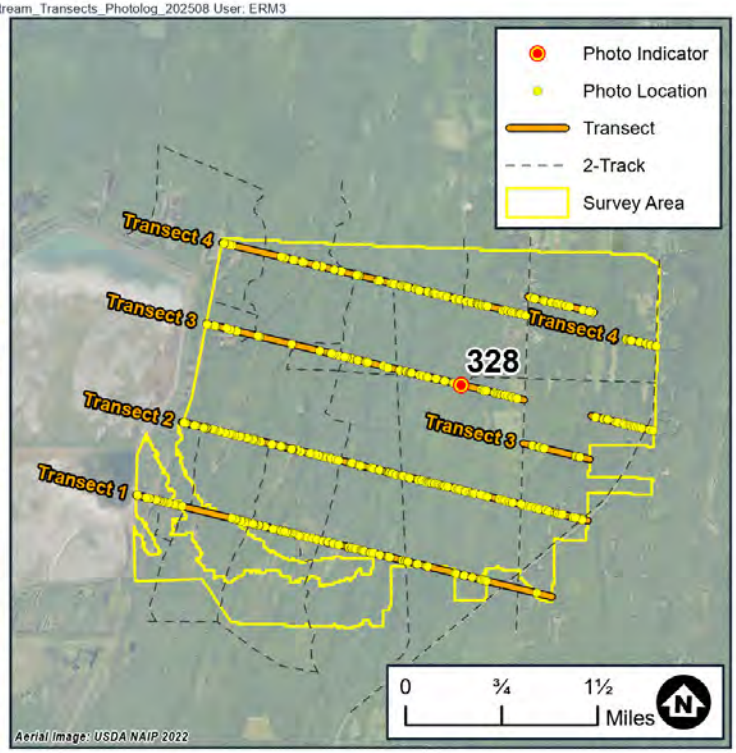
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP12-B, Wetland
**Photo 2 Caption:** T3E-BP12-B, Upland

*Note: Photo locations are approximate*

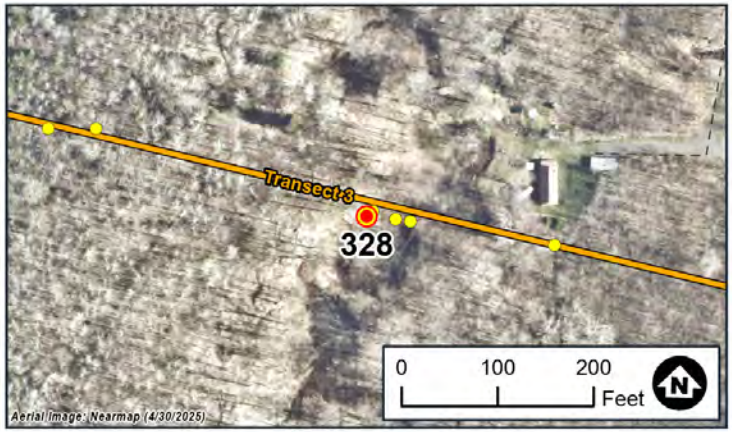
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

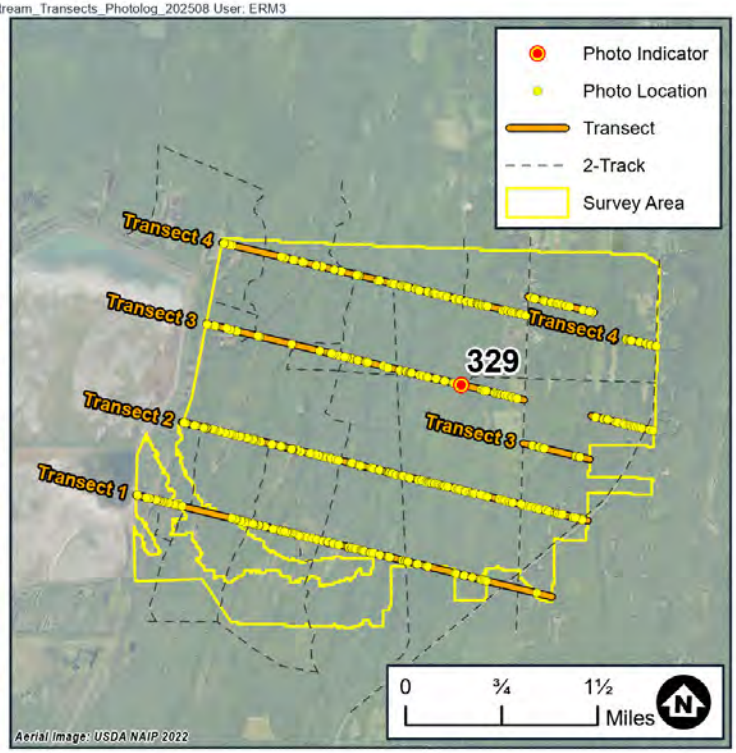
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP12-A, Wetland
**Photo 2 Caption:** T3E-BP12-A, Upland

*Note: Photo locations are approximate*

## Photo 329-1






## Photo 329-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S04-LB, Upstream
**Photo 2 Caption:** T3E-S04-LB, Downstream

*Note: Photo locations are approximate*

**Photo 330-1**



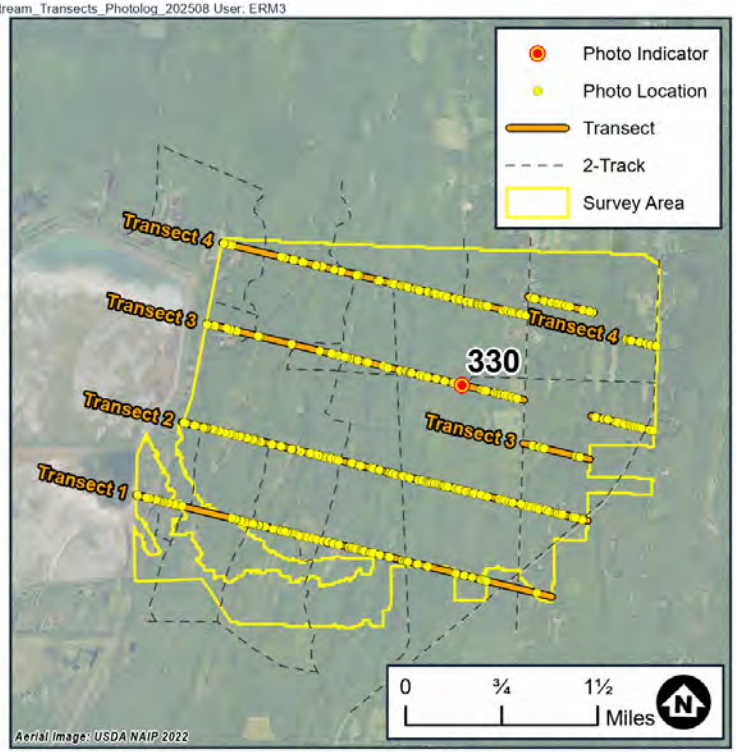



**Photo 330-2**





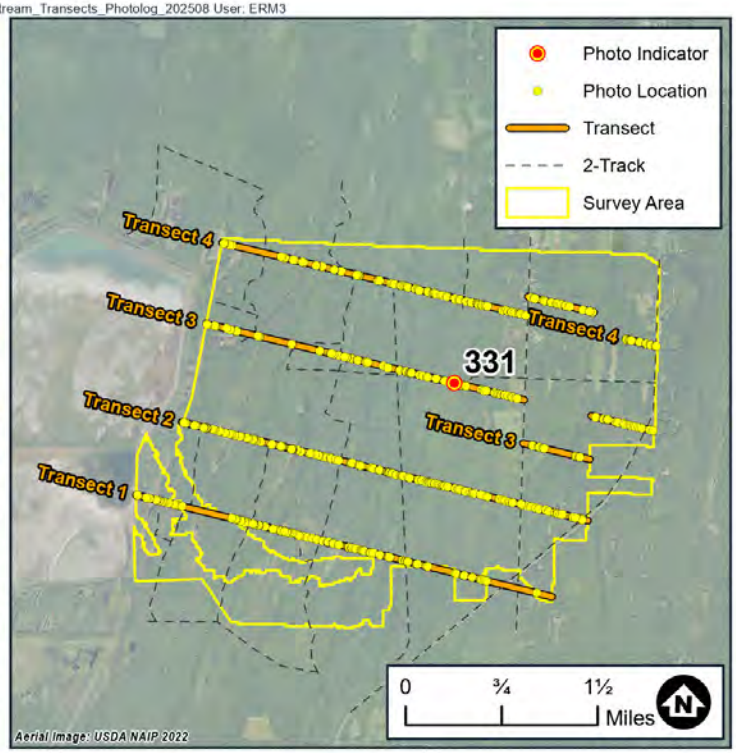

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S04-RB, Upstream
**Photo 2 Caption:** T3E-S04-RB, Downstream

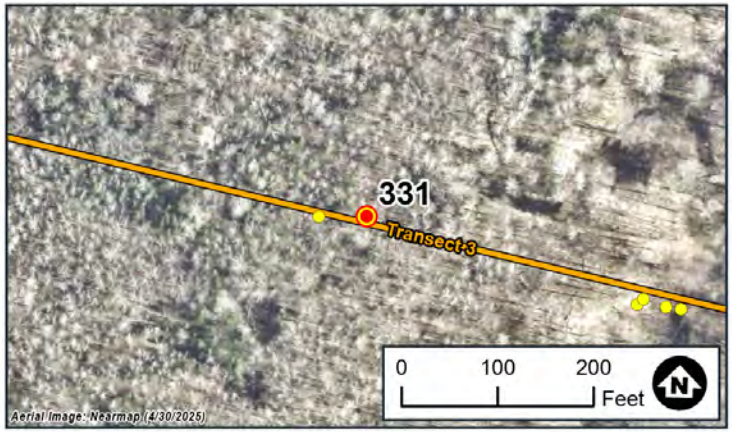
*Note: Photo locations are approximate*











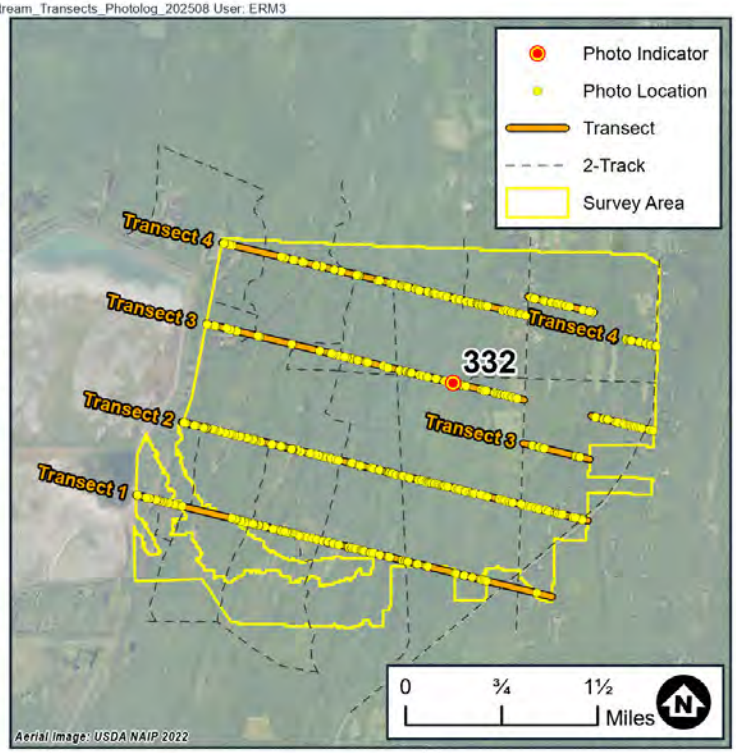

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP11-B, Wetland
**Photo 2 Caption:** T3E-BP11-B, Upland

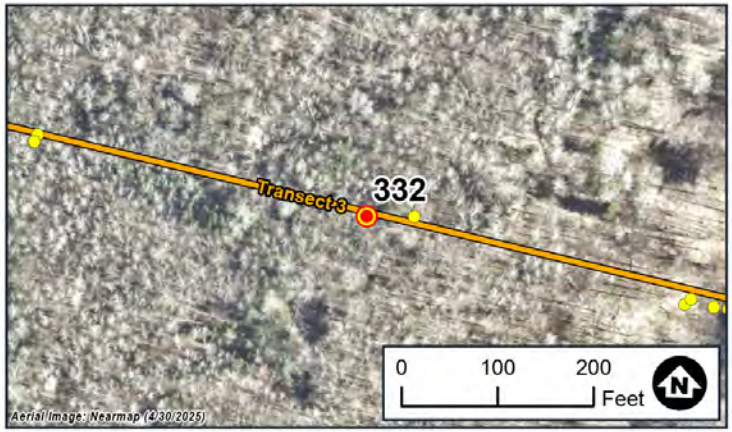
*Note: Photo locations are approximate*











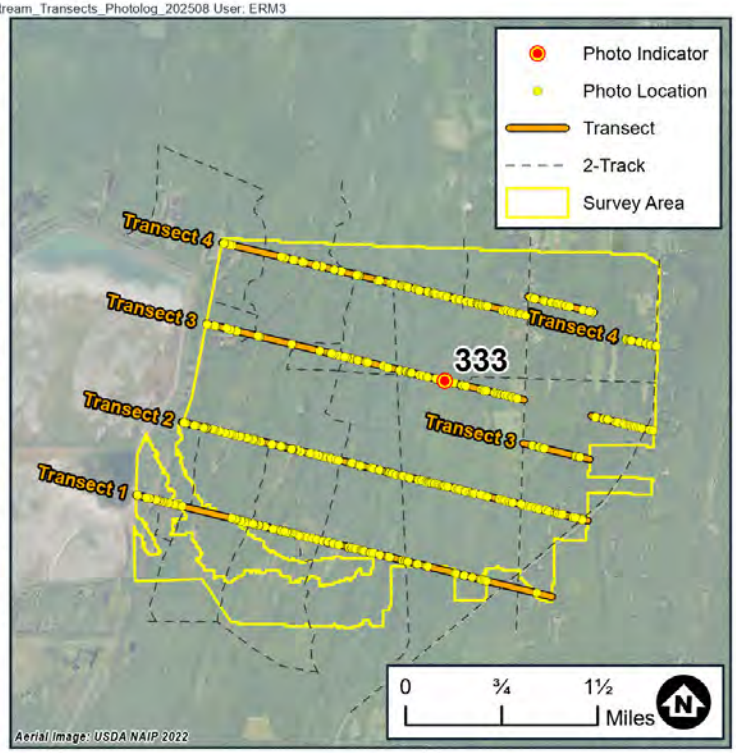

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP11-A, Wetland
**Photo 2 Caption:** T3E-BP11-A, Upland

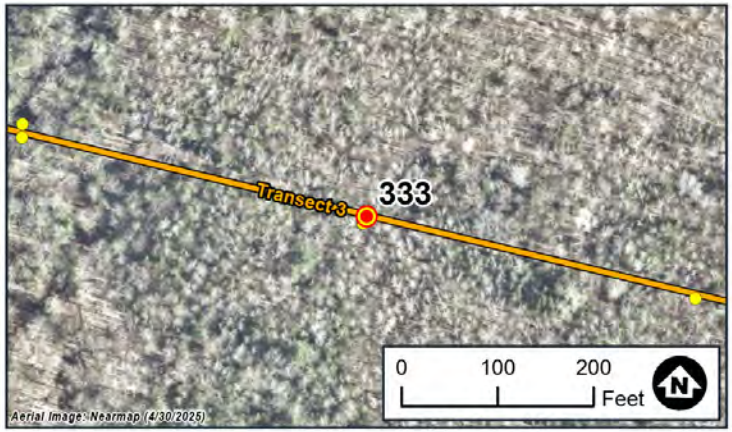
*Note: Photo locations are approximate*











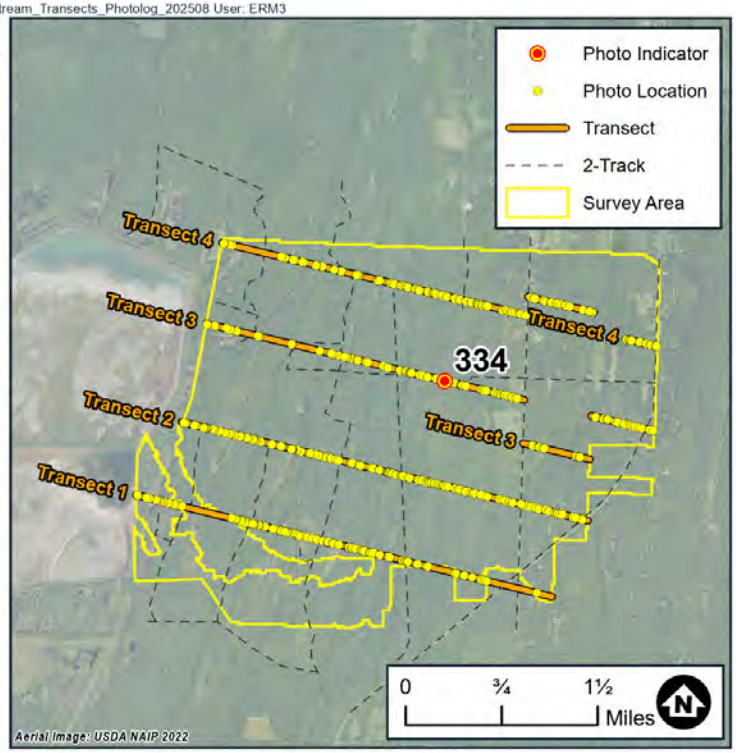

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP10-A, Wetland
**Photo 2 Caption:** T3E-BP10-A, Upland

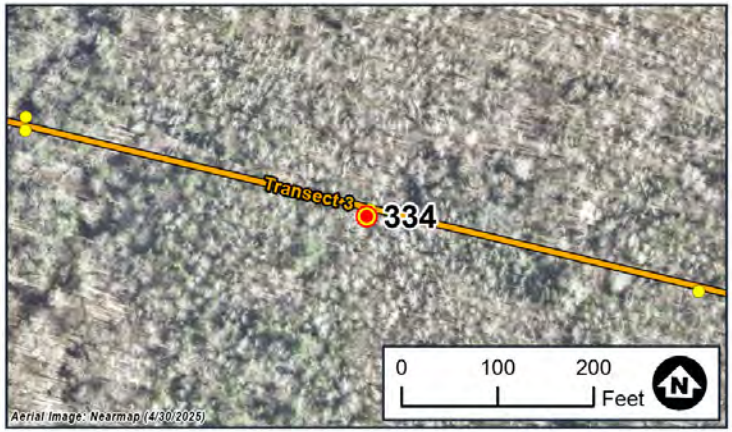
*Note: Photo locations are approximate*











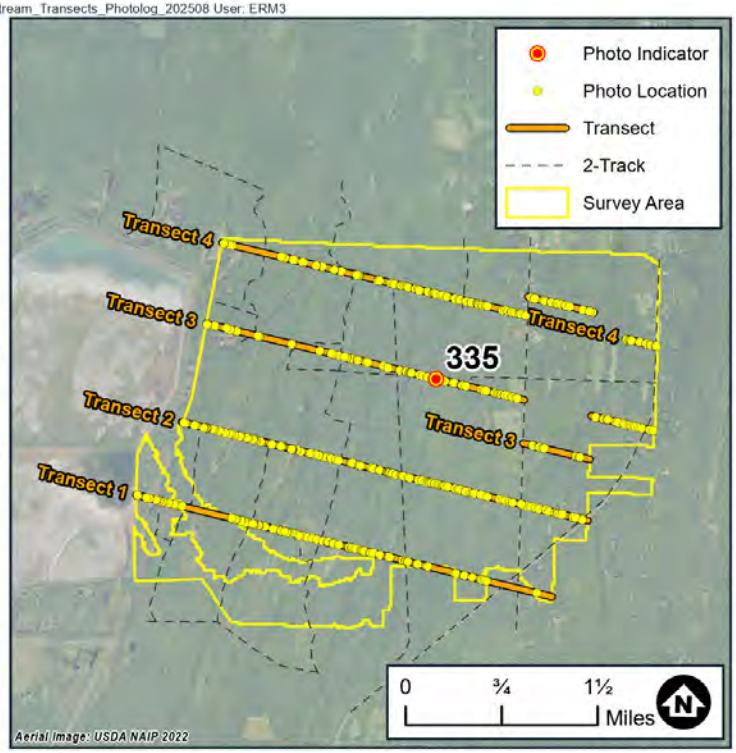

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP10-B, Wetland
**Photo 2 Caption:** T3E-BP10-B, Upland

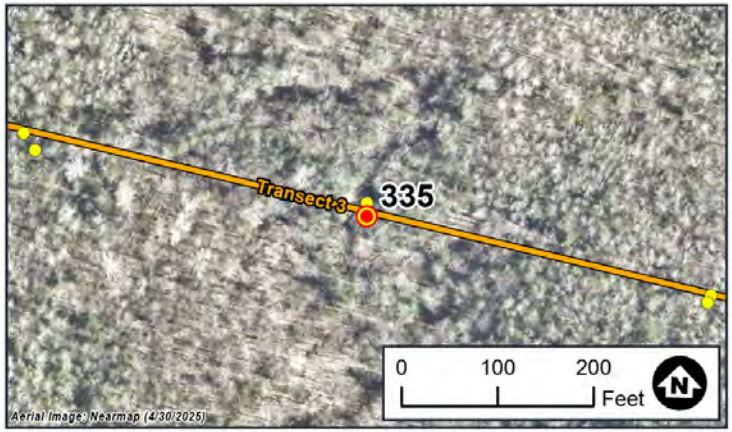
*Note: Photo locations are approximate*











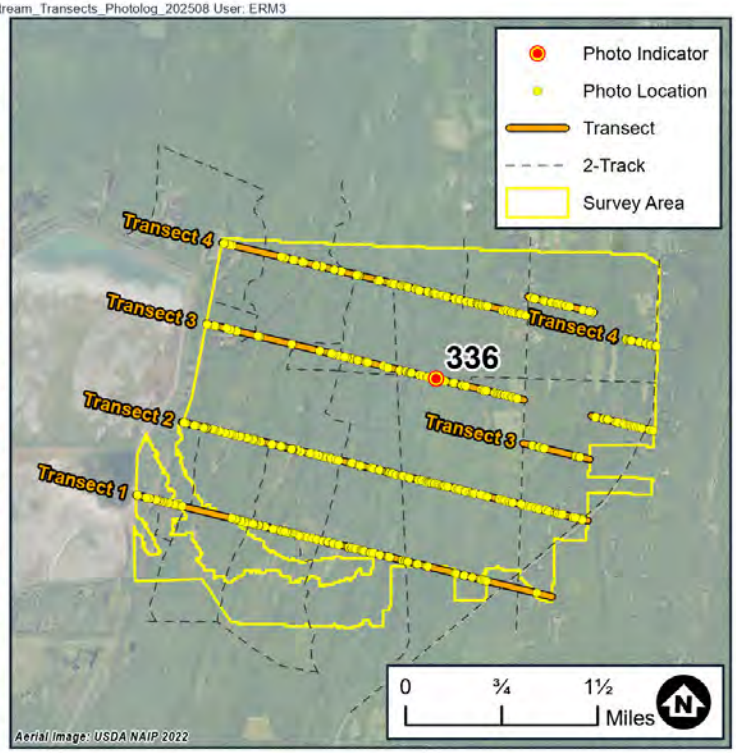

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S03-LB, Upstream
**Photo 2 Caption:** T3E-S03-LB, Downstream

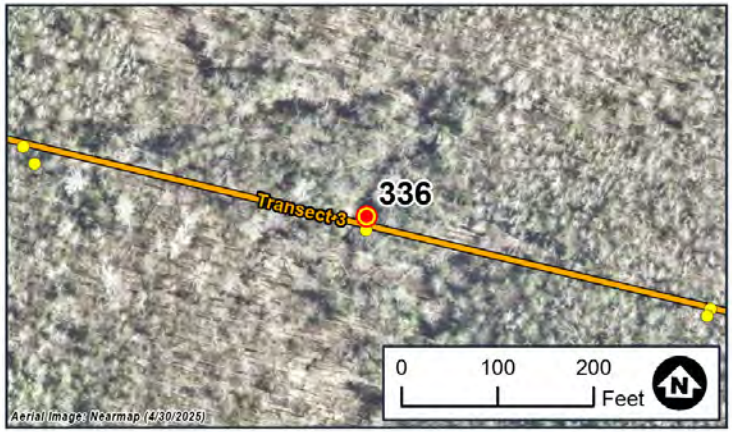
*Note: Photo locations are approximate*










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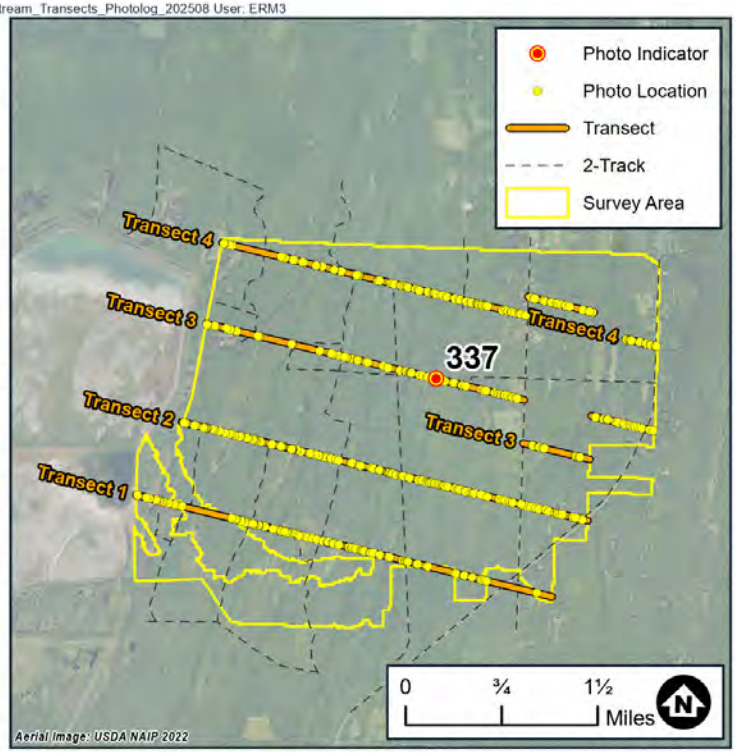
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S03-RB, Upstream
**Photo 2 Caption:** T3E-S03-RB, Downstream

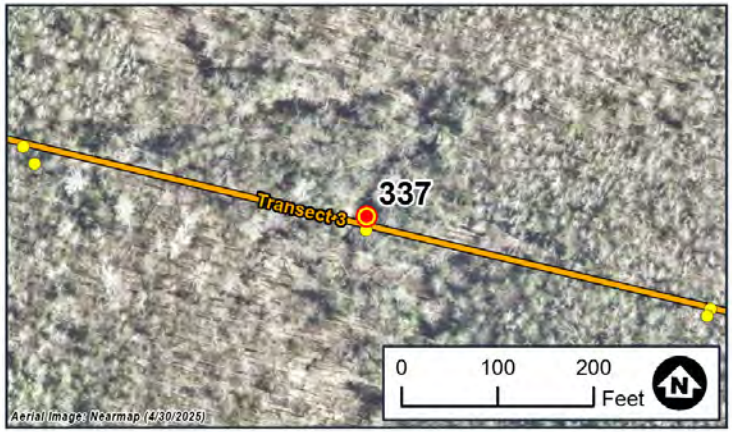
*Note: Photo locations are approximate*









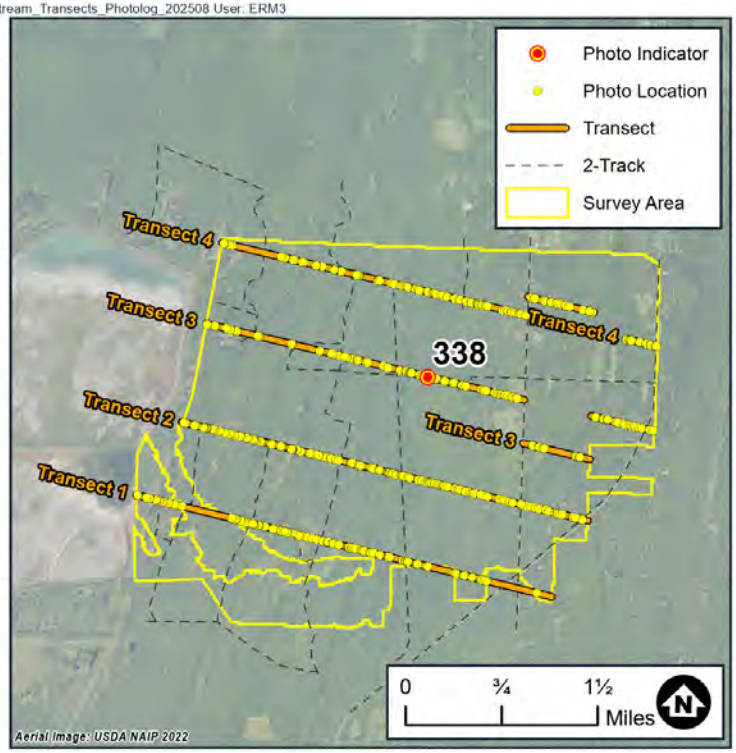

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S02-RB, Upstream
**Photo 2 Caption:** T3E-S02-RB, Upstream

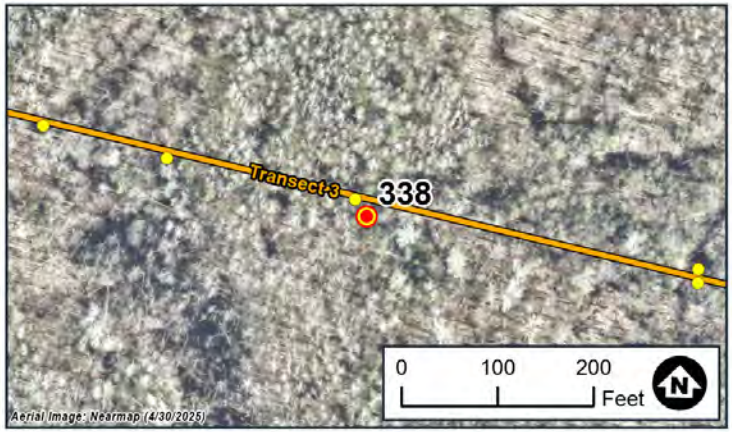
*Note: Photo locations are approximate*










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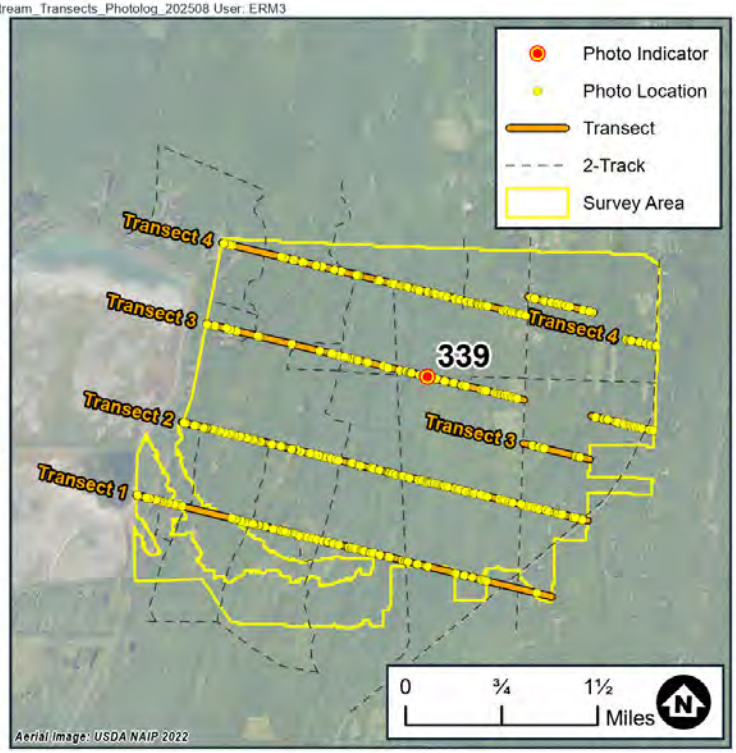
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP09-B, Wetland
**Photo 2 Caption:** T3E-BP09-B, Upland

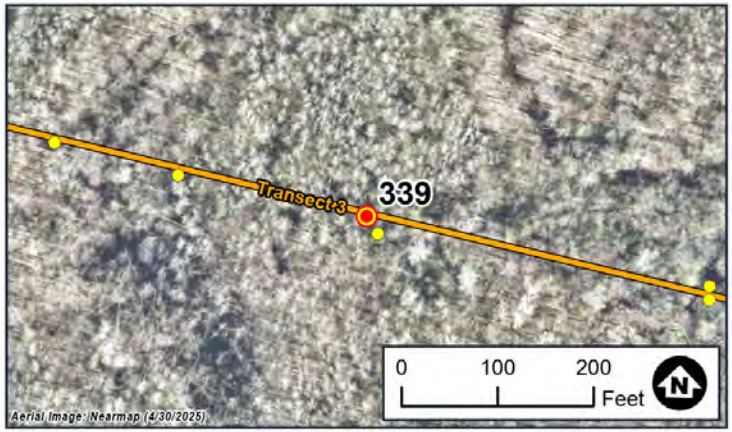
*Note: Photo locations are approximate*











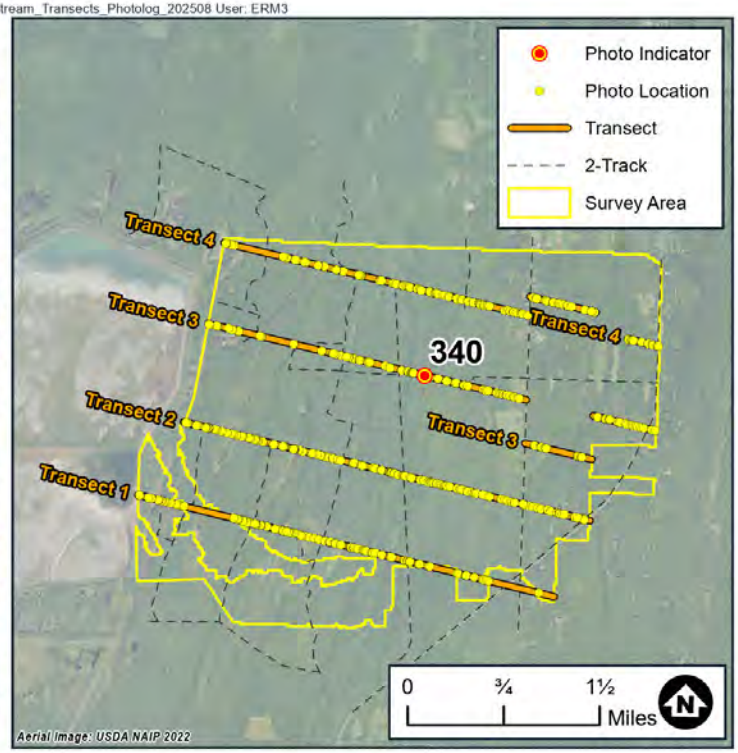

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP09-A, Wetland
**Photo 2 Caption:** T3E-BP09-A, Upland

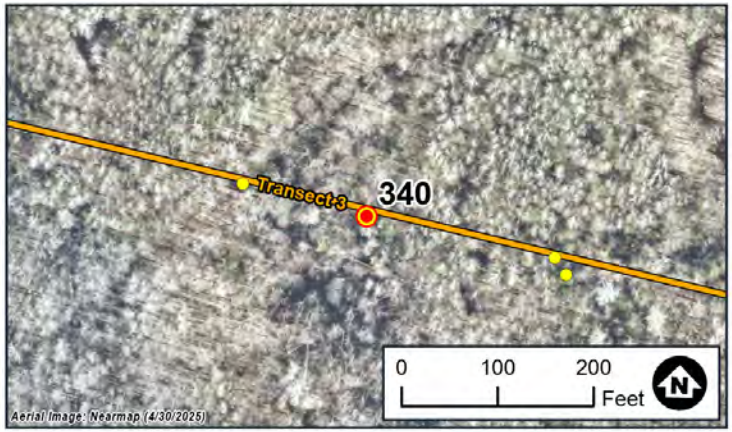
*Note: Photo locations are approximate*











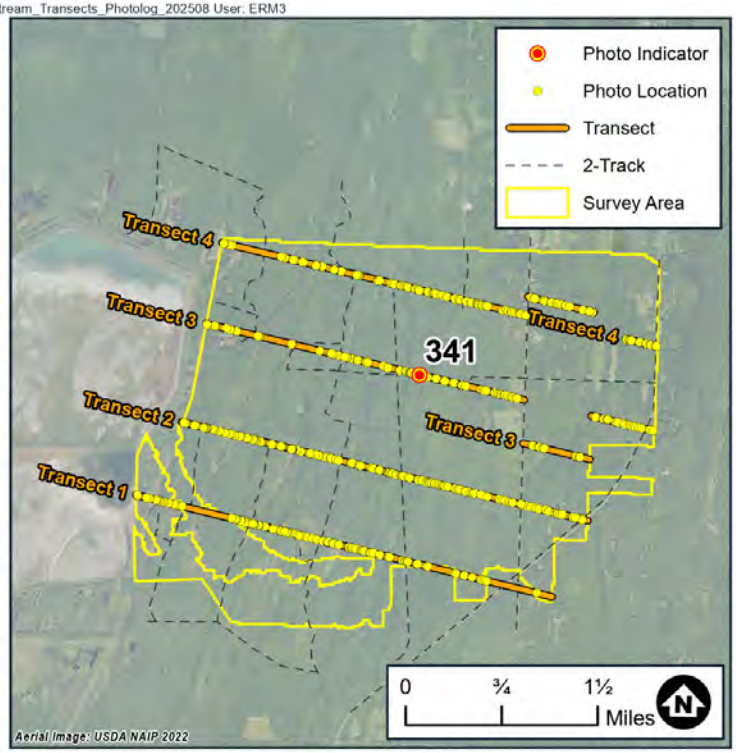

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP08-B, Wetland
**Photo 2 Caption:** T3E-BP08-B, Upland

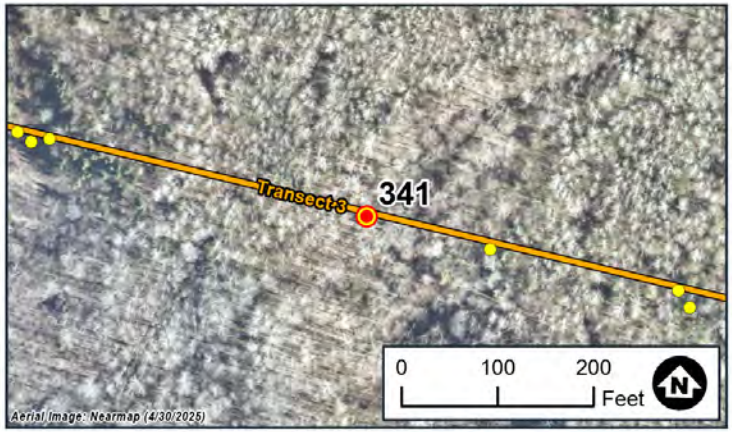
*Note: Photo locations are approximate*










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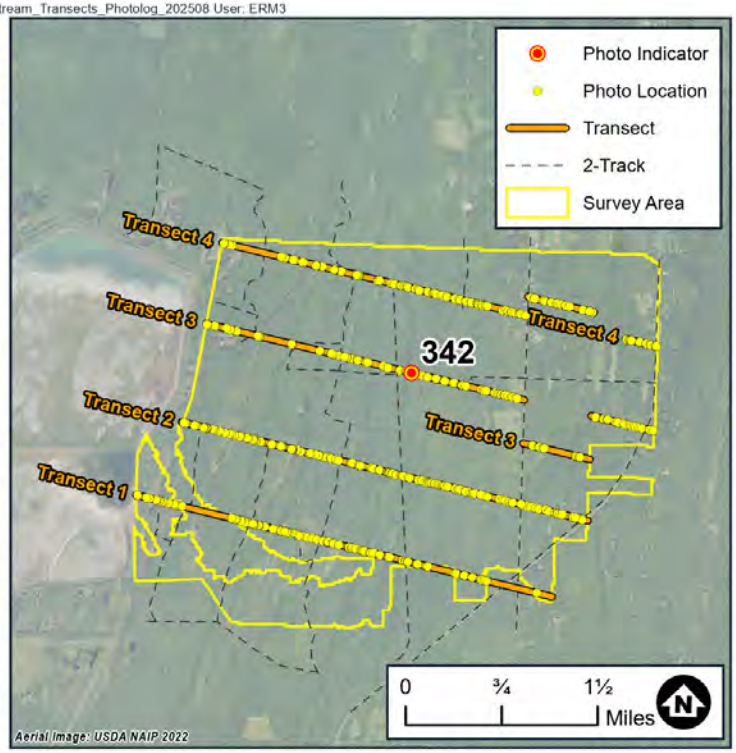
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP08-A, Wetland
**Photo 2 Caption:** T3E-BP08-A, Upland

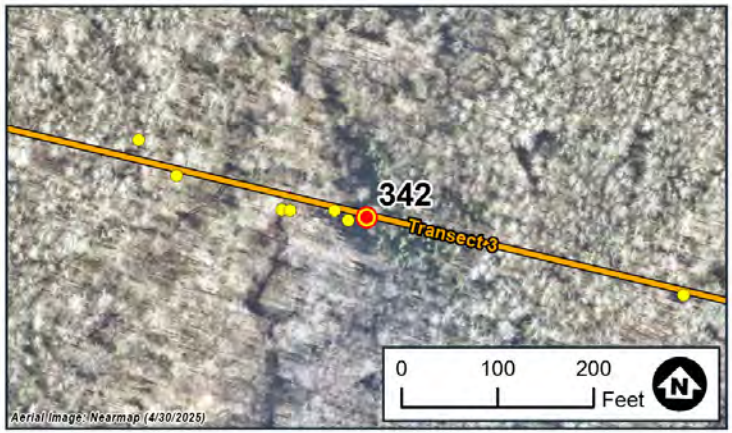
*Note: Photo locations are approximate*











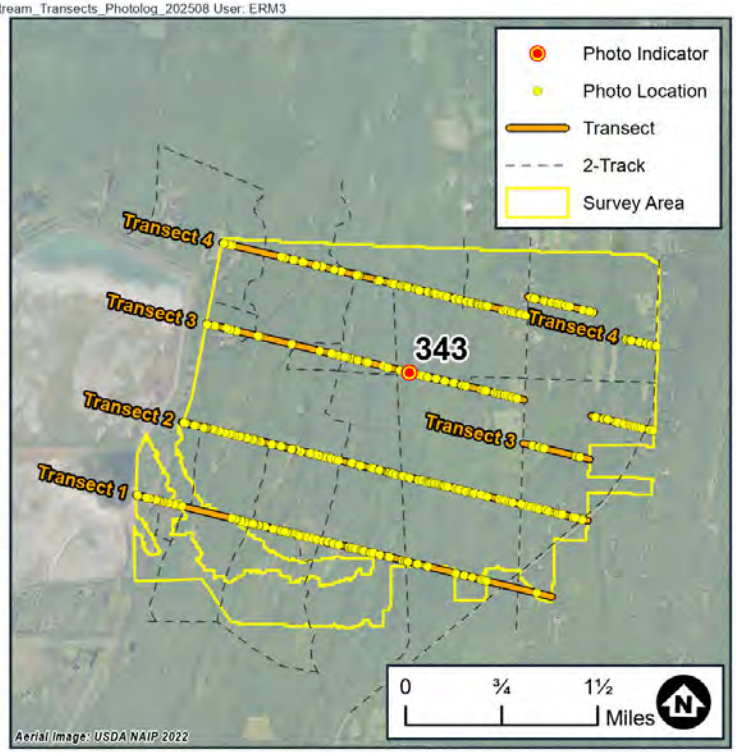

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP07-B, Wetland
**Photo 2 Caption:** T3E-BP07-B, Upland

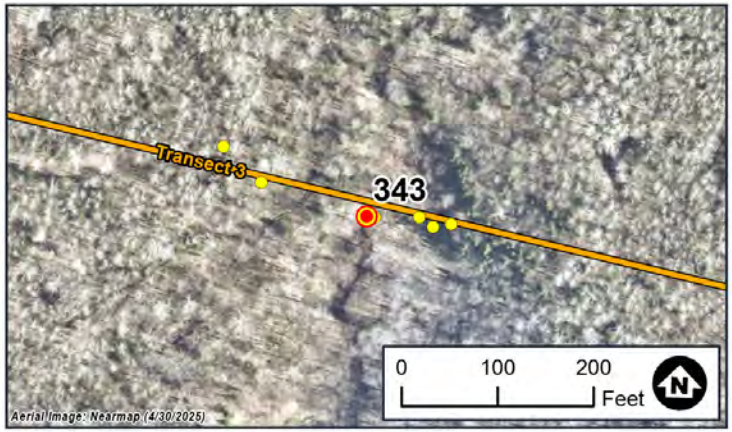
*Note: Photo locations are approximate*









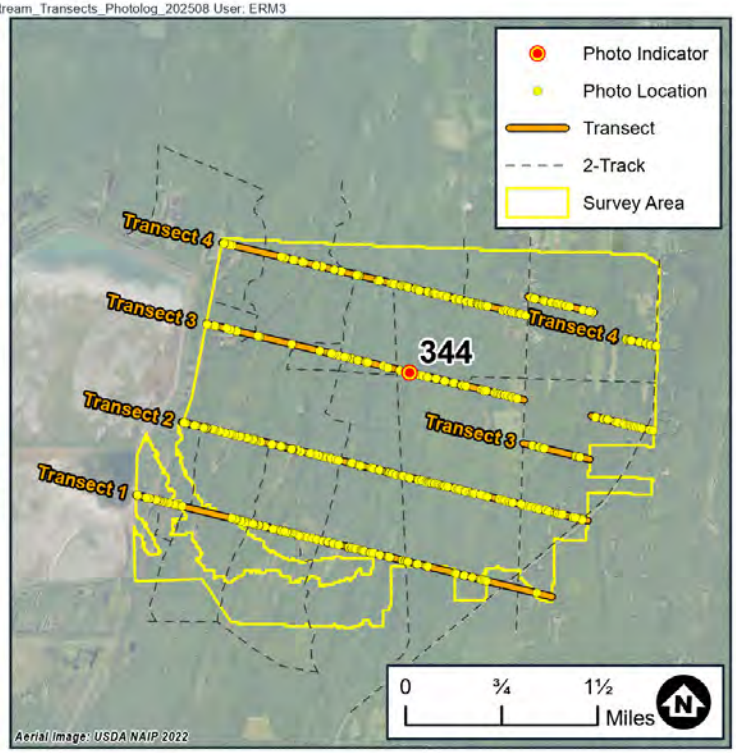

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP07-A, Wetland
**Photo 2 Caption:** T3E-BP07-A, Upland

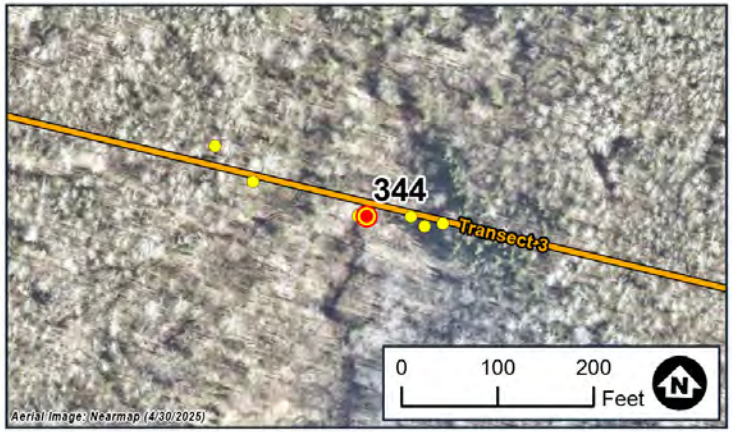
*Note: Photo locations are approximate*











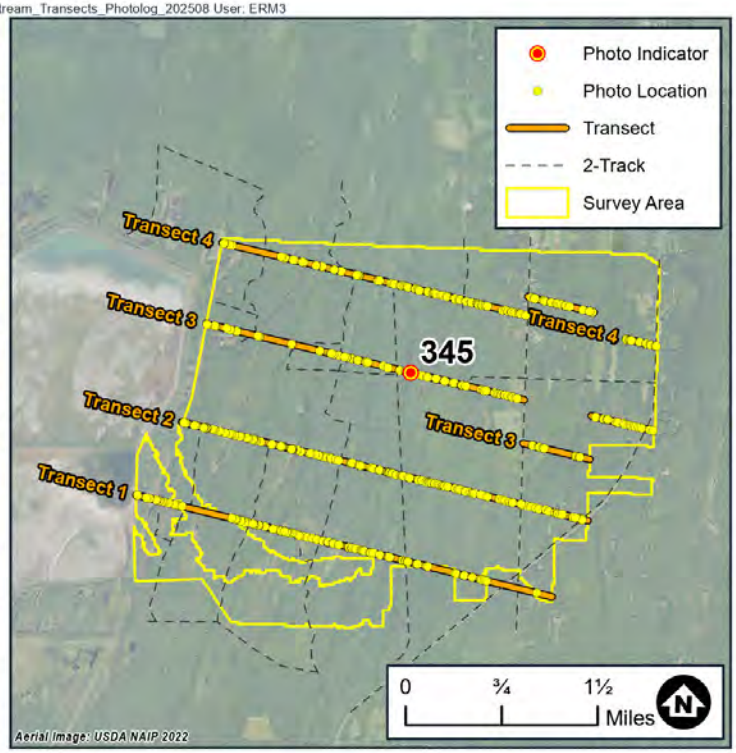

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S02-LB, Upstream
**Photo 2 Caption:** T3E-S02-LB, Downstream

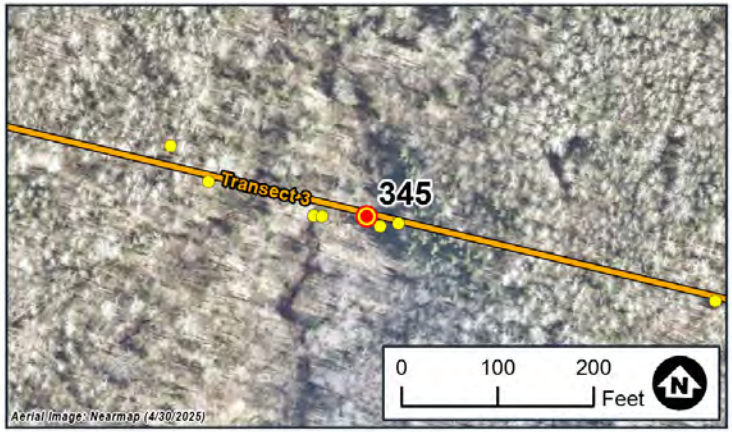
*Note: Photo locations are approximate*











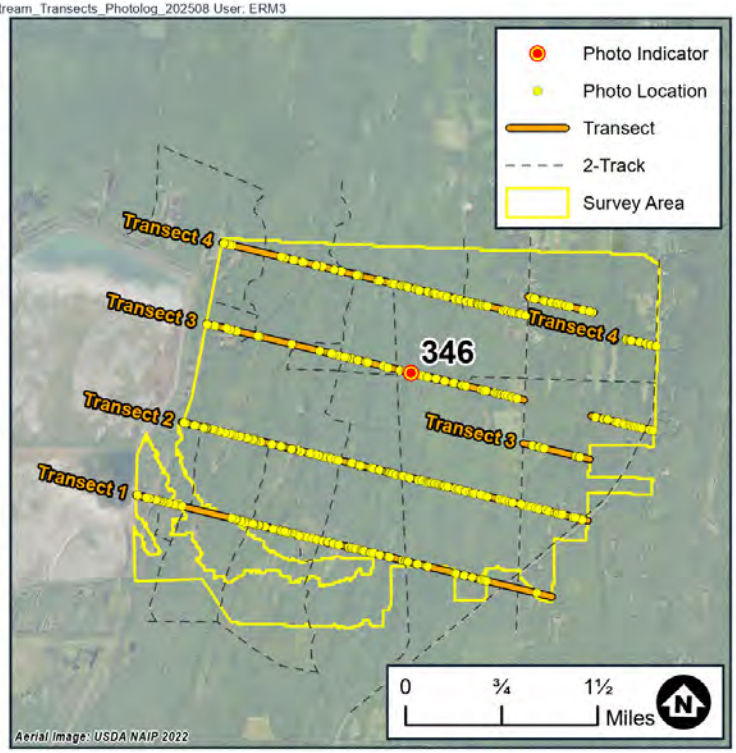

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S02-LB, Upstream
**Photo 2 Caption:** T3E-S02-LB, Downstream

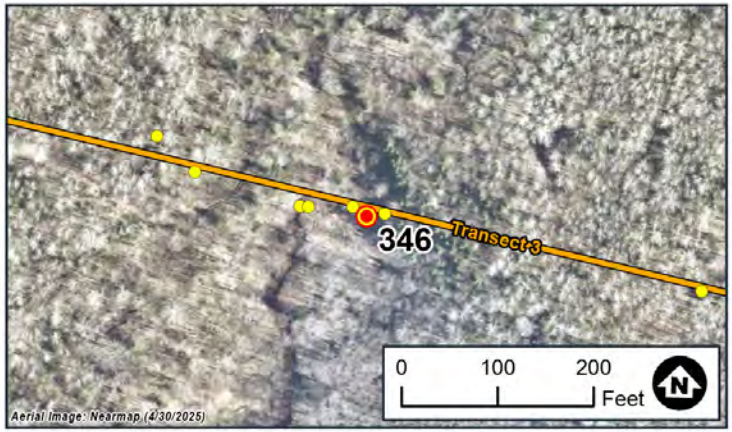
*Note: Photo locations are approximate*










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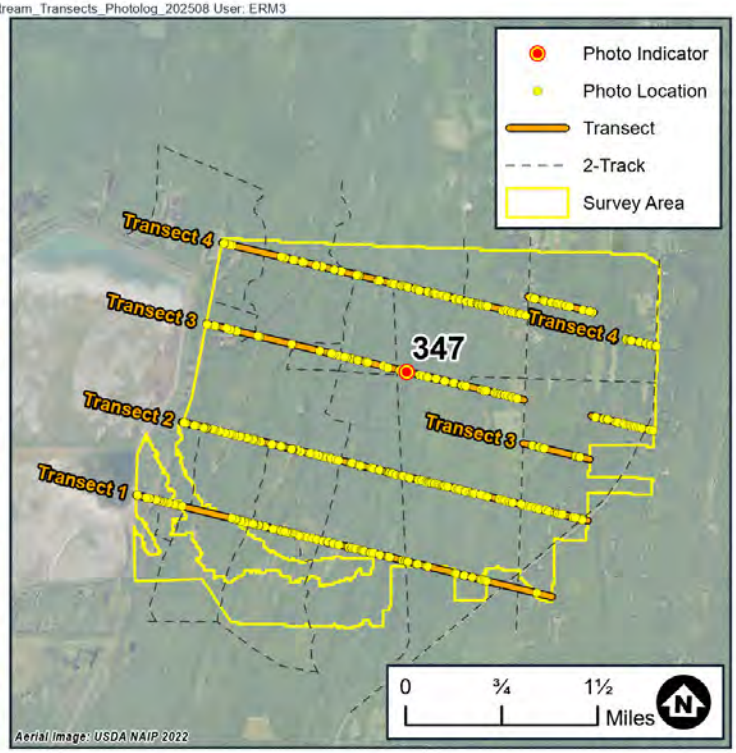
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-S02-RB, Upstream
**Photo 2 Caption:** T3E-S02-RB, Downstream

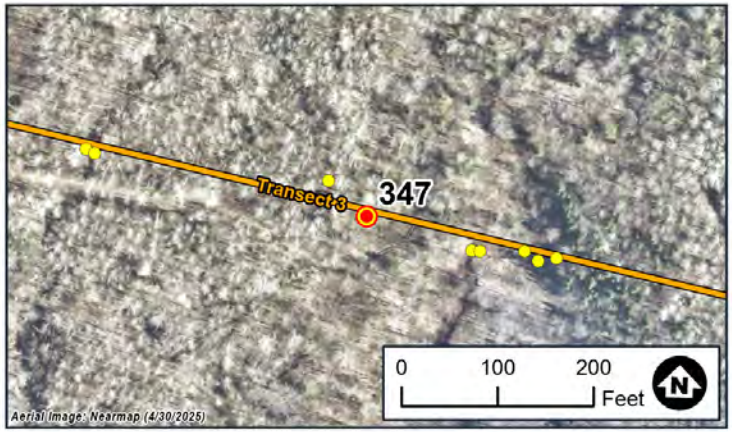
*Note: Photo locations are approximate*









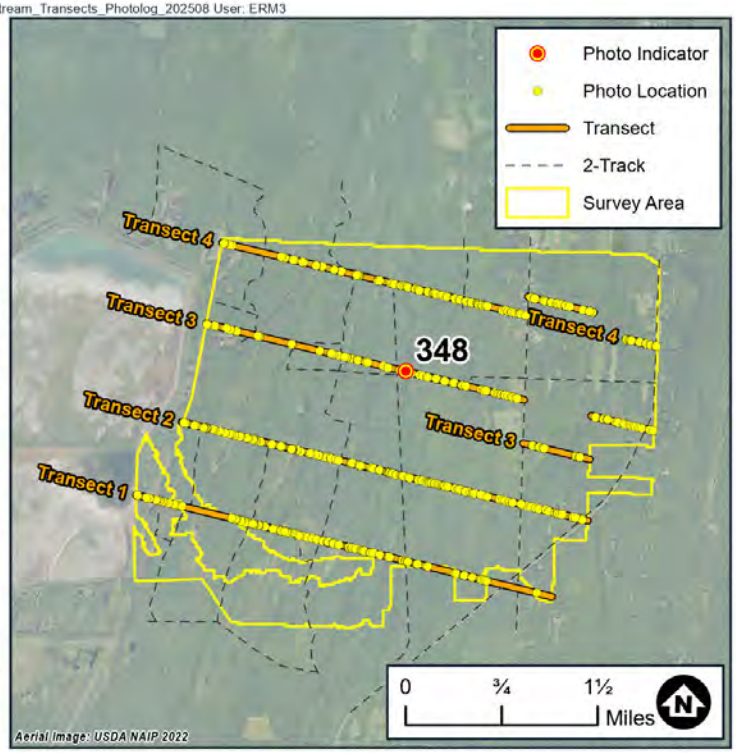

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP06-B, Wetland
**Photo 2 Caption:** T3E-BP06-B, Upland

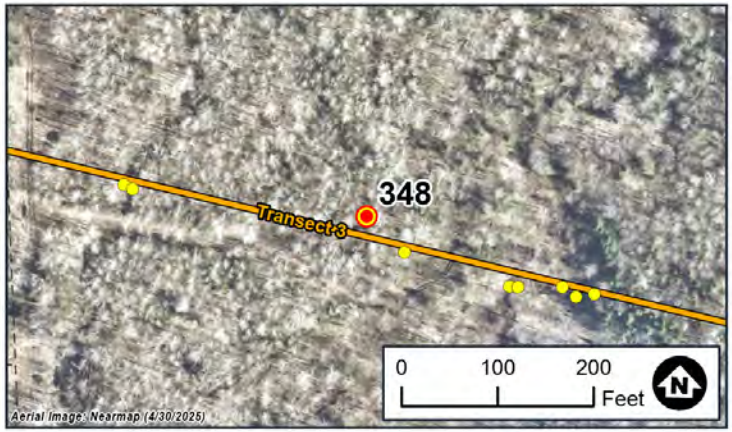
*Note: Photo locations are approximate*











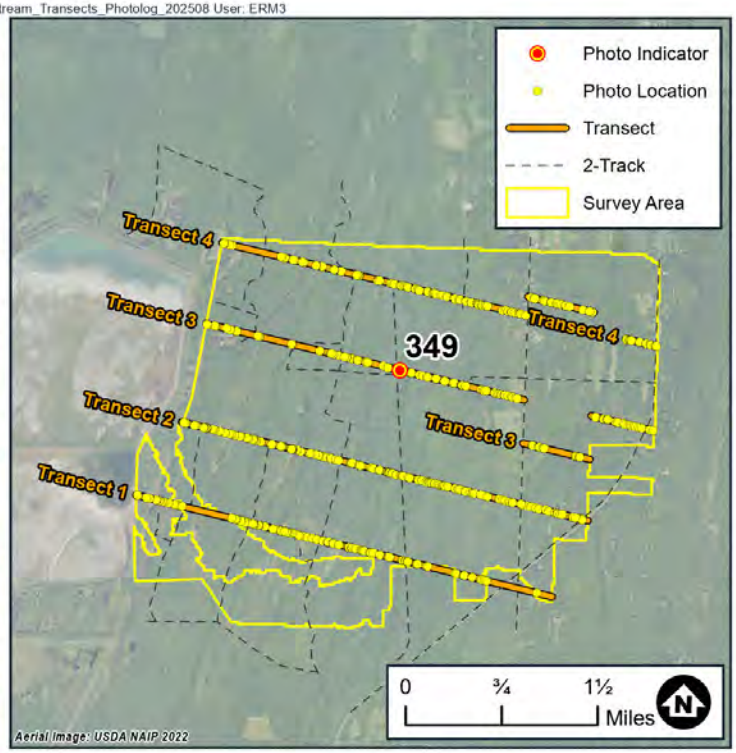

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP06-A, Wetland
**Photo 2 Caption:** T3E-BP06-A, Upland

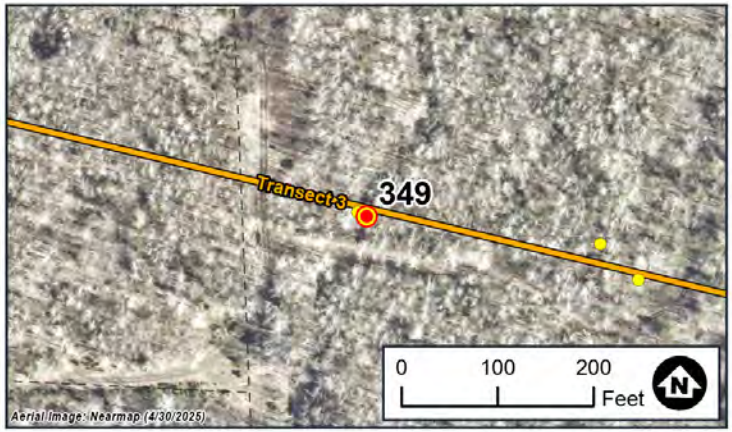
*Note: Photo locations are approximate*











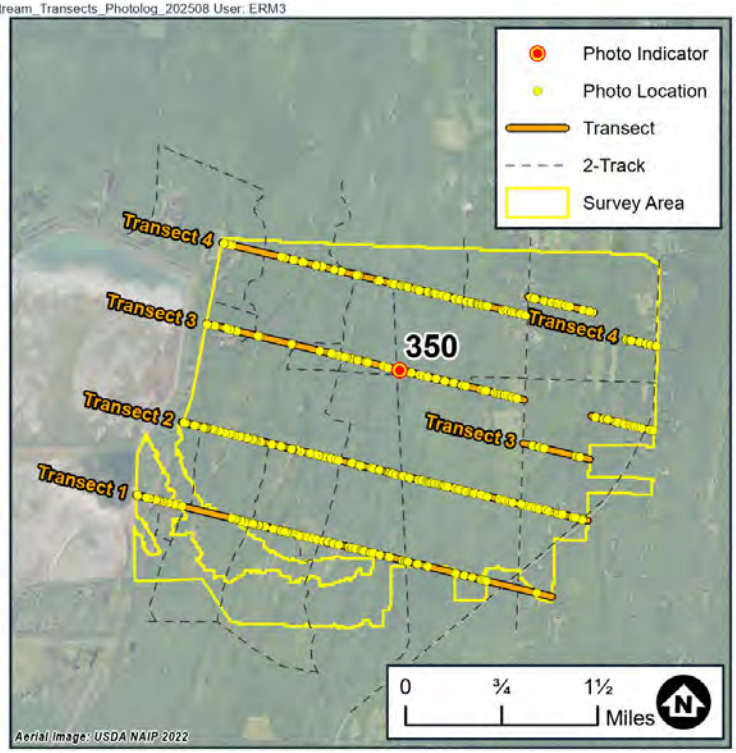

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP05-B, Wetland
**Photo 2 Caption:** T3E-BP05-B, Upland

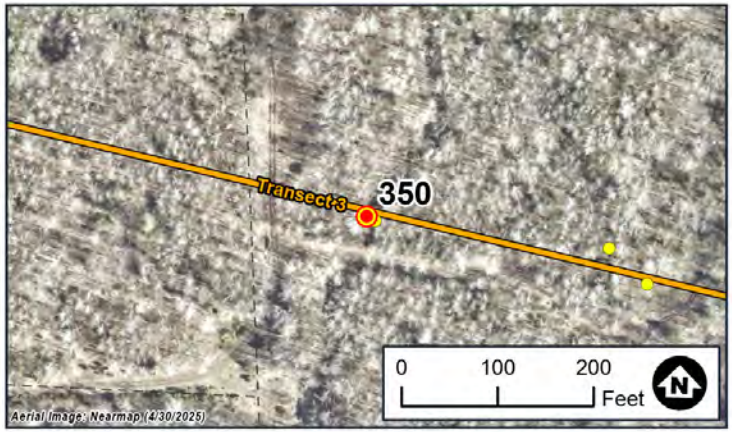
*Note: Photo locations are approximate*









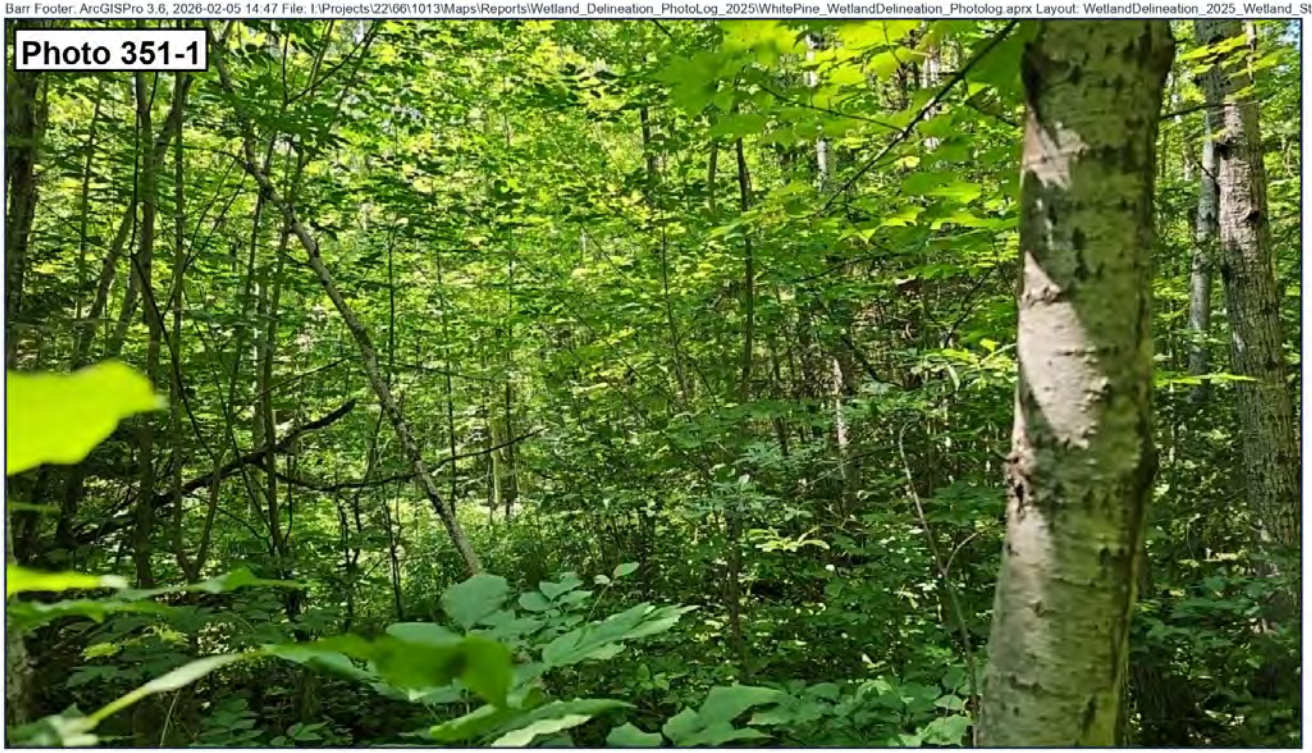


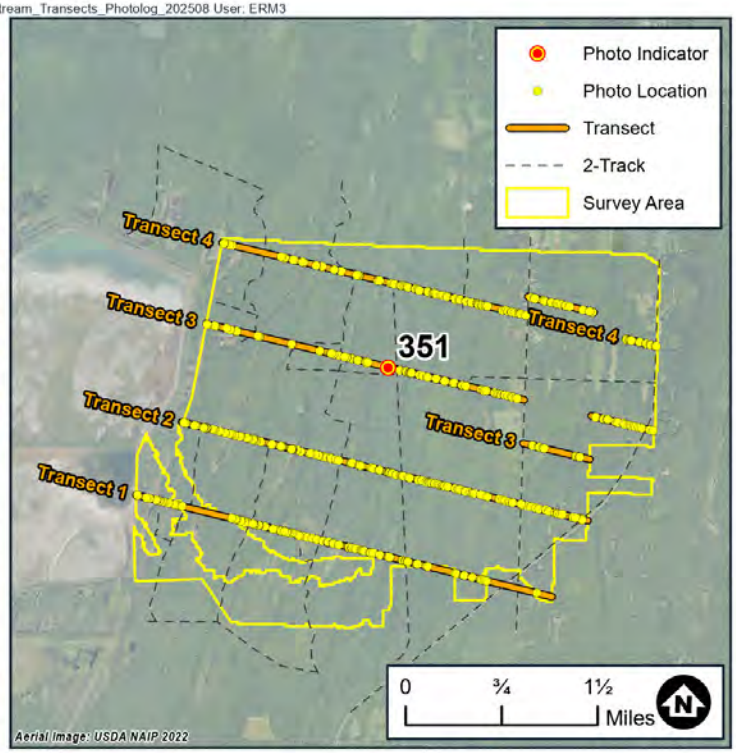

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3E-BP05-A, Wetland
**Photo 2 Caption:** T3E-BP05-A, Upland

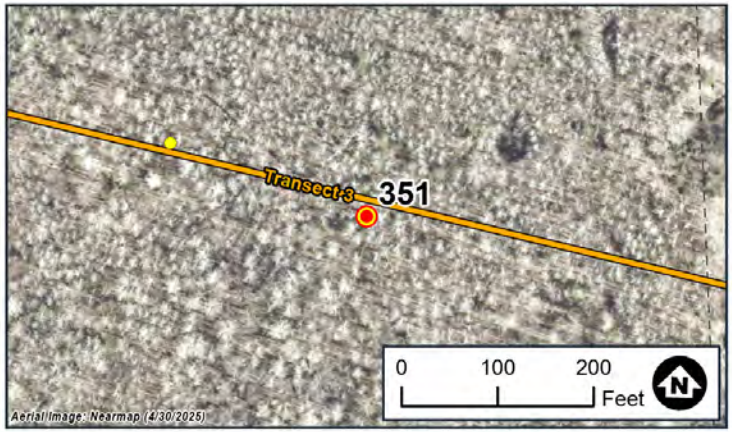
*Note: Photo locations are approximate*









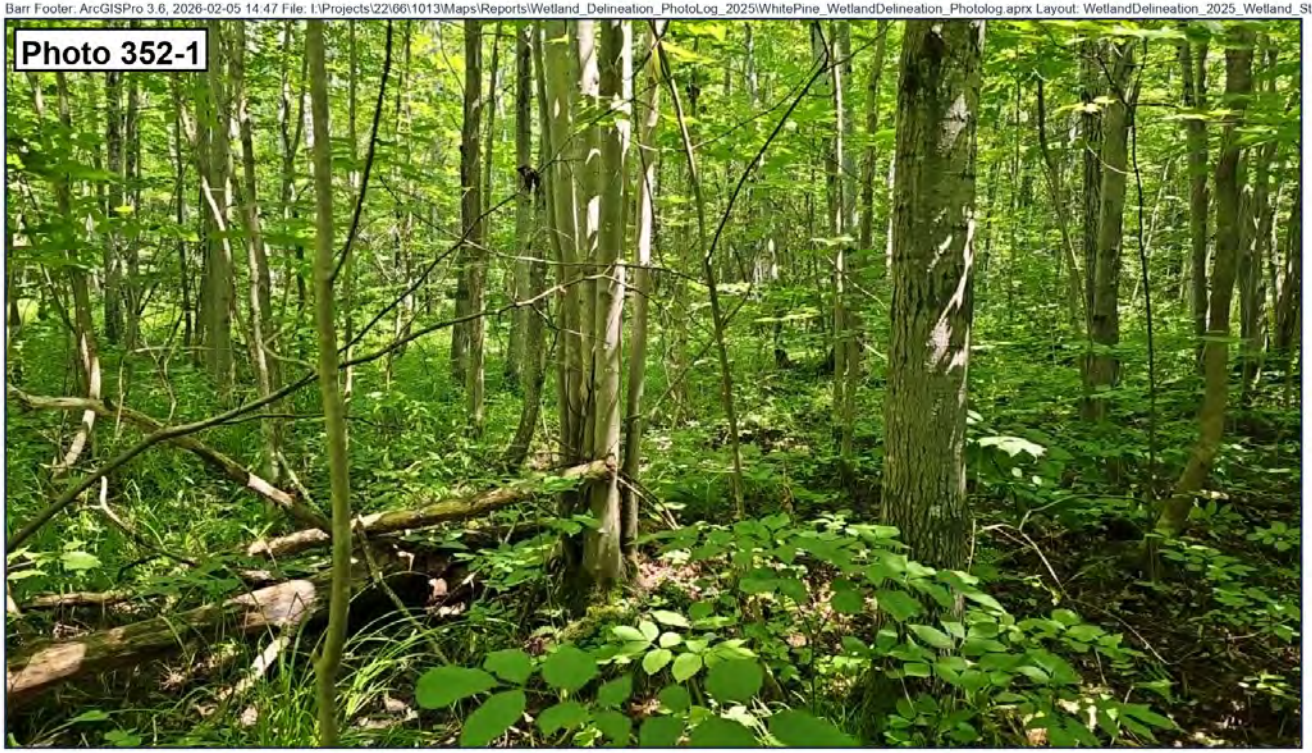


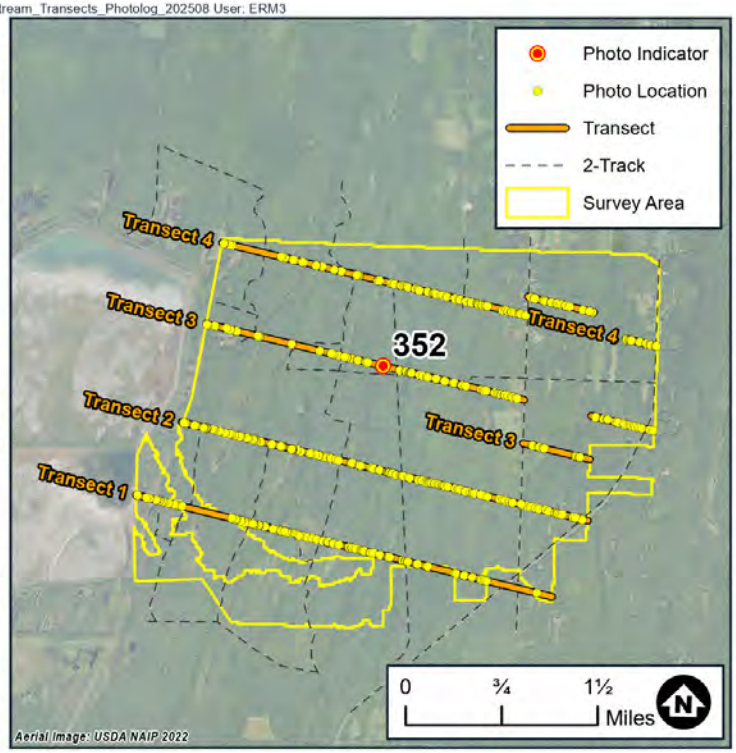

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP04-B, Wetland
**Photo 2 Caption:** T3E-BP04-B, Upland

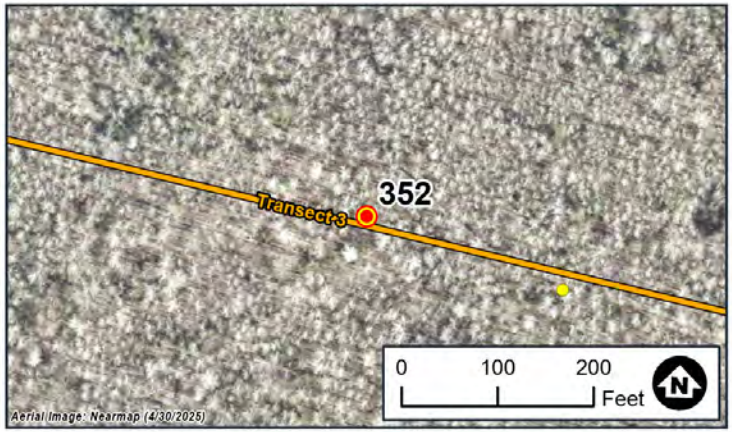
*Note: Photo locations are approximate*









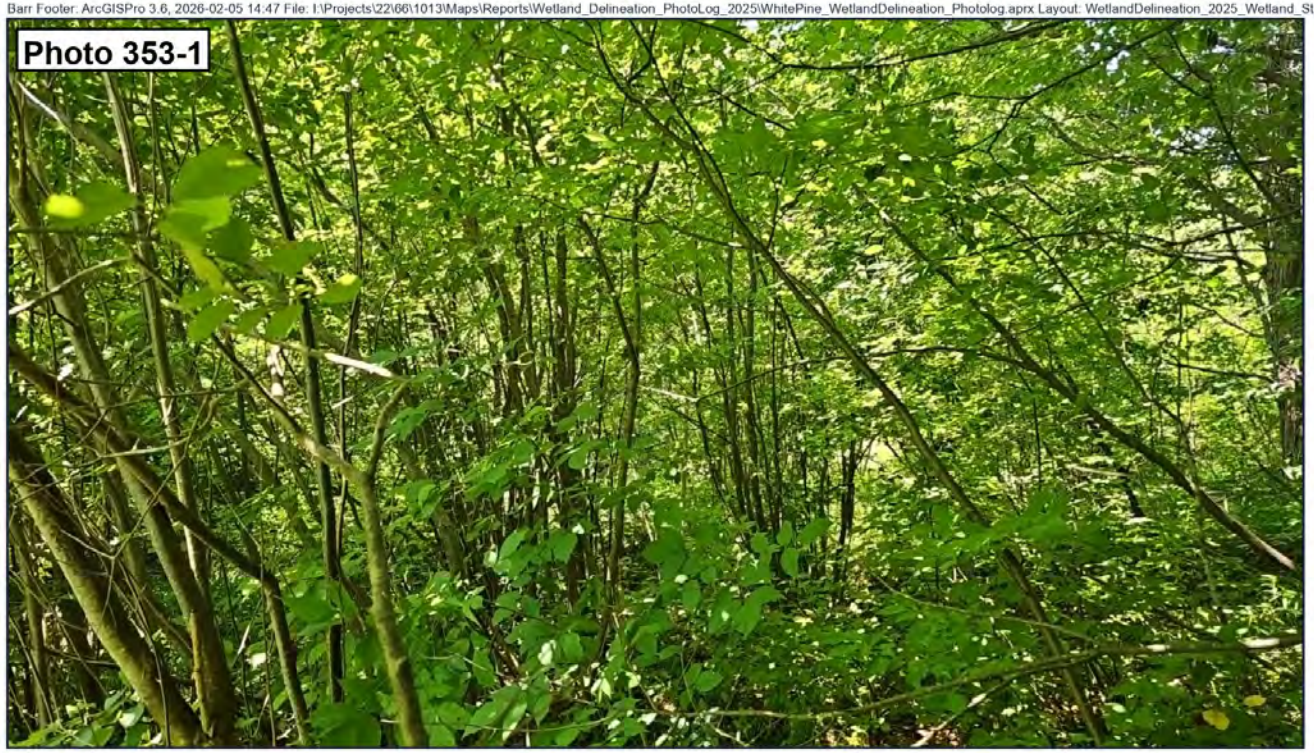


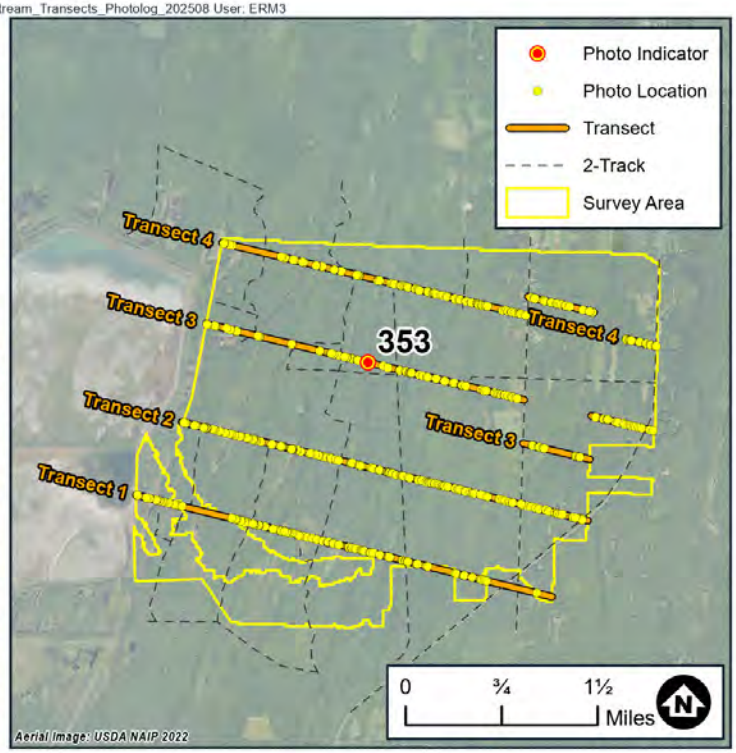

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP04-A, Wetland
**Photo 2 Caption:** T3E-BP04-A, Upland

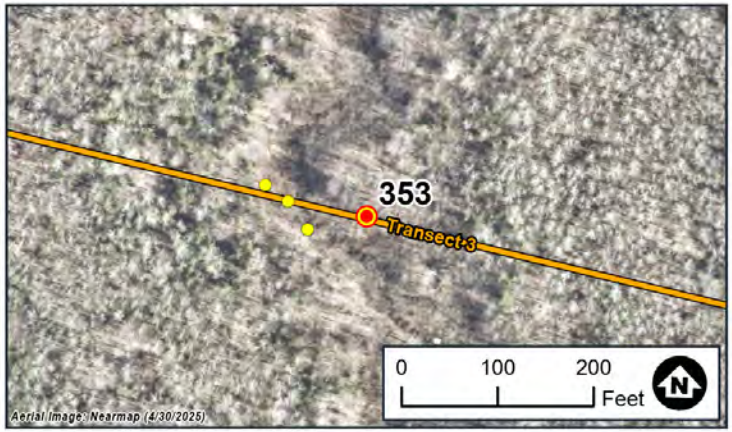
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

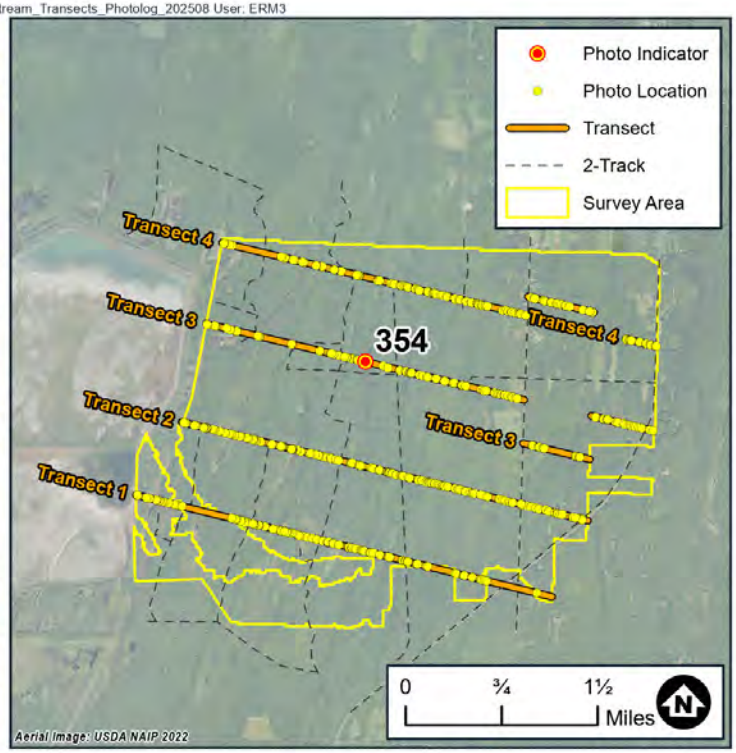
BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP03-B, Wetland
**Photo 2 Caption:** T3E-BP03-B, Upland

*Note: Photo locations are approximate*

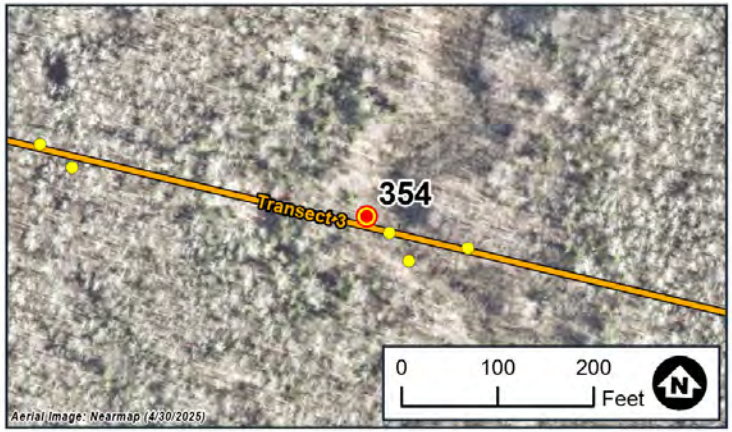
## Photo 354-1






## Photo 354-2





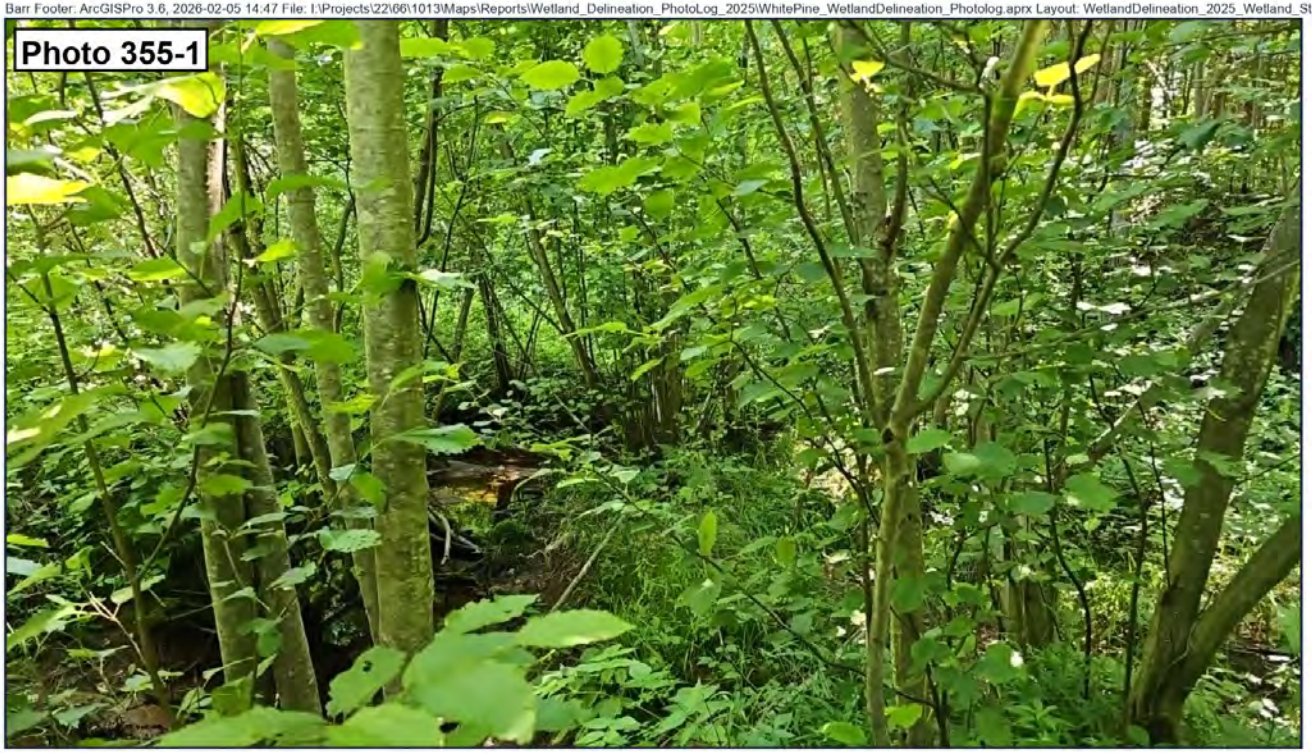


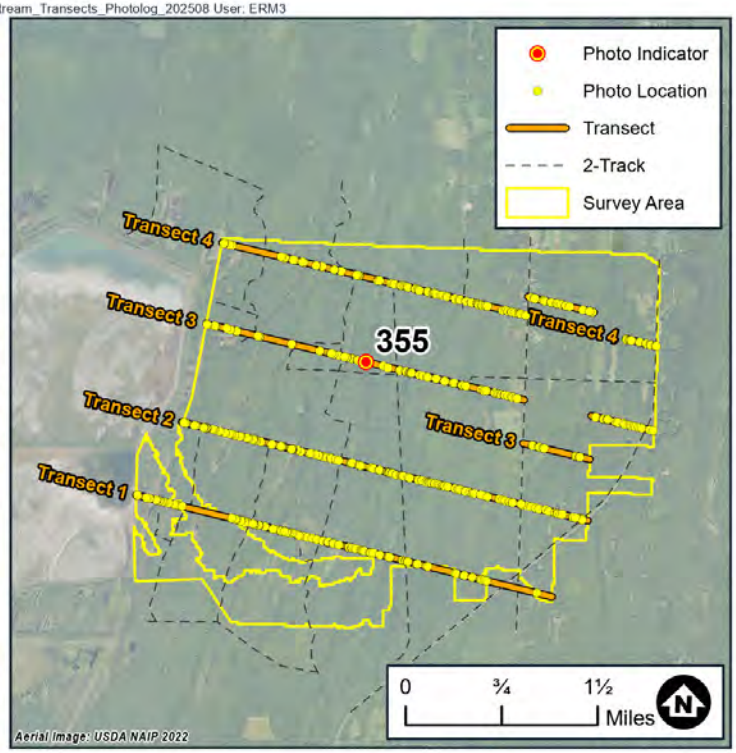

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP03-A, Wetland
**Photo 2 Caption:** T3E-BP03-A, Upland

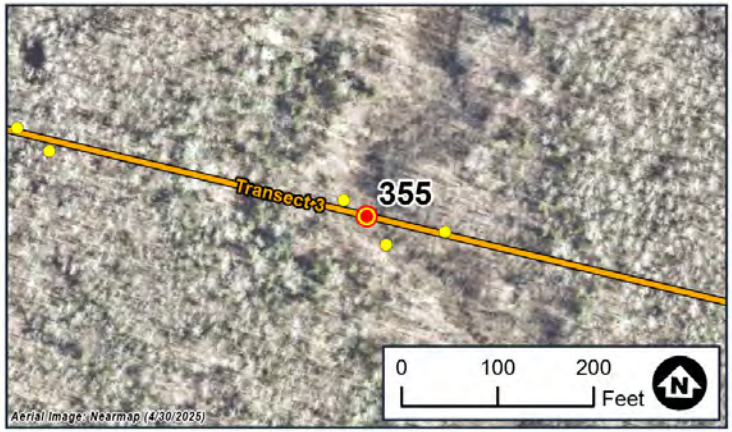
*Note: Photo locations are approximate*










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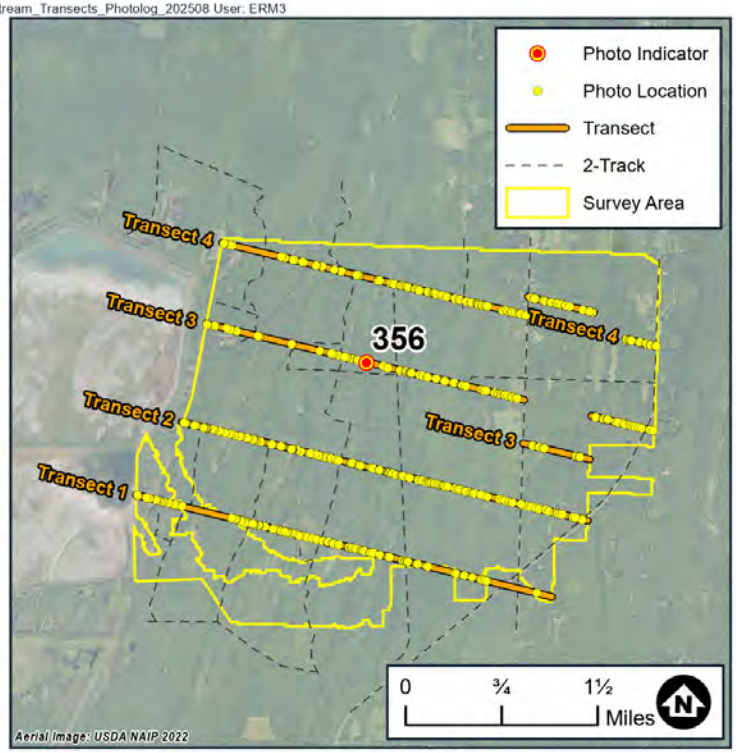
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-S01-LB, Upstream
**Photo 2 Caption:** T3E-S01-LB, Downstream

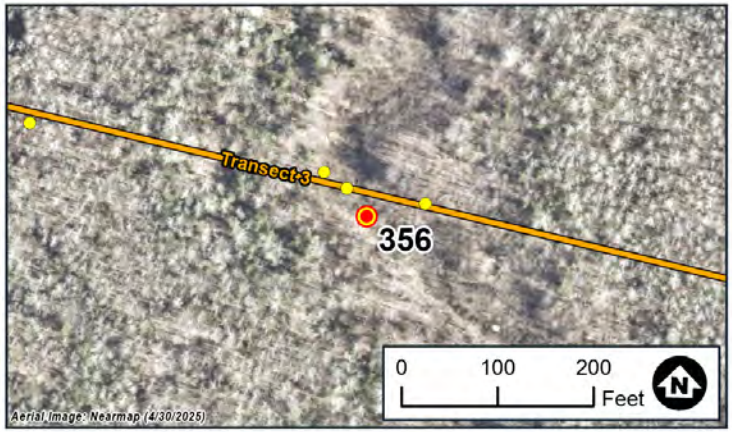
*Note: Photo locations are approximate*










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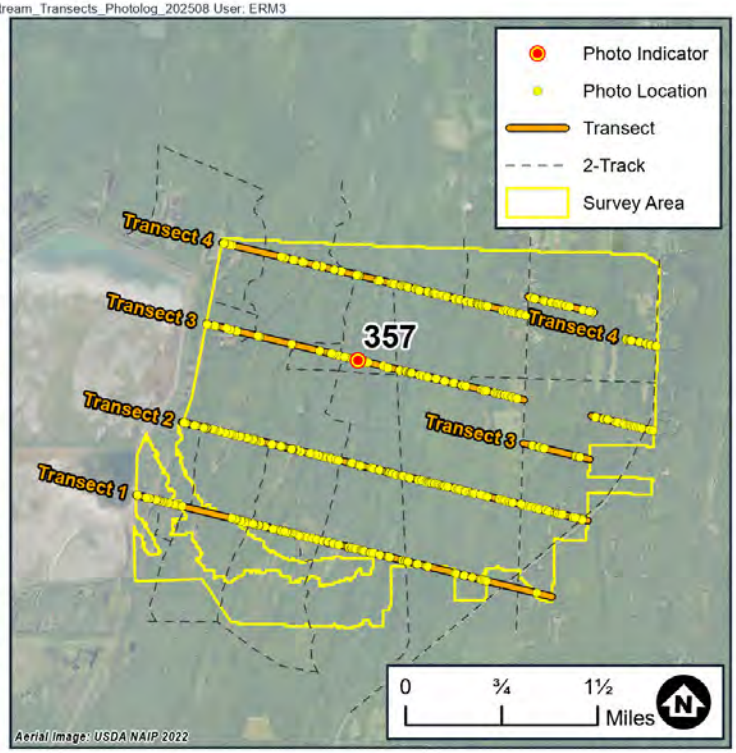
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-S01-RB, Upstream
**Photo 2 Caption:** T3E-S01-RB, Downstream

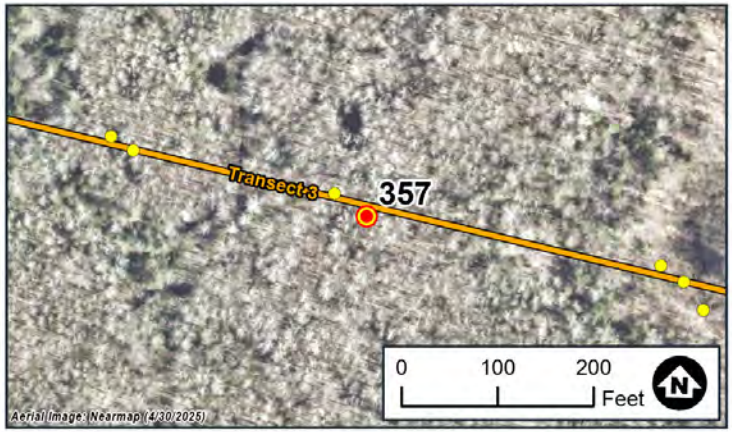
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP02-B, Wetland
**Photo 2 Caption:** T3E-BP02-B, Upland

*Note: Photo locations are approximate*

**Photo 358-1**



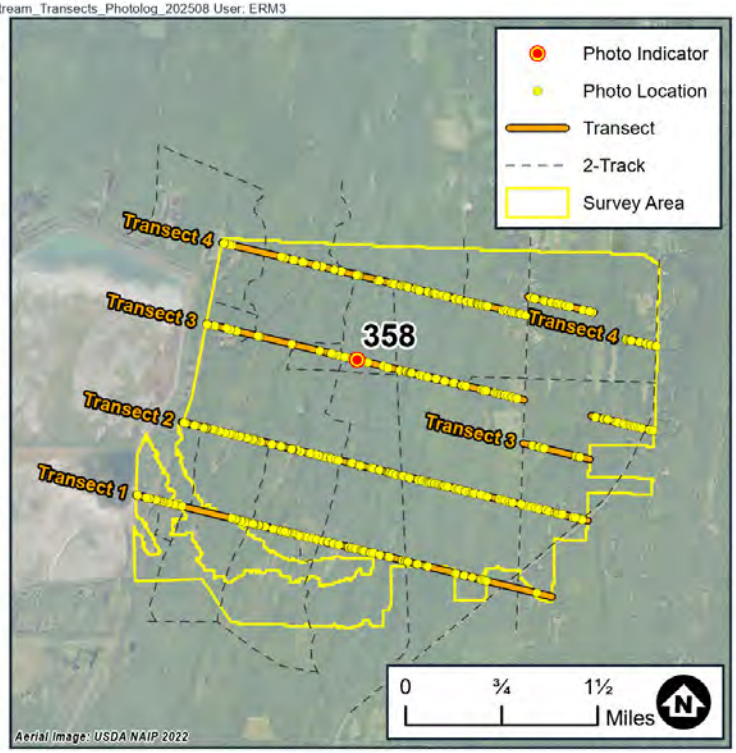
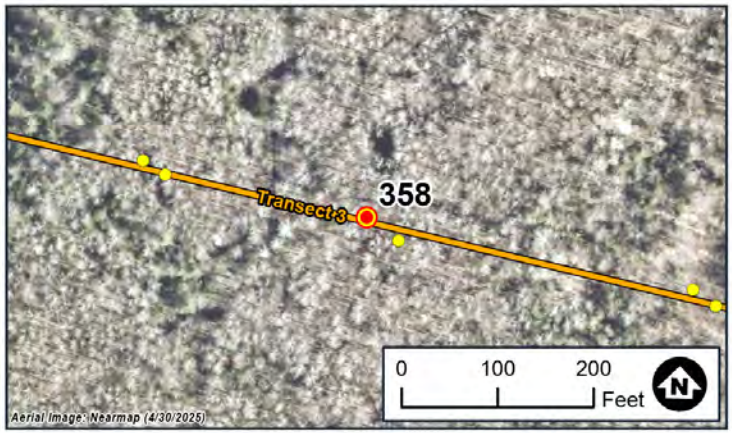



**Photo 358-2**





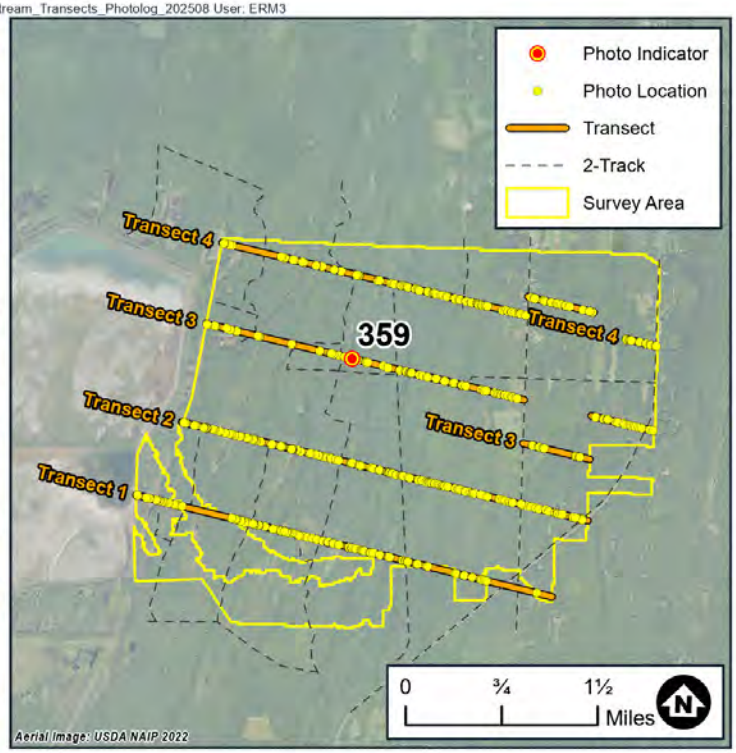

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP02-A, Wetland
**Photo 2 Caption:** T3E-BP02-A, Upland

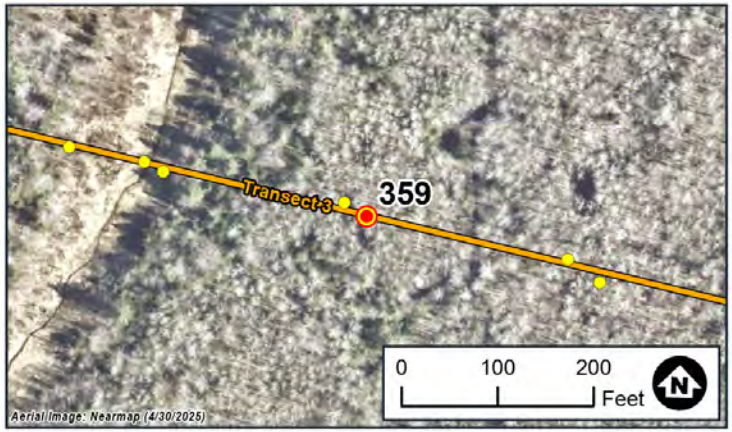
*Note: Photo locations are approximate*









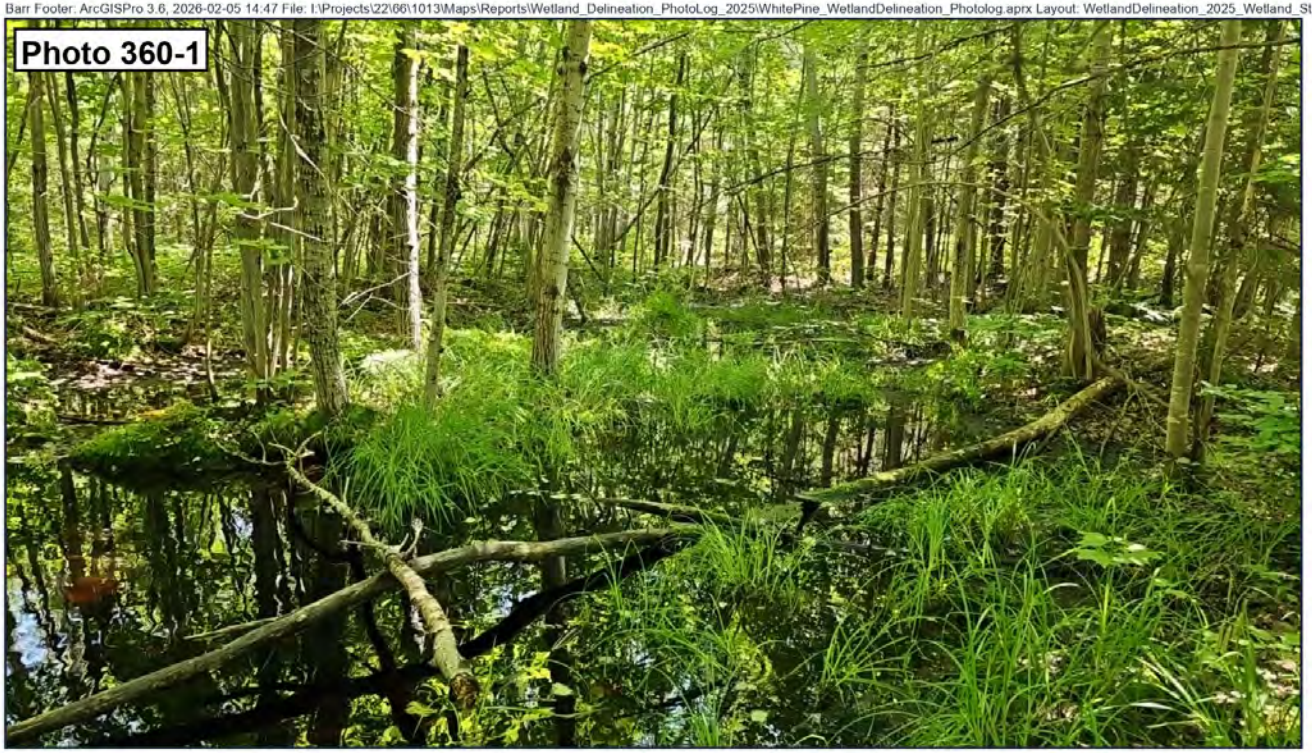


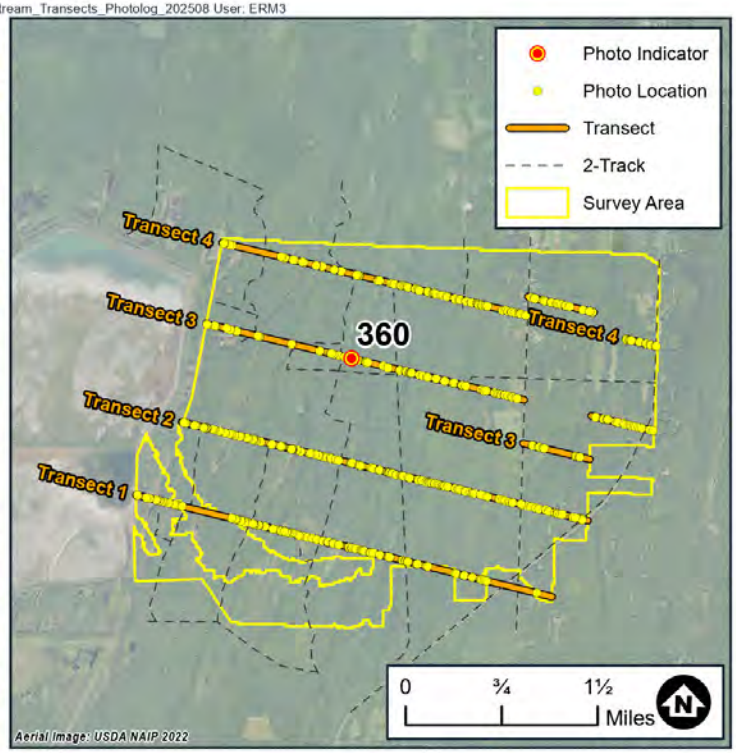

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP01-B, Wetland
**Photo 2 Caption:** T3E-BP01-B, Upland

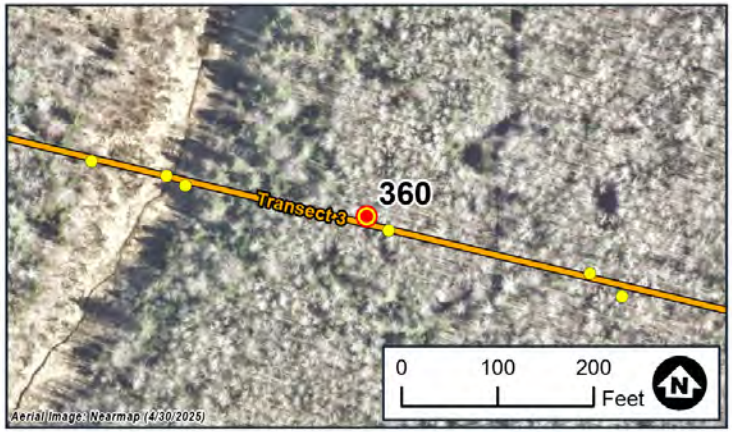
*Note: Photo locations are approximate*










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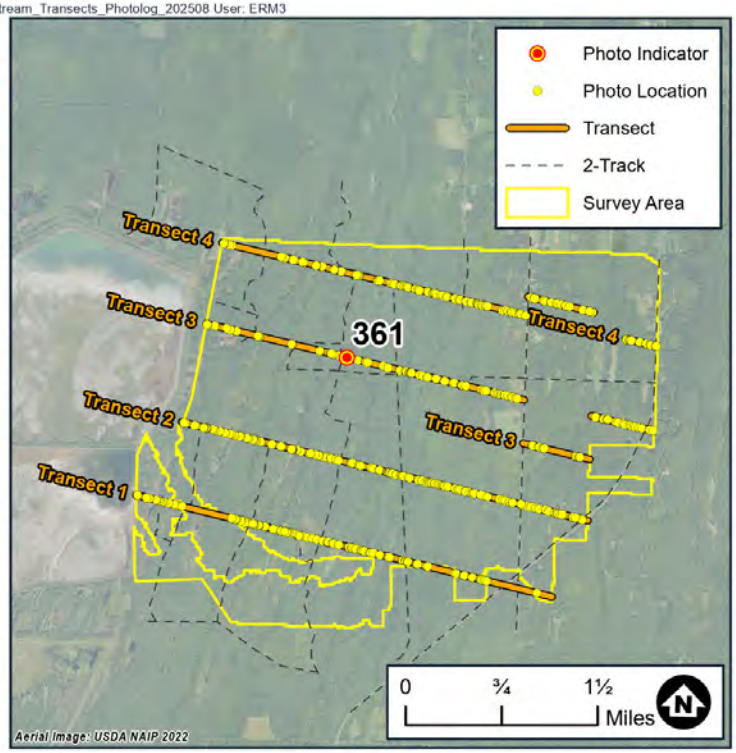
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/28/2025
**Photo 1 Caption:** T3E-BP01-A, Wetland
**Photo 2 Caption:** T3E-BP01-A, Upland

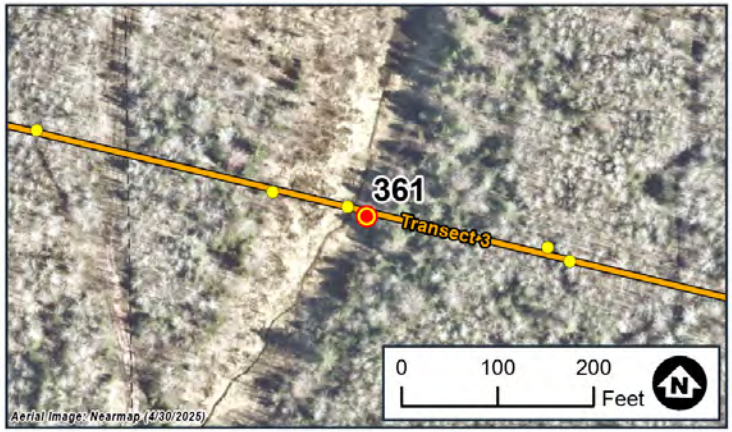
*Note: Photo locations are approximate*











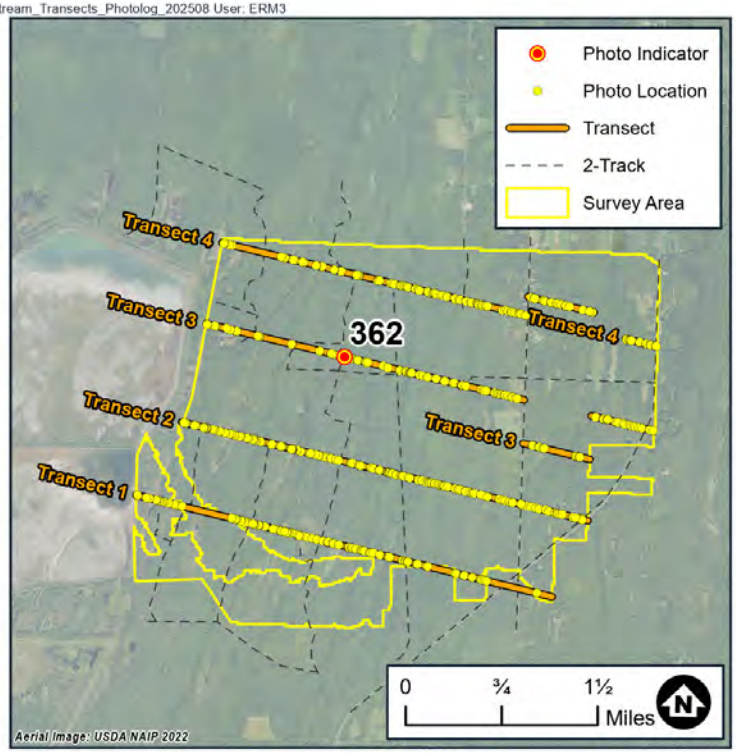

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP01-A, Wetland
**Photo 2 Caption:** T3W-BP01-A, Upland

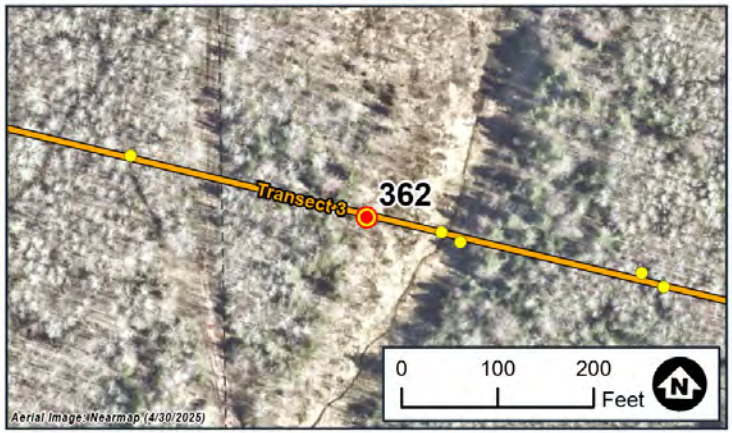
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP01-B, Wetland
**Photo 2 Caption:** T3W-BP01-B, Upland

*Note: Photo locations are approximate*

**Photo 363-1**



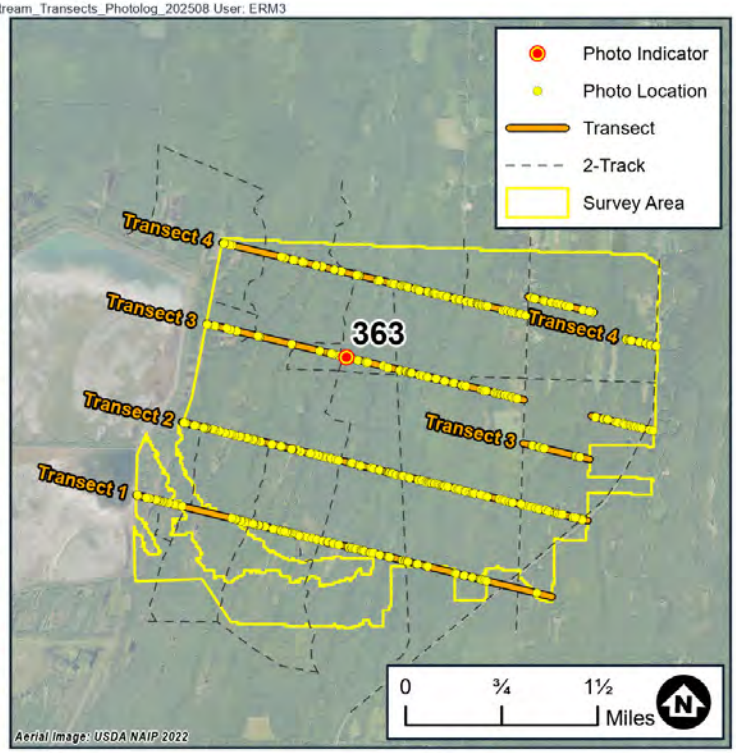
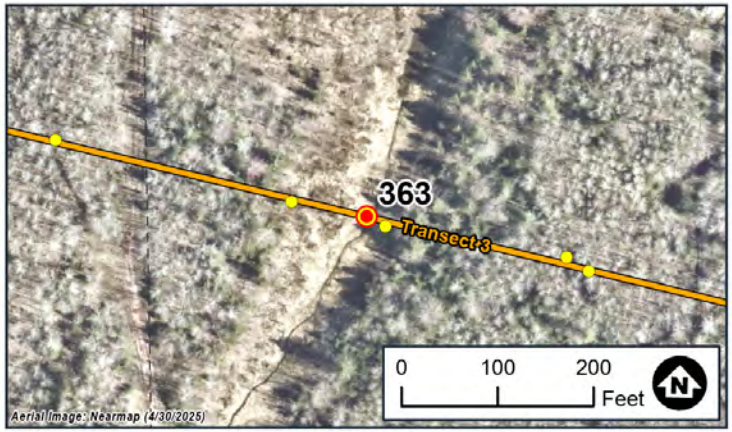



**Photo 363-2**






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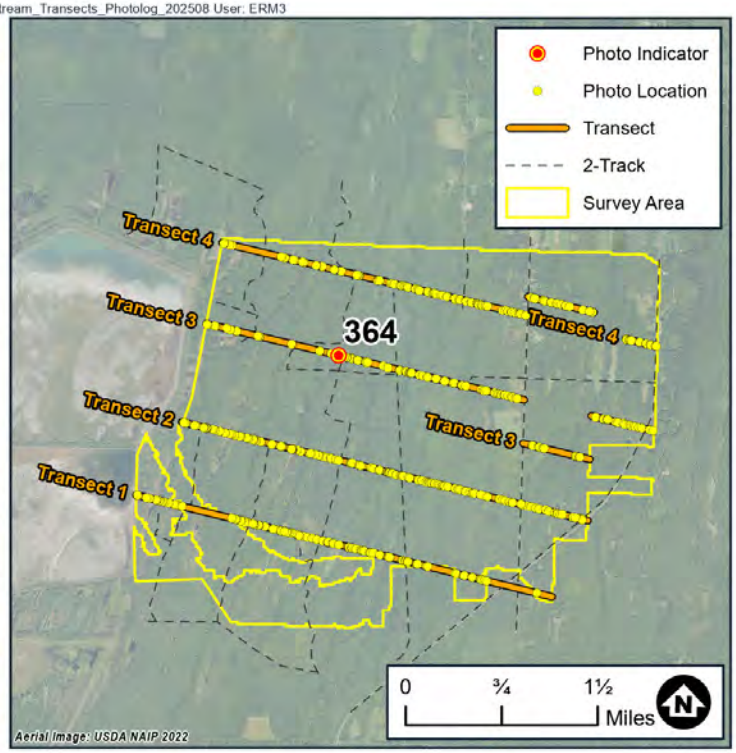
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-S01-RB, Upstream
**Photo 2 Caption:** T3W-S01-RB, Downstream

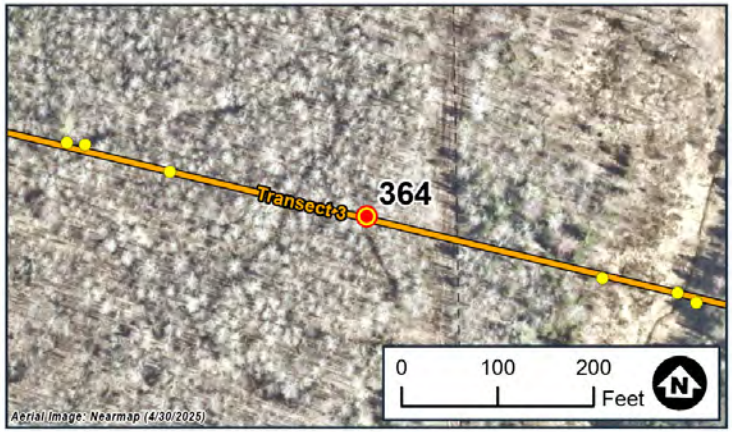
*Note: Photo locations are approximate*









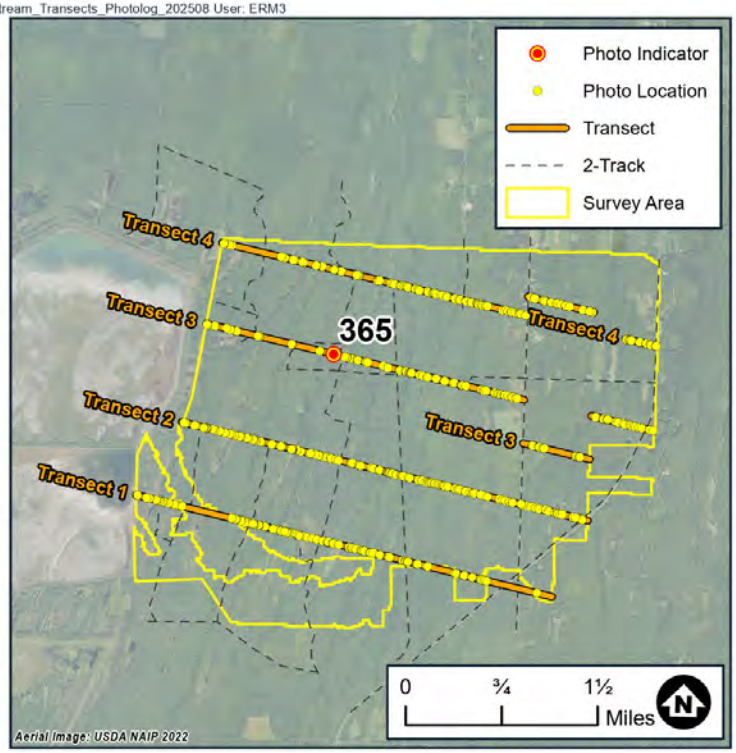

Page 364 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP02-A, Wetland
**Photo 2 Caption:** T3W-BP02-A, Upland

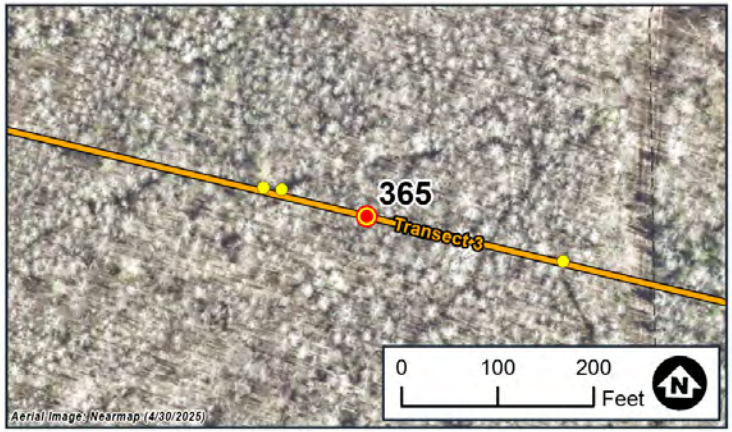
*Note: Photo locations are approximate*











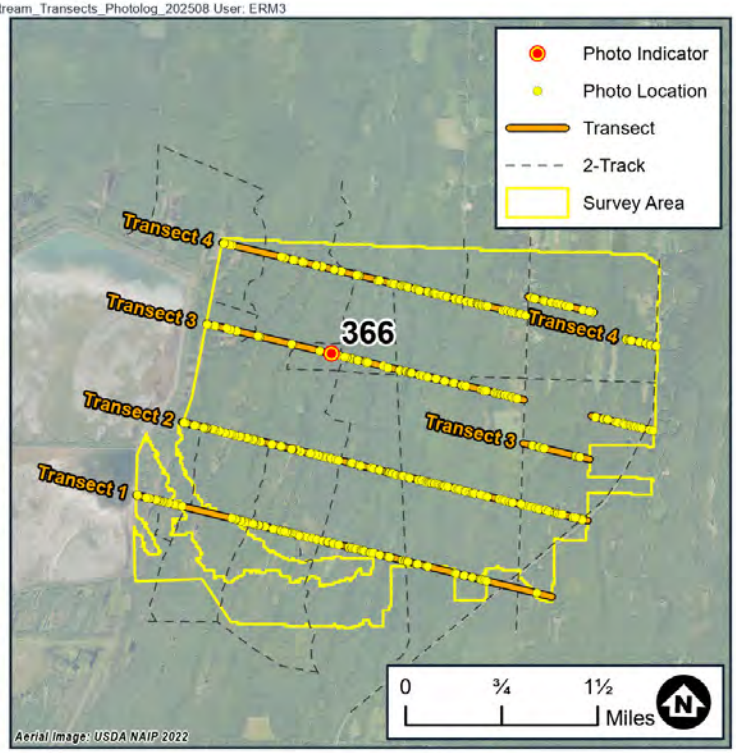

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP02-B, Wetland
**Photo 2 Caption:** T3W-BP02-B, Upland

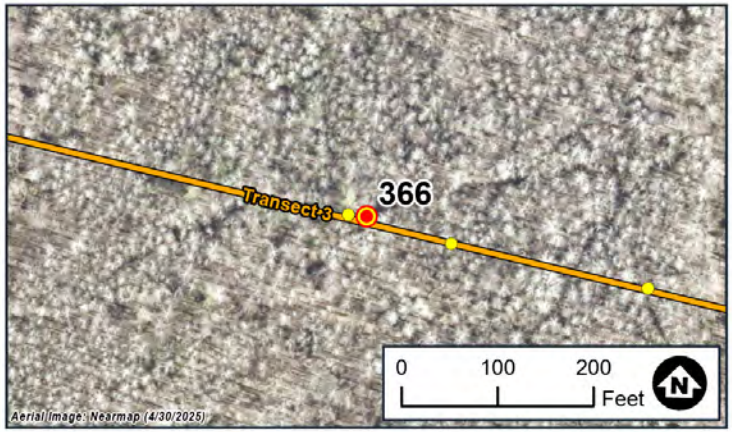
*Note: Photo locations are approximate*










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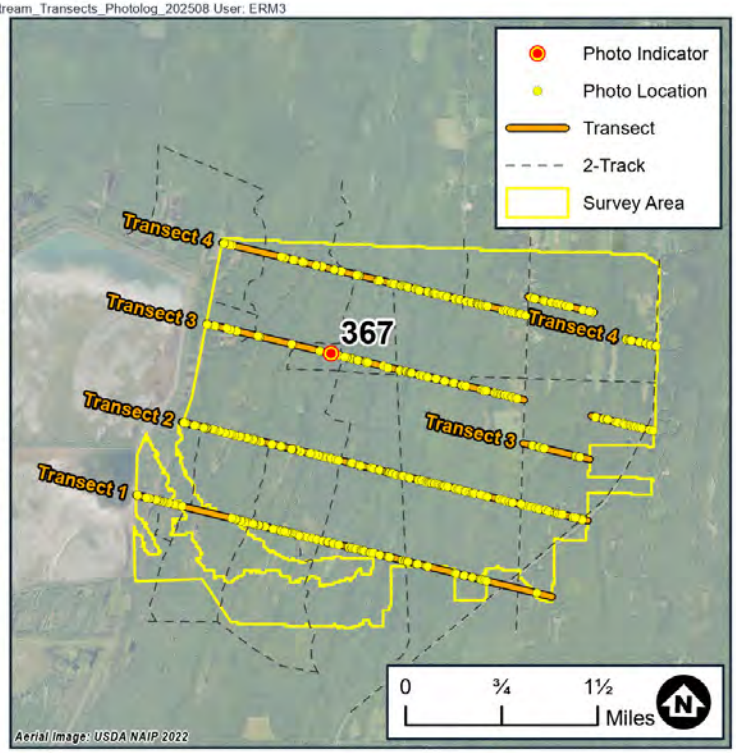
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP03-A, Wetland
**Photo 2 Caption:** T3W-BP03-A, Upland

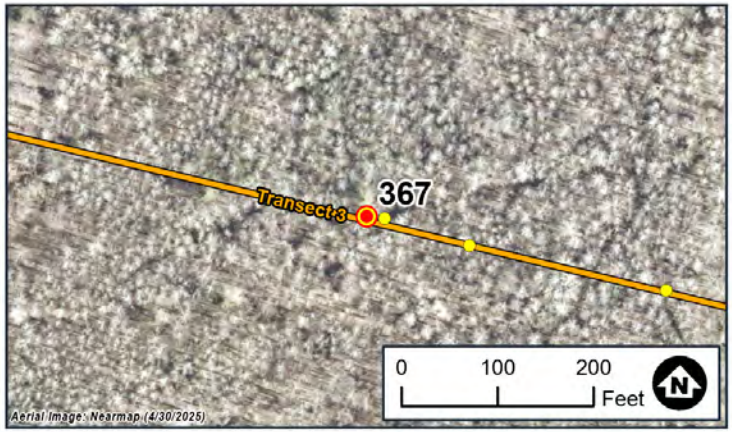
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP03-B, Wetland
**Photo 2 Caption:** T3W-BP03-B, Upland

*Note: Photo locations are approximate*

**Photo 368-1**



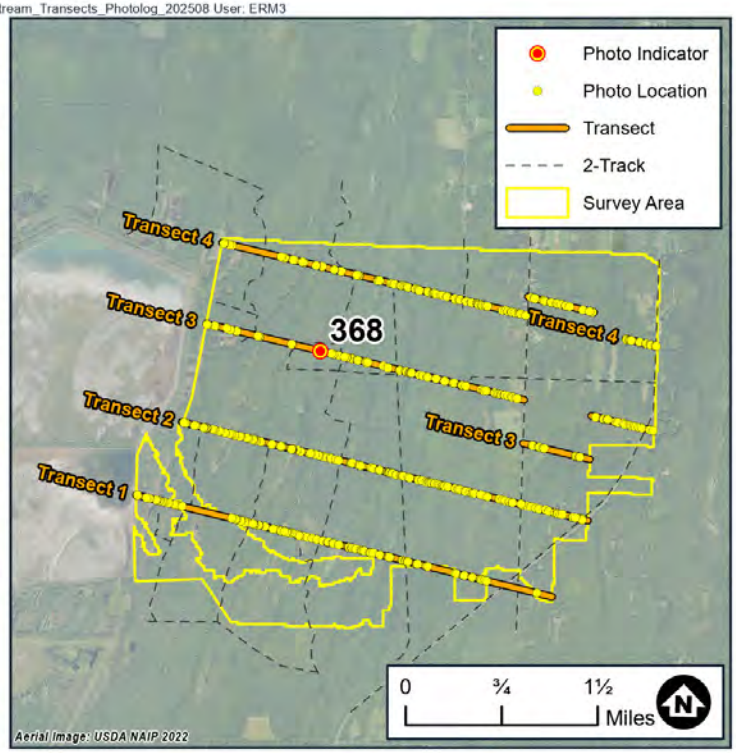
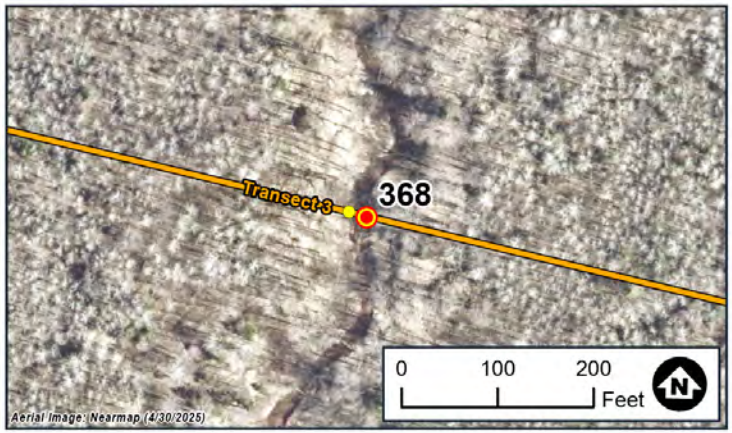



**Photo 368-2**







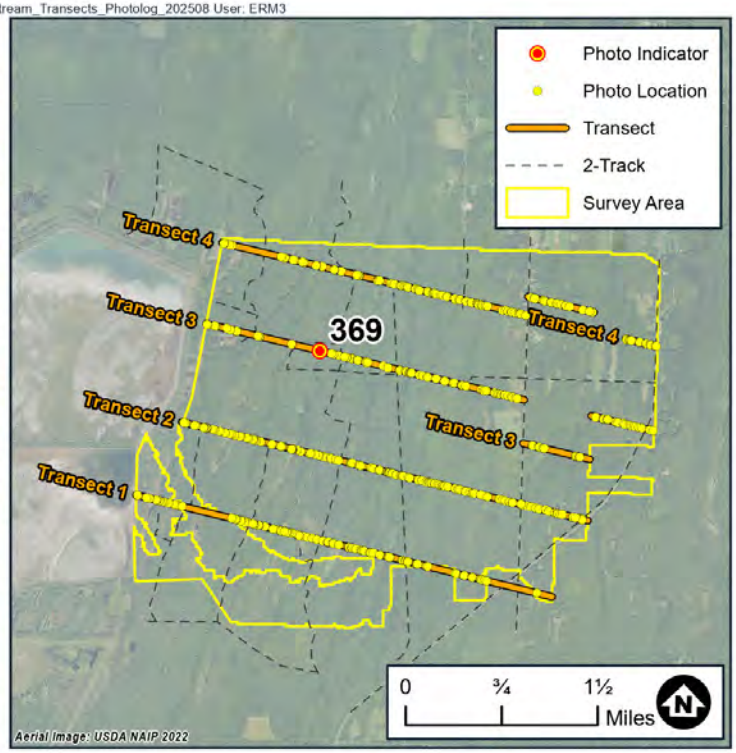

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-S02-RB, Upstream
**Photo 2 Caption:** T3W-S02-RB, Downstream

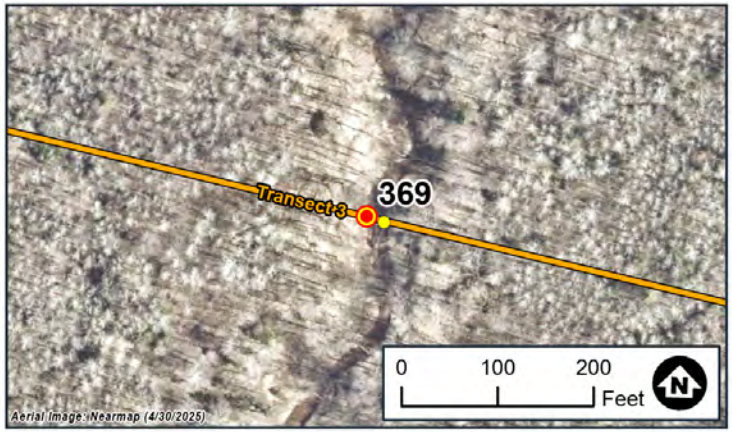
*Note: Photo locations are approximate*









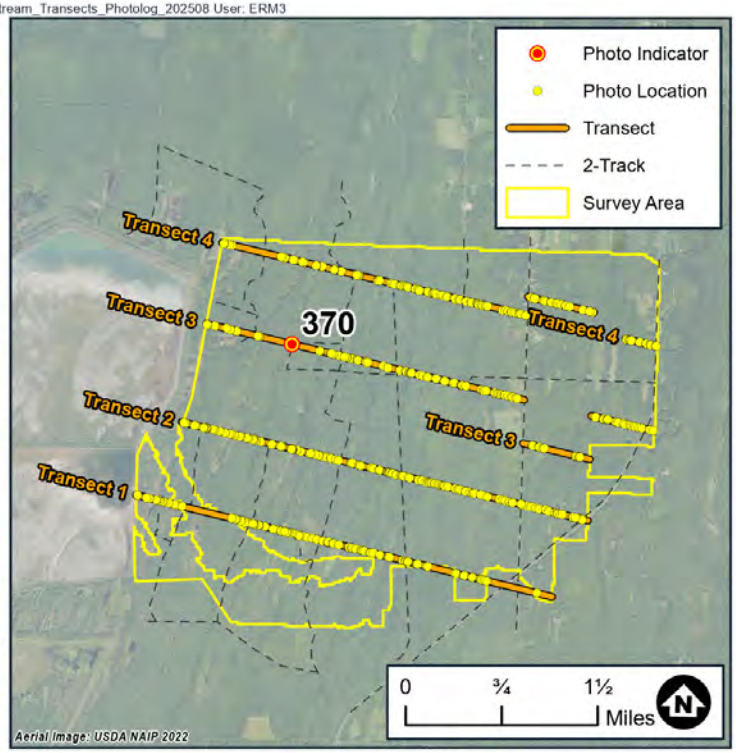

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-S02-LB, Upstream
**Photo 2 Caption:** T3W-S02-LB, Downstream

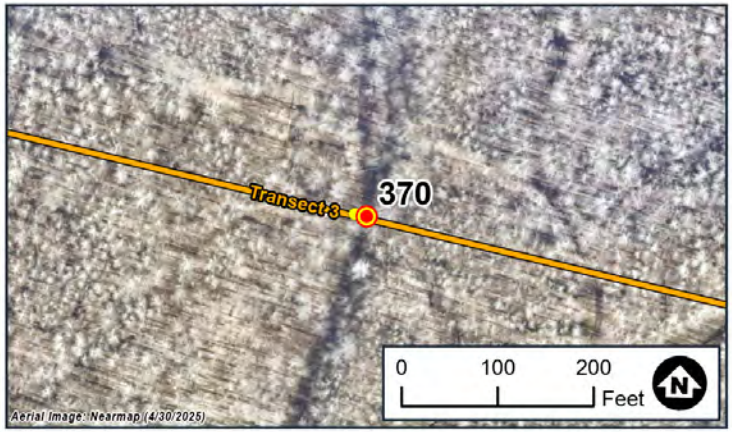
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

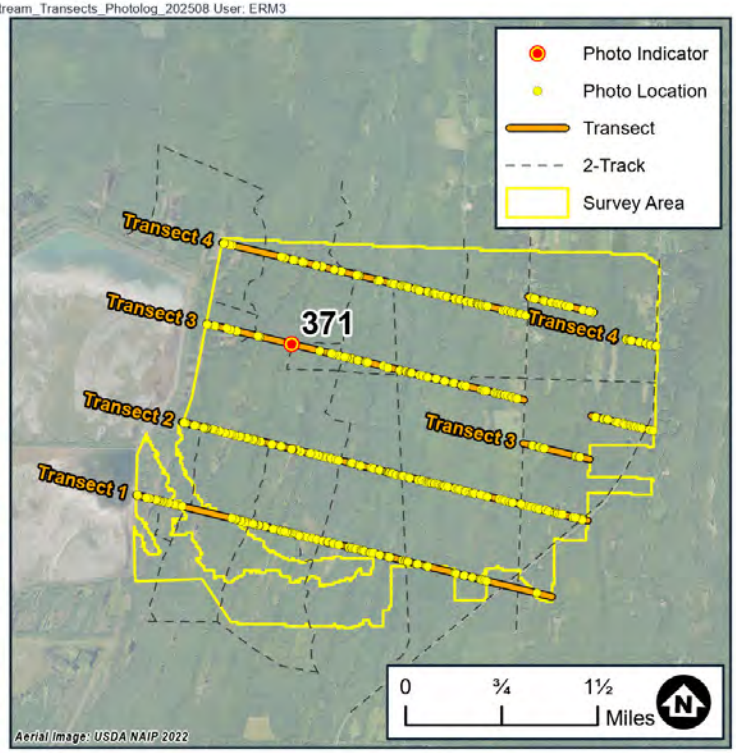
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-S03-RB, Upstream
**Photo 2 Caption:** T3W-S03-RB, Downstream

*Note: Photo locations are approximate*

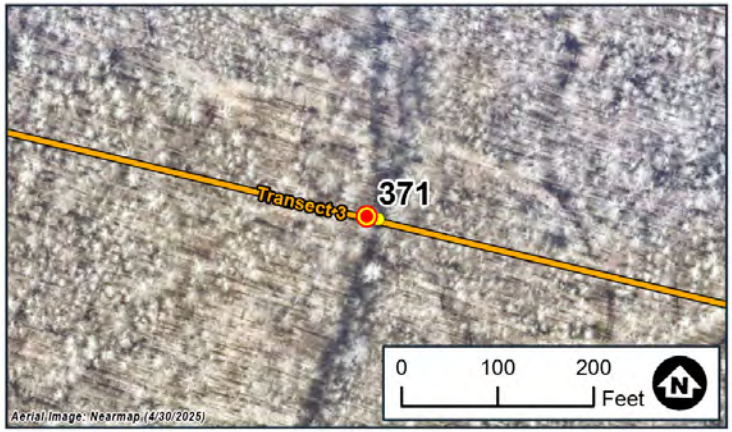
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

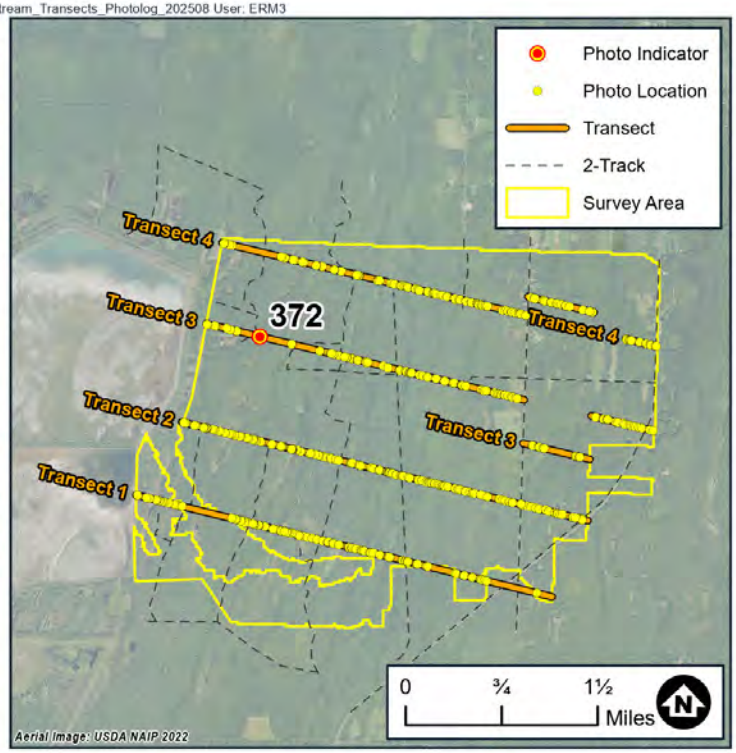
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-S03-LB, Upstream
**Photo 2 Caption:** T3W-S03-LB, Downstream

*Note: Photo locations are approximate*

Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

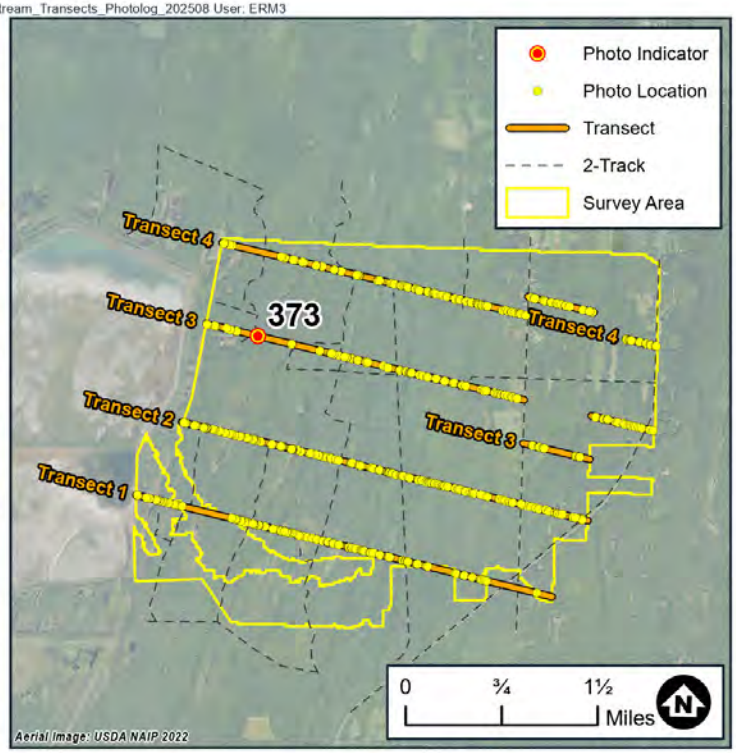
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-BP04-A, Wetland
**Photo 2 Caption:** T3W-BP04-A, Upland

*Note: Photo locations are approximate*

## Photo 373-1






## Photo 373-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

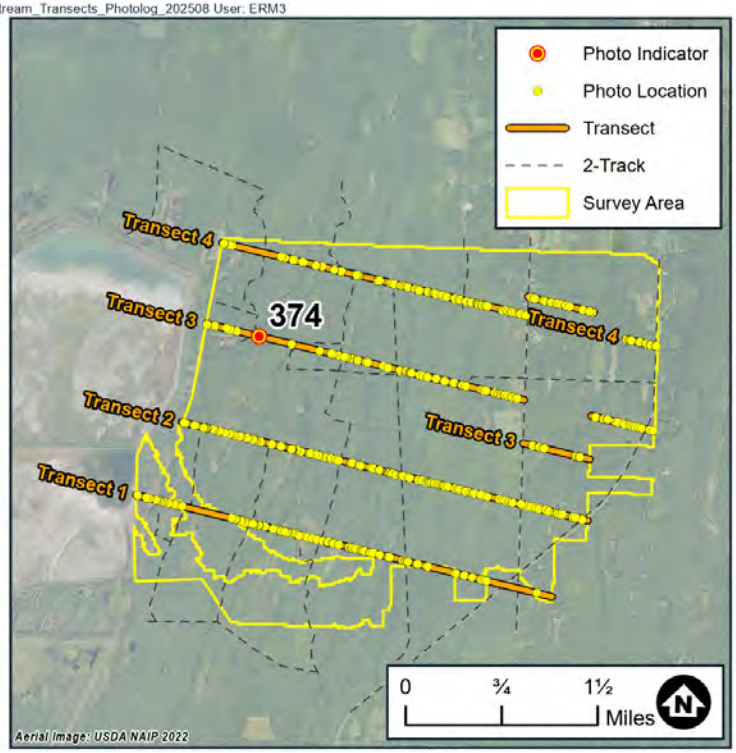
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP04-B, Wetland
**Photo 2 Caption:** T3W-BP04-B, Upland

*Note: Photo locations are approximate*

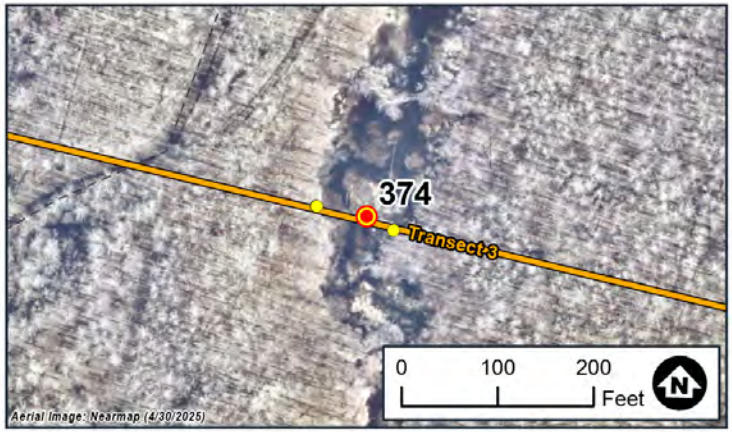
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3









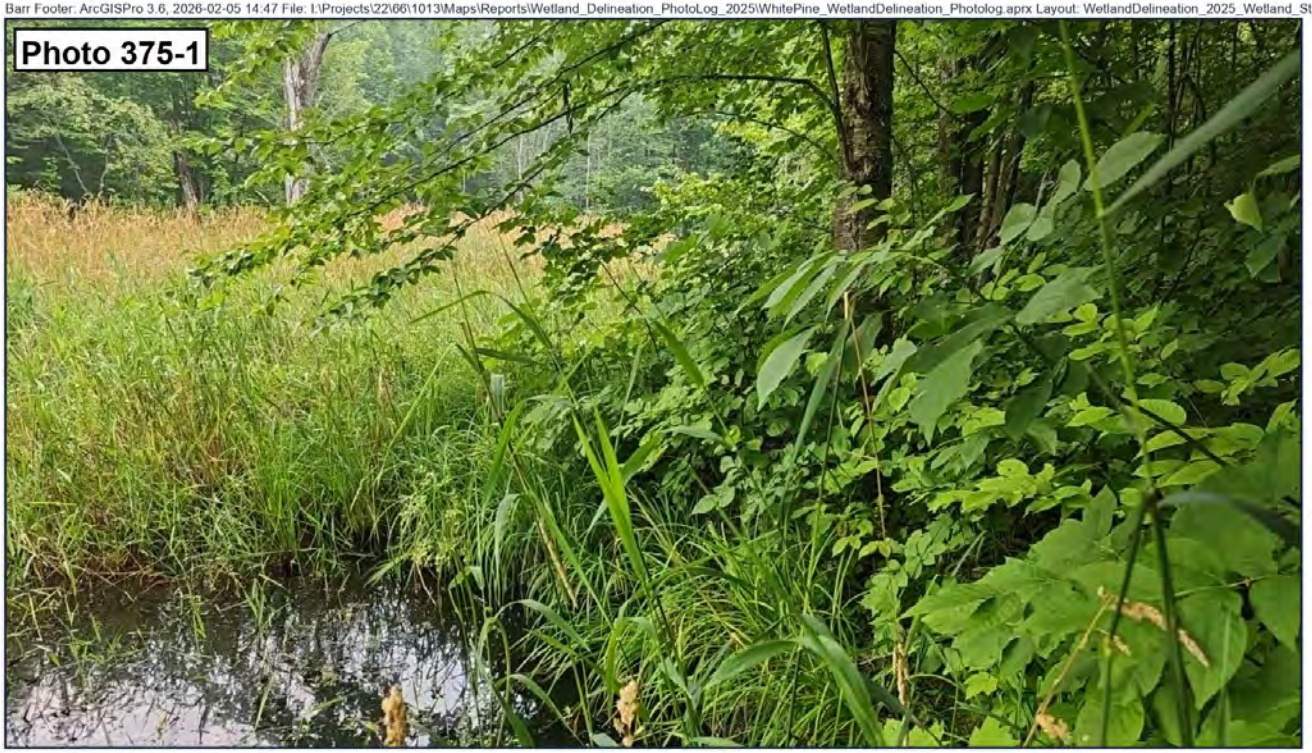


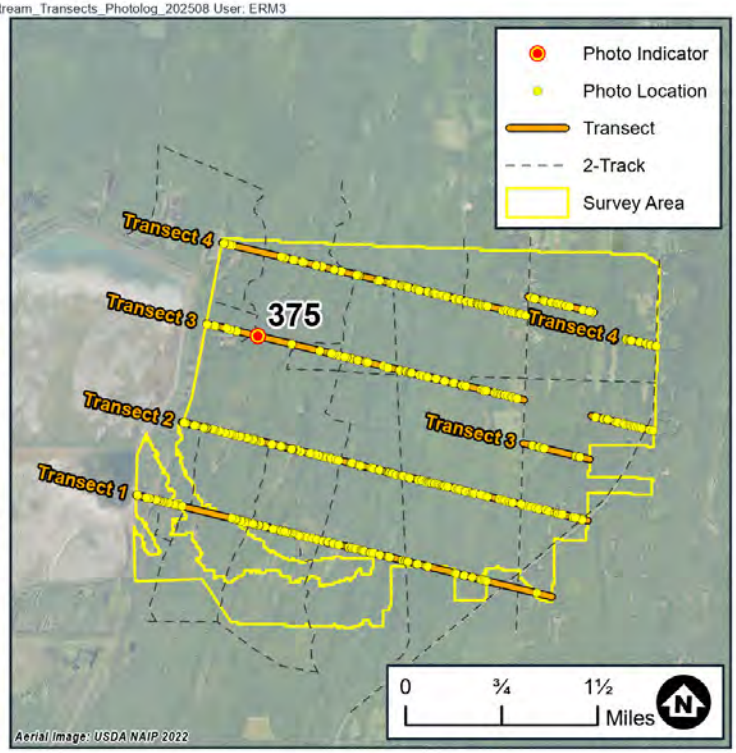

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T3W-S04-RB, Upstream
**Photo 2 Caption:** T3W-S04-RB, Downstream

*Note: Photo locations are approximate*









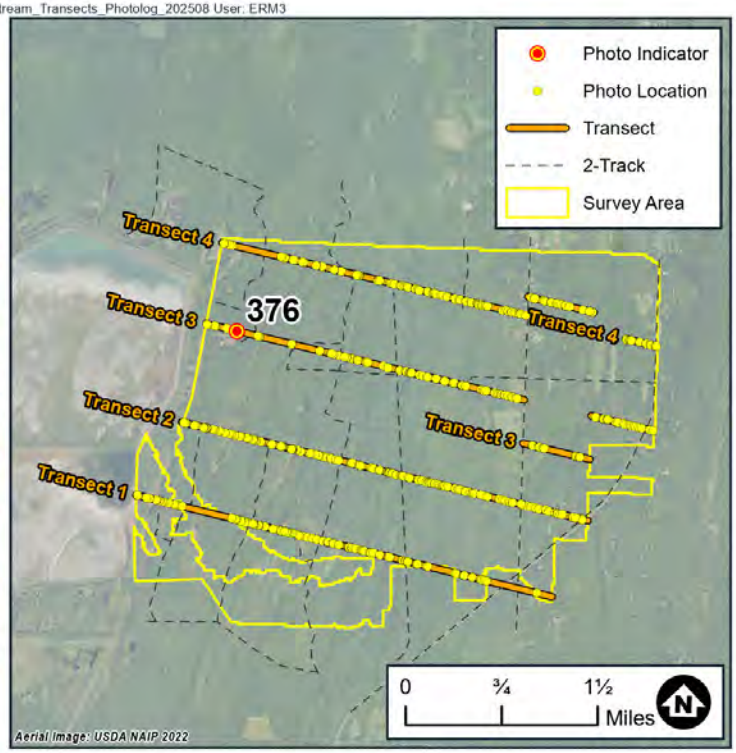

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-S04-LB, Upstream
**Photo 2 Caption:** T3W-S04-LB, Downstream

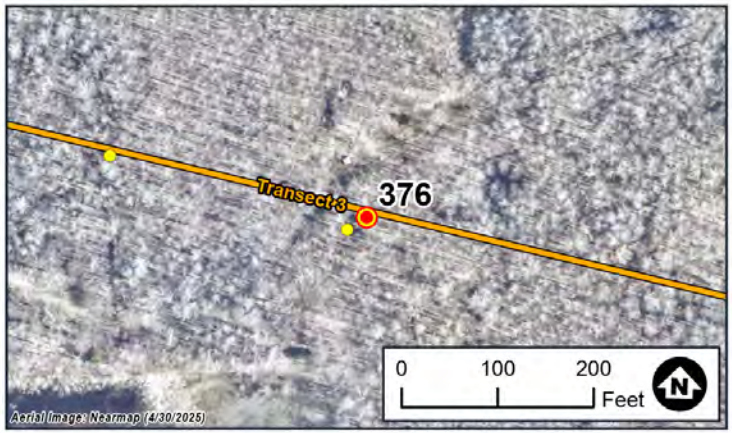
*Note: Photo locations are approximate*











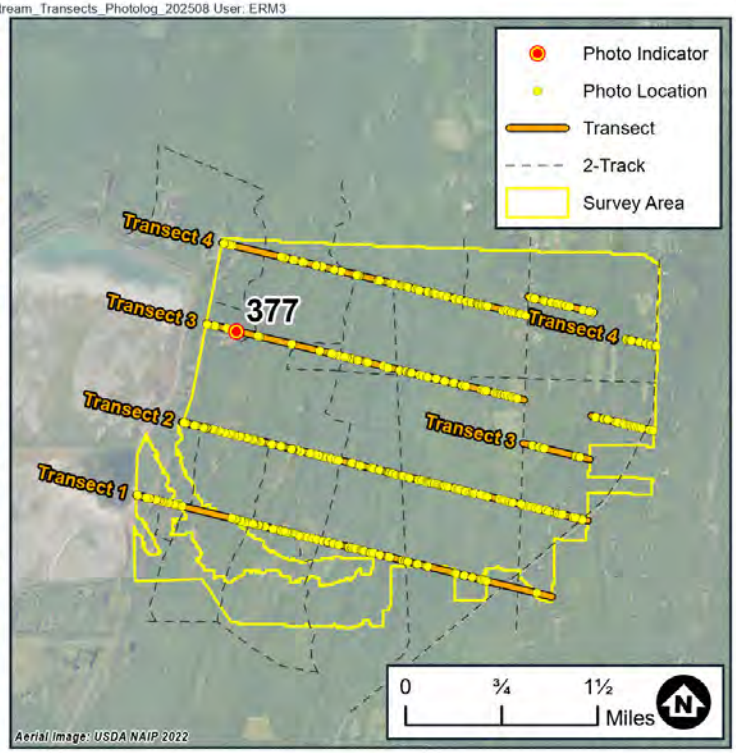

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP05-B, Wetland
**Photo 2 Caption:** T3W-BP05-B, Upland

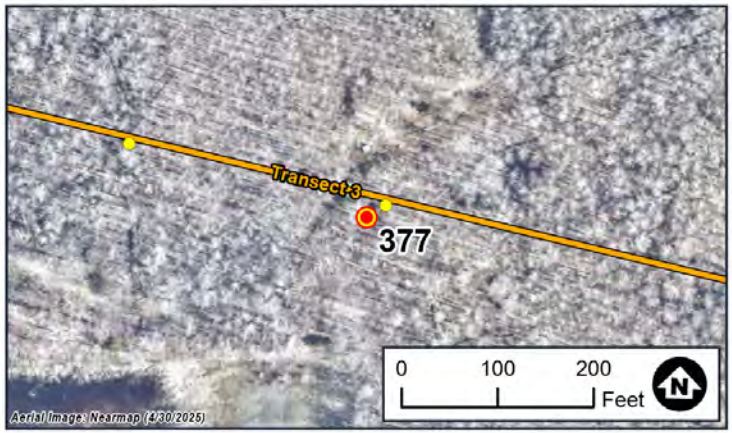
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

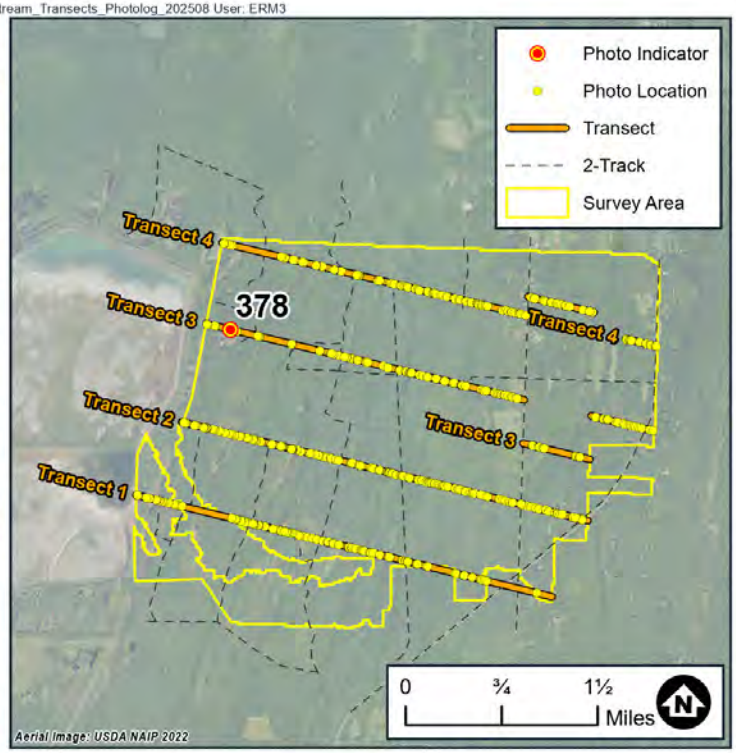
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP05-A, Wetland
**Photo 2 Caption:** T3W-BP05-A, Upland

*Note: Photo locations are approximate*

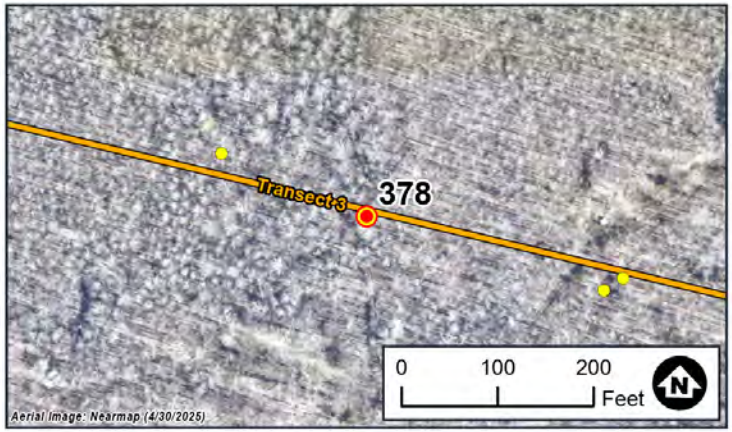
## Photo 378-1






## Photo 378-2







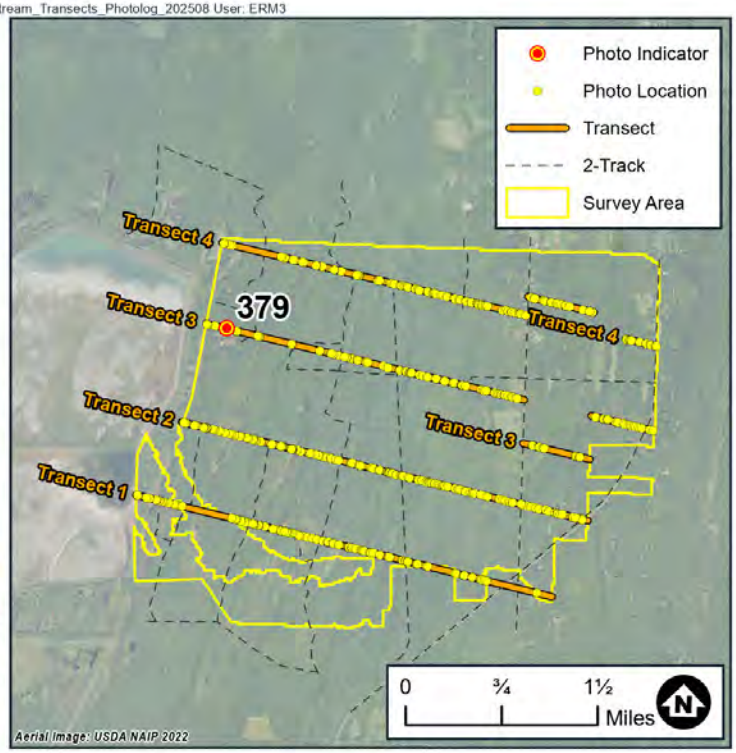

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP06-A, Wetland
**Photo 2 Caption:** T3W-BP06-A, Upland

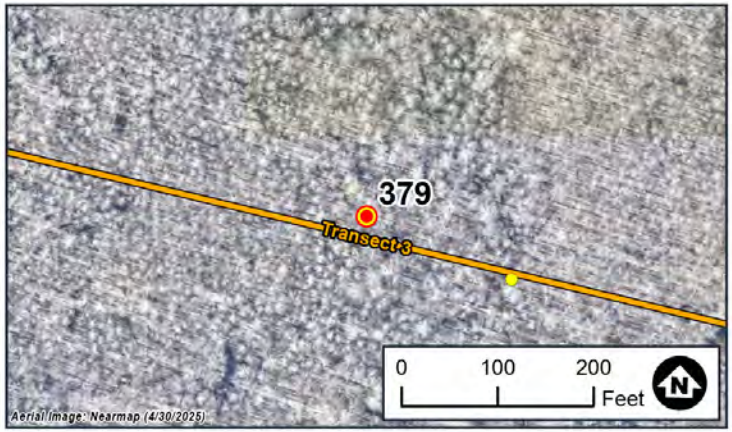
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

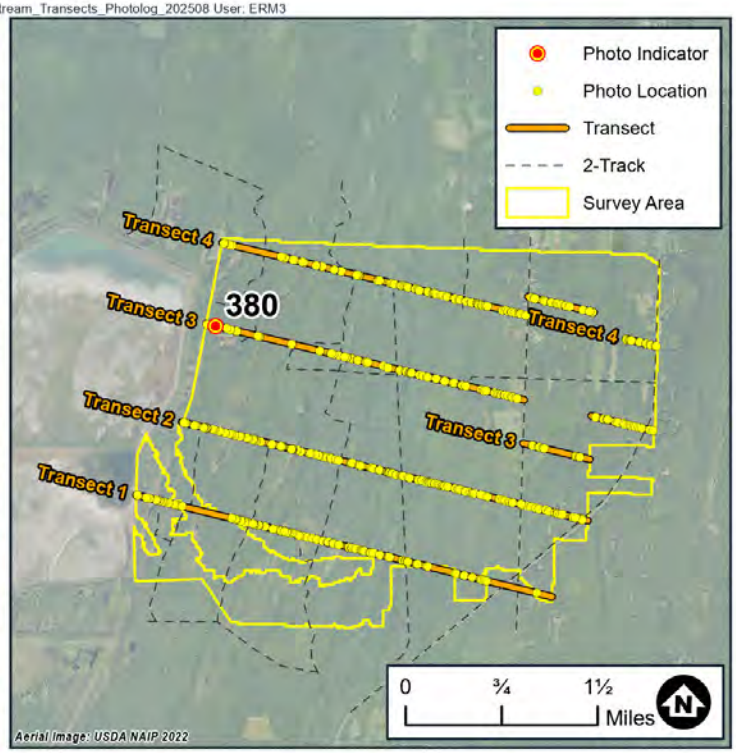
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP06-B, Wetland
**Photo 2 Caption:** T3W-BP06-B, Upland

*Note: Photo locations are approximate*

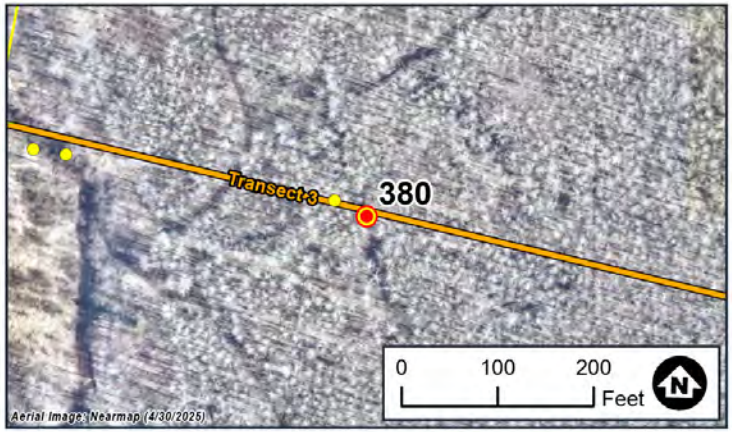
## Photo 380-1






## Photo 380-2







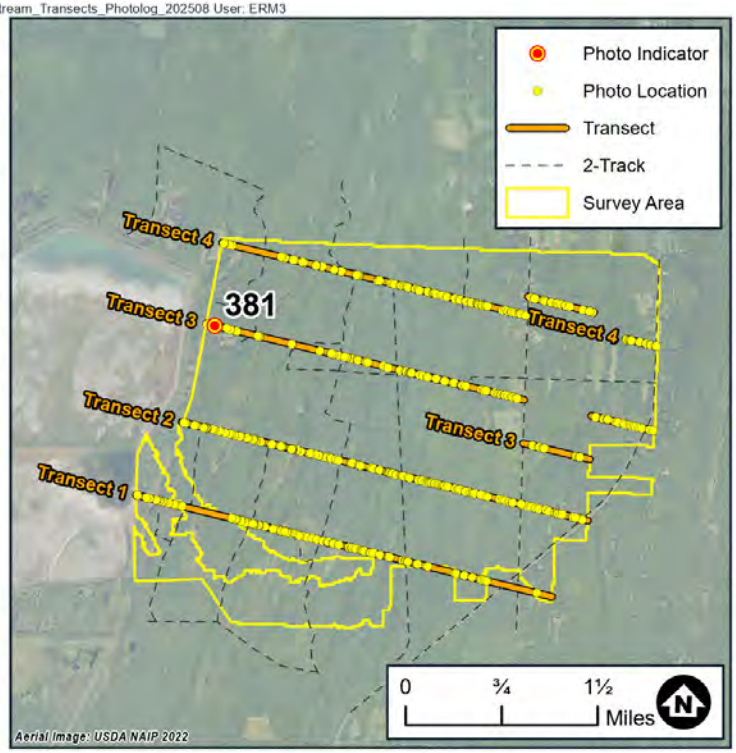

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP07-A, Wetland
**Photo 2 Caption:** T3W-BP07-A, Upland

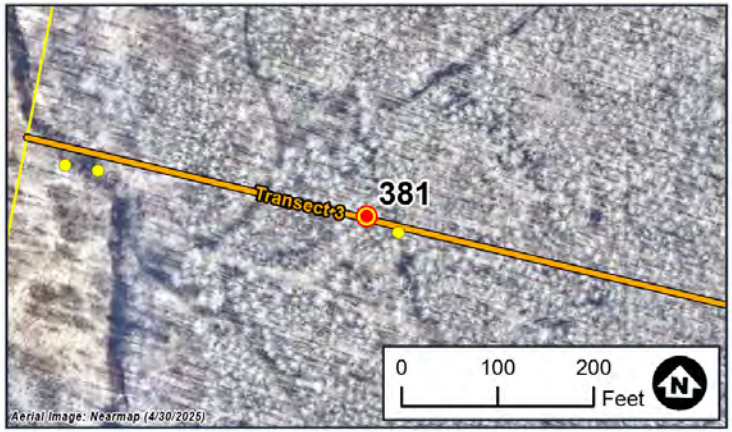
*Note: Photo locations are approximate*











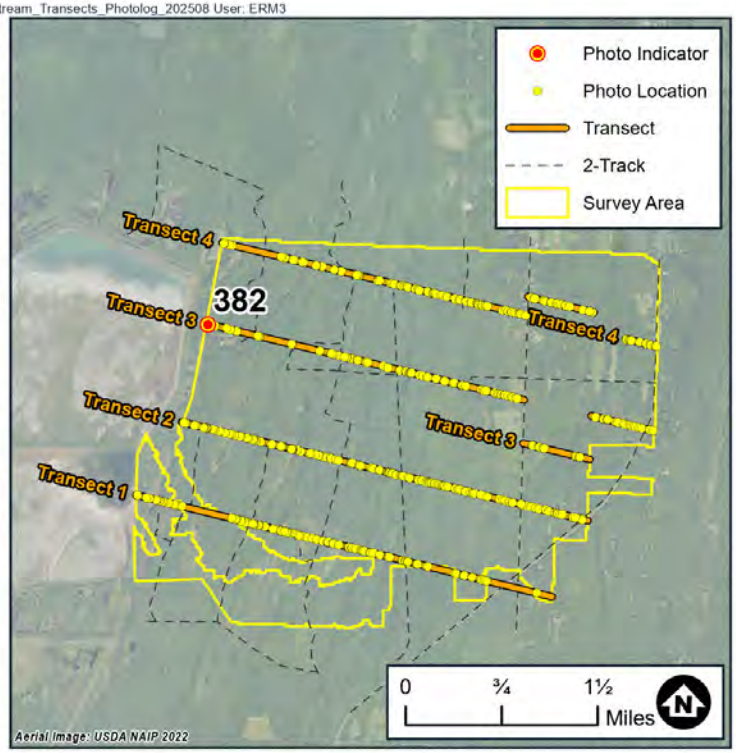

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-BP07-B, Wetland
**Photo 2 Caption:** T3W-BP07-B, Upland

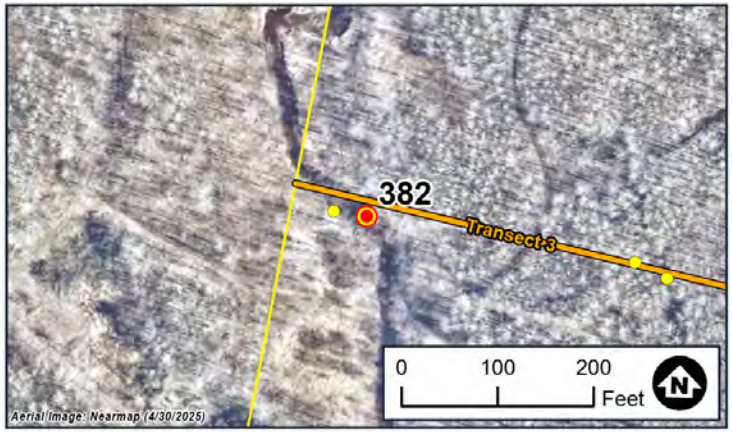
*Note: Photo locations are approximate*











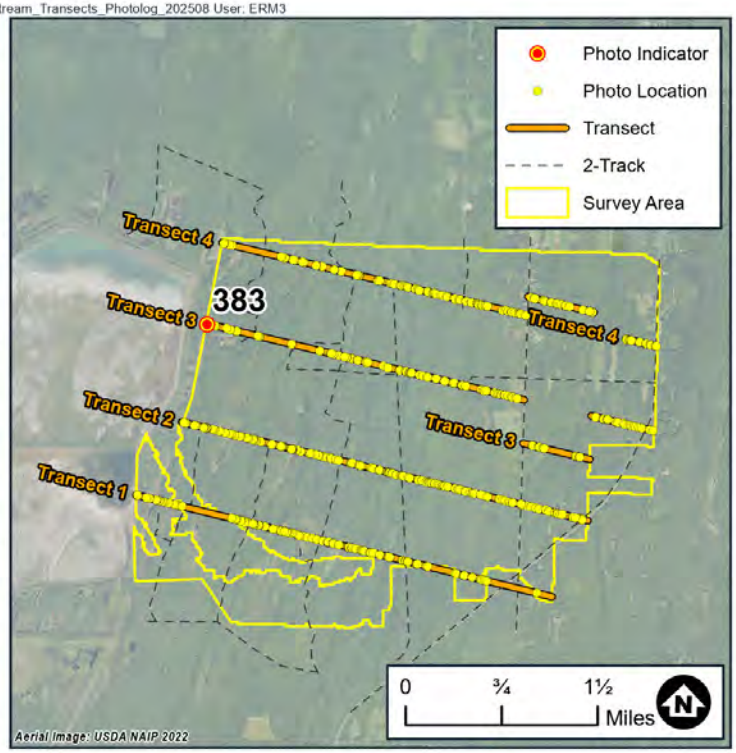

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-S05-RB, Upstream
**Photo 2 Caption:** T3W-S05-RB, Downstream

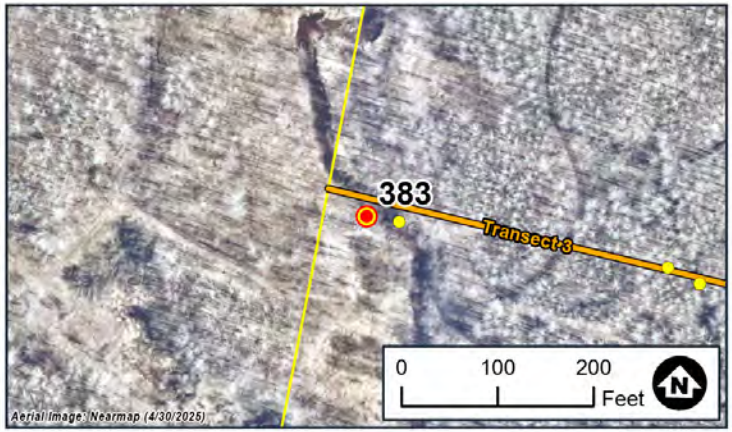
*Note: Photo locations are approximate*










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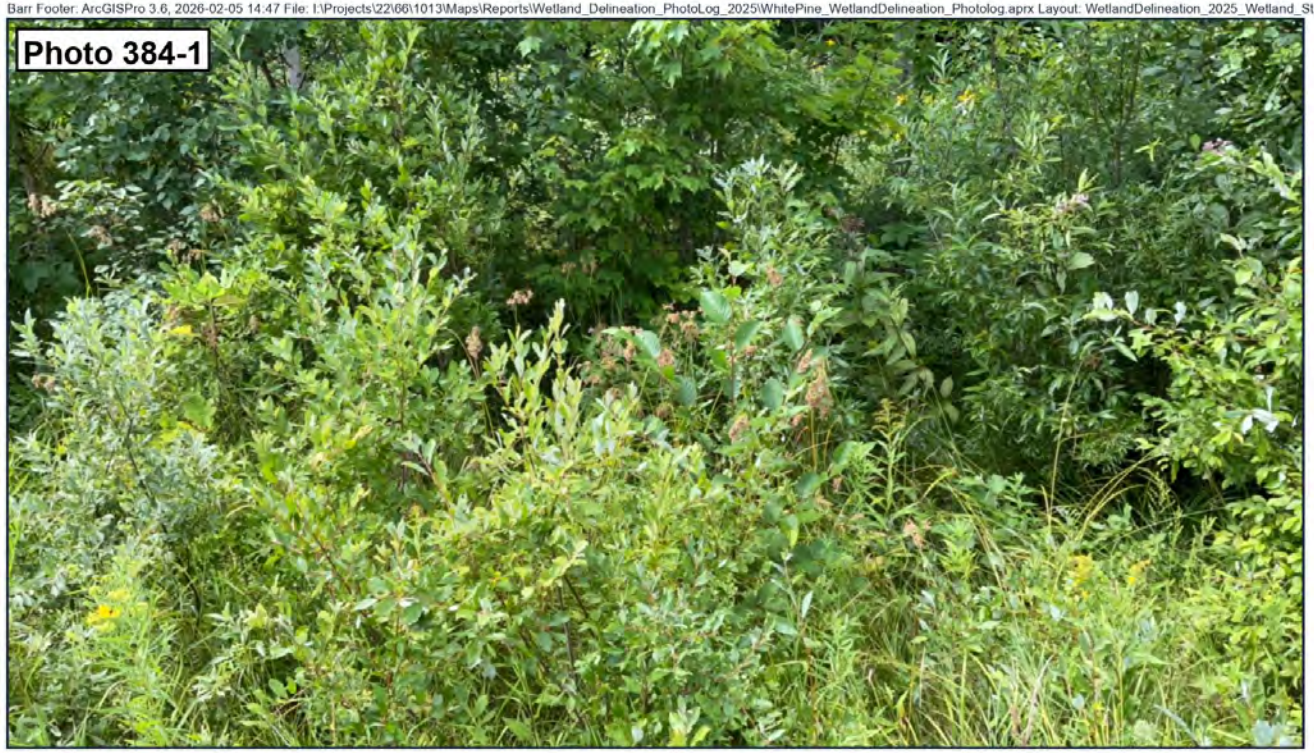
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

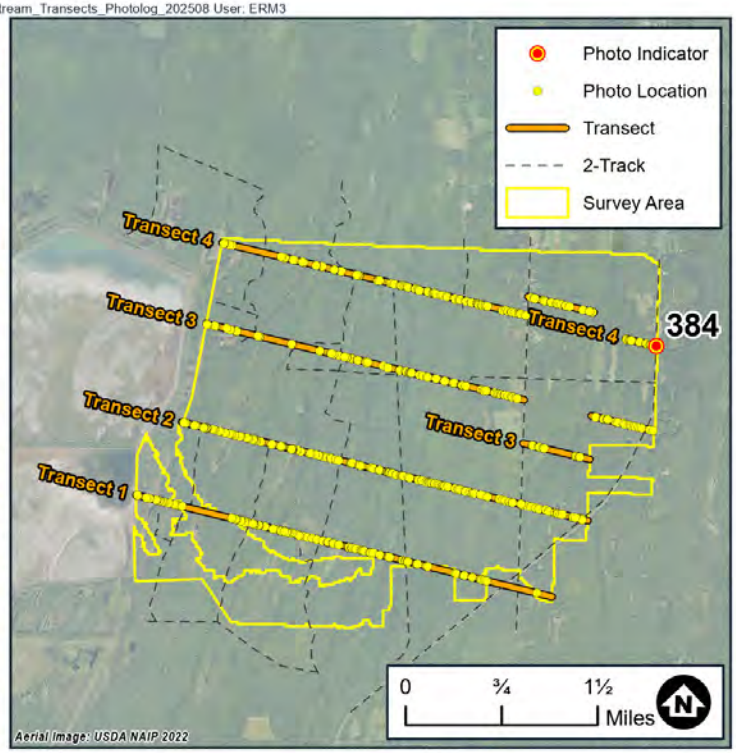
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T3W-S05-LB, Upstream
**Photo 2 Caption:** T3W-S05-LB, Downstream

*Note: Photo locations are approximate*

## Photo 384-1






## Photo 384-2






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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

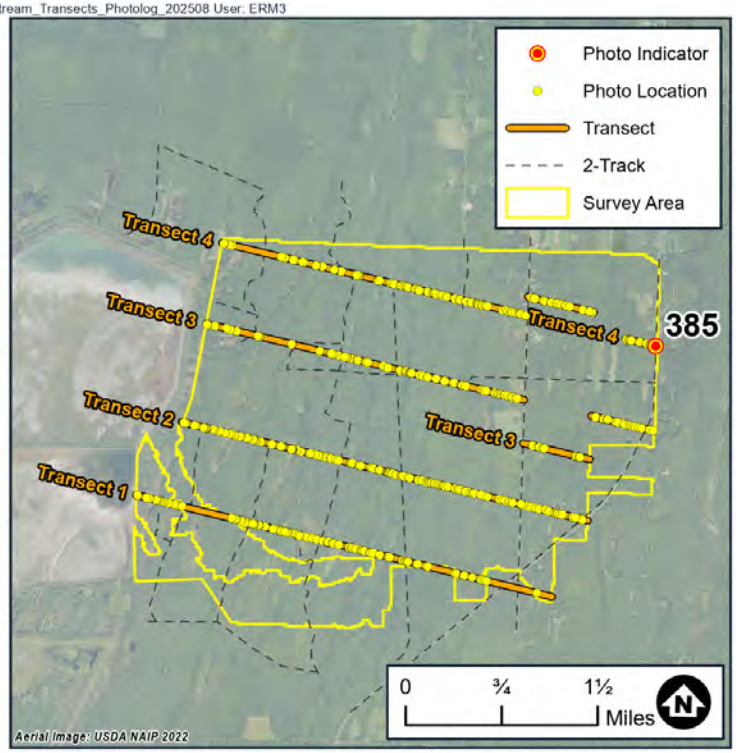
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP36-B, Wetland
**Photo 2 Caption:** T4E-BP36-B, Upland

*Note: Photo locations are approximate*

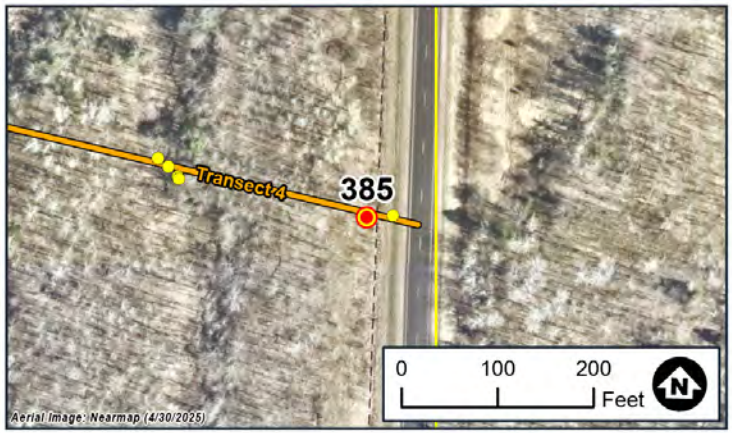
## Photo 385-1






## Photo 385-2







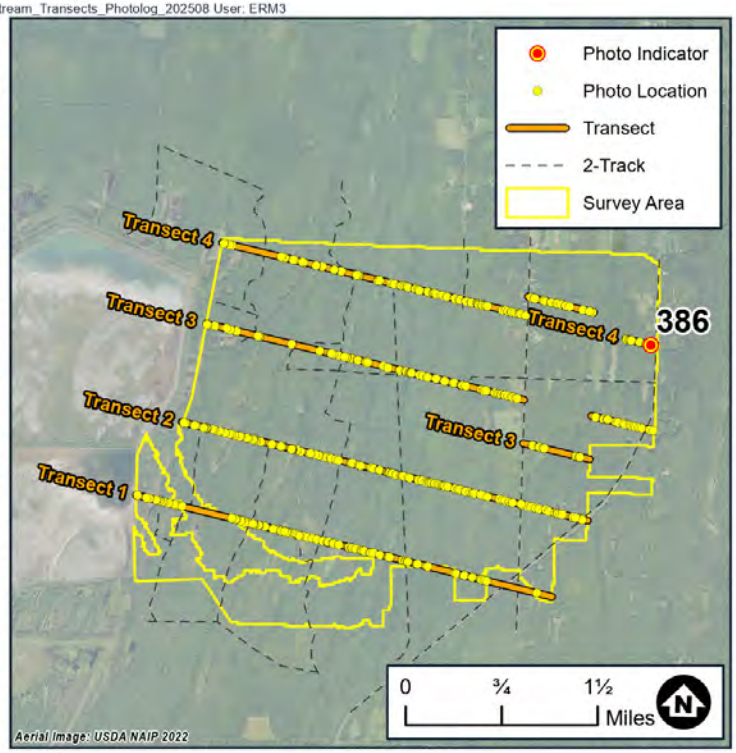

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP36-A, Wetland
**Photo 2 Caption:** T4E-BP36-A, Upland

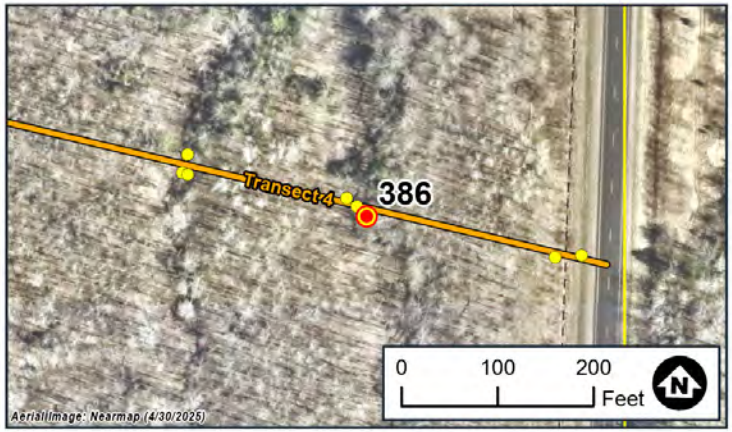
*Note: Photo locations are approximate*









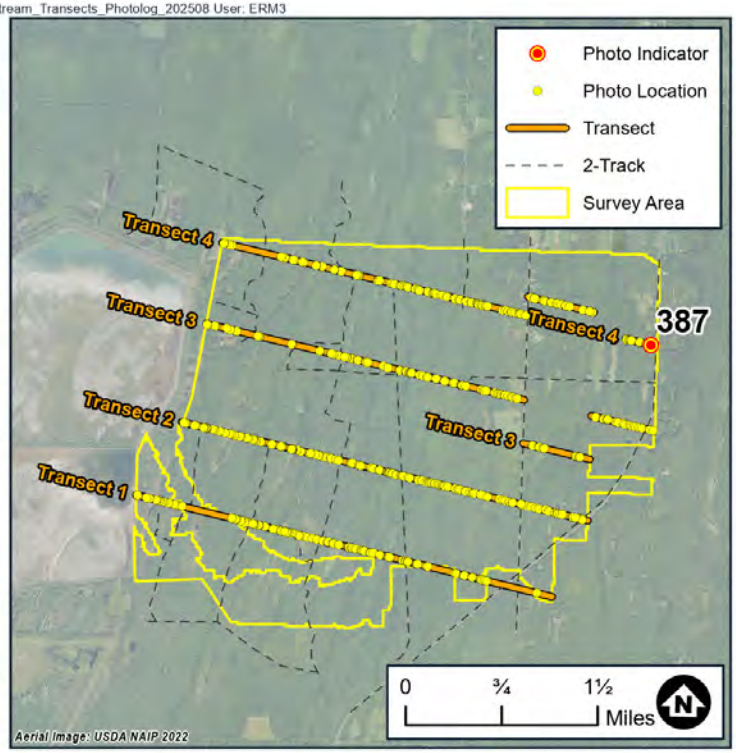

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S13-LB, Upstream
**Photo 2 Caption:** T4E-S13-LB, Downstream

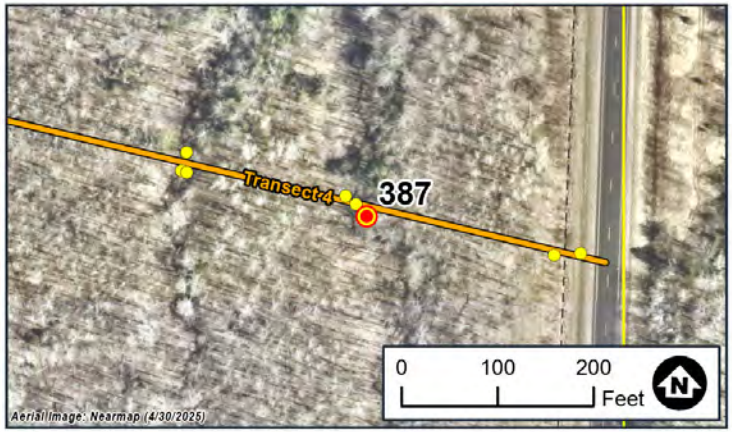
*Note: Photo locations are approximate*











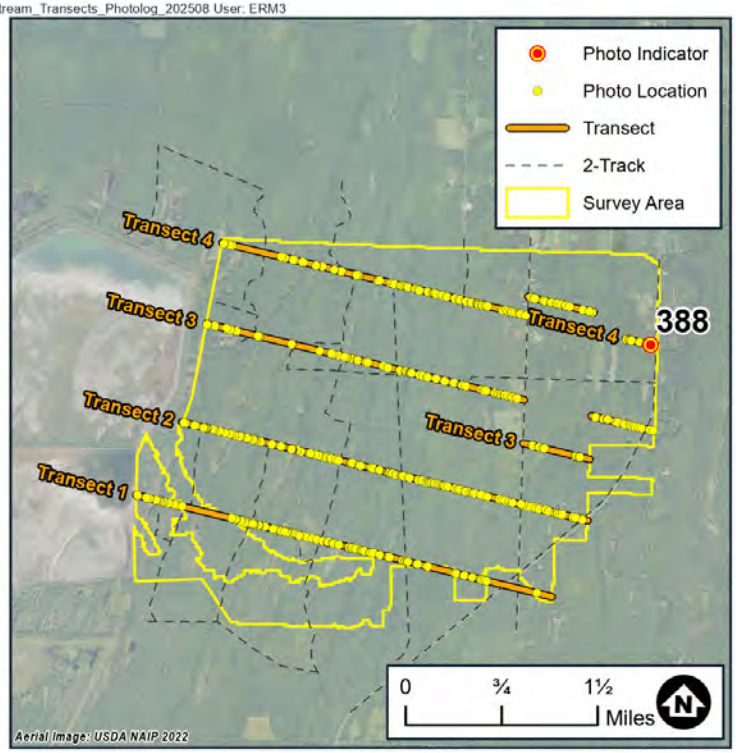

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S13-RB, Upstream
**Photo 2 Caption:** T4E-S13-RB, Downstream

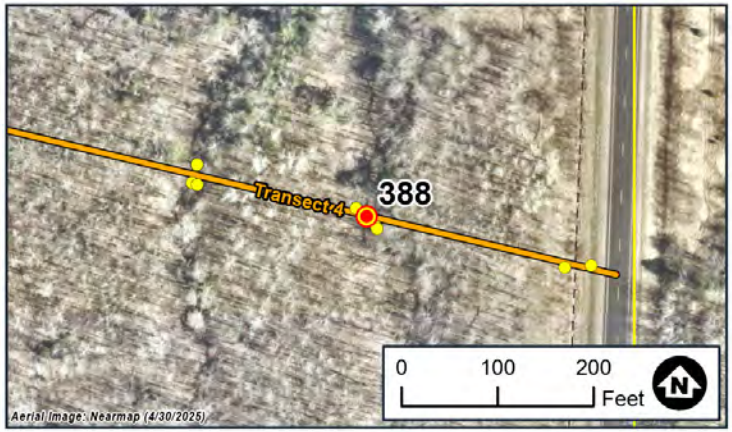
*Note: Photo locations are approximate*










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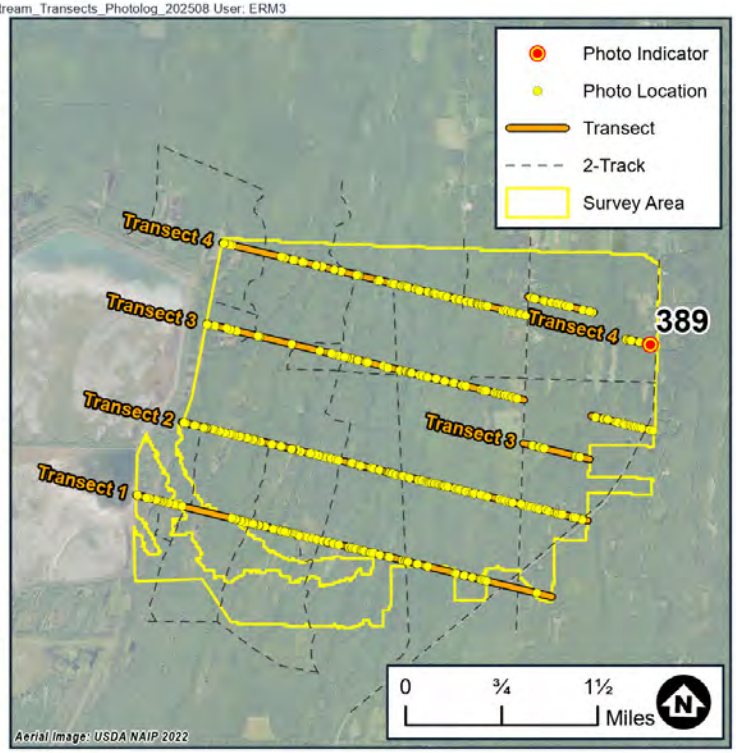
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP35-A, Wetland
**Photo 2 Caption:** T4E-BP35-A, Upland

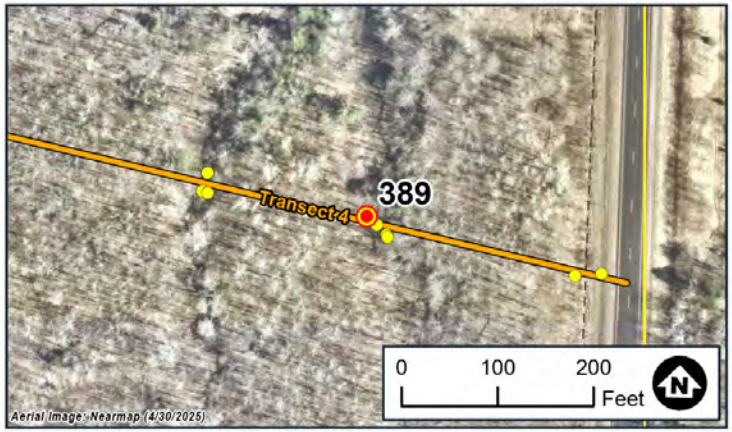
*Note: Photo locations are approximate*











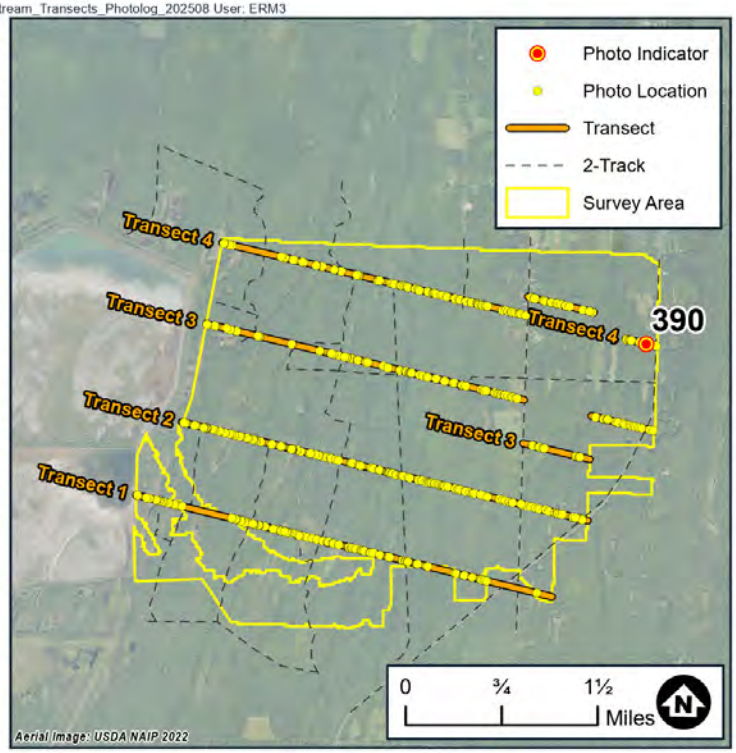

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP35-B, Wetland
**Photo 2 Caption:** T4E-BP35-B, Upland

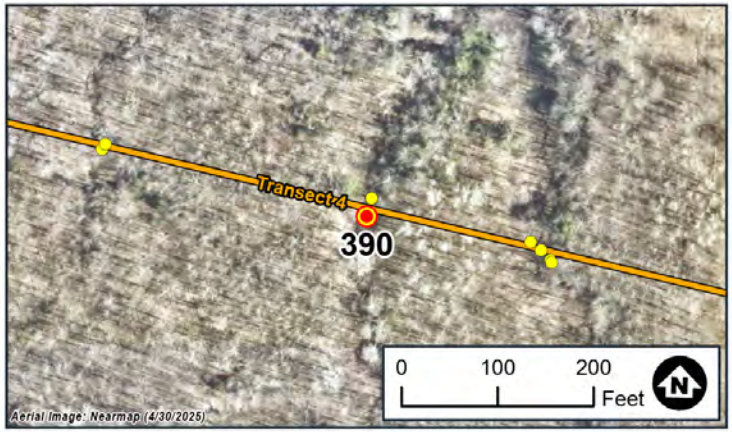
*Note: Photo locations are approximate*










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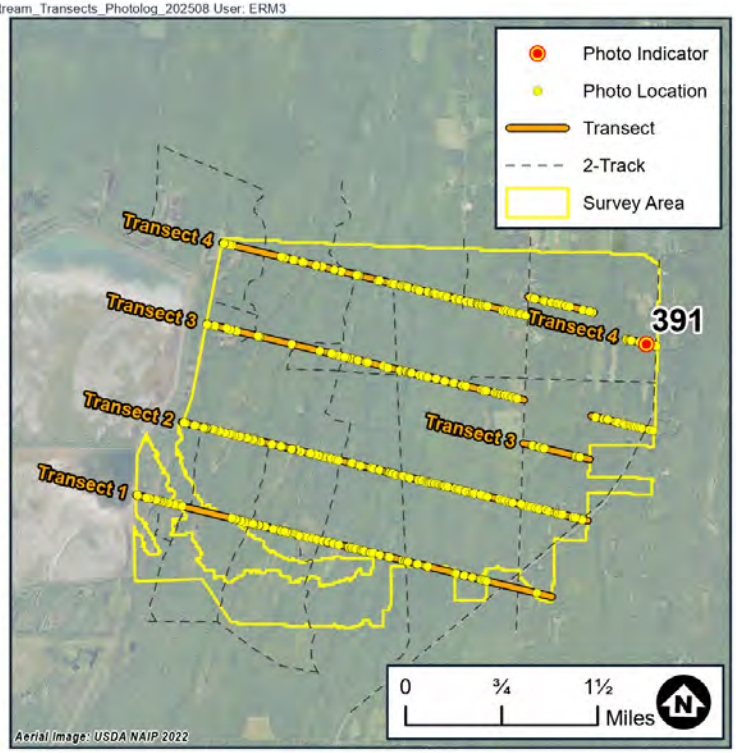
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S12-LB, Upstream
**Photo 2 Caption:** T4E-S12-LB, Downstream

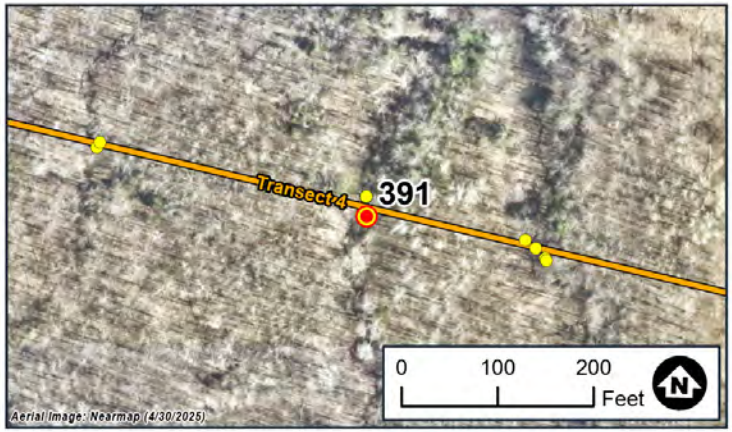
*Note: Photo locations are approximate*










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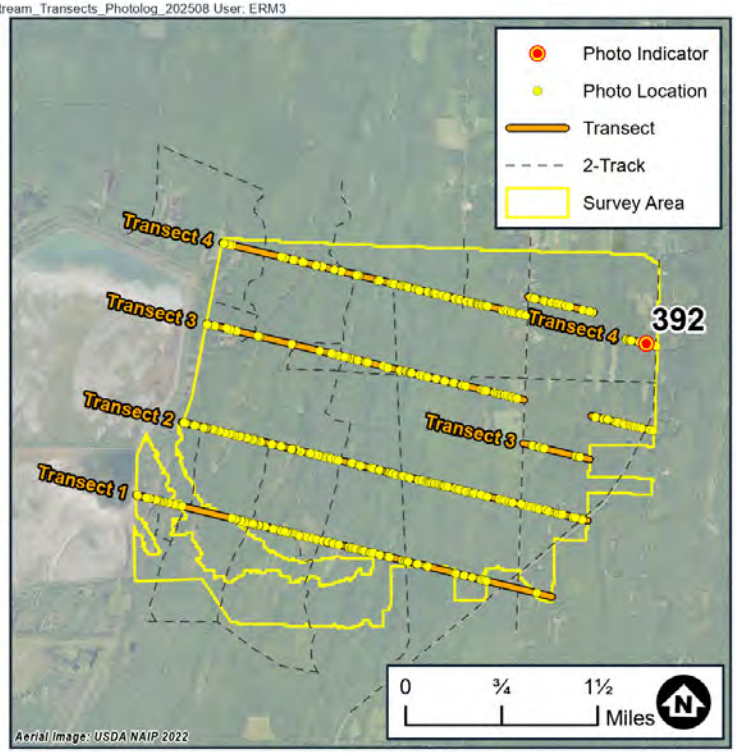
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S12-RB, Upstream
**Photo 2 Caption:** T4E-S12-RB, Downstream

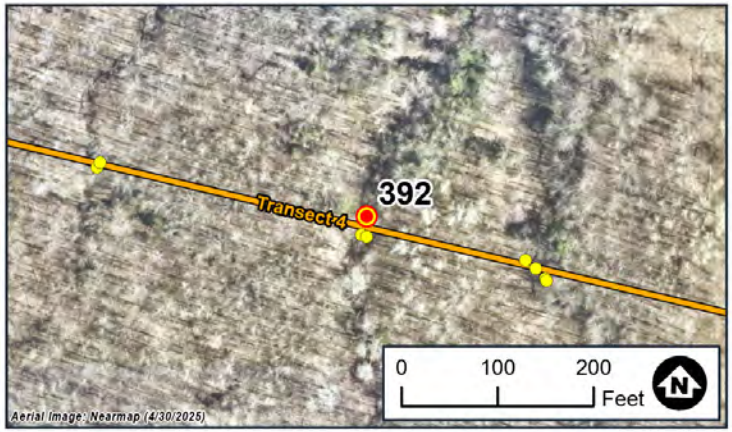
*Note: Photo locations are approximate*











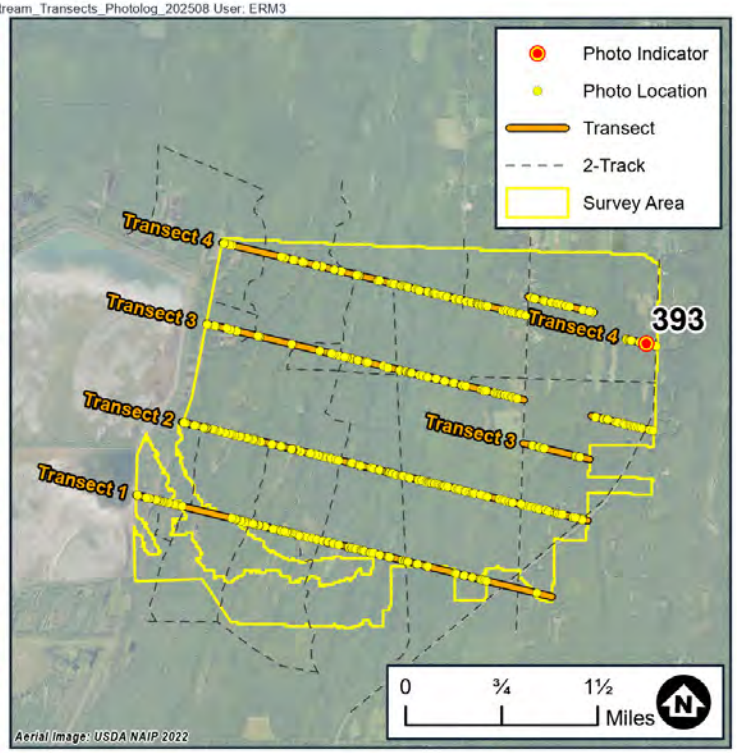

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP34-B, Wetland
**Photo 2 Caption:** T4E-BP34-B, Upland

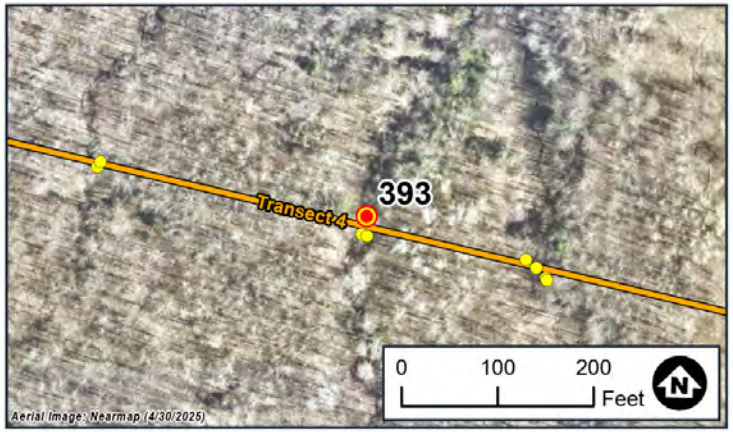
*Note: Photo locations are approximate*









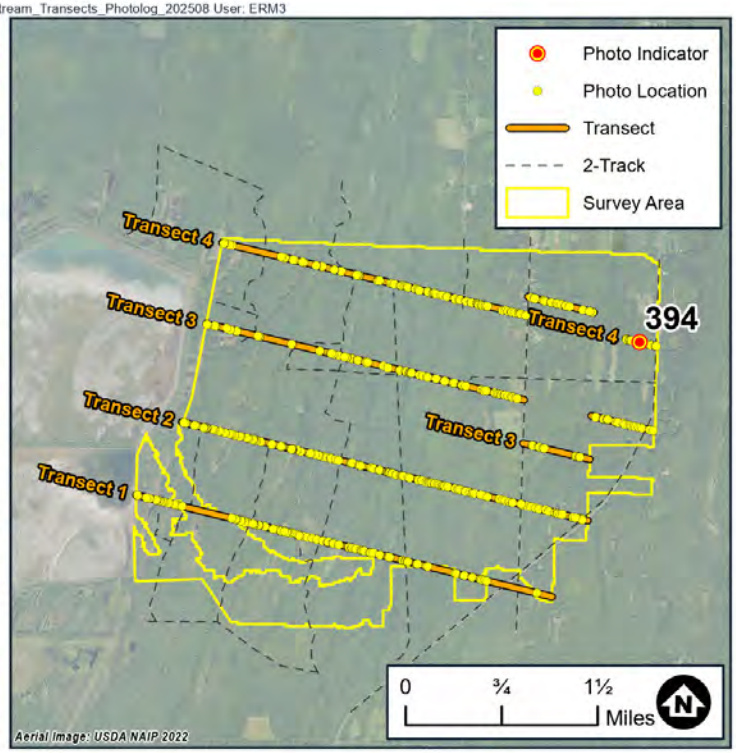

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP34-A, Wetland
**Photo 2 Caption:** T4E-BP34-A, Upland

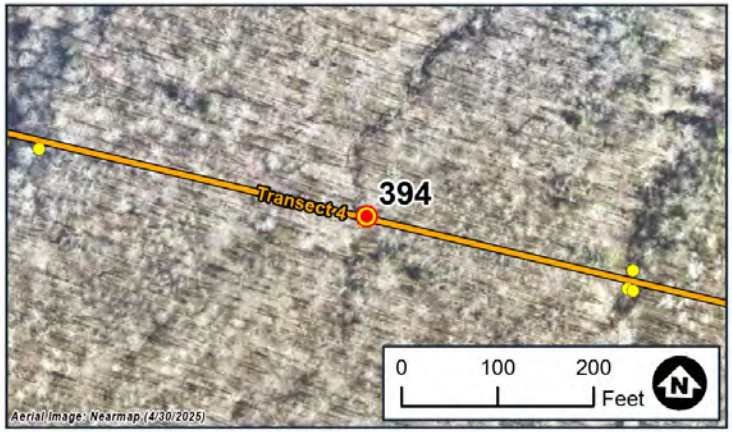
*Note: Photo locations are approximate*










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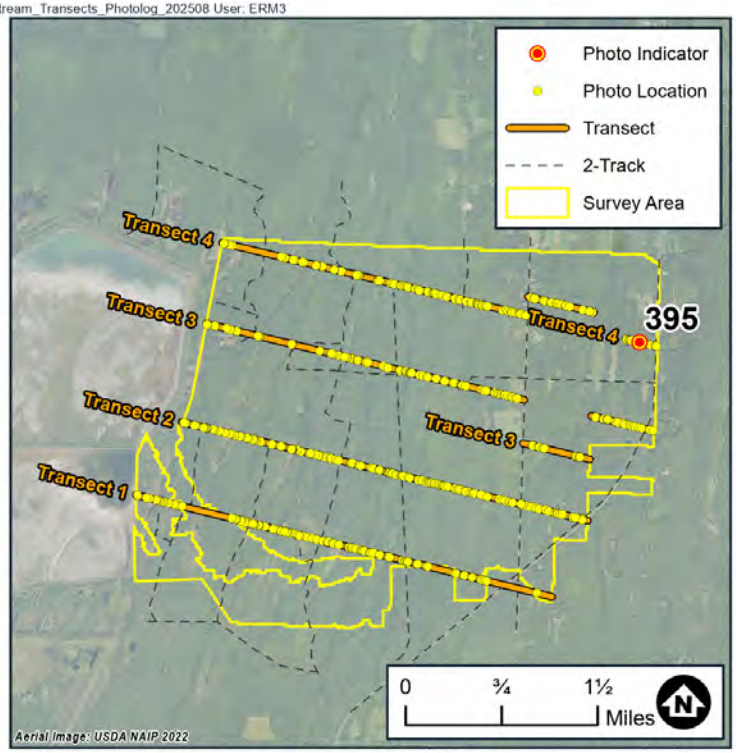
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP33-B, Wetland
**Photo 2 Caption:** T4E-BP33-B, Upland

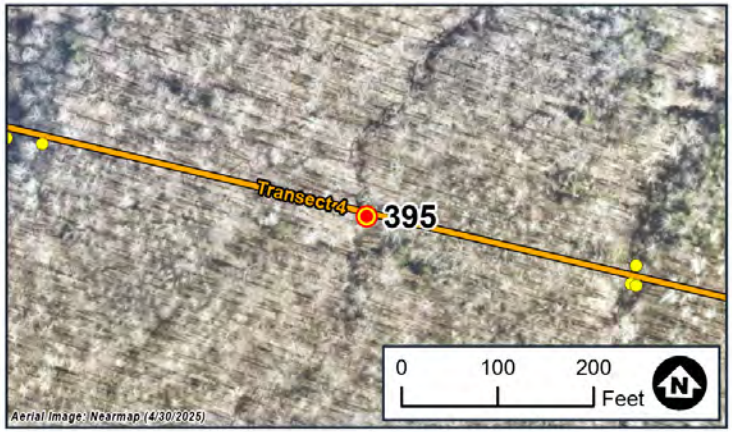
*Note: Photo locations are approximate*











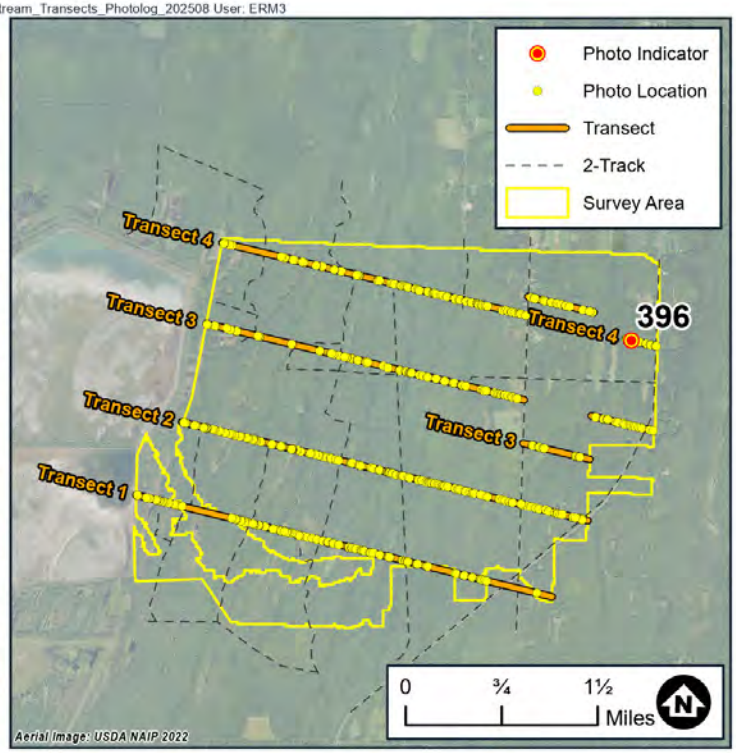

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP33-A, Wetland
**Photo 2 Caption:** T4E-BP33-A, Upland

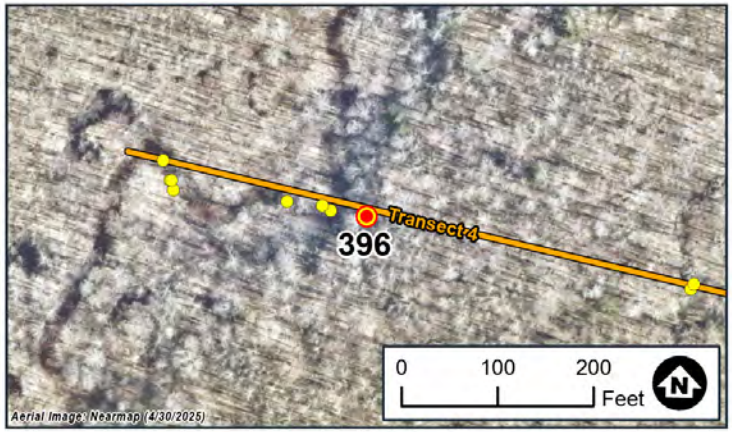
*Note: Photo locations are approximate*











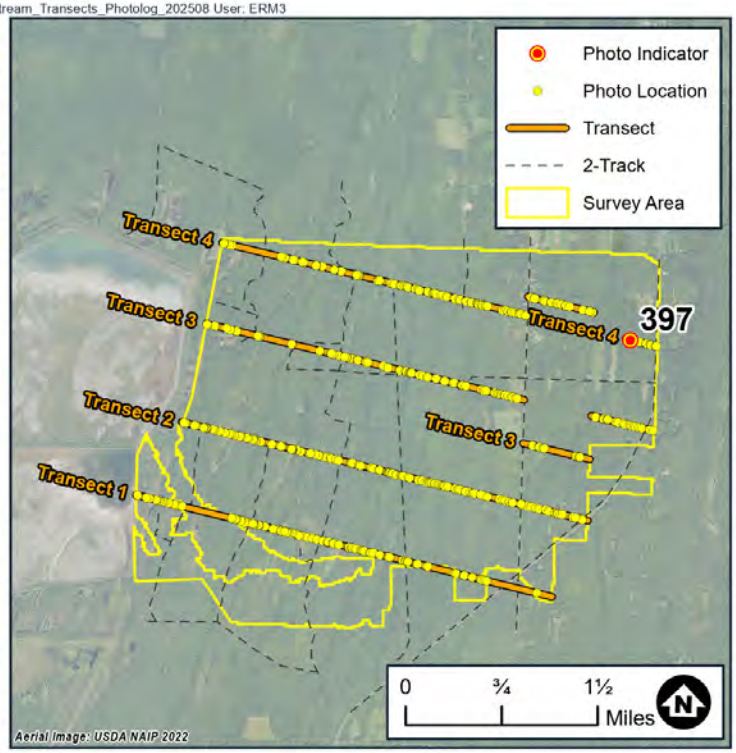

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP32-B, Wetland
**Photo 2 Caption:** T4E-BP32-B, Upland

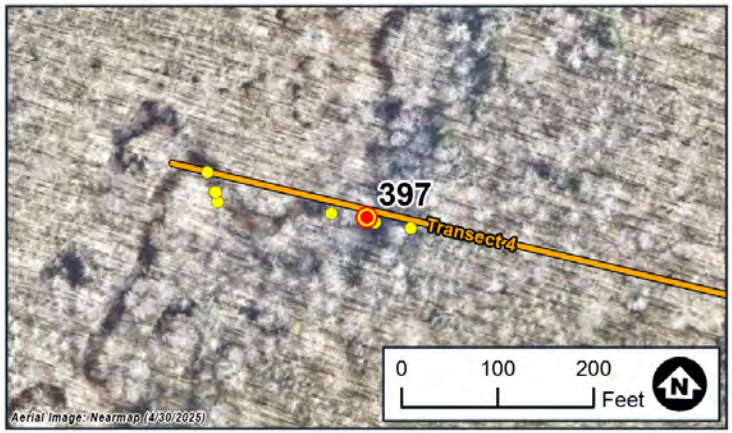
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

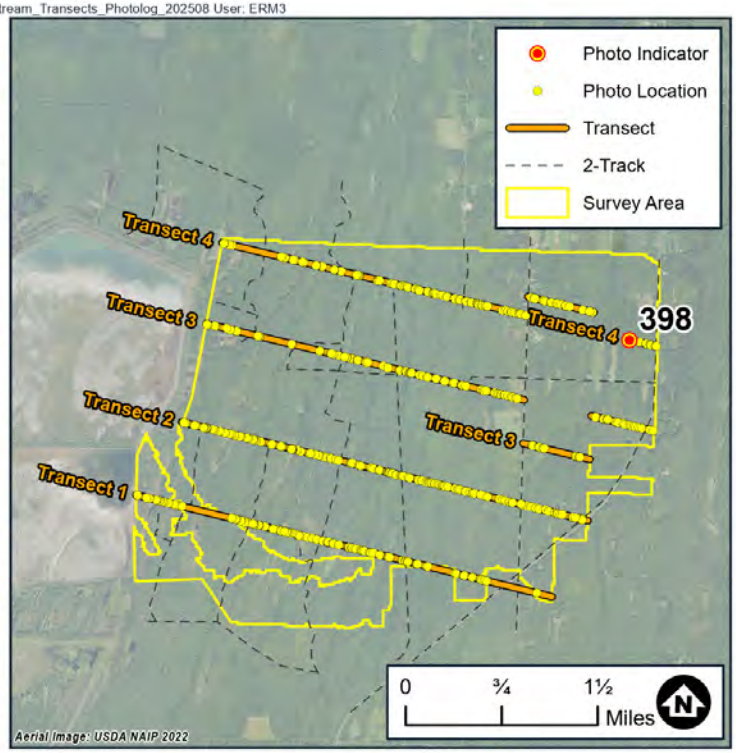
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP32-A, Wetland
**Photo 2 Caption:** T4E-BP32-A, Upland

*Note: Photo locations are approximate*

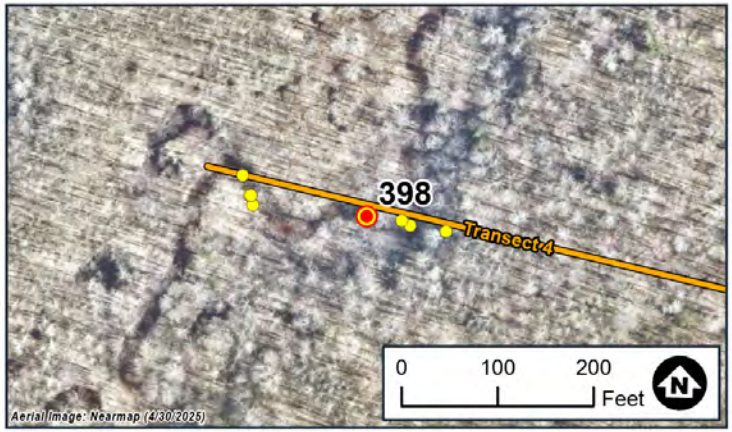
## Photo 398-1






## Photo 398-2





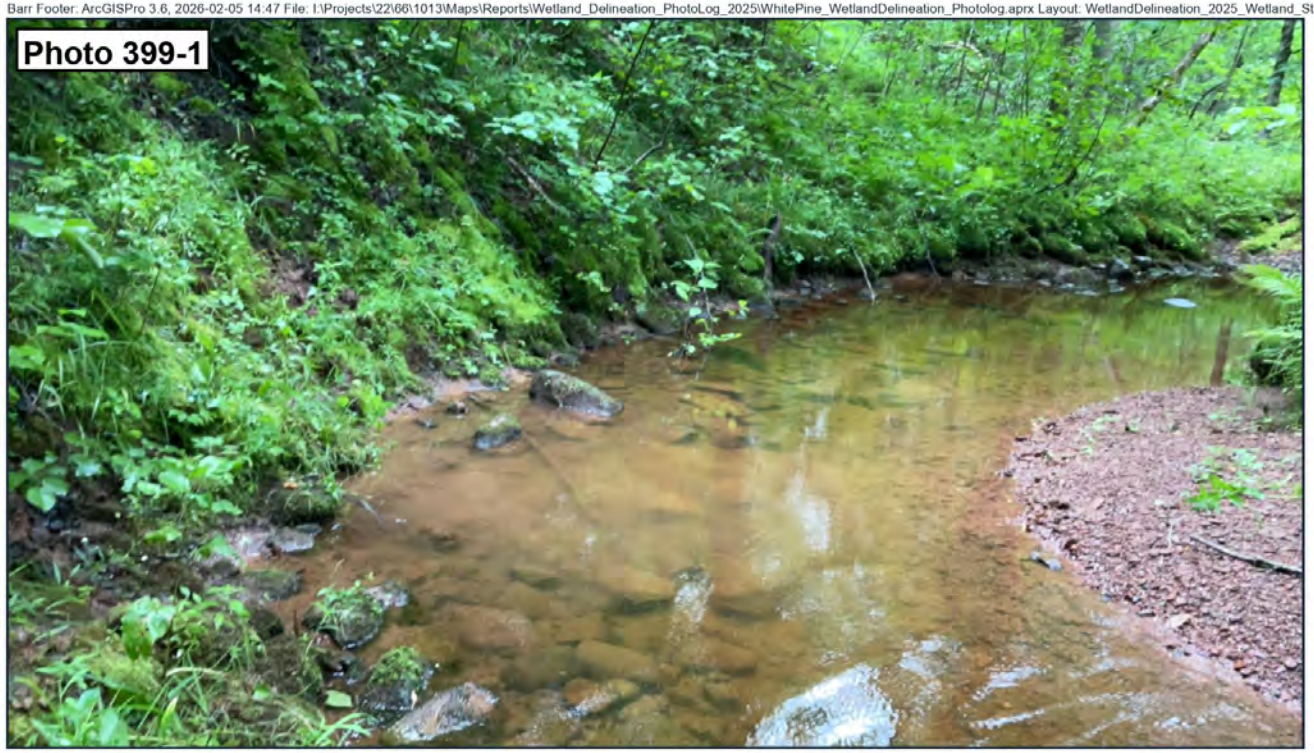


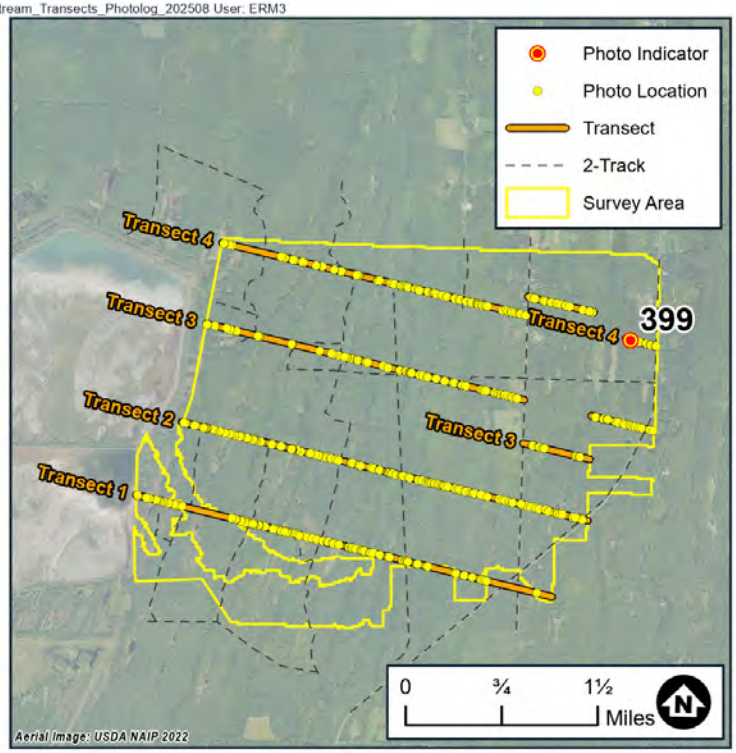

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S11-LB, Upstream
**Photo 2 Caption:** T4E-S11-LB, Downstream

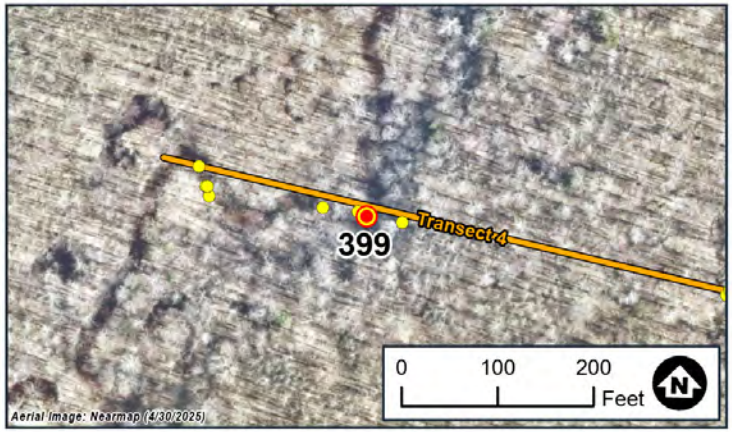
*Note: Photo locations are approximate*











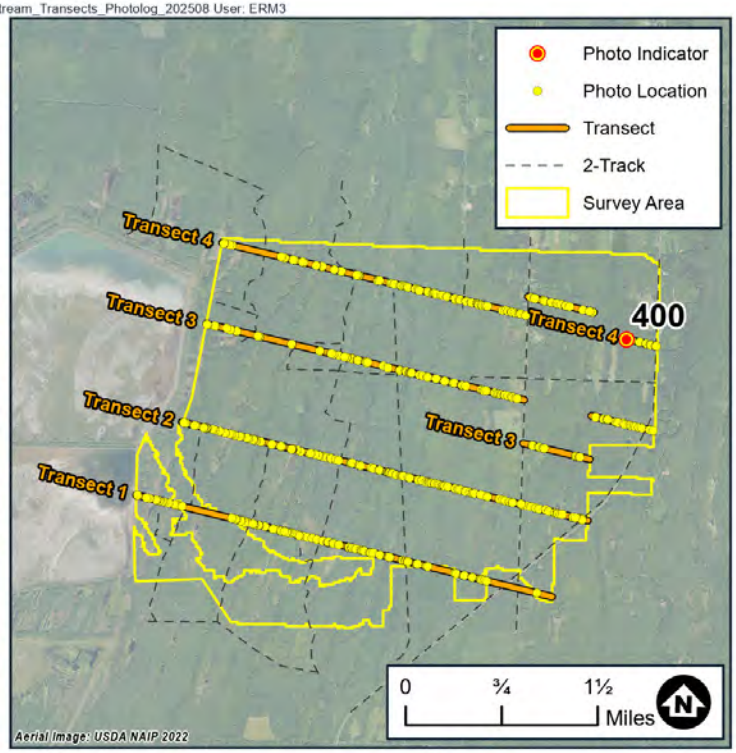

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S11-RB, Upstream
**Photo 2 Caption:** T4E-S11-RB, Downstream

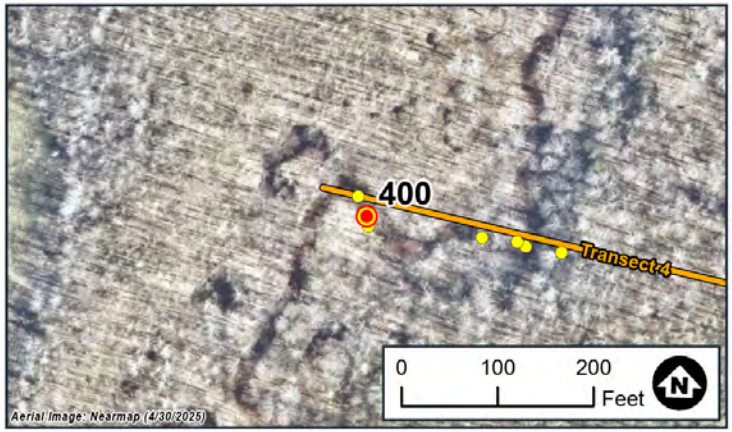
*Note: Photo locations are approximate*










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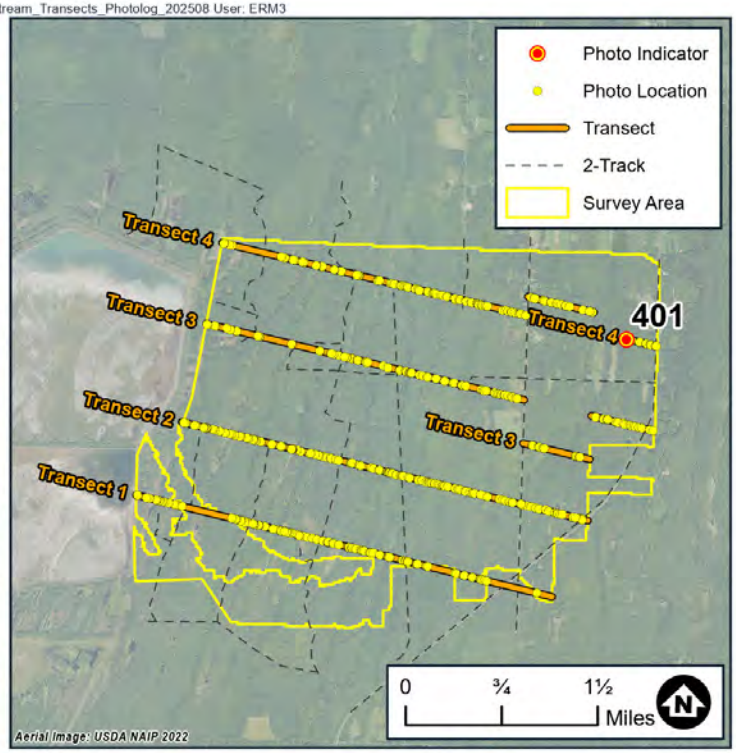
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S10-LB, Upstream
**Photo 2 Caption:** T4E-S10-LB, Downstream

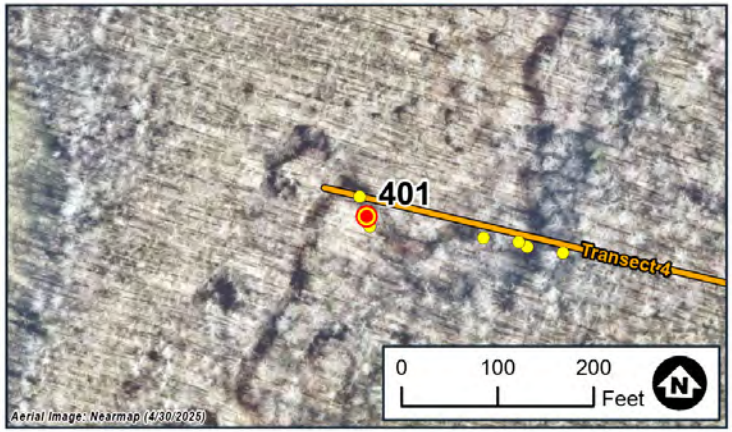
*Note: Photo locations are approximate*










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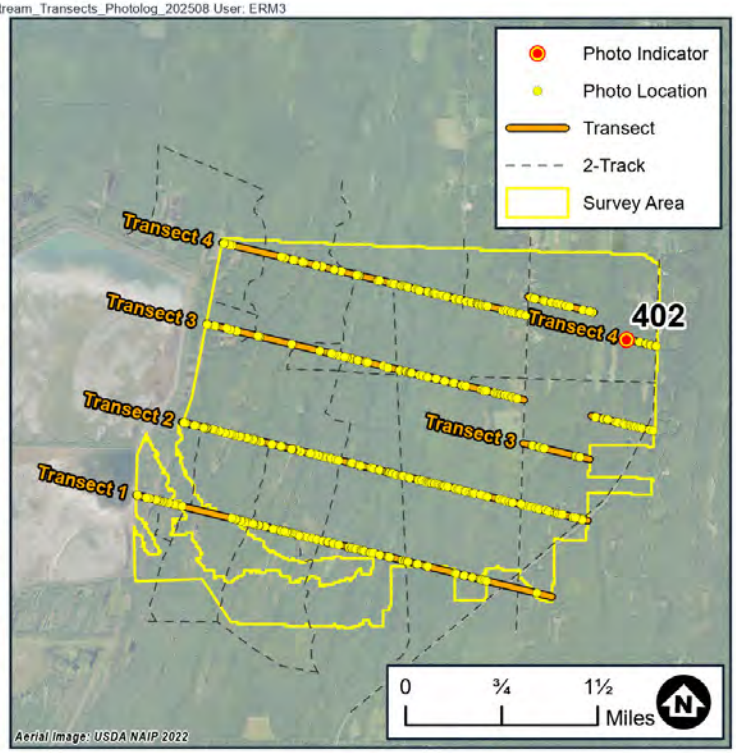
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S10-RB, Upstream
**Photo 2 Caption:** T4E-S10-RB, Downstream

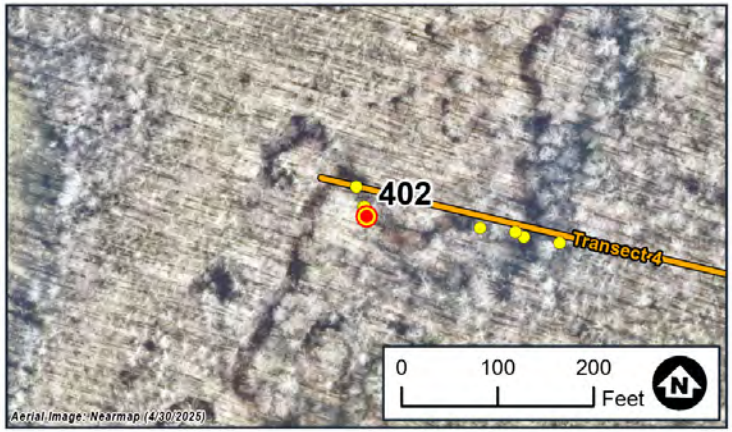
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

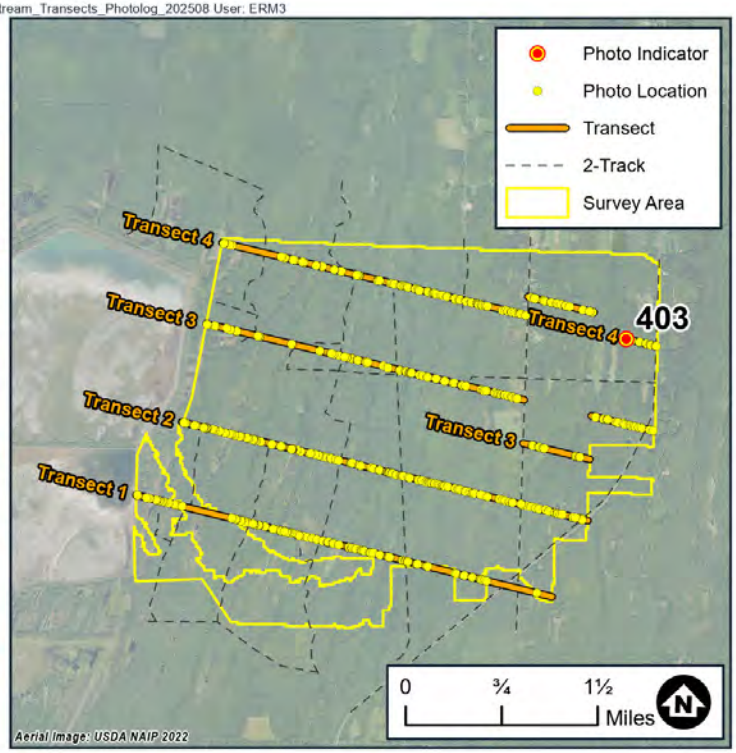
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S09-LB, Upstream
**Photo 2 Caption:** T4E-S09-LB, Downstream

*Note: Photo locations are approximate*

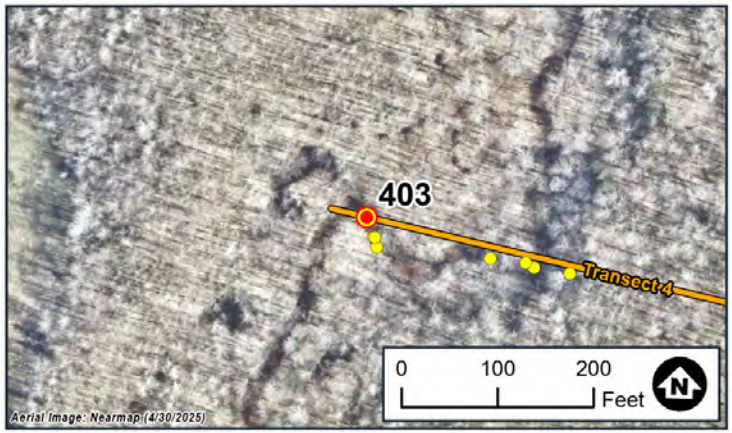
## Photo 403-1






## Photo 403-2







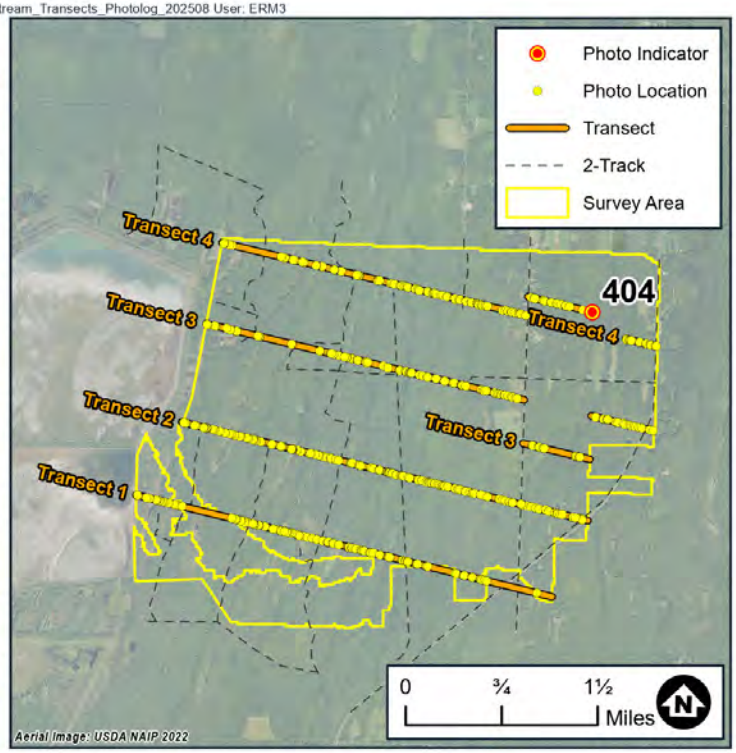

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S09-RB, Upstream
**Photo 2 Caption:** T4E-S09-RB, Downstream

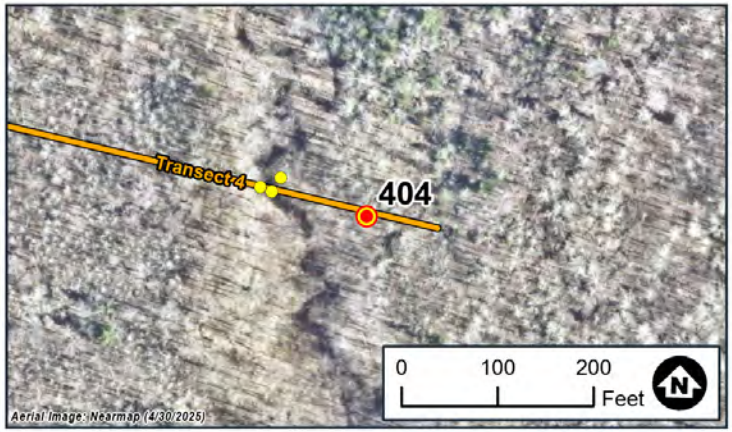
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

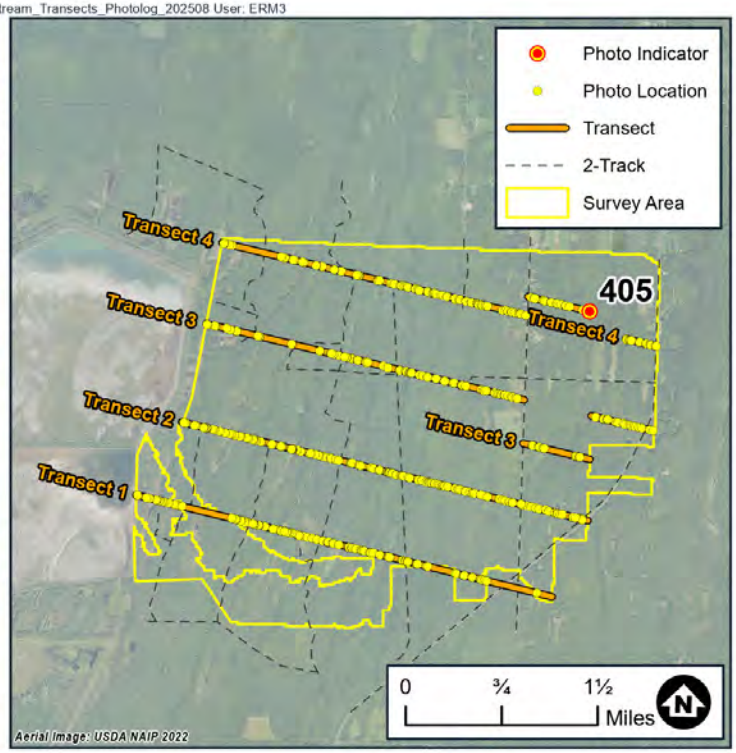
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP31-B, Wetland
**Photo 2 Caption:** T4E-BP31-B, Upland

*Note: Photo locations are approximate*

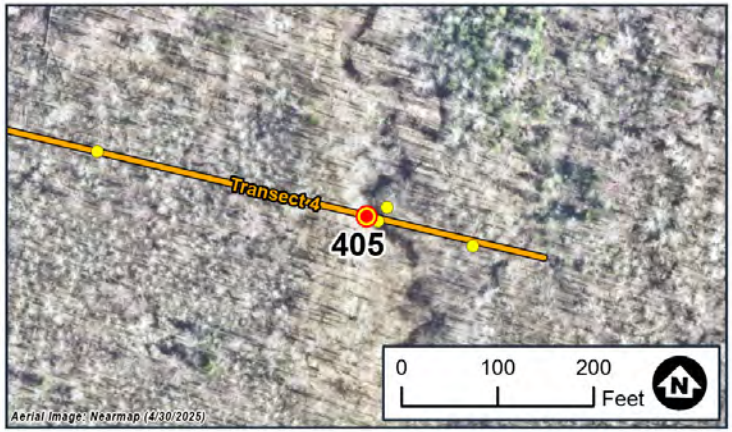
## Photo 405-1






## Photo 405-2







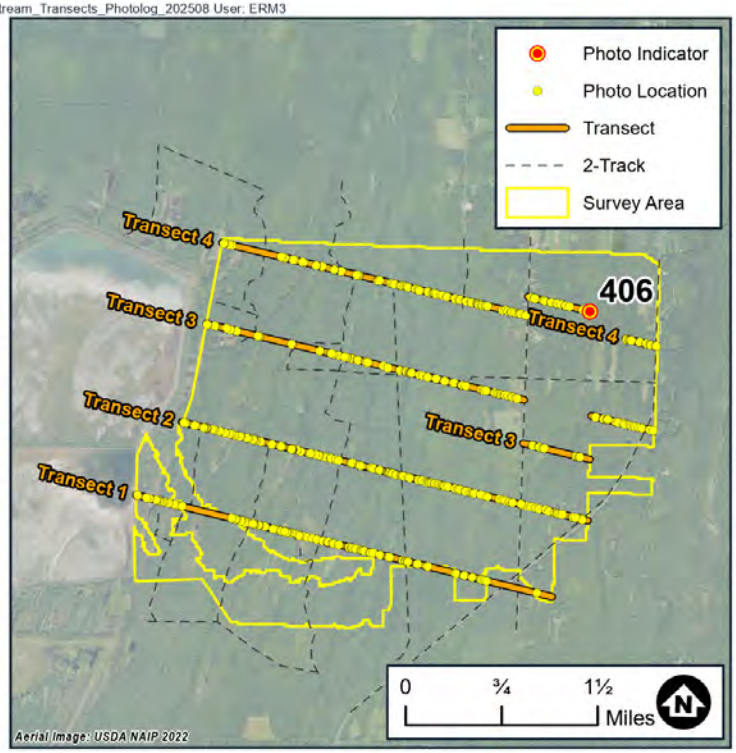

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP31-A, Wetland
**Photo 2 Caption:** T4E-BP31-A, Upland

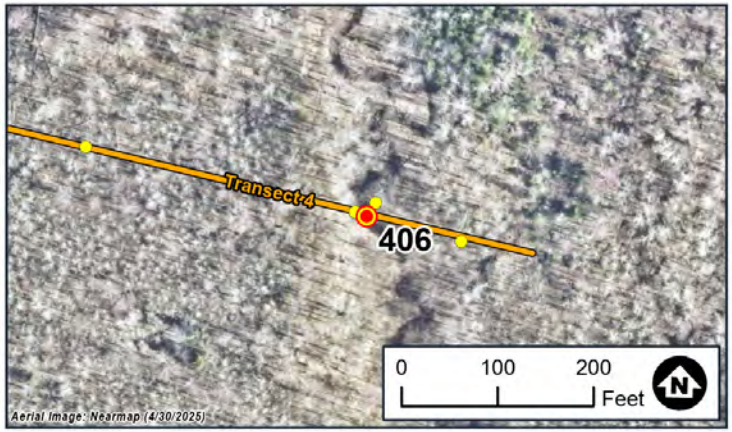
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

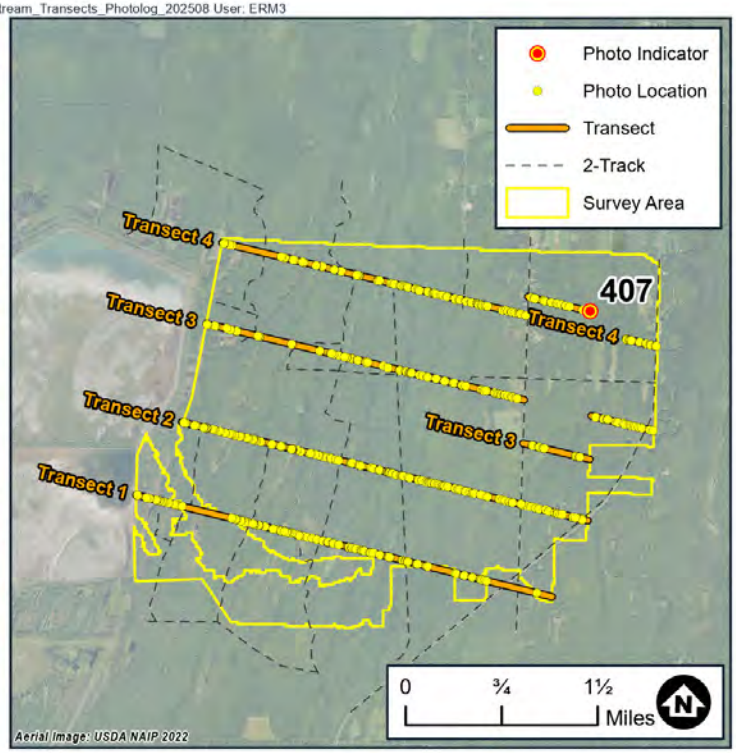
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S08-LB, Upstream
**Photo 2 Caption:** T4E-S08-LB, Downstream

*Note: Photo locations are approximate*

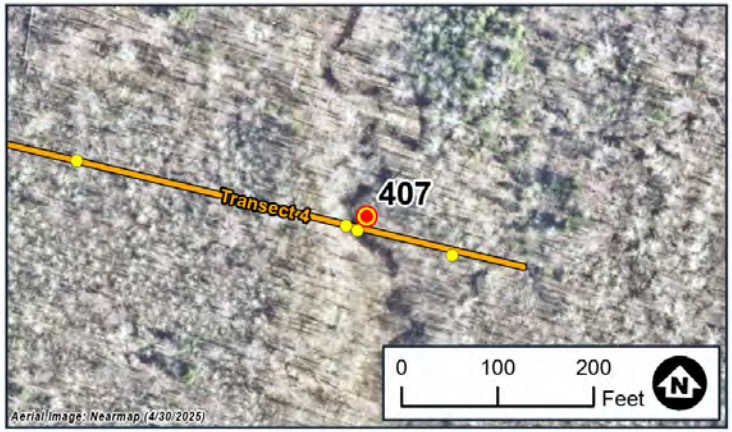
## Photo 407-1






## Photo 407-2








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S08-RB, Upstream
**Photo 2 Caption:** T4E-S08-RB, Downstream

*Note: Photo locations are approximate*

**Photo 408-1**



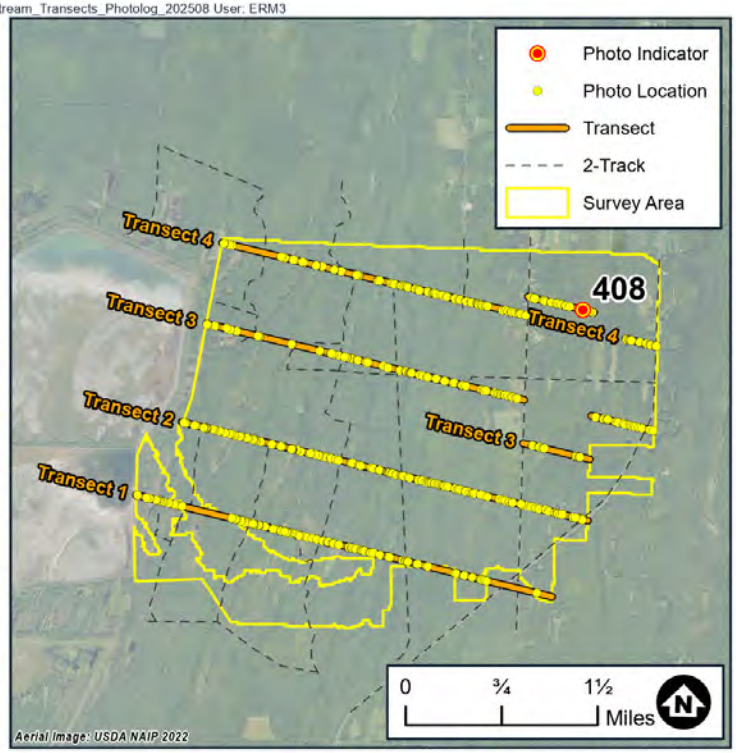
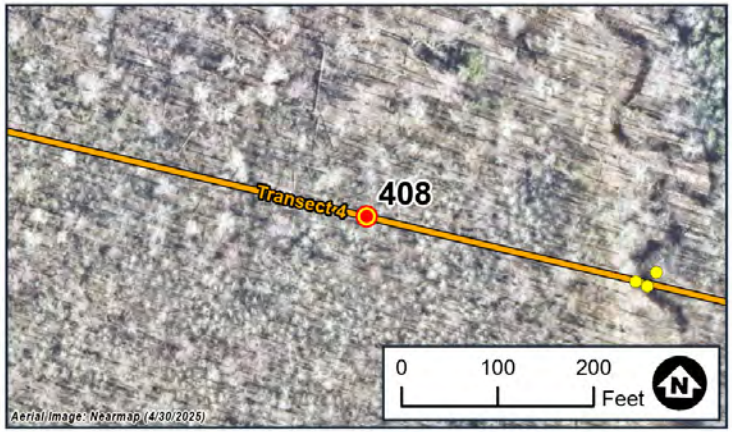



**Photo 408-2**





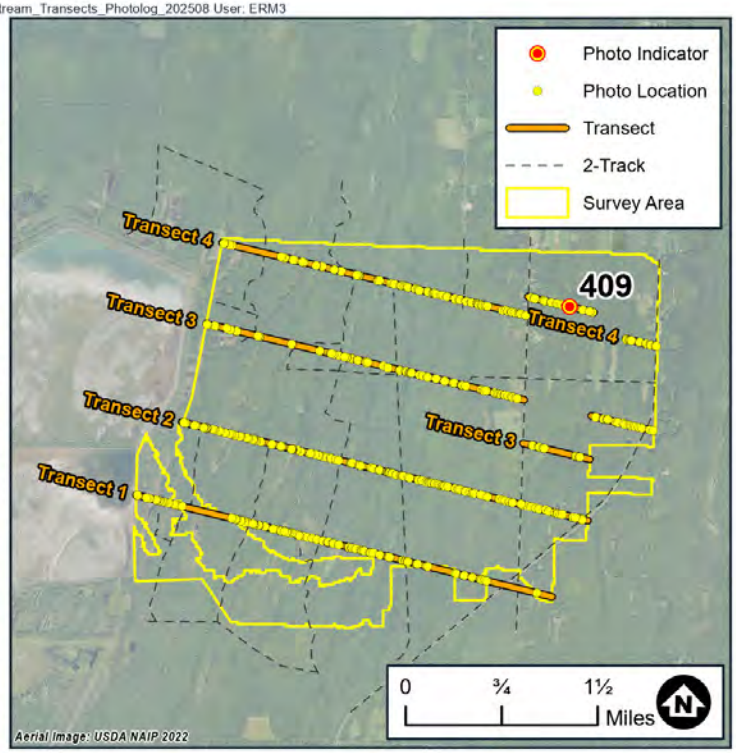

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP30-B, Wetland
**Photo 2 Caption:** T4E-BP30-B, Upland

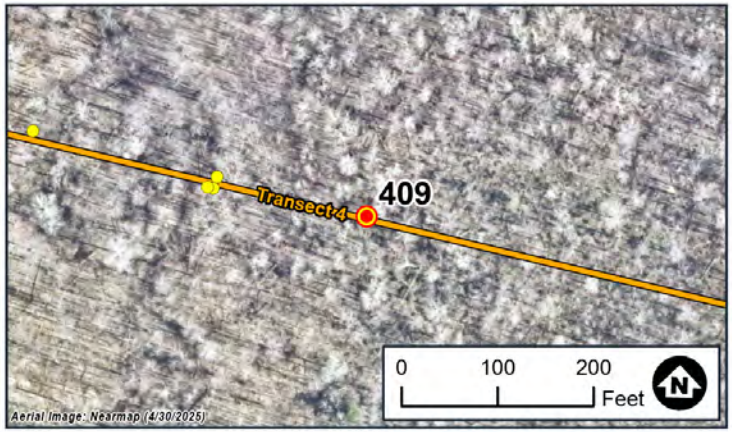
*Note: Photo locations are approximate*











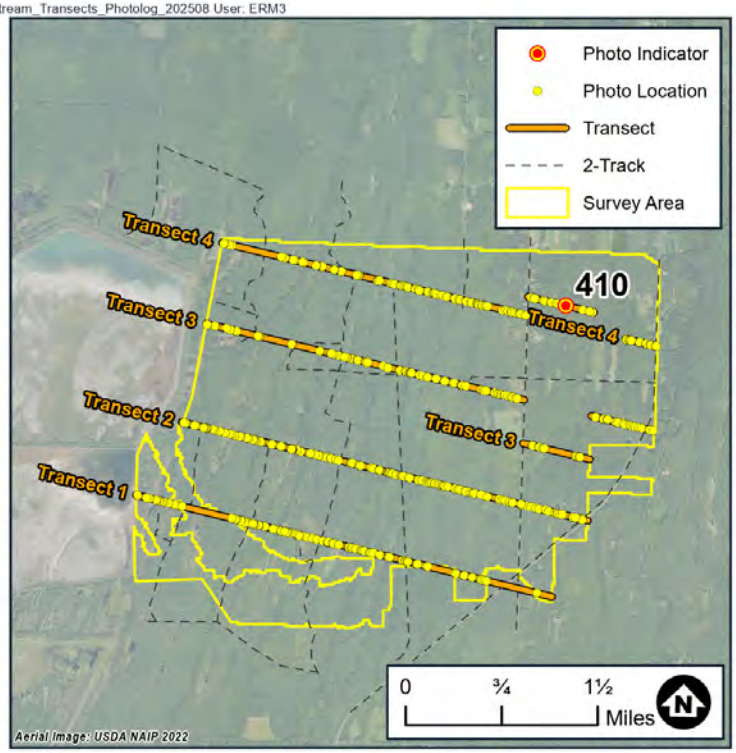

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP30-A, Wetland
**Photo 2 Caption:** T4E-BP30-A, Upland

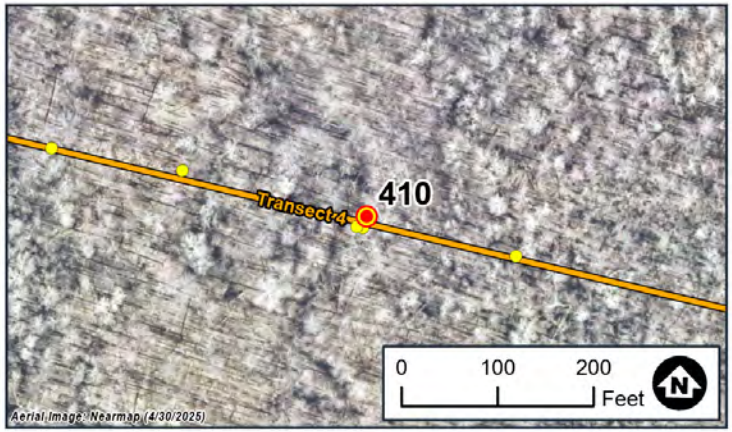
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP29-B, Wetland
**Photo 2 Caption:** T4E-BP29-B, Upland

*Note: Photo locations are approximate*

**Photo 411-1**



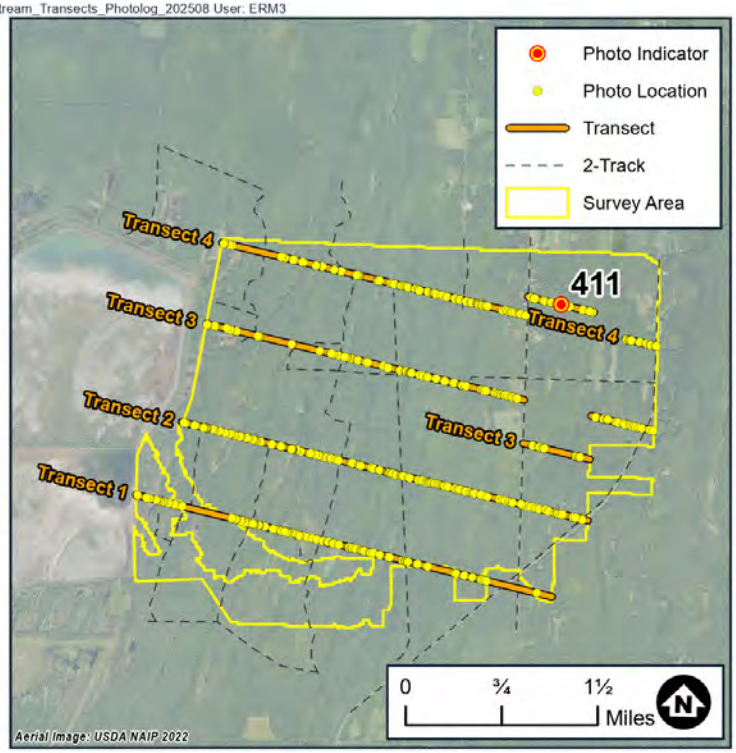
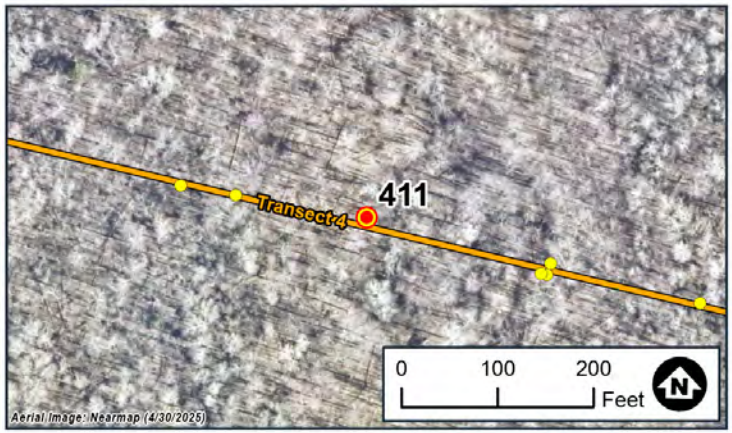



**Photo 411-2**





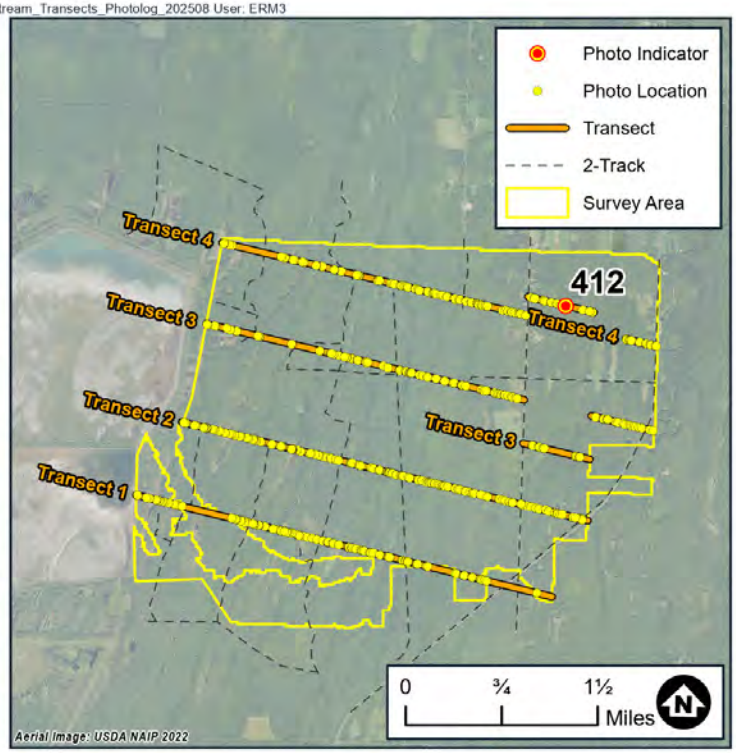

Page 411 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP29-A, Wetland
**Photo 2 Caption:** T4E-BP29-A, Upland

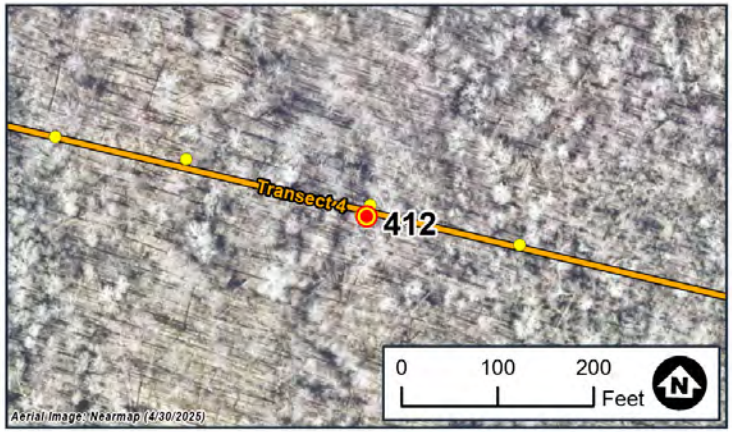
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

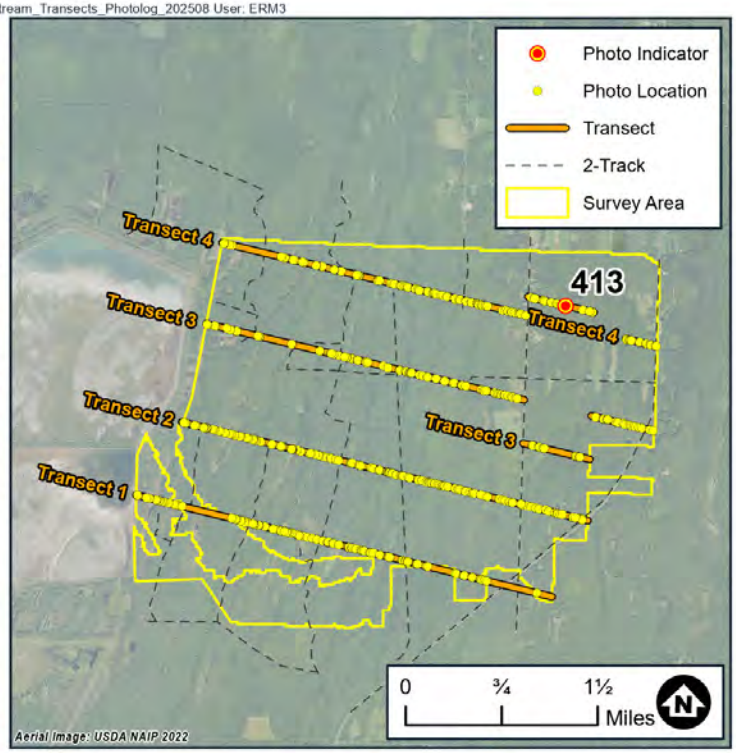
BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S07-LB, Upstream
**Photo 2 Caption:** T4E-S07-LB, Downstream

*Note: Photo locations are approximate*

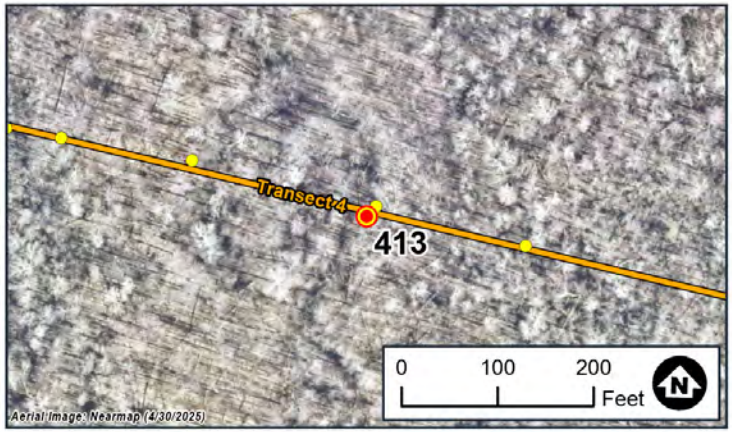
## Photo 413-1






## Photo 413-2







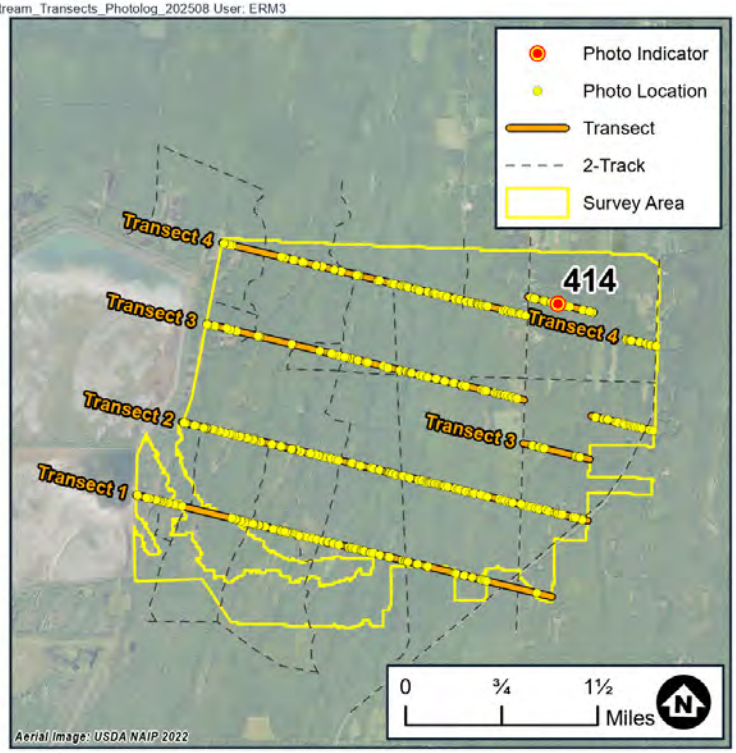

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-S07-RB, Upstream
**Photo 2 Caption:** T4E-S07-RB, Downstream

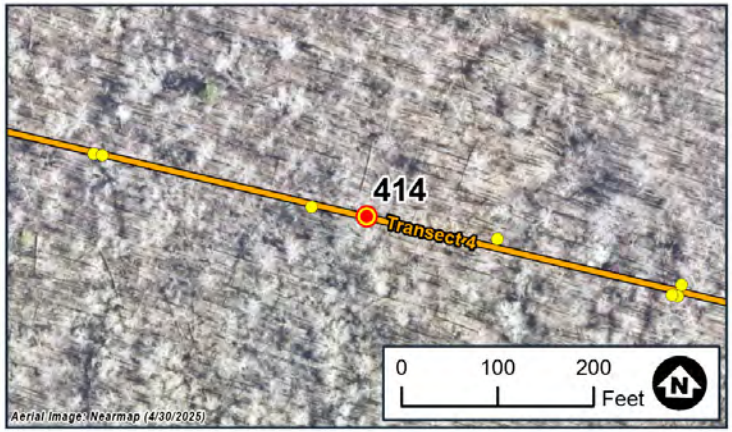
*Note: Photo locations are approximate*











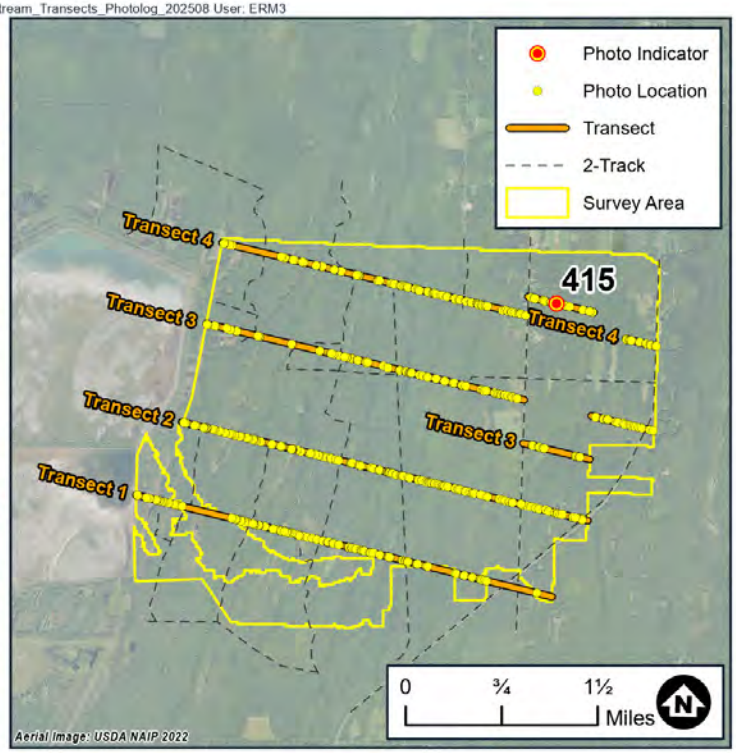

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP28-B, Wetland
**Photo 2 Caption:** T4E-BP28-B, Upland

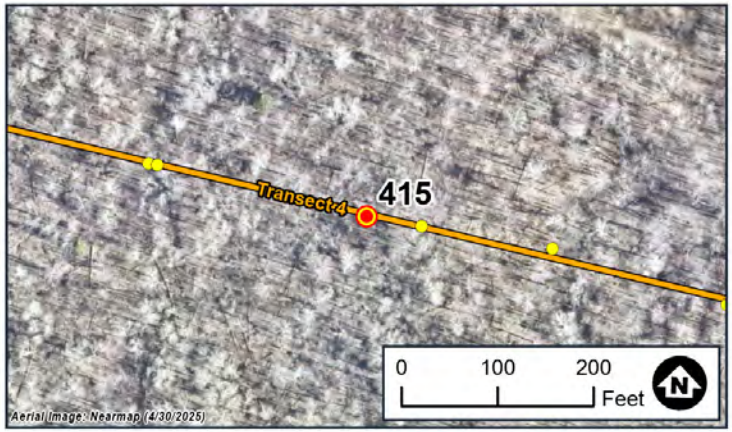
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP28-A, Wetland
**Photo 2 Caption:** T4E-BP28-A, Upland

*Note: Photo locations are approximate*

**Photo 416-1**



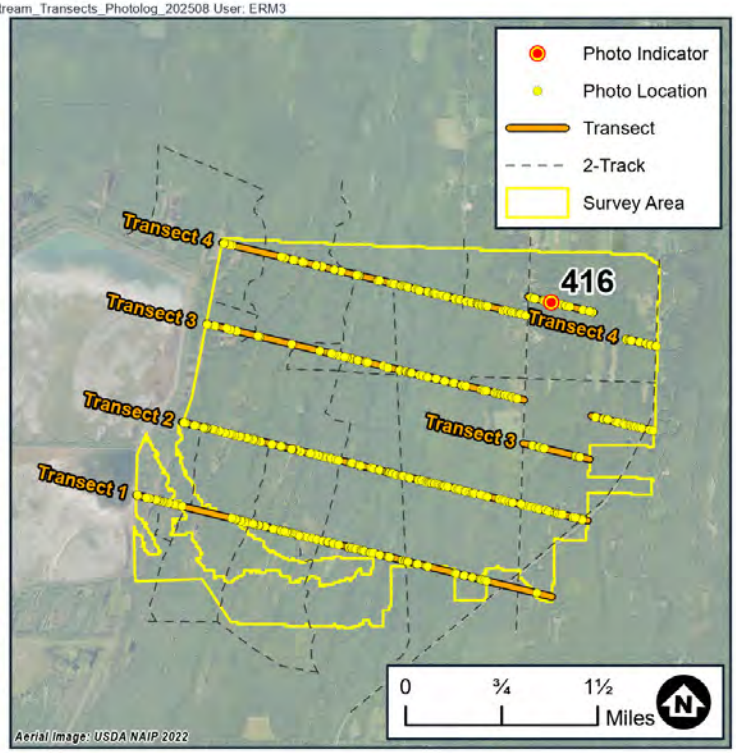
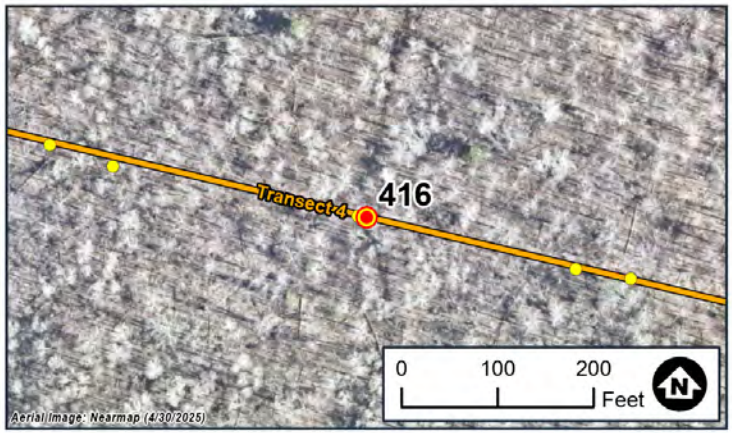



**Photo 416-2**






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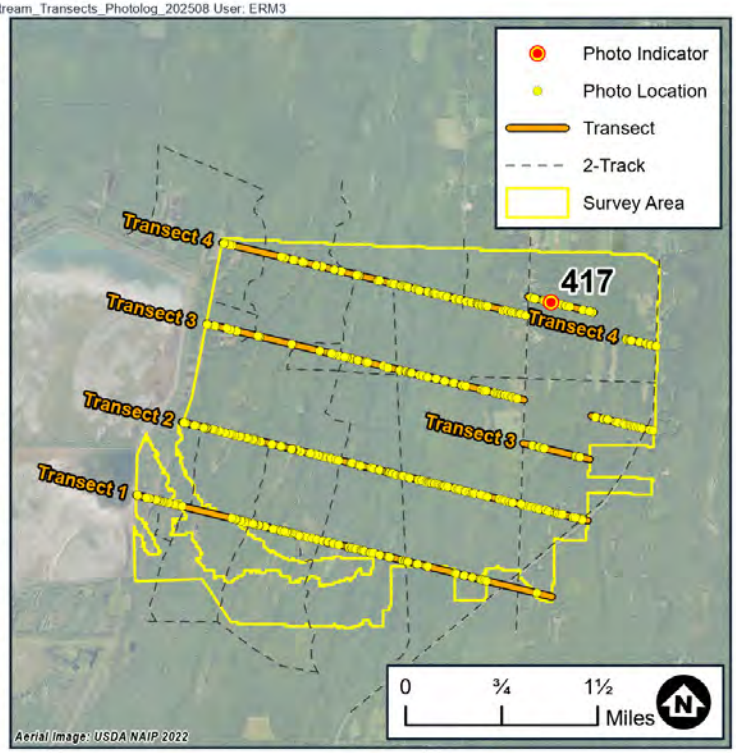
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP27-B, Wetland
**Photo 2 Caption:** T4E-BP27-B, Upland

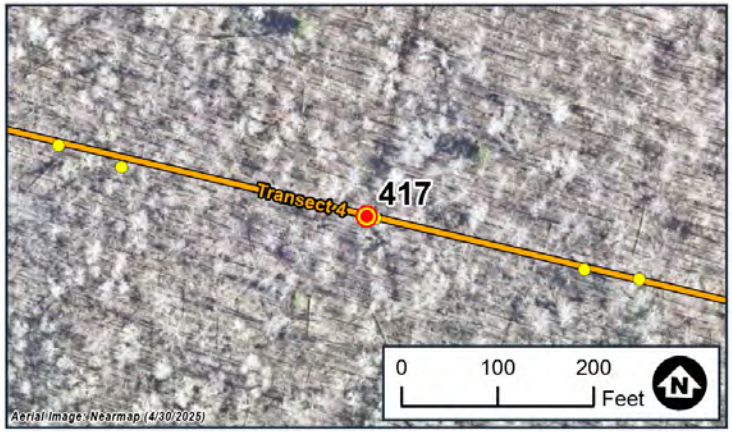
*Note: Photo locations are approximate*











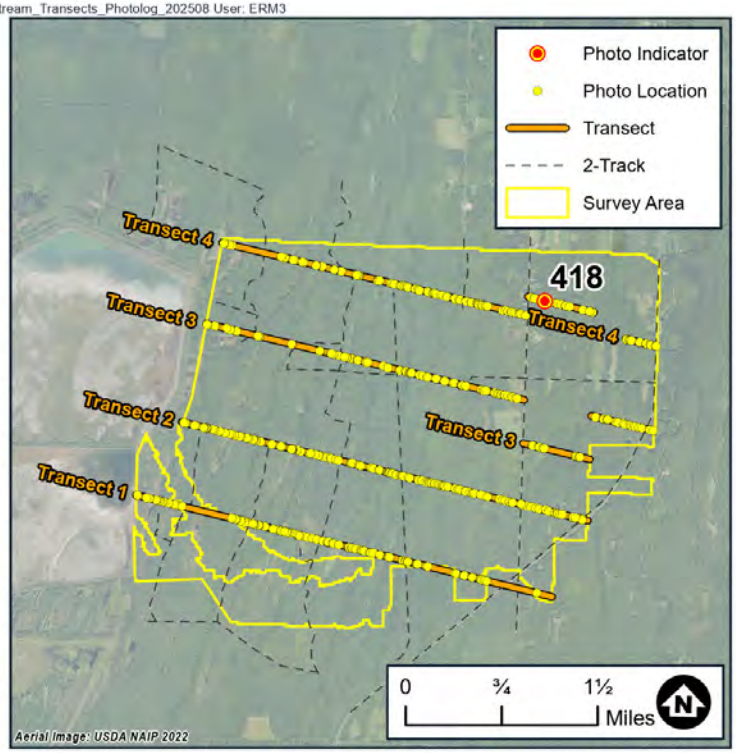

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP27-A, Wetland
**Photo 2 Caption:** T4E-BP27-A, Upland

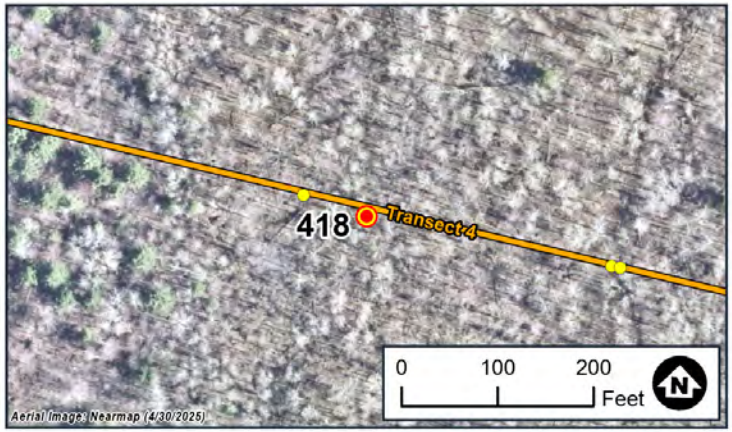
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP26-B, Wetland
**Photo 2 Caption:** T4E-BP26-B, Upland

*Note: Photo locations are approximate*

**Photo 419-1**



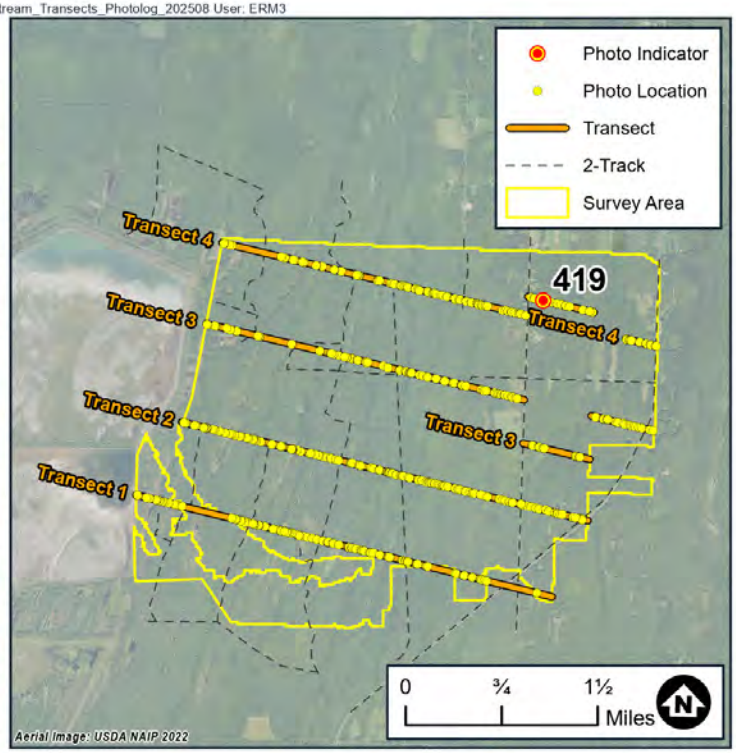
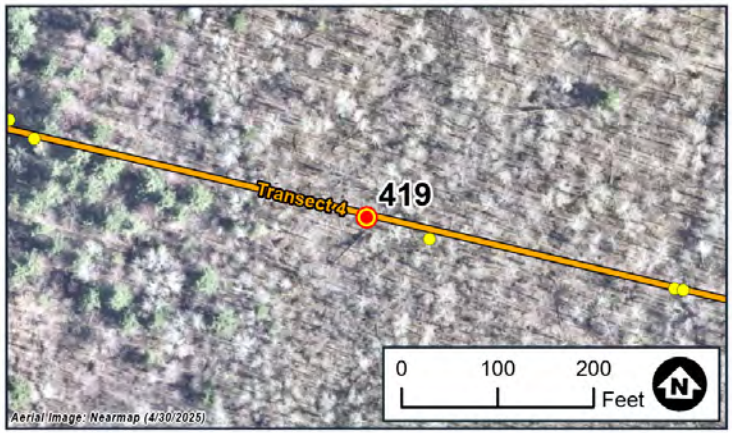



**Photo 419-2**








**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP26-A, Wetland
**Photo 2 Caption:** T4E-BP26-A, Upland

*Note: Photo locations are approximate*

**Photo 420-1**



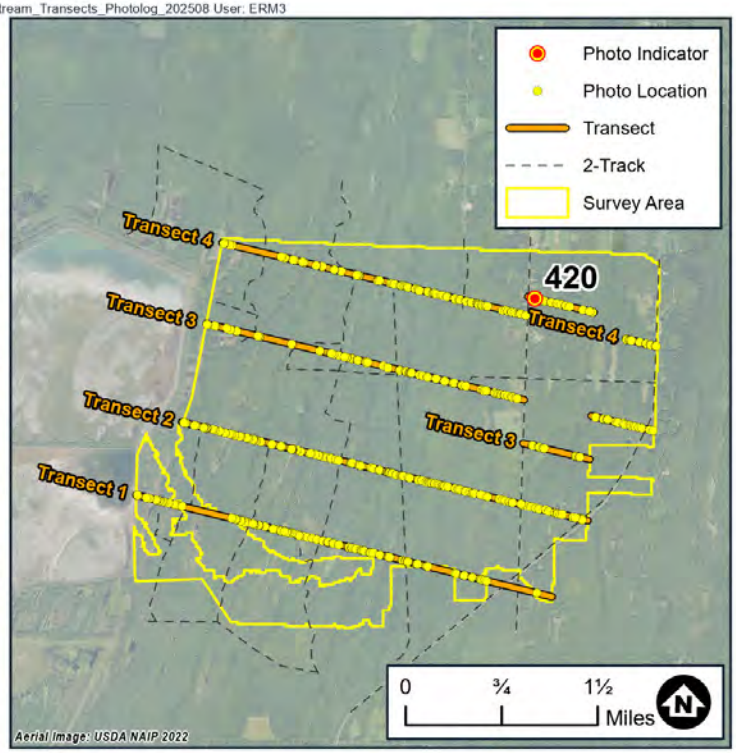
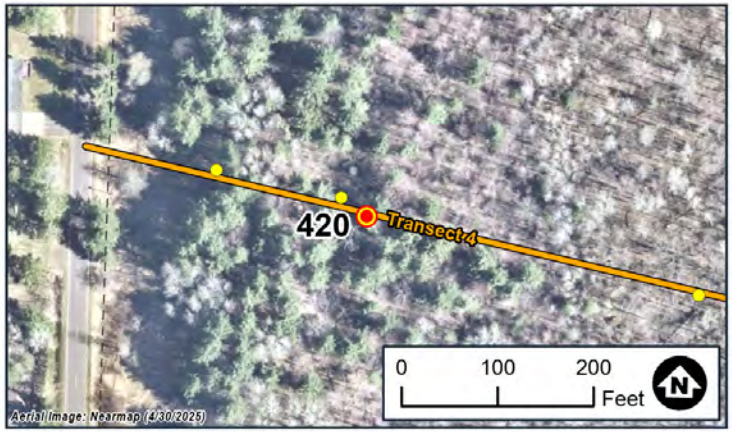



**Photo 420-2**






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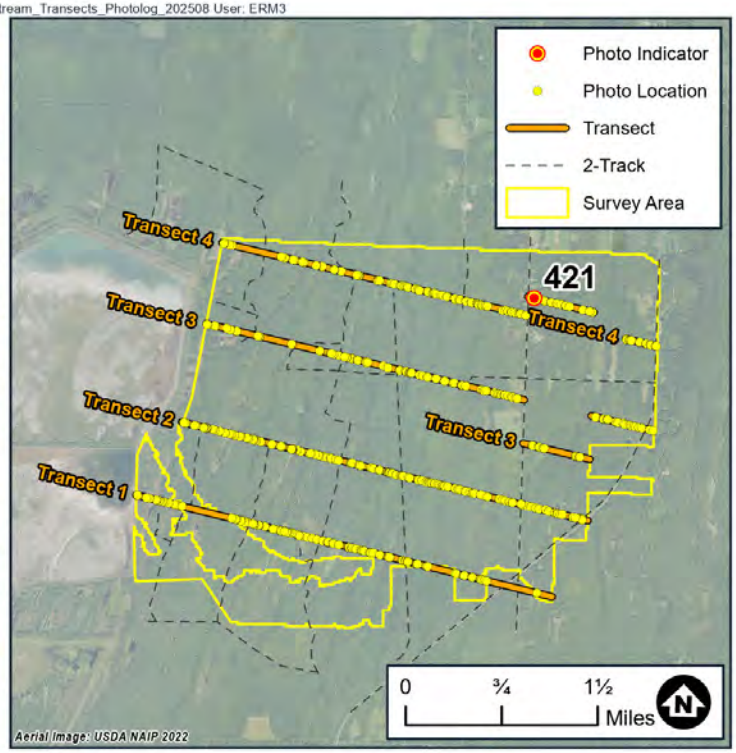
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP25-B, Wetland
**Photo 2 Caption:** T4E-BP25-B, Upland

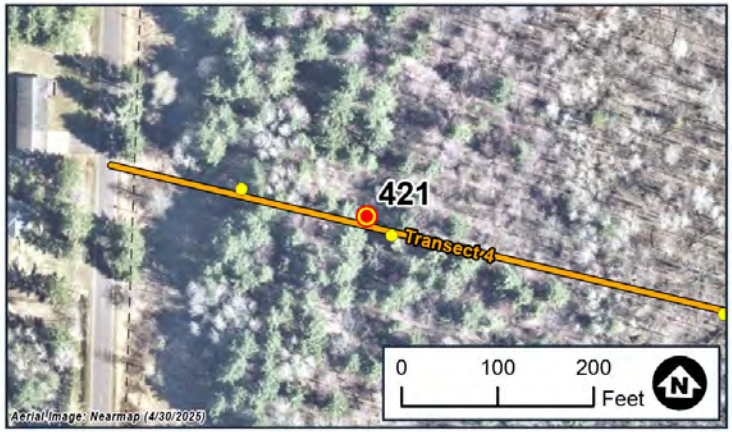
*Note: Photo locations are approximate*










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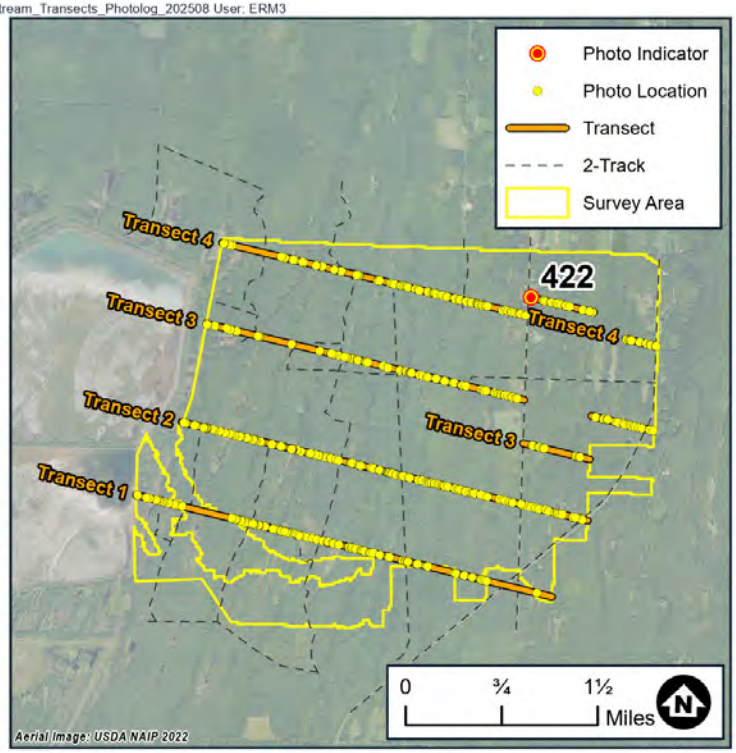
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP25-A, Wetland
**Photo 2 Caption:** T4E-BP25-A, Upland

*Note: Photo locations are approximate*











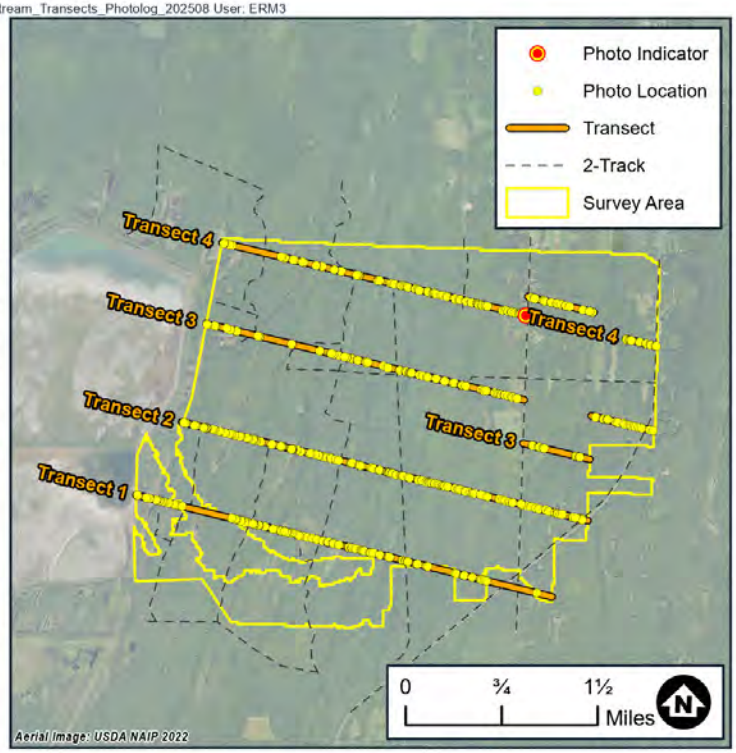

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 8/19/2025
**Photo 1 Caption:** T4E-BP24-B, Wetland
**Photo 2 Caption:** T4E-BP24-B, Upland

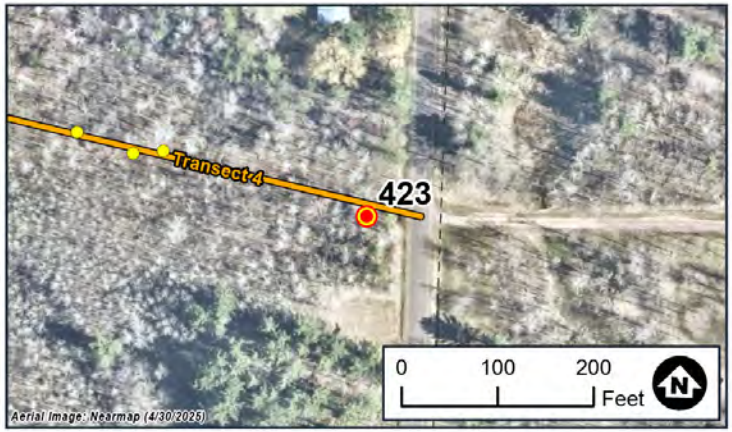
*Note: Photo locations are approximate*









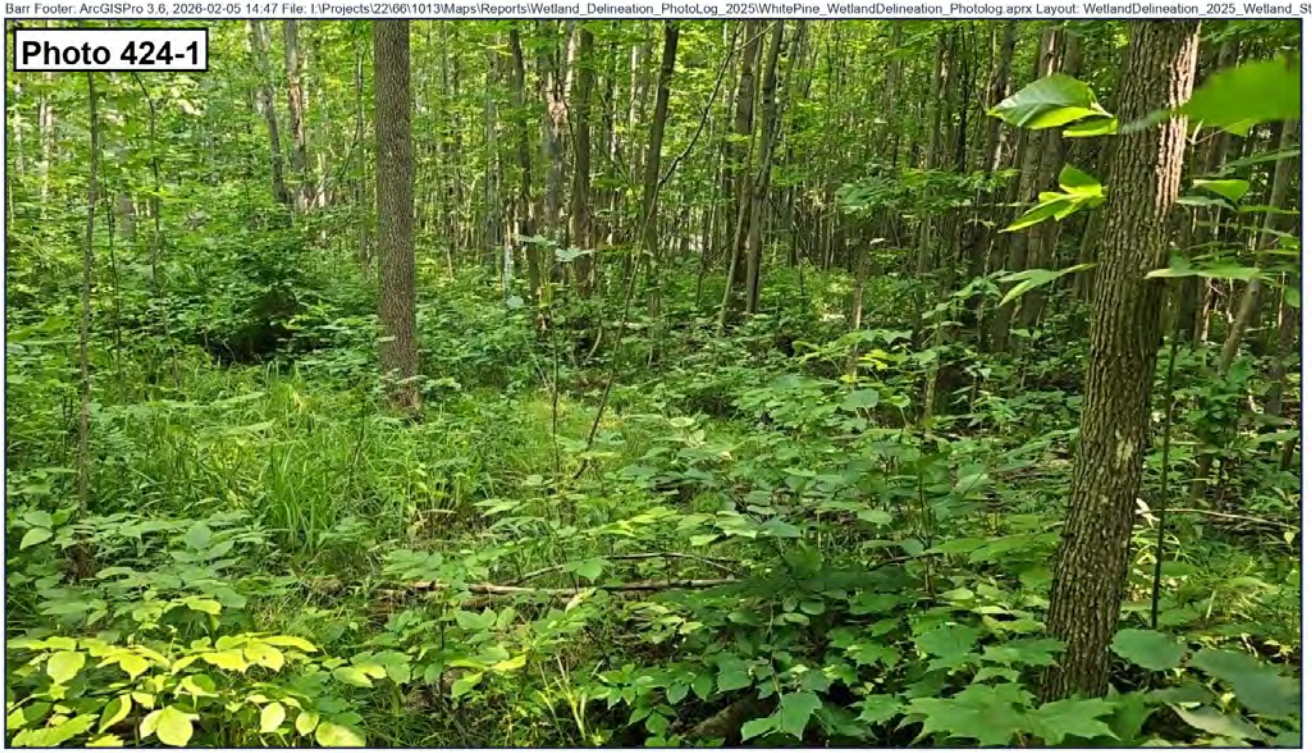


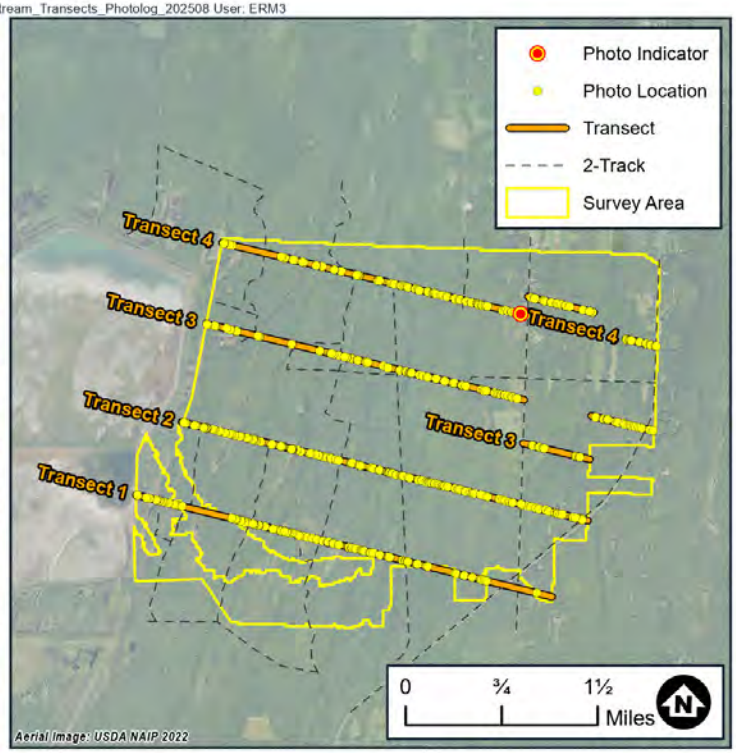

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP23-B, Wetland
**Photo 2 Caption:** T4E-BP23-B, Upland

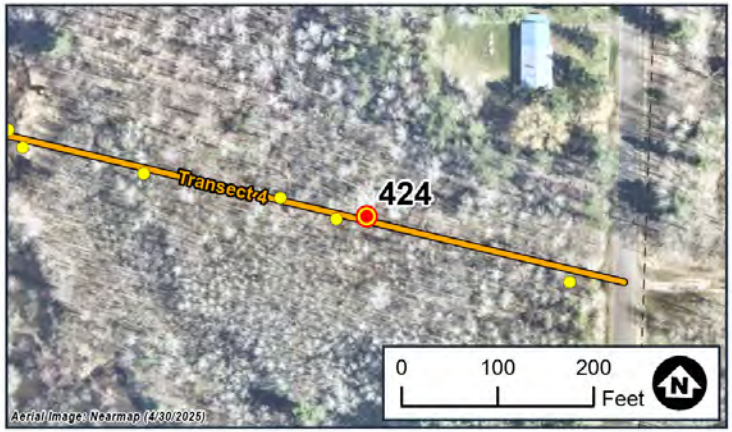
*Note: Photo locations are approximate*











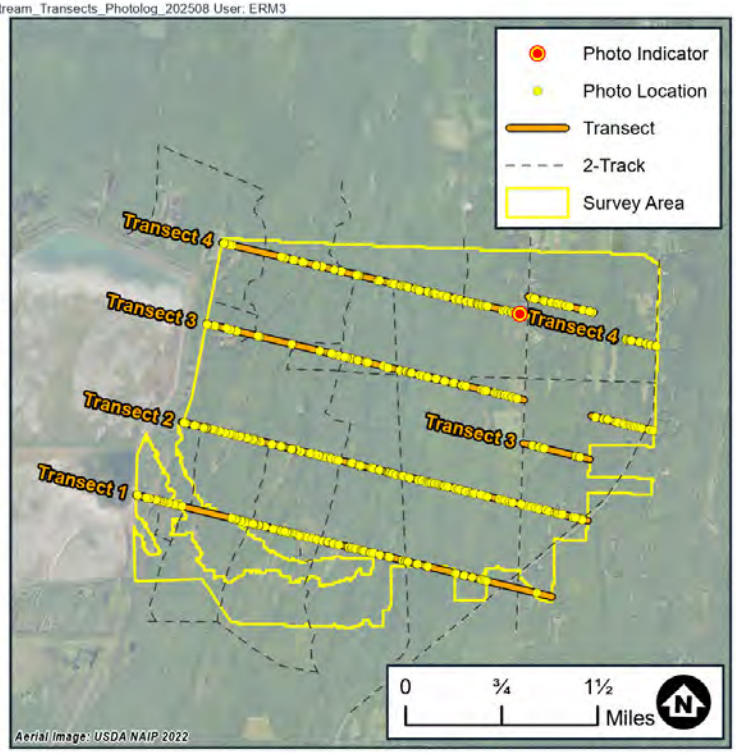

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP23-A, Wetland
**Photo 2 Caption:** T4E-BP23-A, Upland

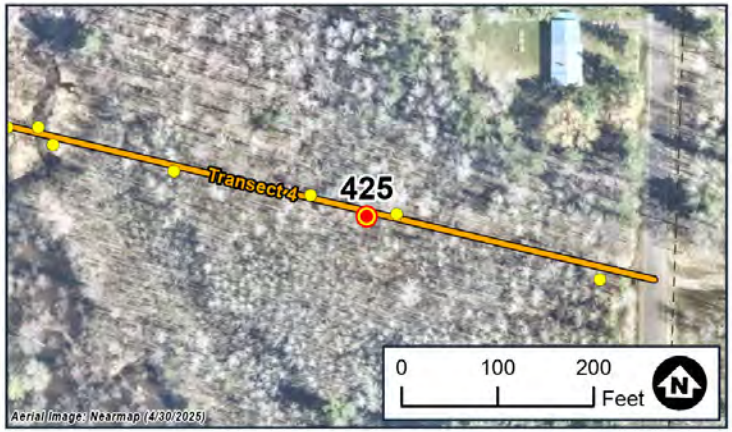
*Note: Photo locations are approximate*











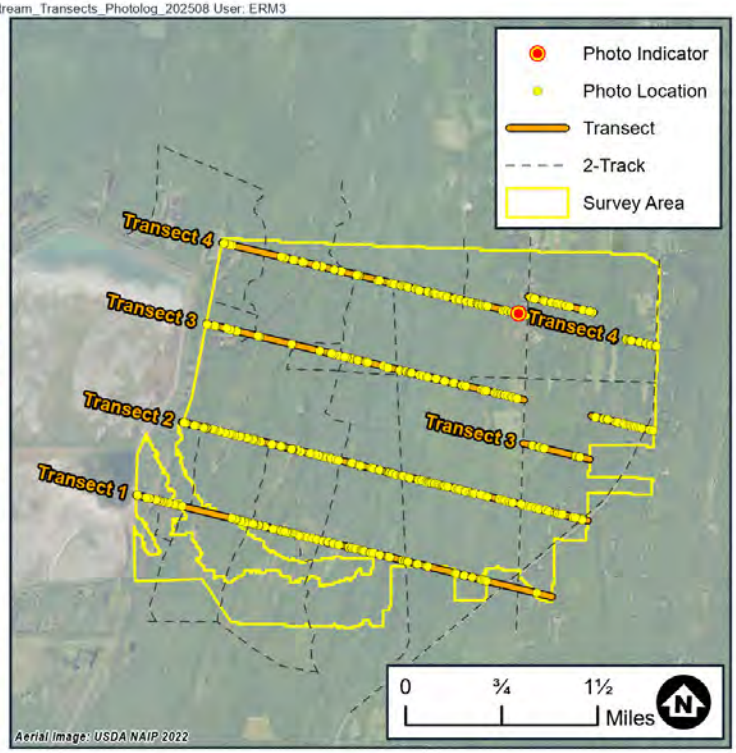

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP22-B, Wetland
**Photo 2 Caption:** T4E-BP22-B, Upland

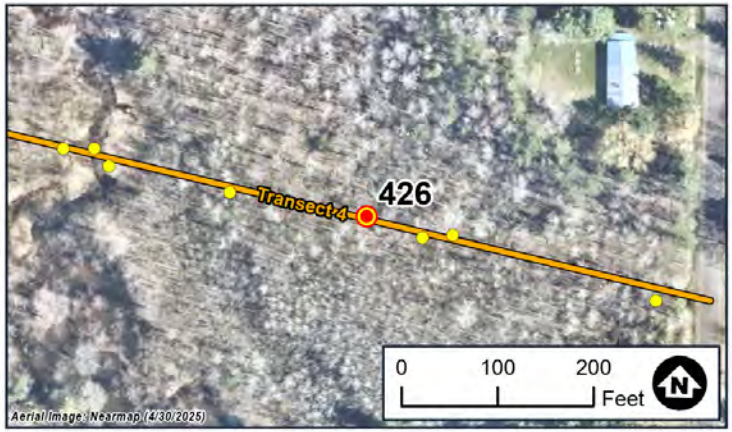
*Note: Photo locations are approximate*











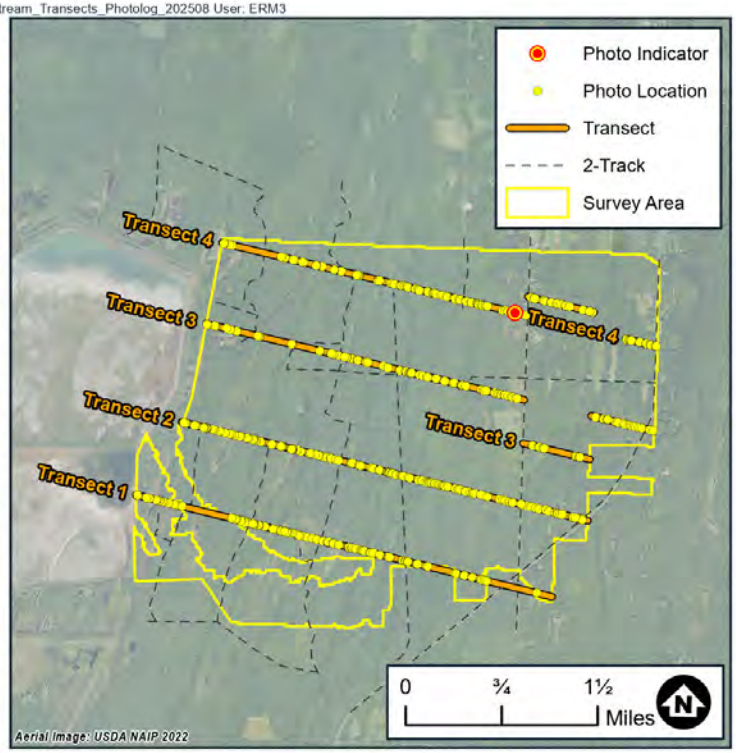

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP22-A, Wetland
**Photo 2 Caption:** T4E-BP22-A, Upland

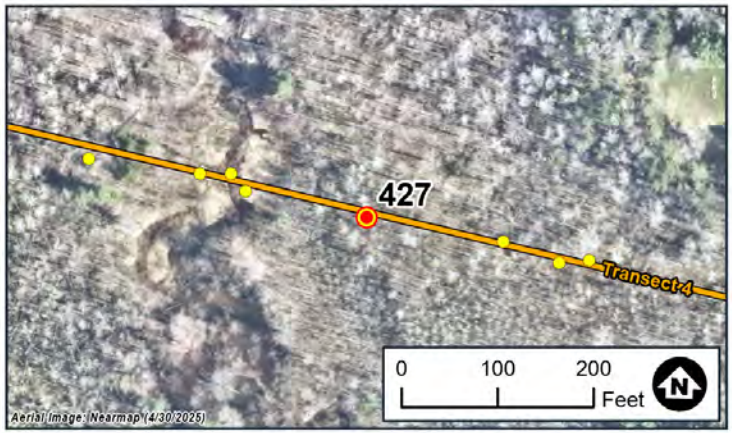
*Note: Photo locations are approximate*










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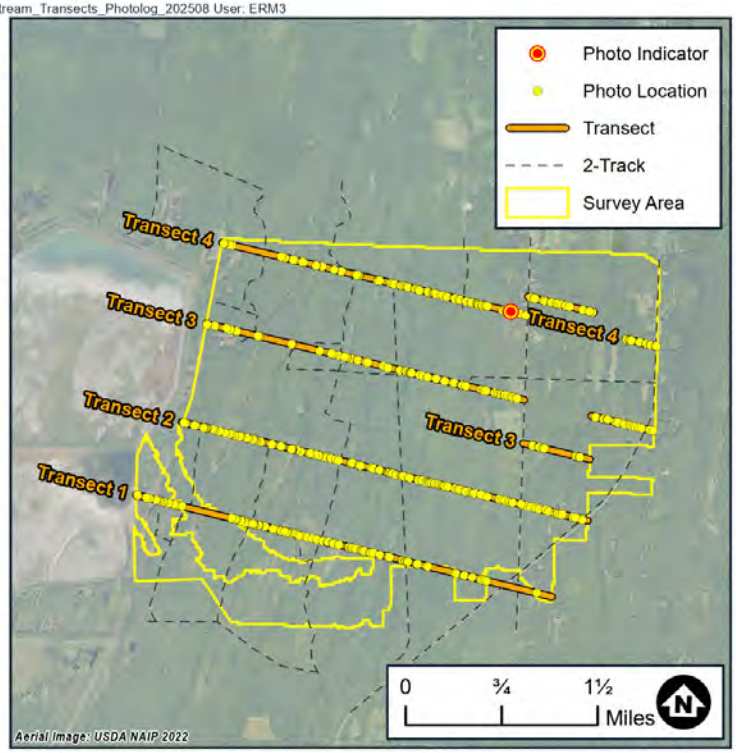
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP21-B, Wetland
**Photo 2 Caption:** T4E-BP21-B, Upland

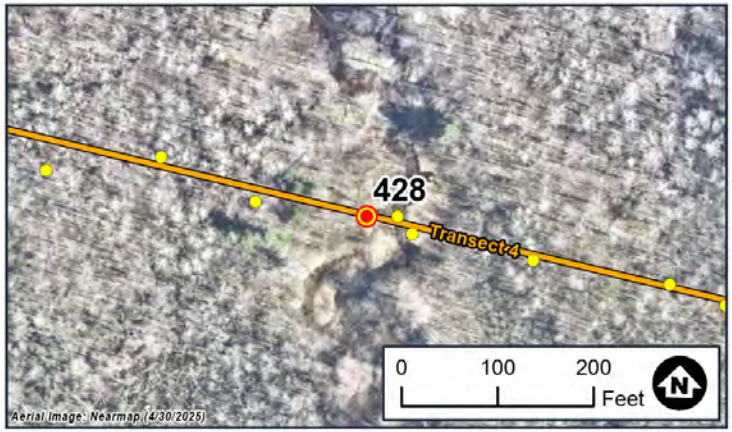
*Note: Photo locations are approximate*











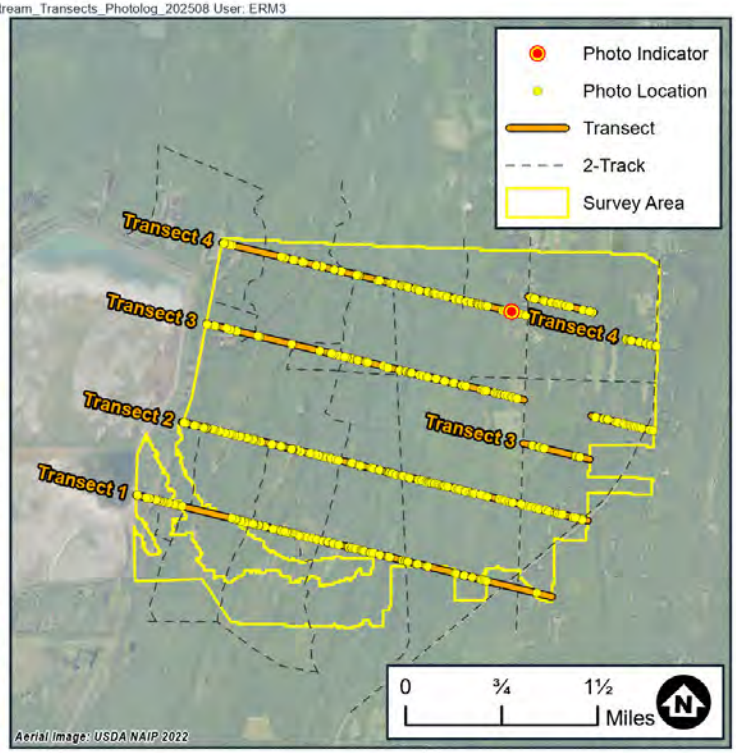

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP21-A, Wetland
**Photo 2 Caption:** T4E-BP21-A, Upland

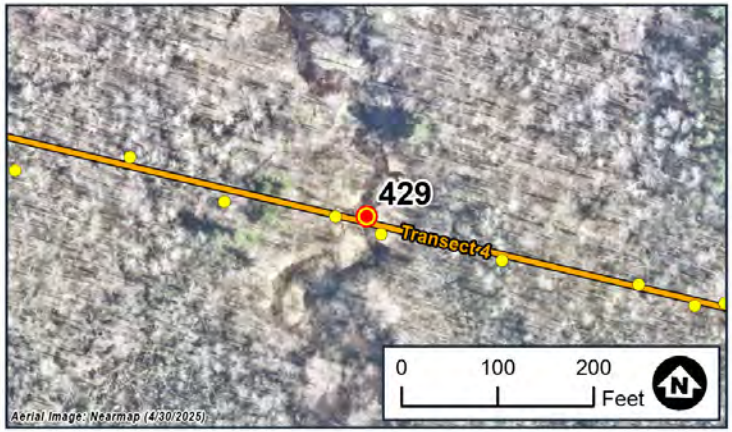
*Note: Photo locations are approximate*







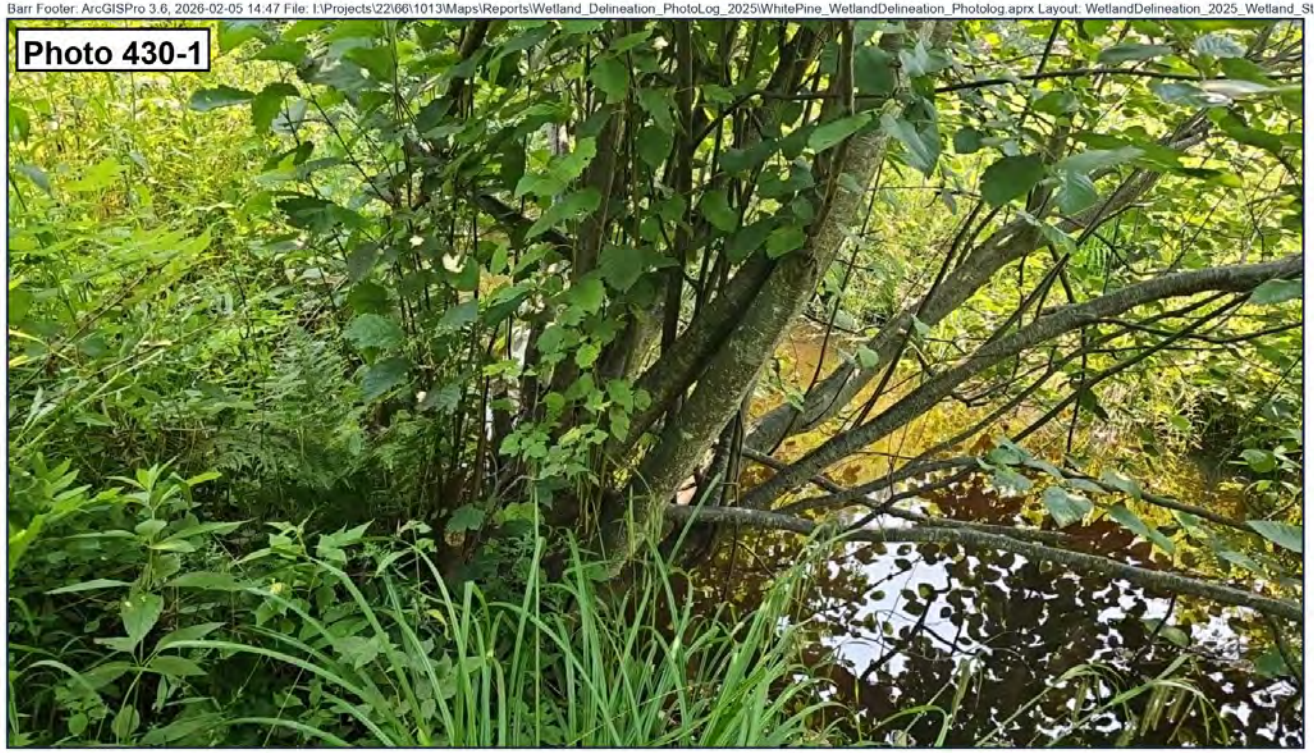


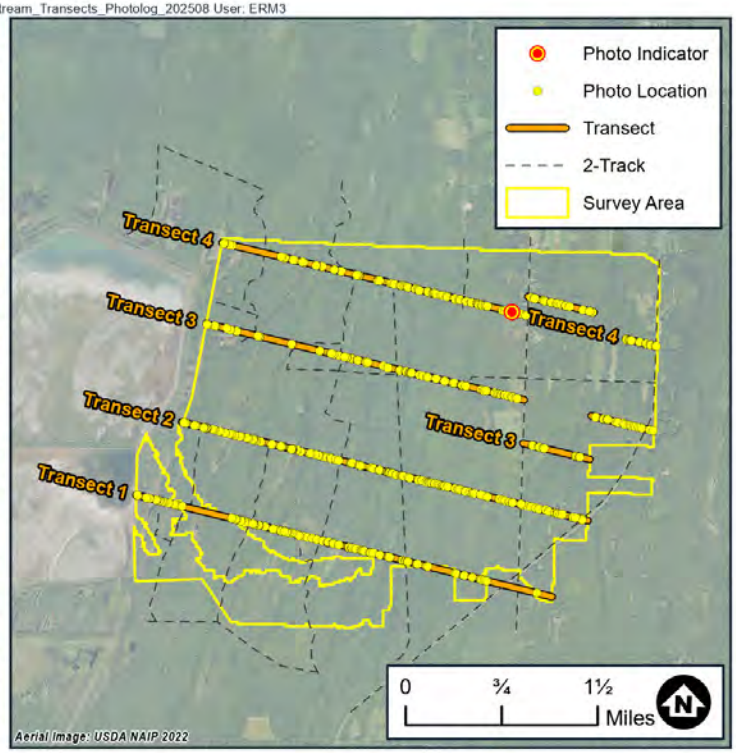

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

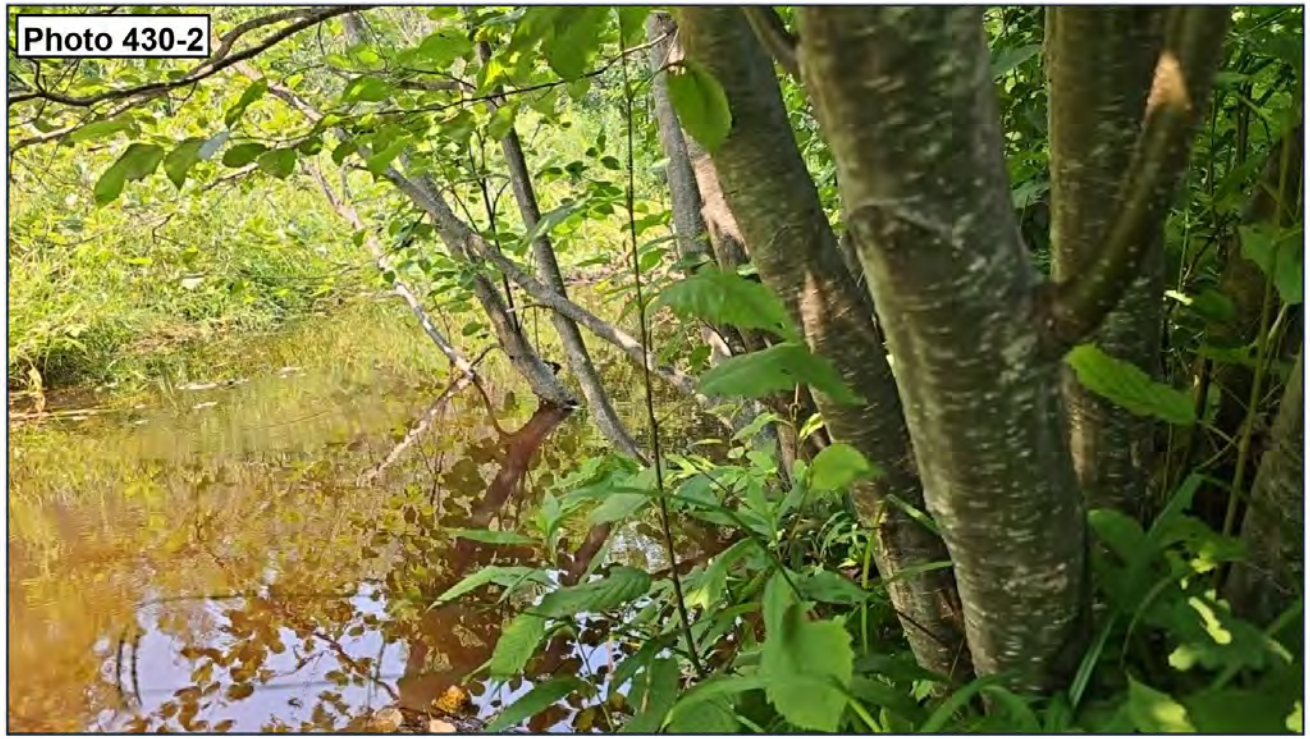
BARR

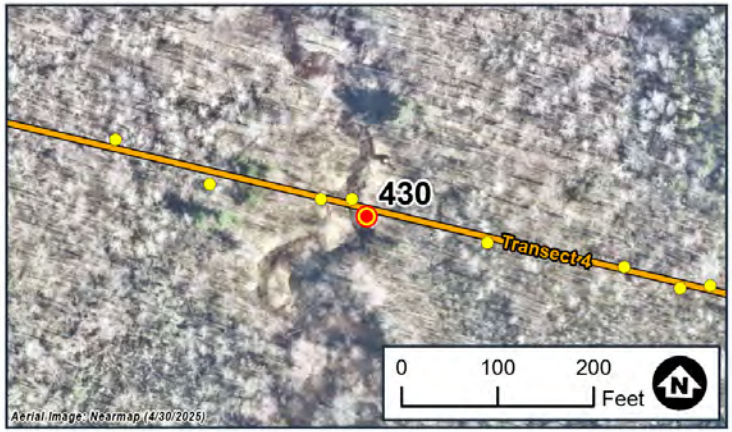
**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S06-LB, Upstream
**Photo 2 Caption:** T4E-S06-LB, Downstream

*Note: Photo locations are approximate*



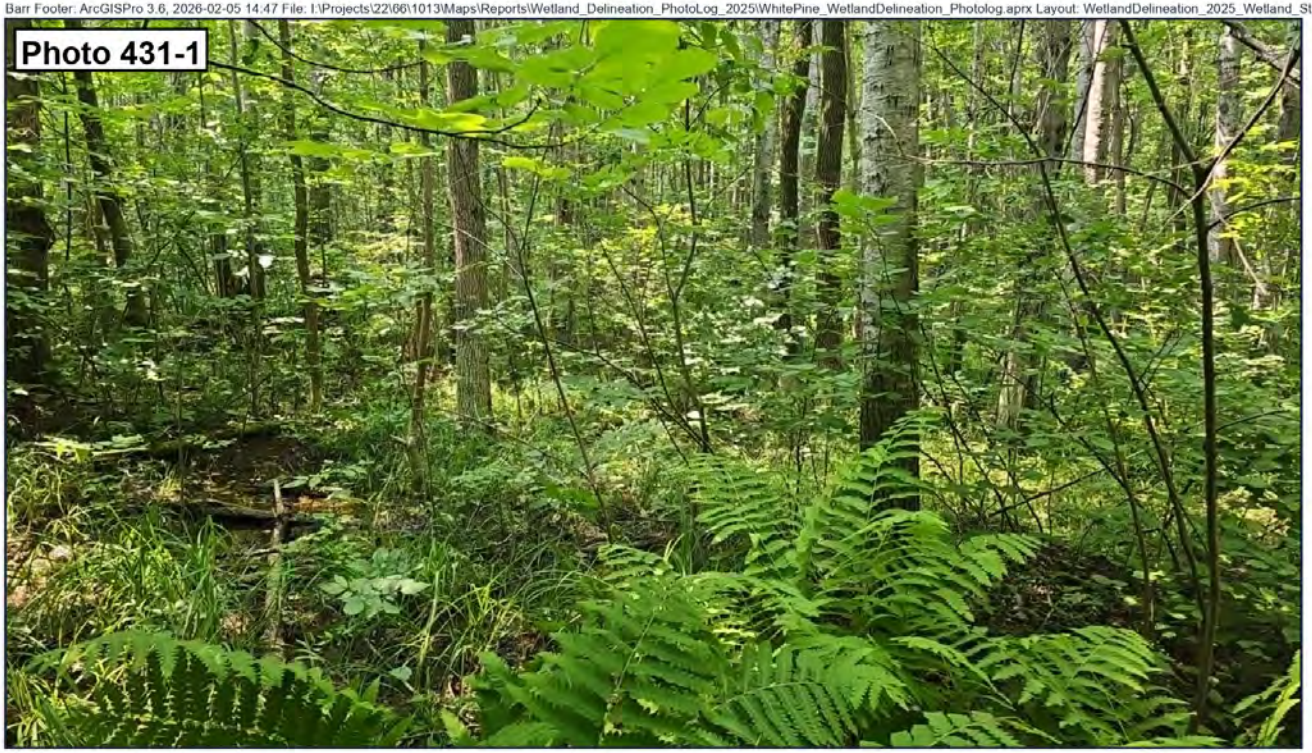

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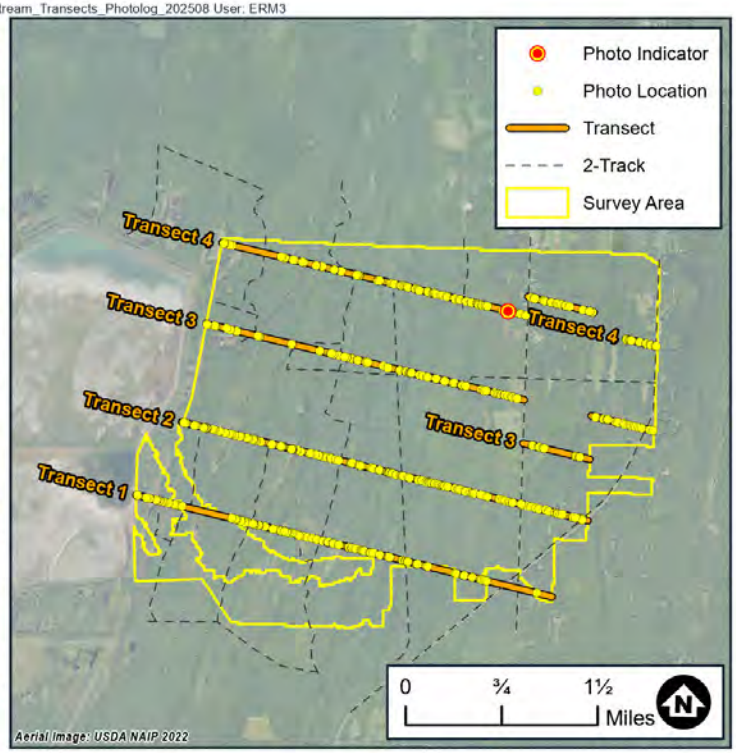
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S06-RB, Upstream
**Photo 2 Caption:** T4E-S06-RB, Downstream

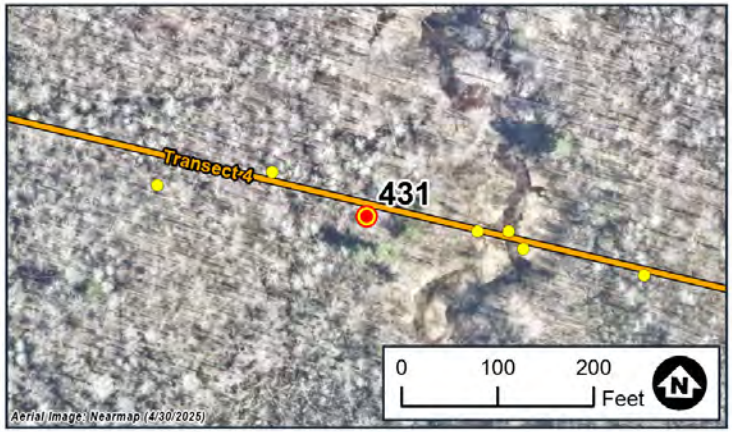
*Note: Photo locations are approximate*











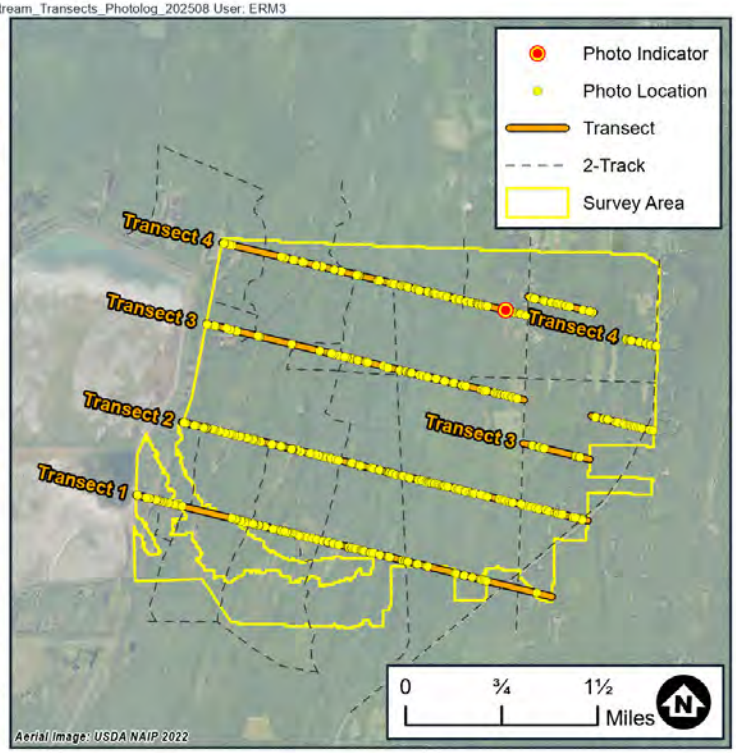

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP20-B, Wetland
**Photo 2 Caption:** T4E-BP20-B, Upland

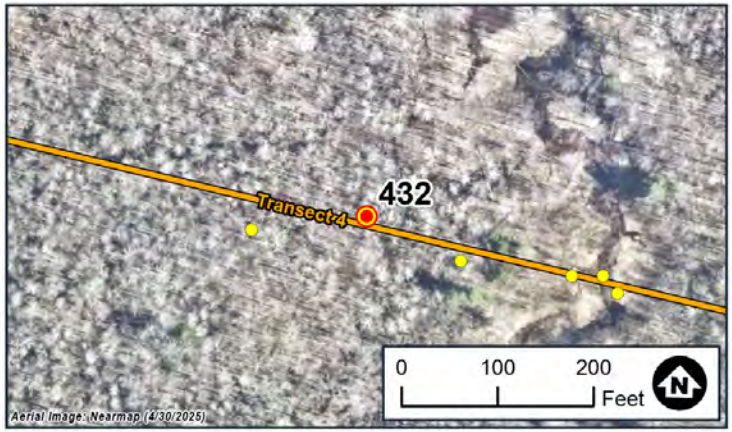
*Note: Photo locations are approximate*










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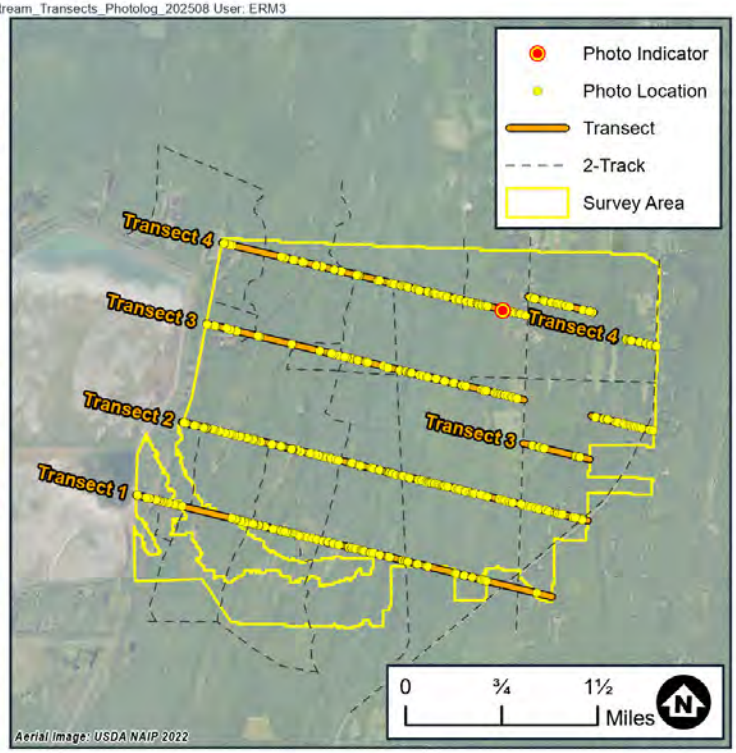
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP20-A, Wetland
**Photo 2 Caption:** T4E-BP20-A, Upland

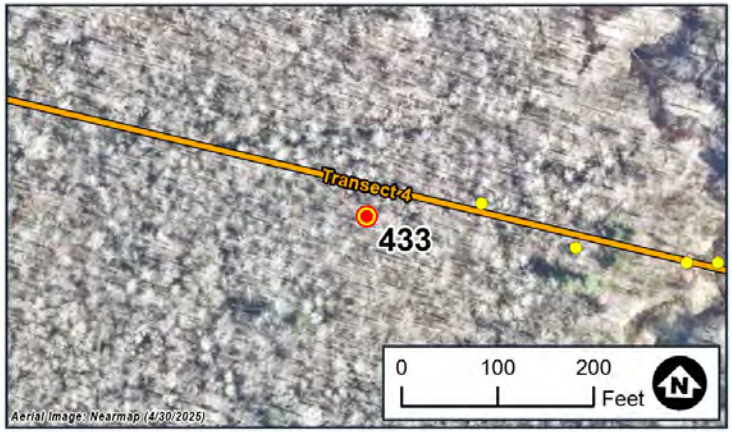
*Note: Photo locations are approximate*











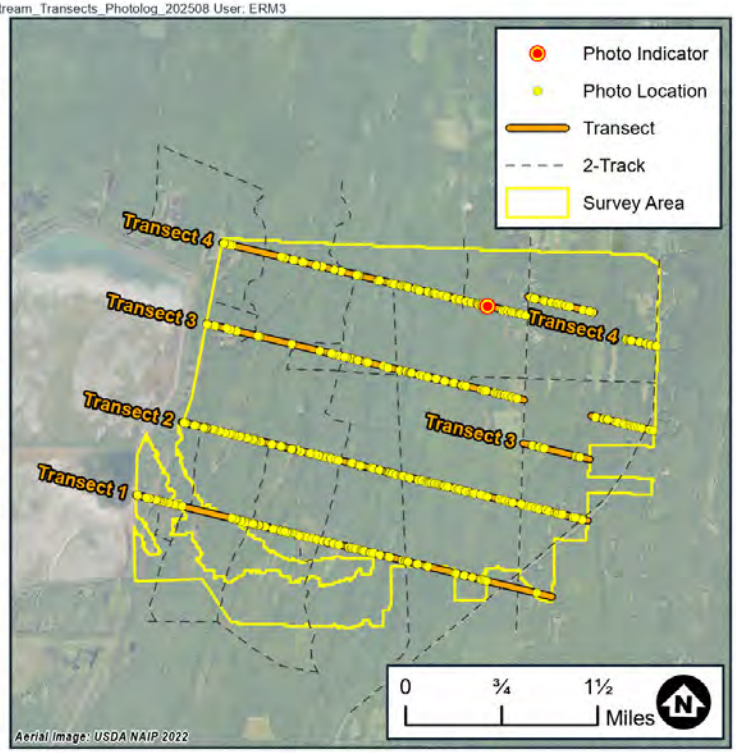

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP19-B, Wetland
**Photo 2 Caption:** T4E-BP19-B, Upland

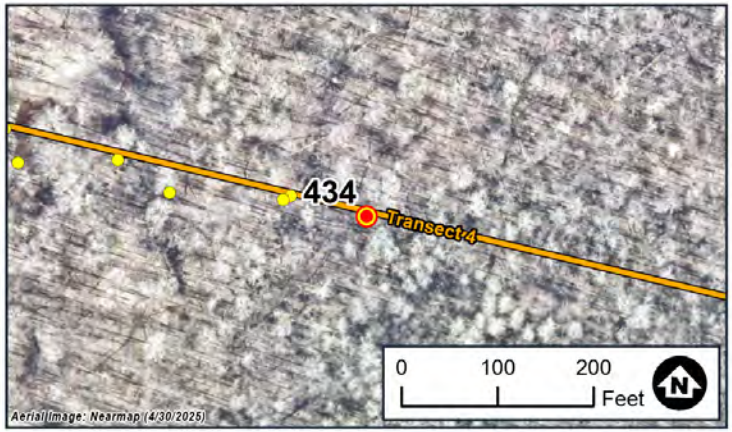
*Note: Photo locations are approximate*










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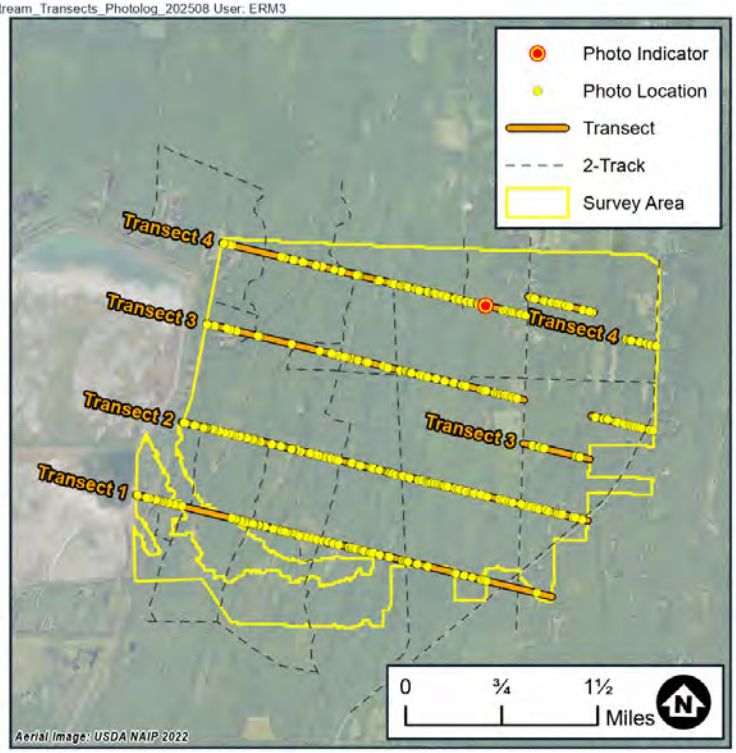
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP19-A, Wetland
**Photo 2 Caption:** T4E-BP19-A, Upland

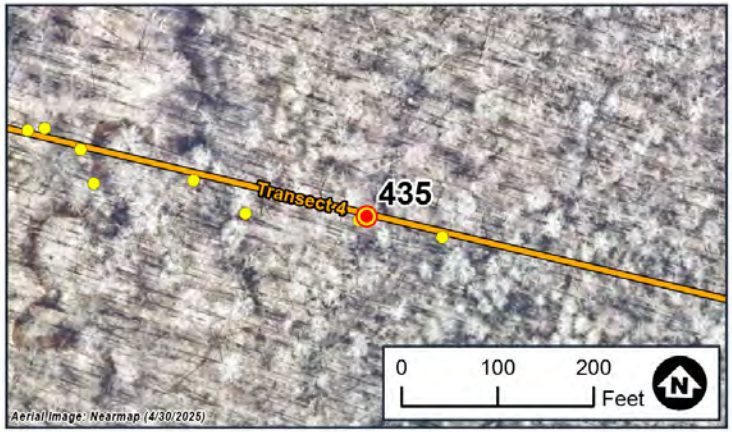
*Note: Photo locations are approximate*











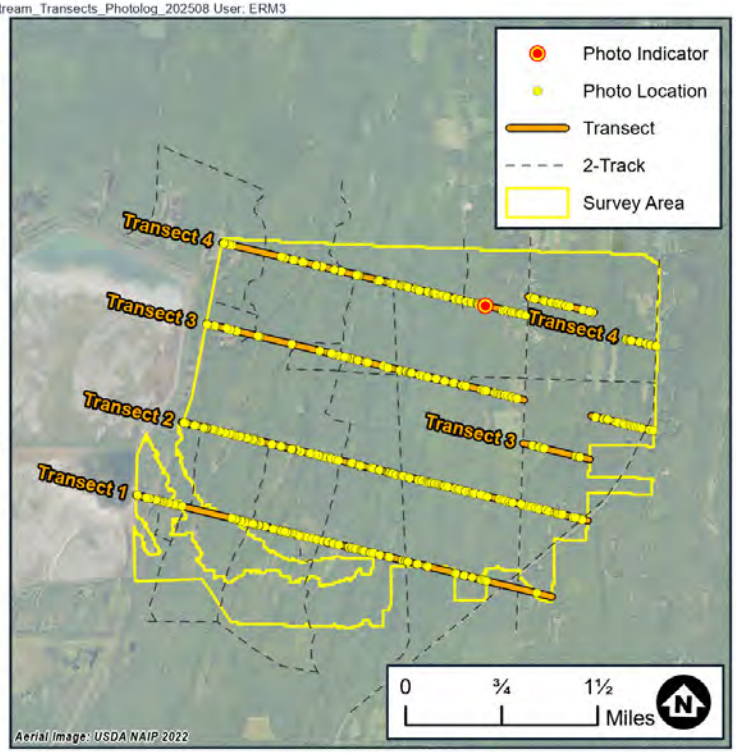

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP18-A, Wetland
**Photo 2 Caption:** T4E-BP18-A, Upland

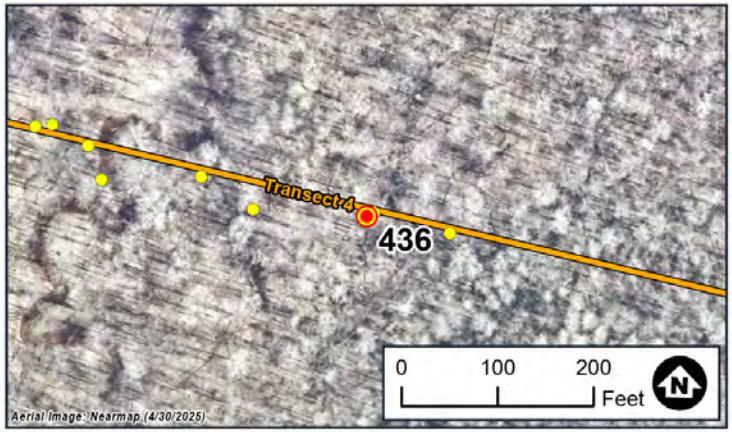
*Note: Photo locations are approximate*









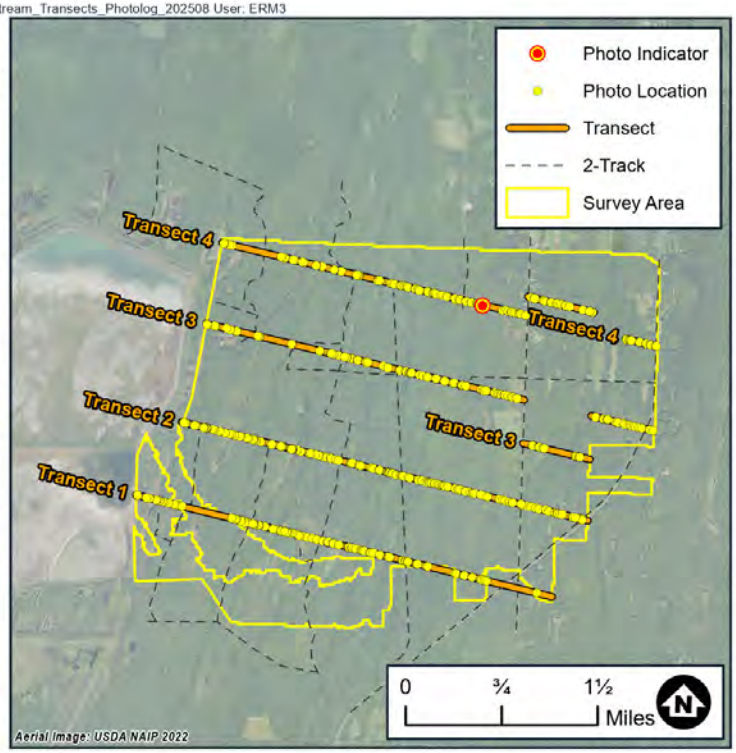

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP18-B, Wetland
**Photo 2 Caption:** T4E-BP18-B, Upland

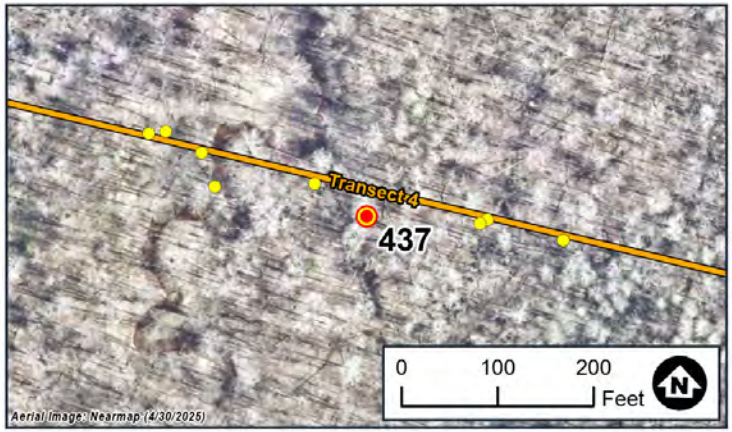
*Note: Photo locations are approximate*











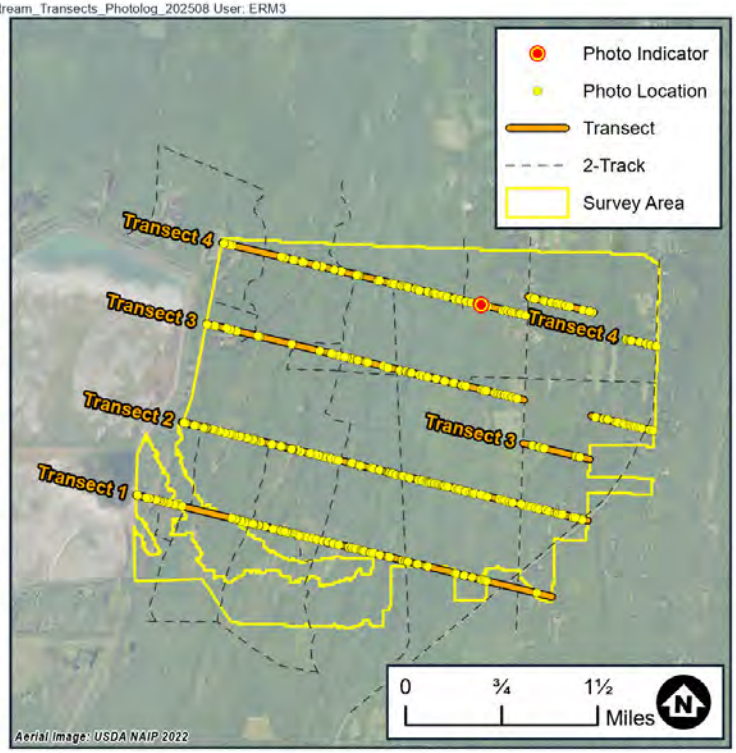

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP17-B, Wetland
**Photo 2 Caption:** T4E-BP17-B, Upland

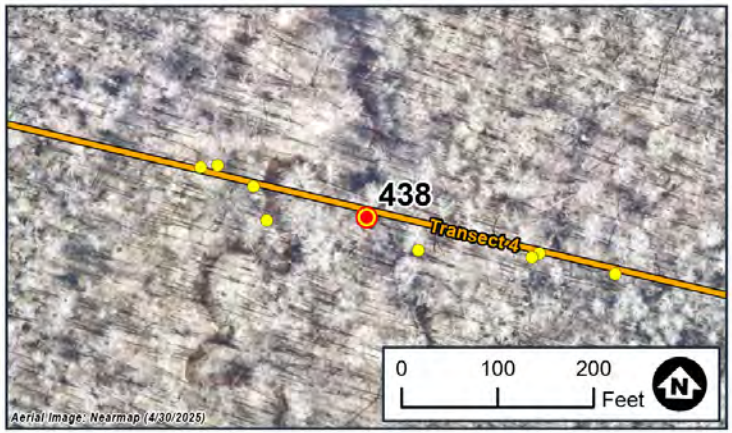
*Note: Photo locations are approximate*











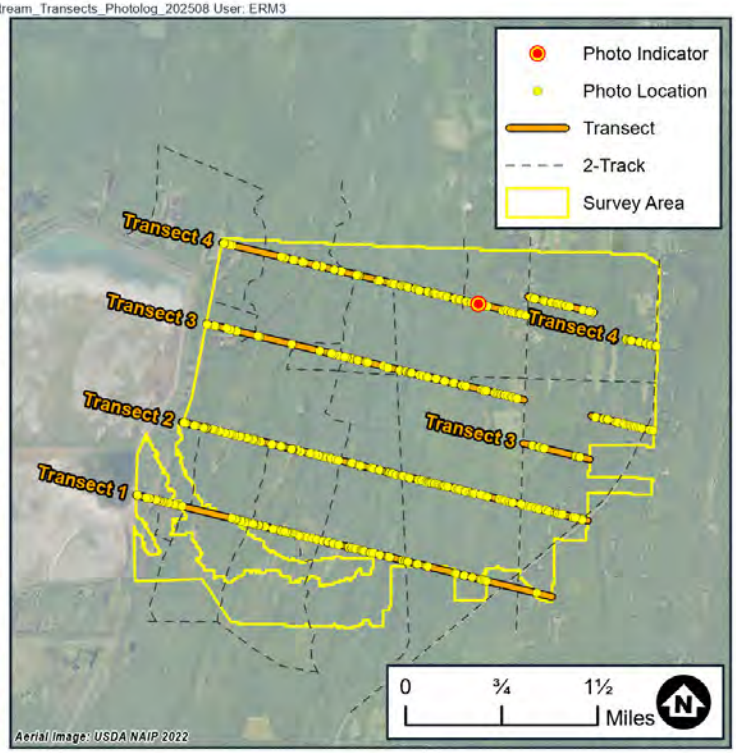

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP17-A, Wetland
**Photo 2 Caption:** T4E-BP17-A, Upland

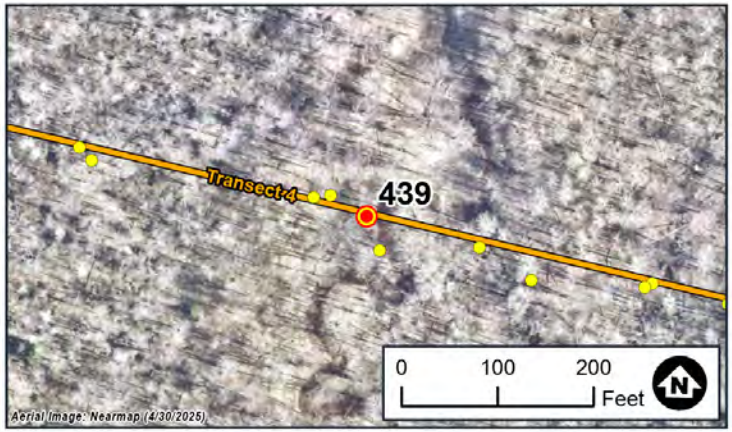
*Note: Photo locations are approximate*











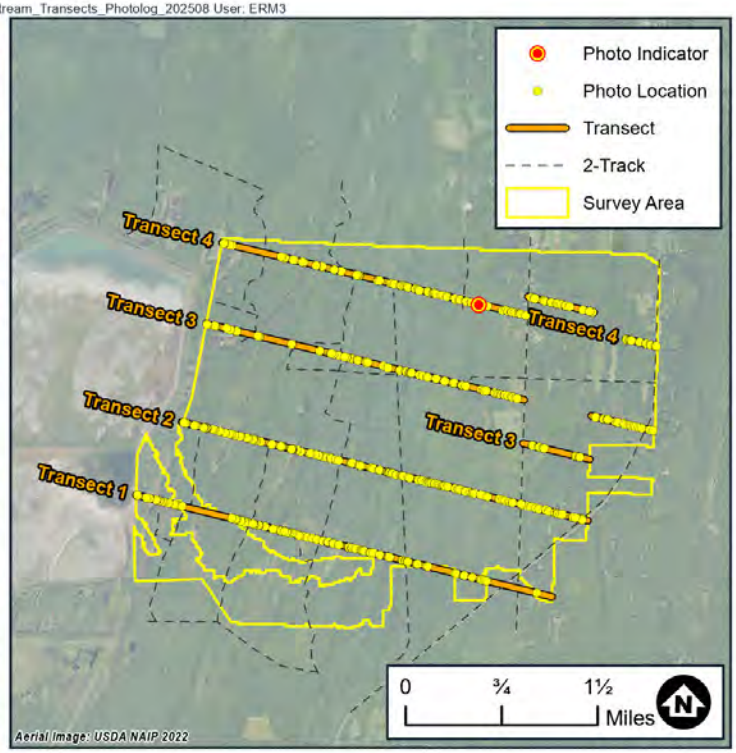

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S05-LB, Upstream
**Photo 2 Caption:** T4E-S05-LB, Downstream

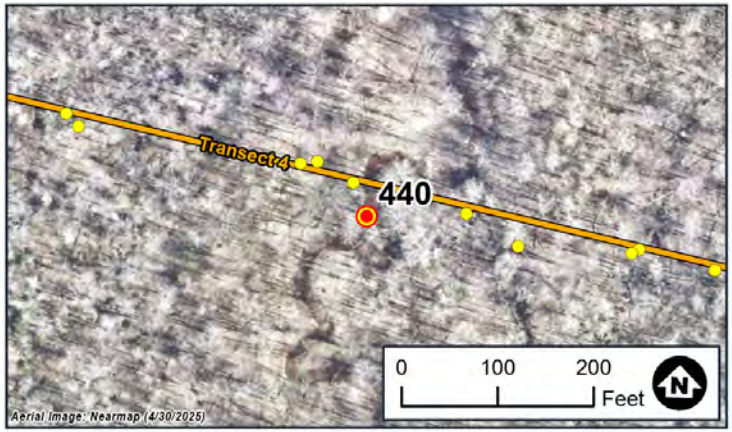
*Note: Photo locations are approximate*









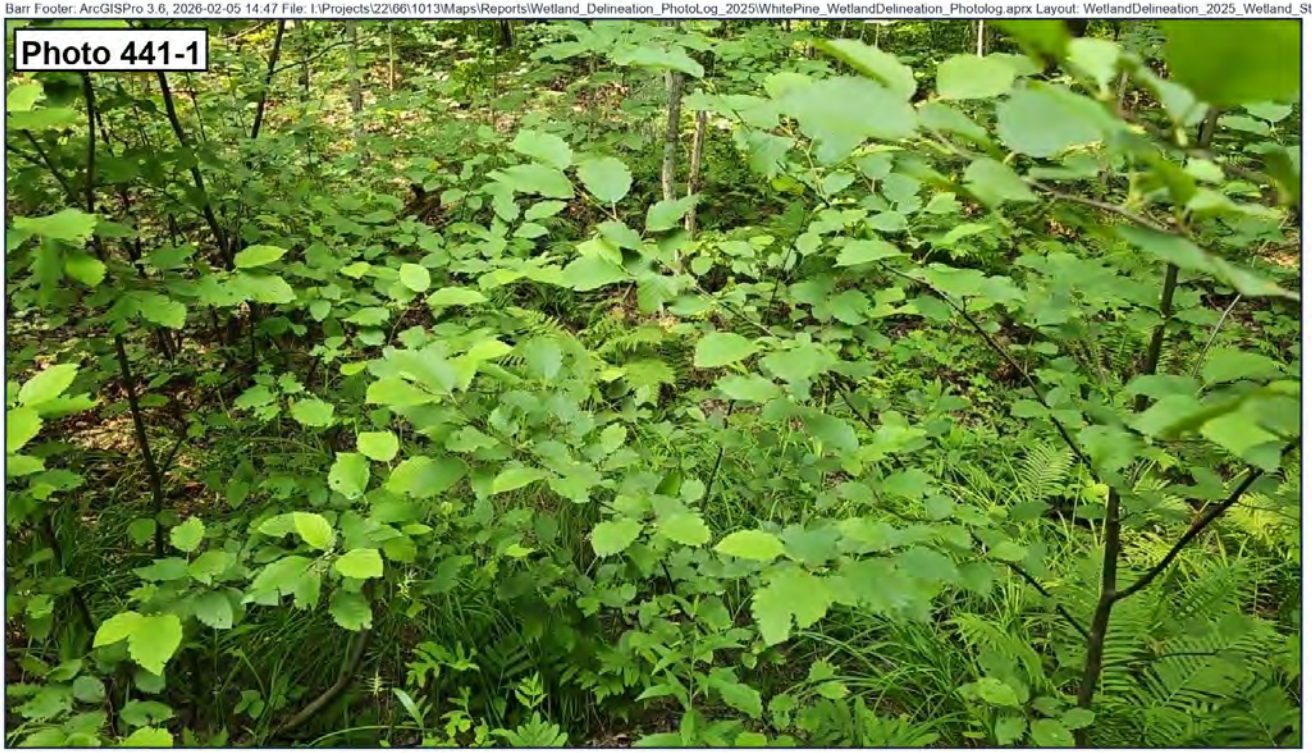


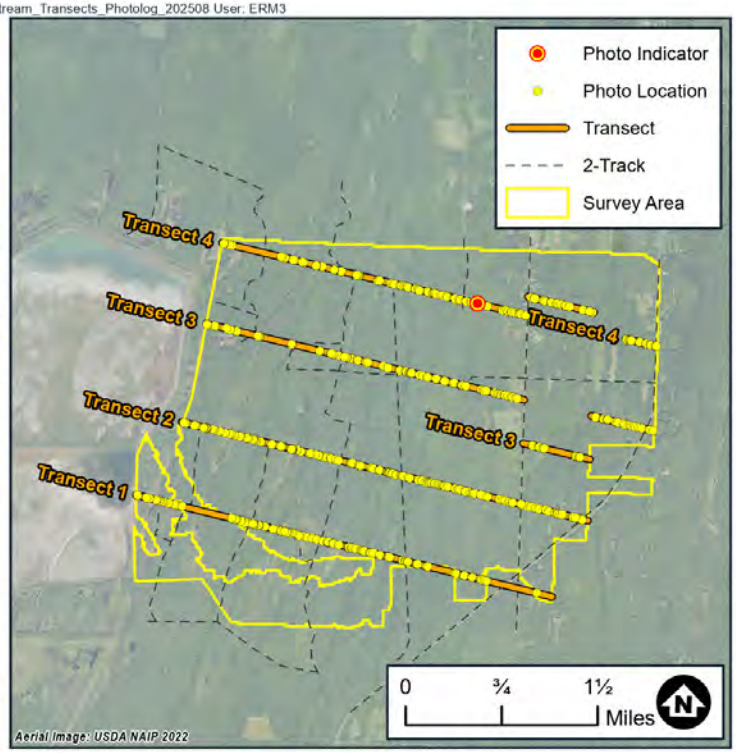

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S05-RB, Upstream
**Photo 2 Caption:** T4E-S05-RB, Downstream

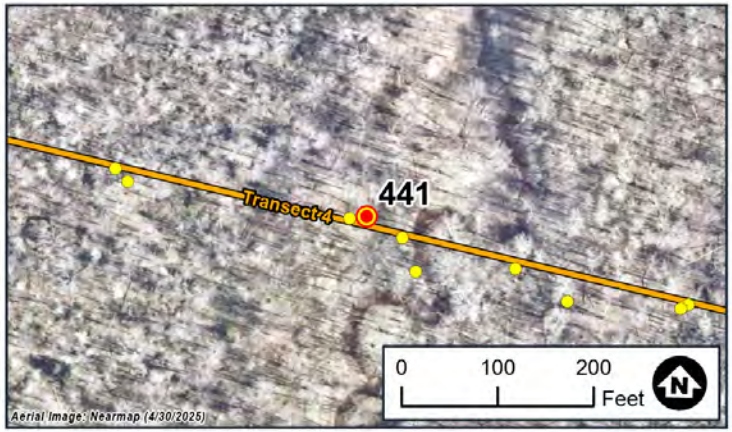
*Note: Photo locations are approximate*









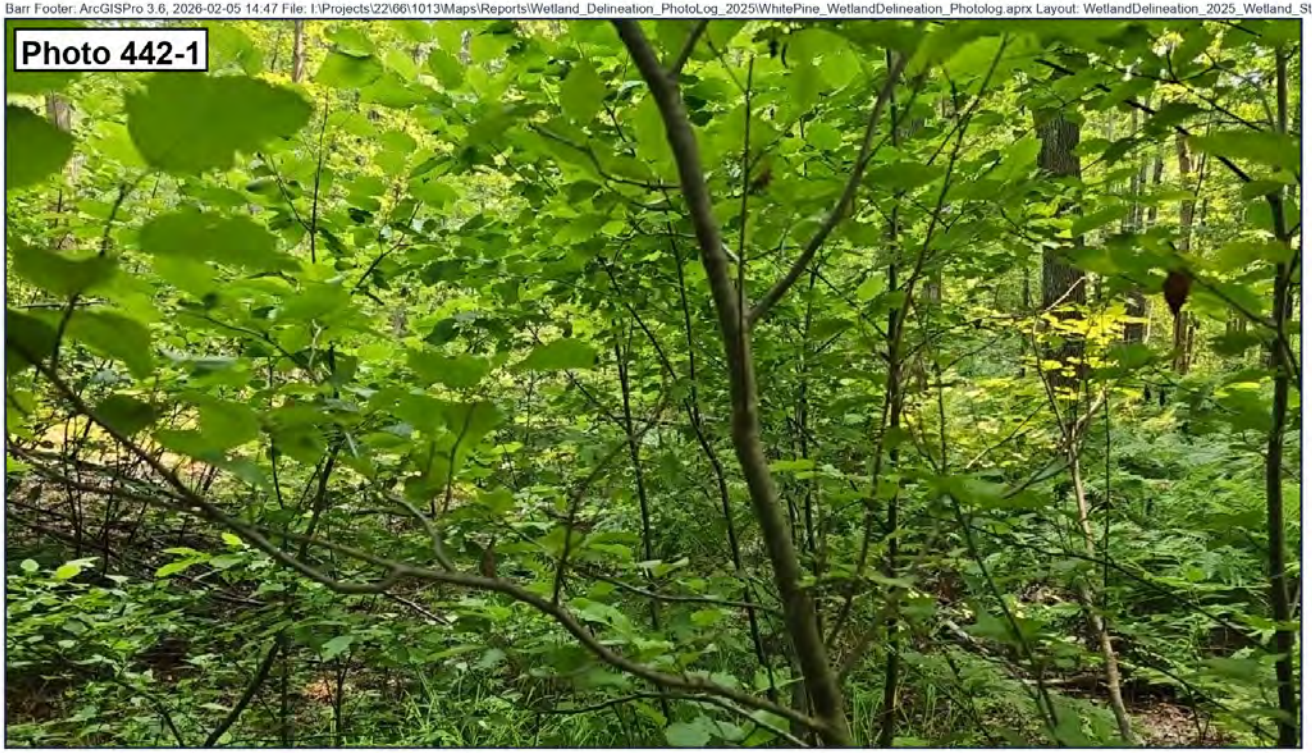


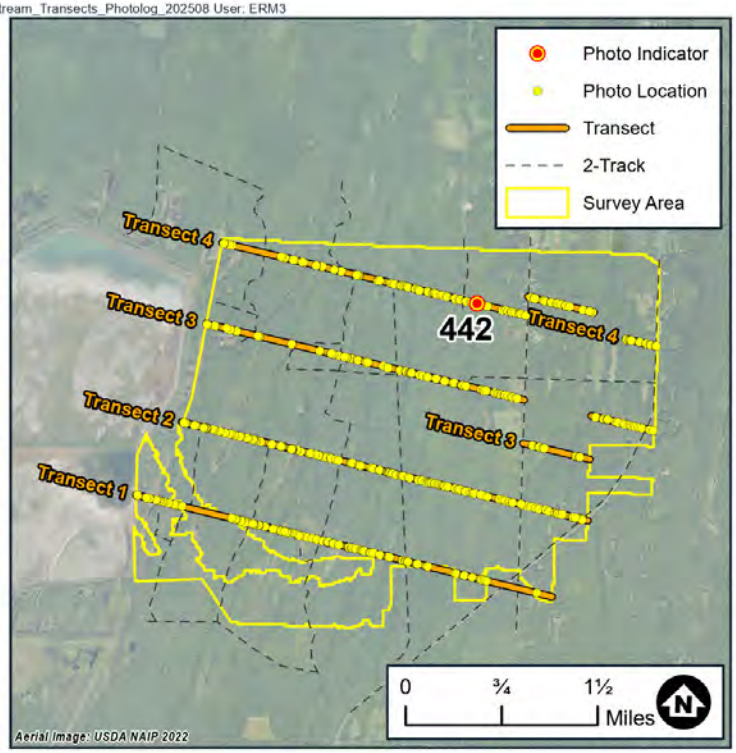

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP16-B, Wetland
**Photo 2 Caption:** T4E-BP16-B, Upland

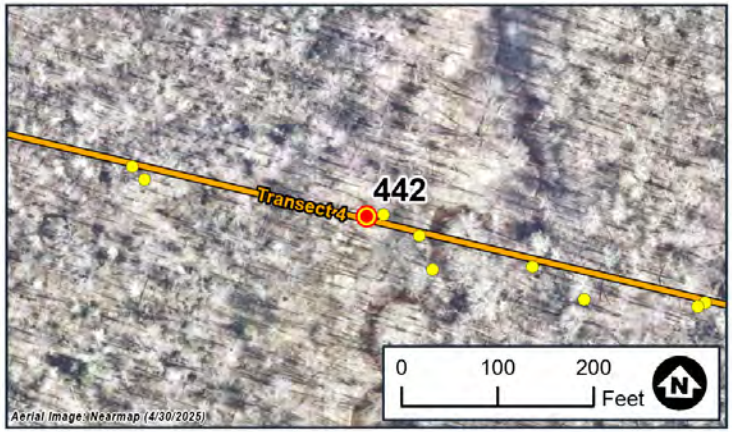
*Note: Photo locations are approximate*










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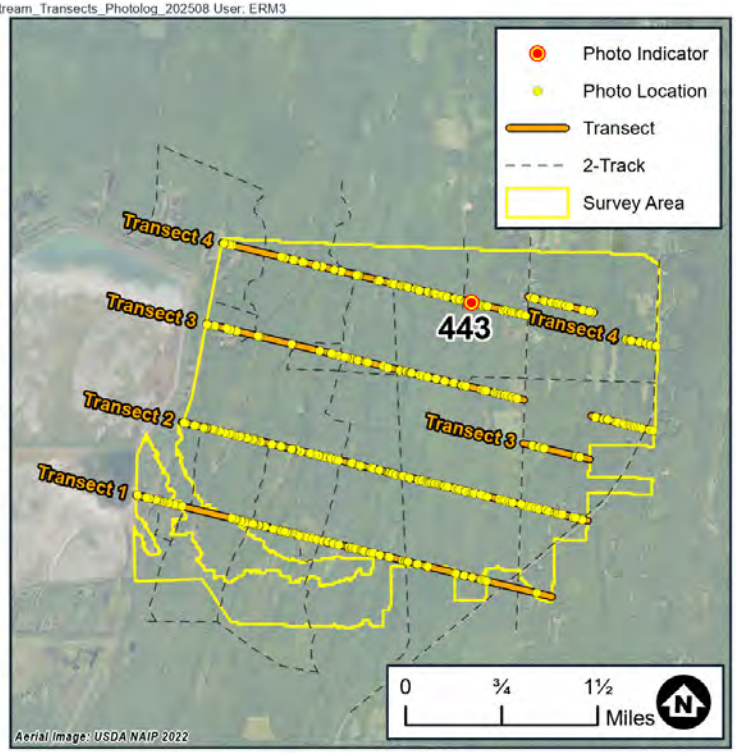
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP16-A, Wetland
**Photo 2 Caption:** T4E-BP16-A, Upland

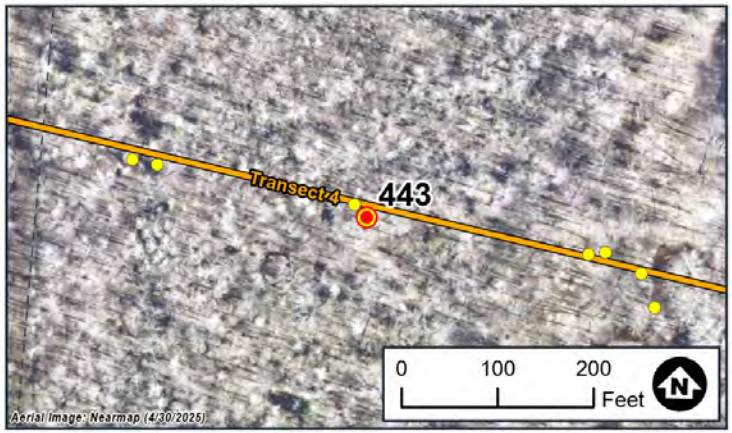
*Note: Photo locations are approximate*









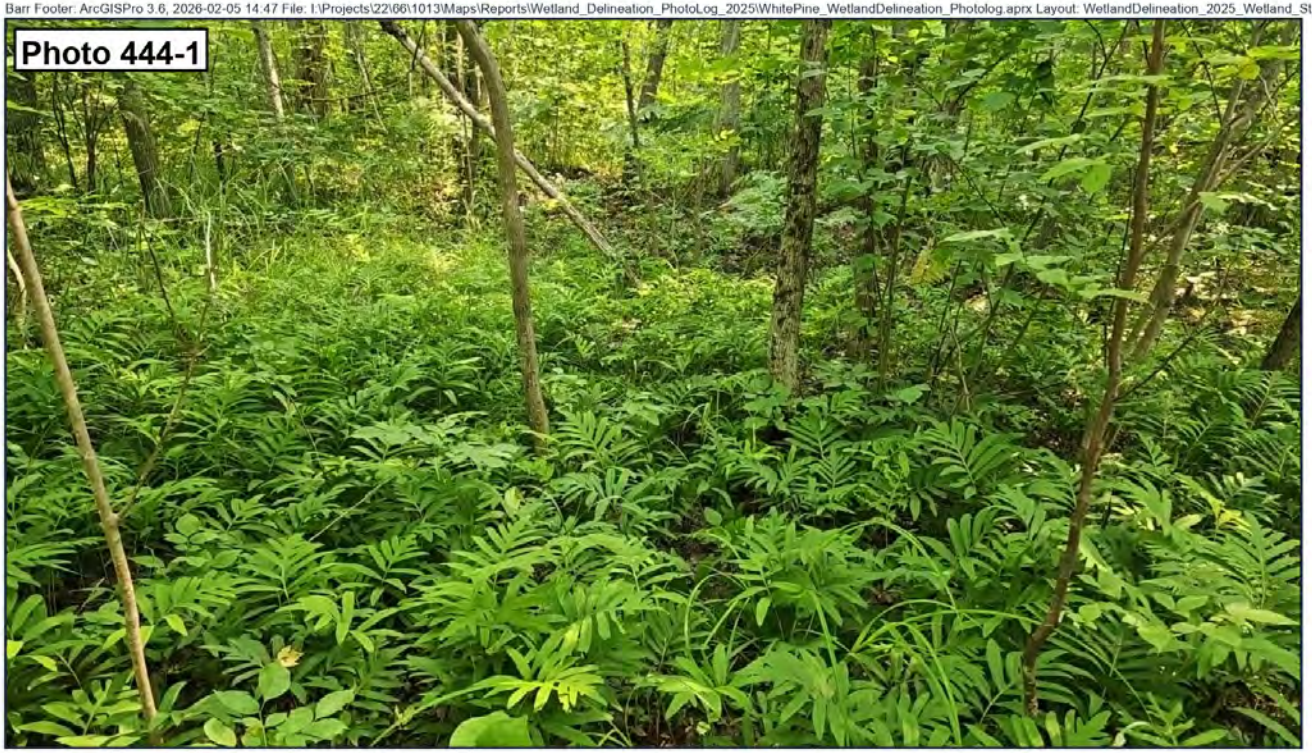


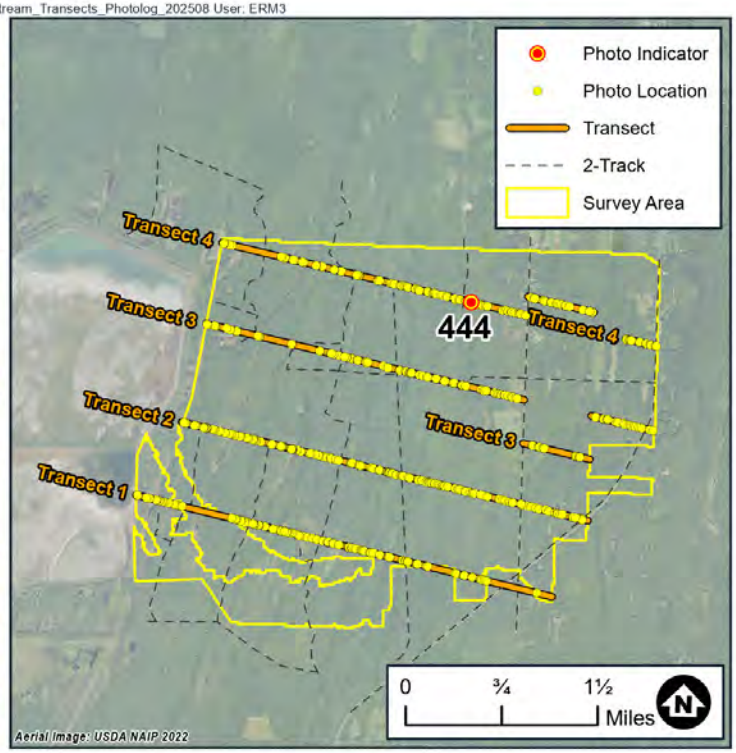

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP15-B, Wetland
**Photo 2 Caption:** T4E-BP15-B, Upland

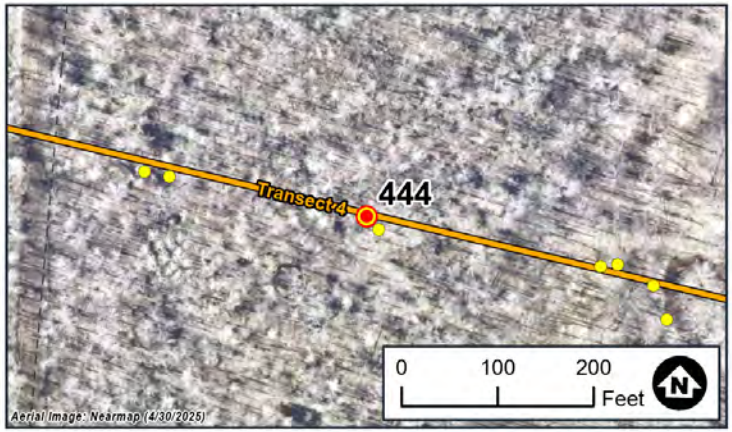
*Note: Photo locations are approximate*









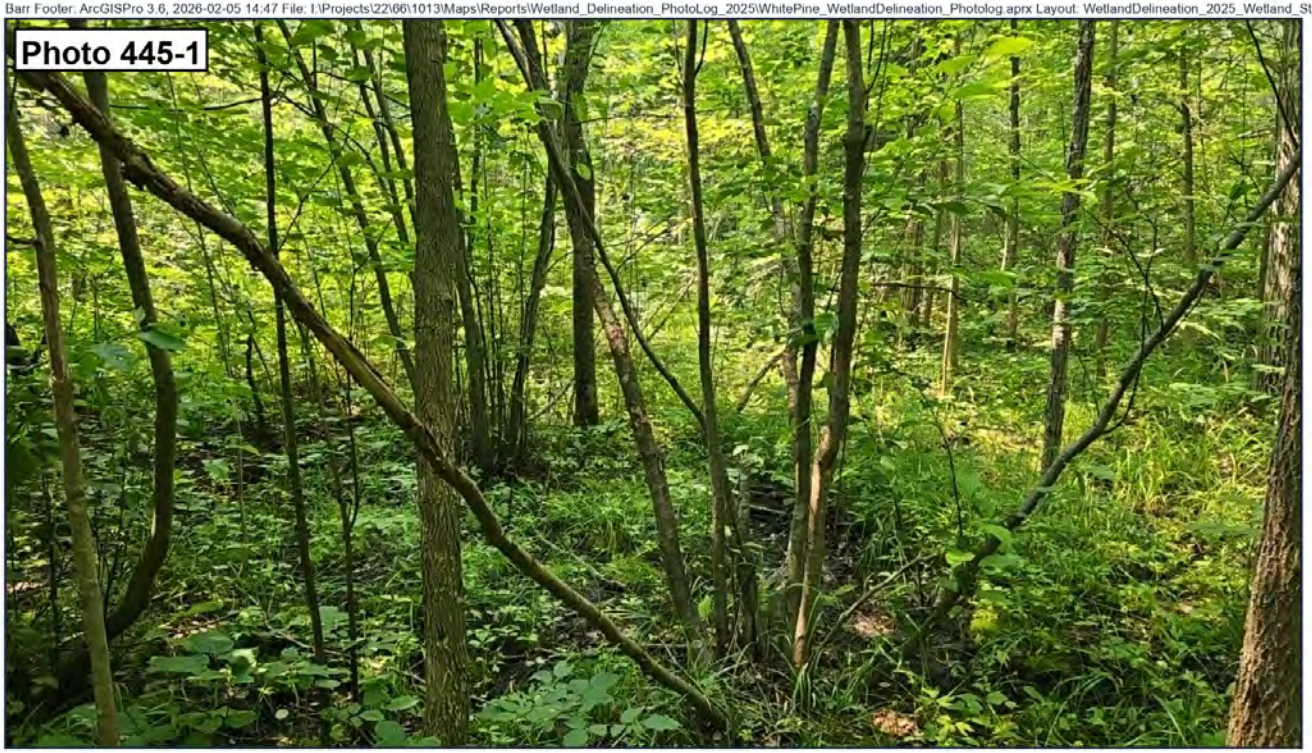


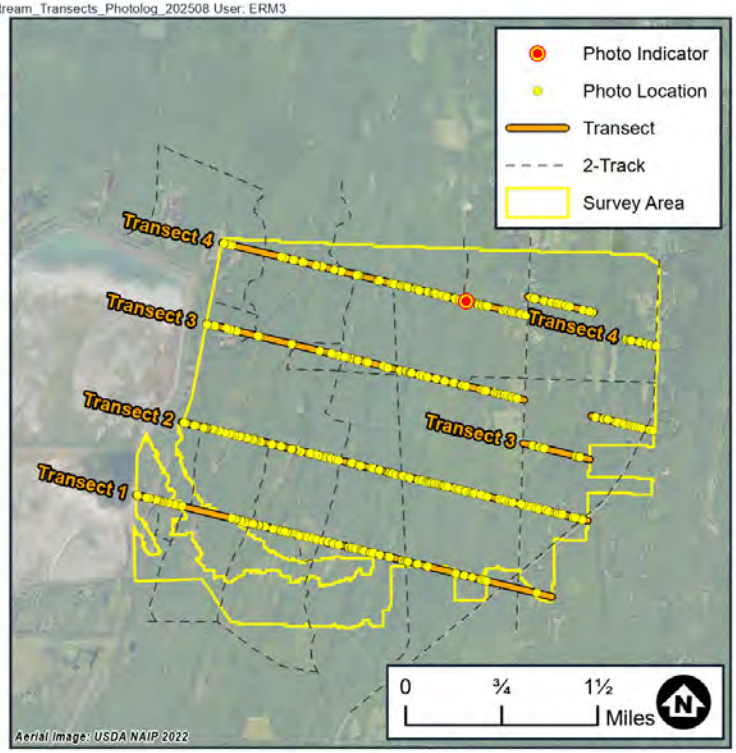

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP15-A, Wetland
**Photo 2 Caption:** T4E-BP15-A, Upland

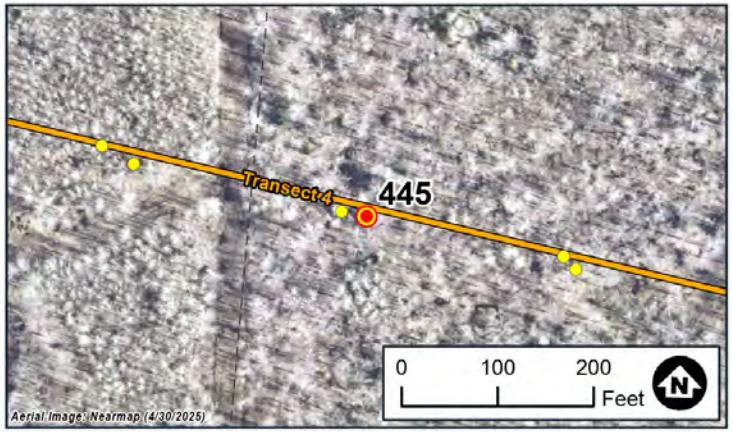
*Note: Photo locations are approximate*











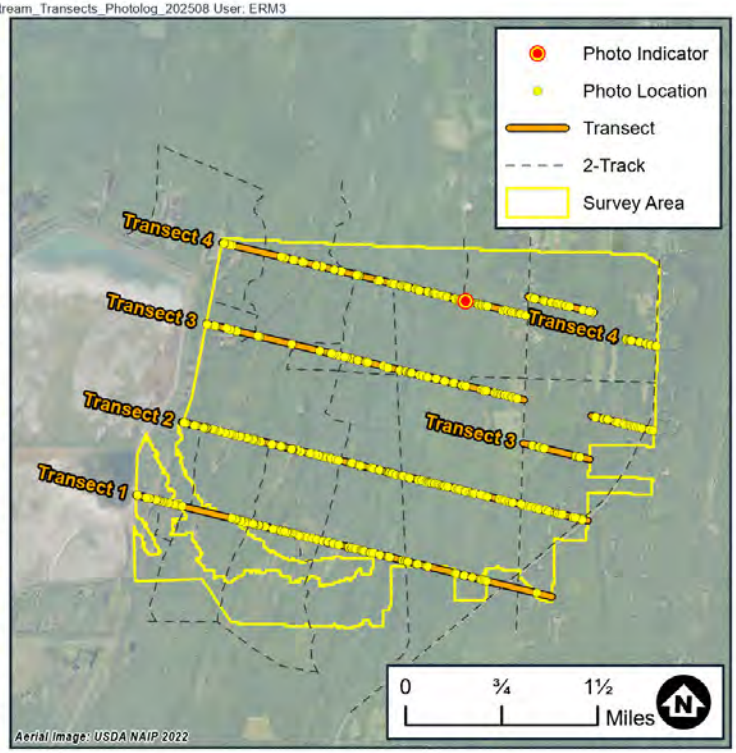

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP14-B, Wetland
**Photo 2 Caption:** T4E-BP14-B, Upland

*Note: Photo locations are approximate*









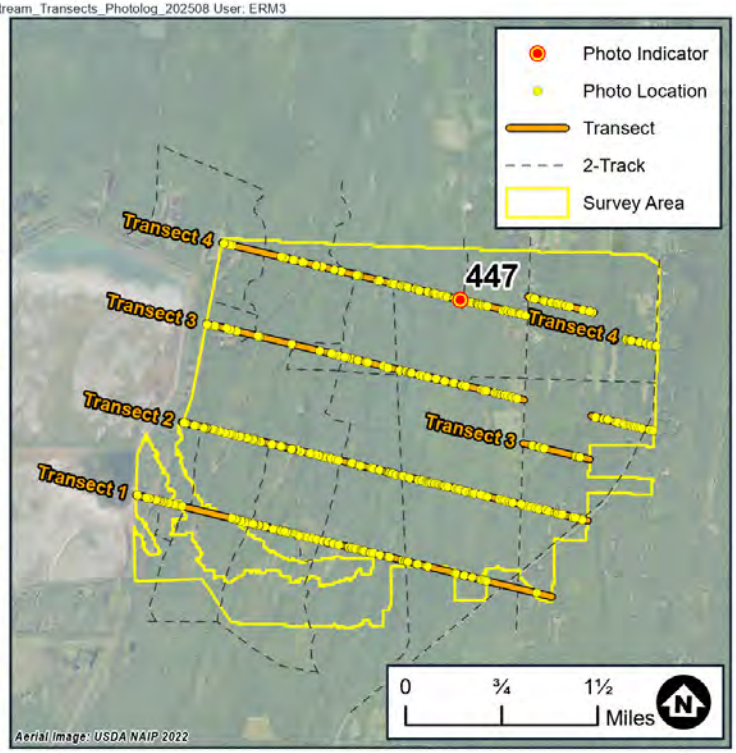

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP14-A, Wetland
**Photo 2 Caption:** T4E-BP14-A, Upland

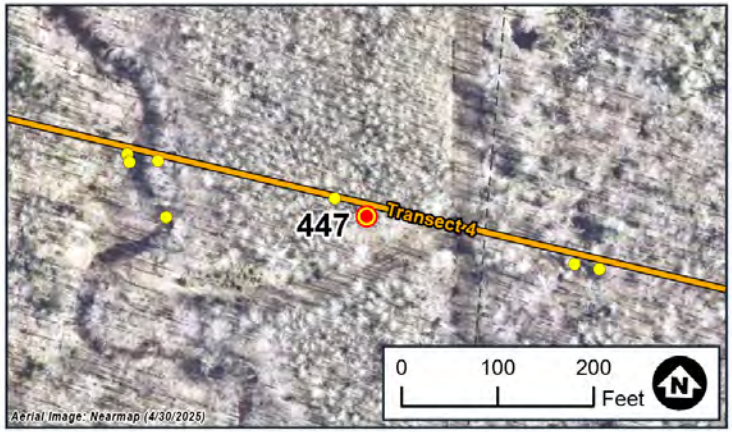
*Note: Photo locations are approximate*











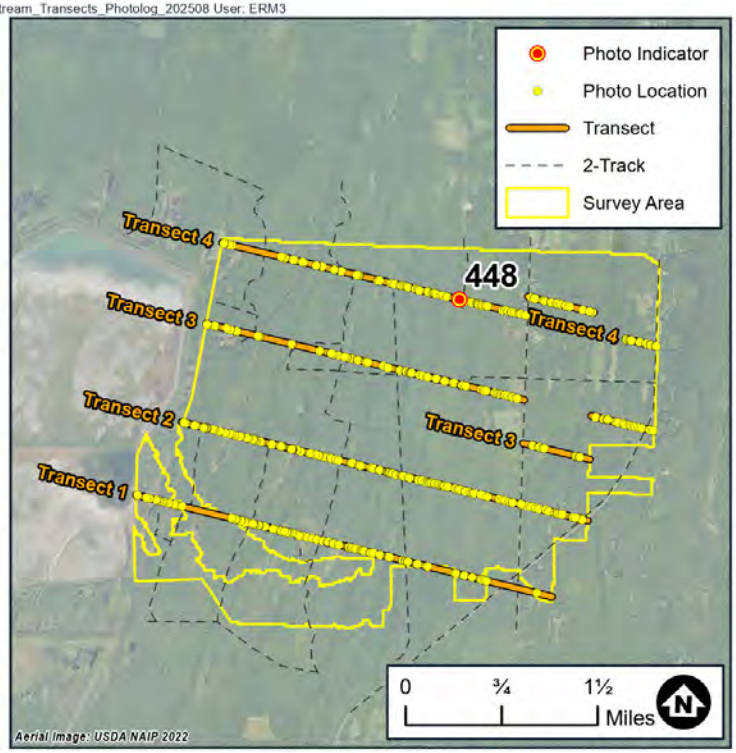

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP13-B, Wetland
**Photo 2 Caption:** T4E-BP13-B, Upland

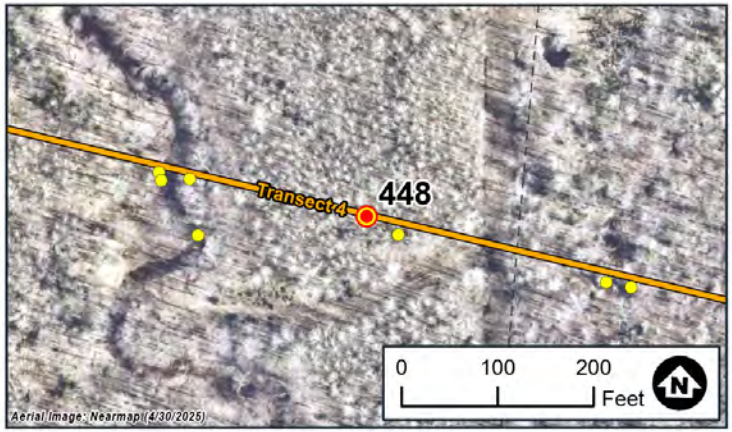
*Note: Photo locations are approximate*









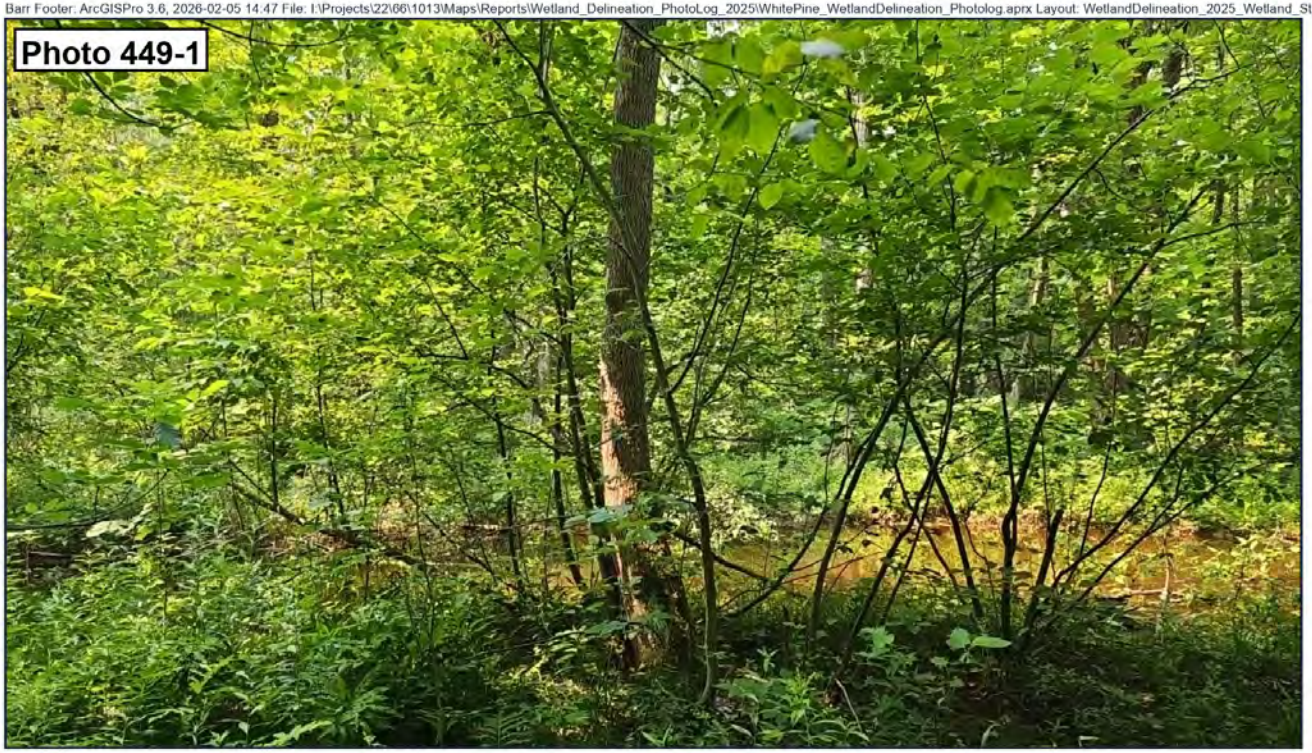


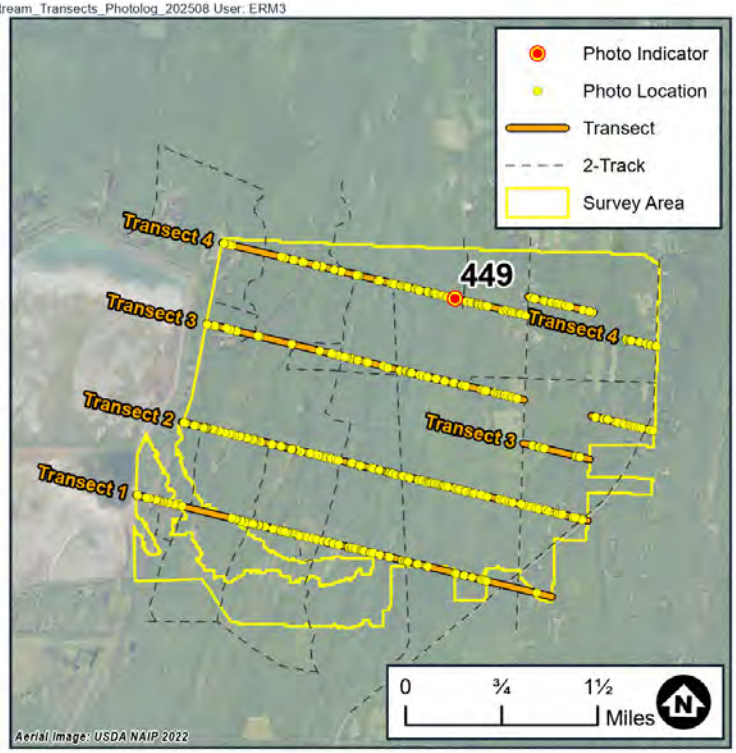

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP13-A, Wetland
**Photo 2 Caption:** T4E-BP13-A, Upland

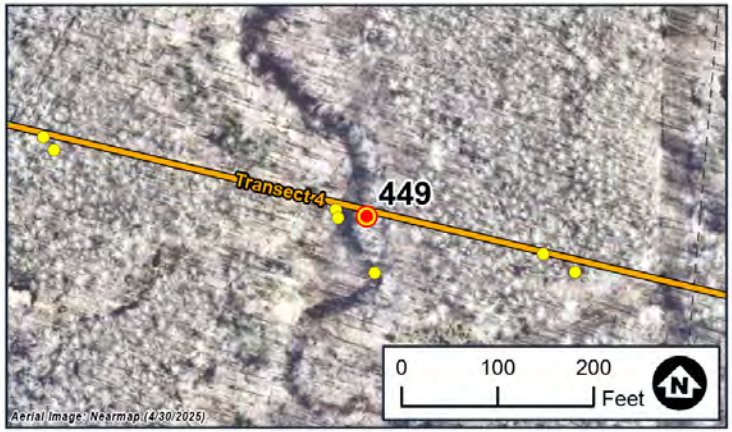
*Note: Photo locations are approximate*









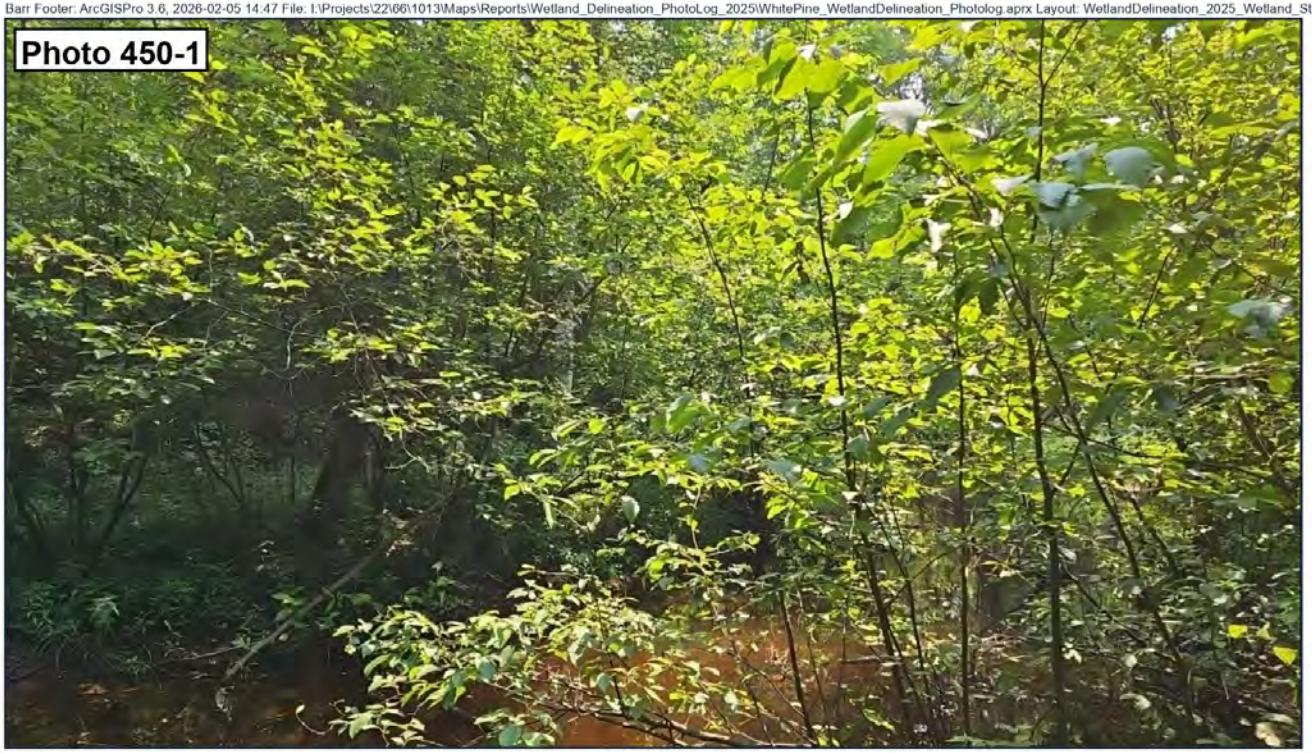


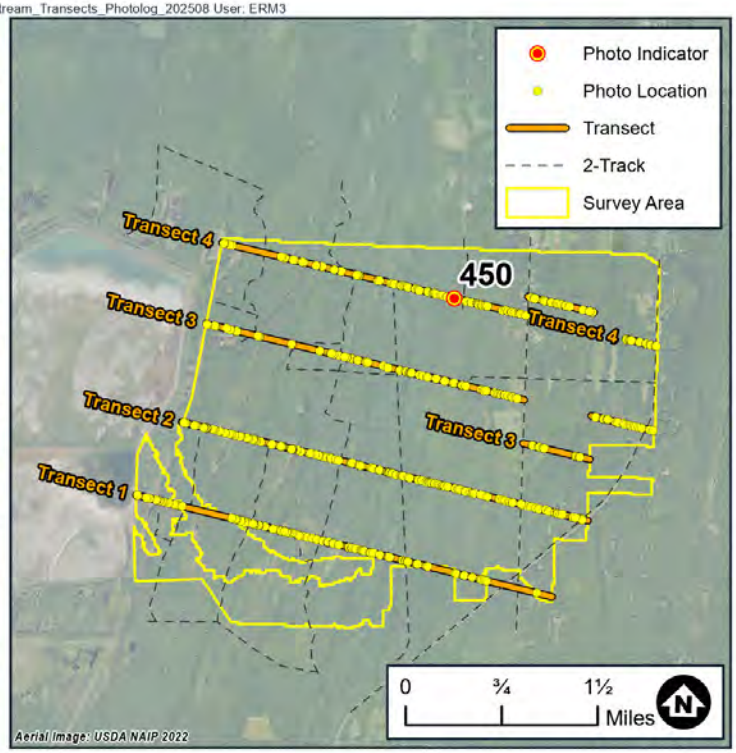

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP12-B, Wetland
**Photo 2 Caption:** T4E-BP12-B, Upland

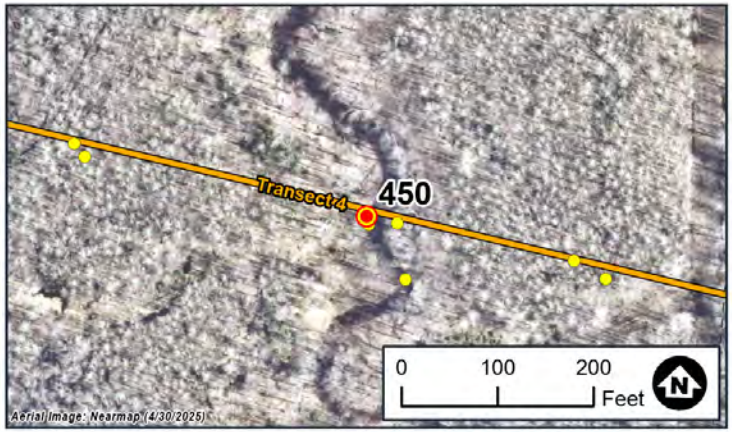
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

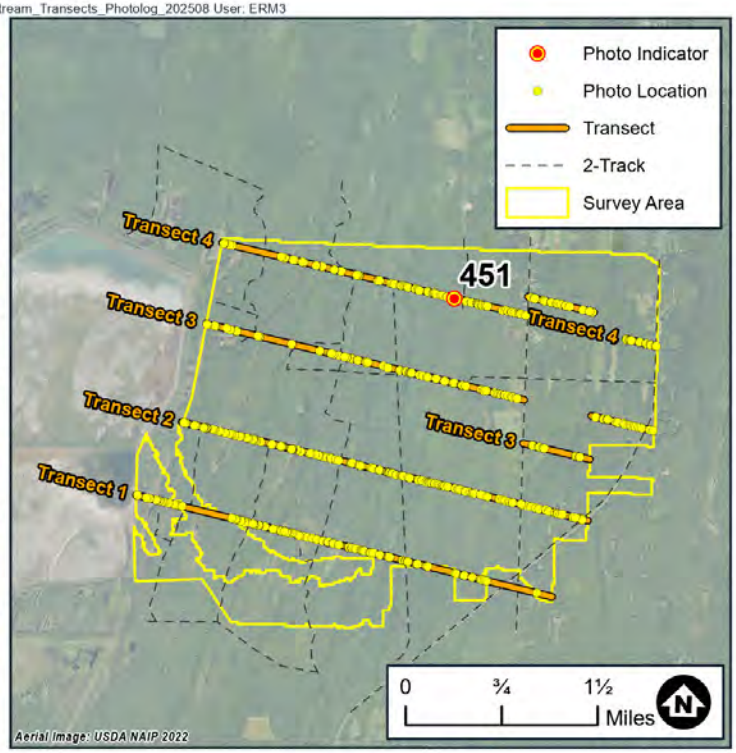
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP12-A, Wetland
**Photo 2 Caption:** T4E-BP12-A, Upland

*Note: Photo locations are approximate*

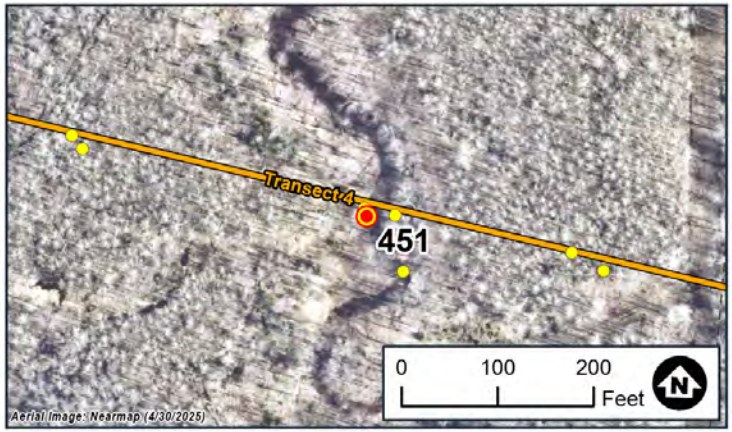
## Photo 451-1






## Photo 451-2





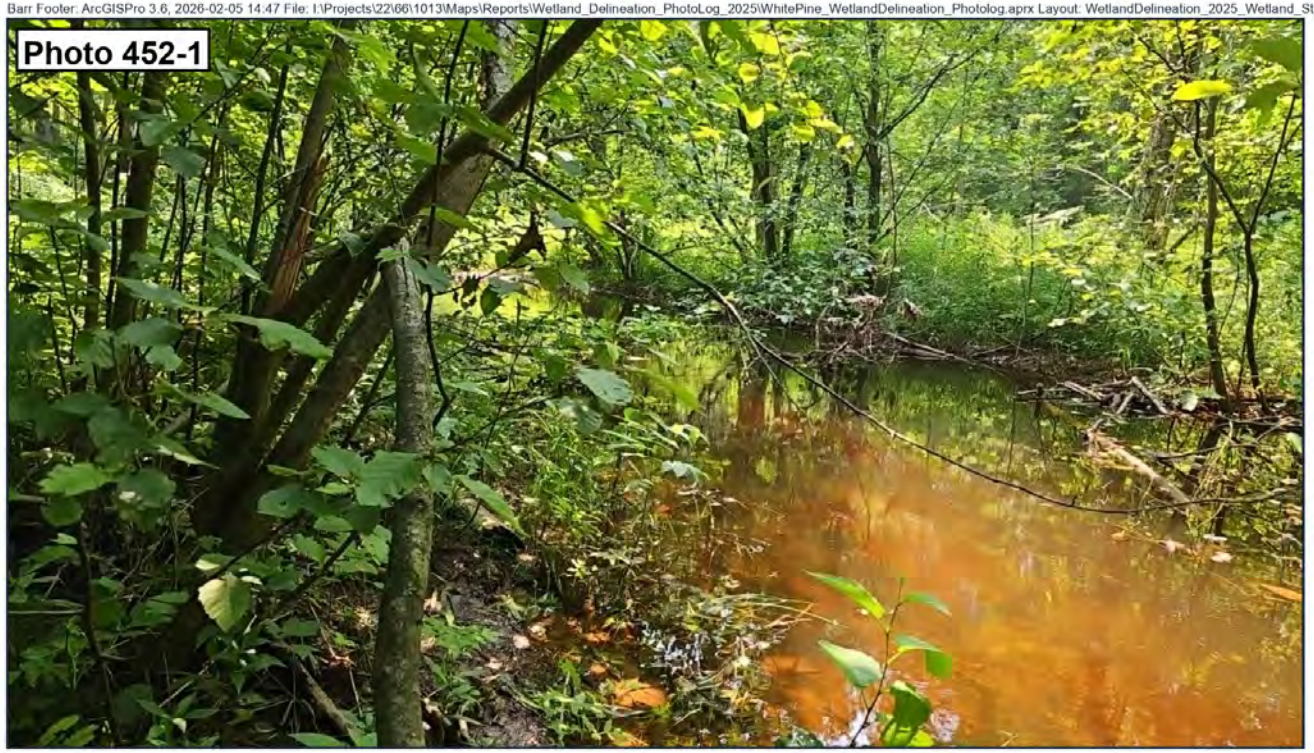


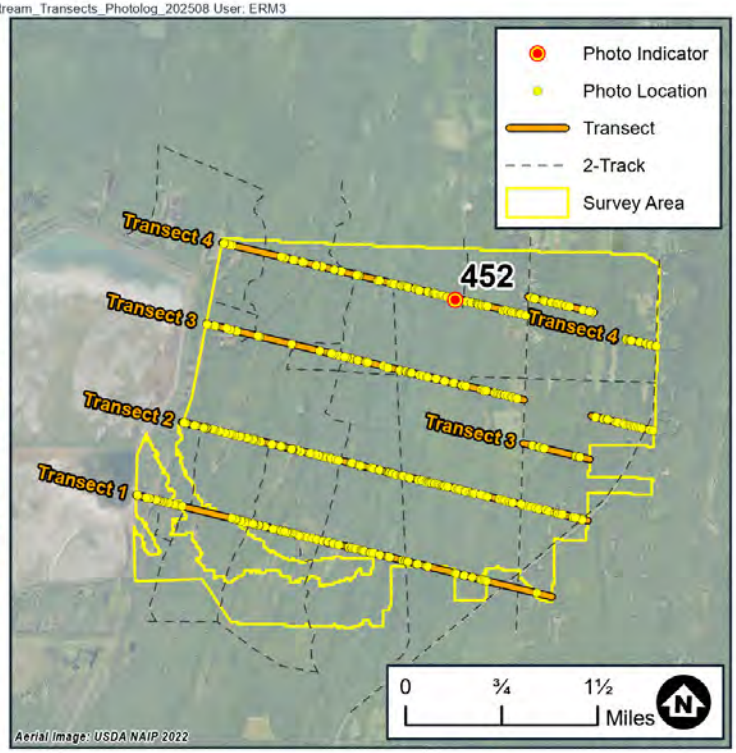

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S04-LB, Upstream
**Photo 2 Caption:** T4E-S04-LB, Downstream

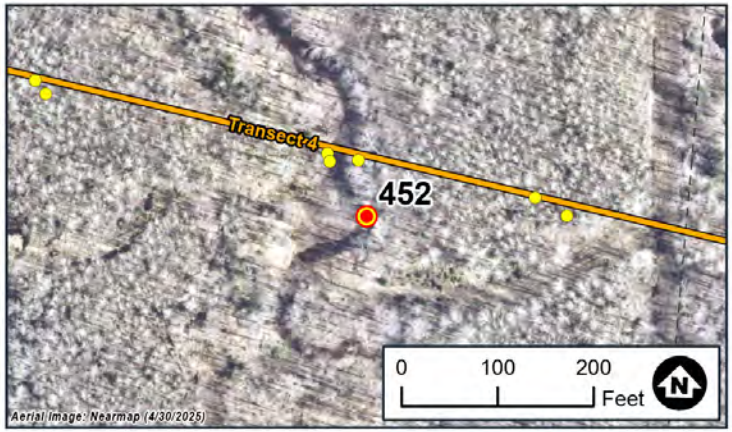
*Note: Photo locations are approximate*









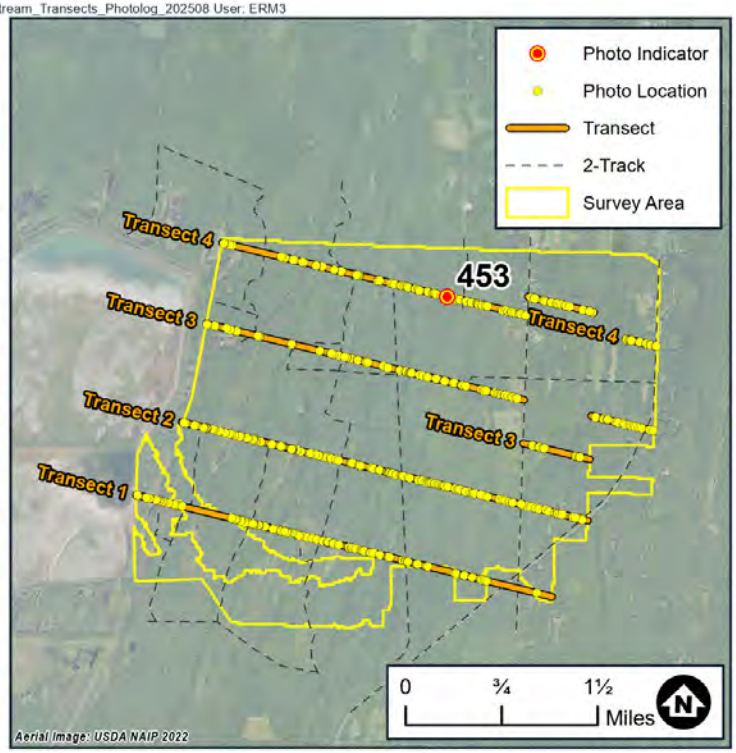

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S04-RB, Upstream
**Photo 2 Caption:** T4E-S04-RB, Downstream

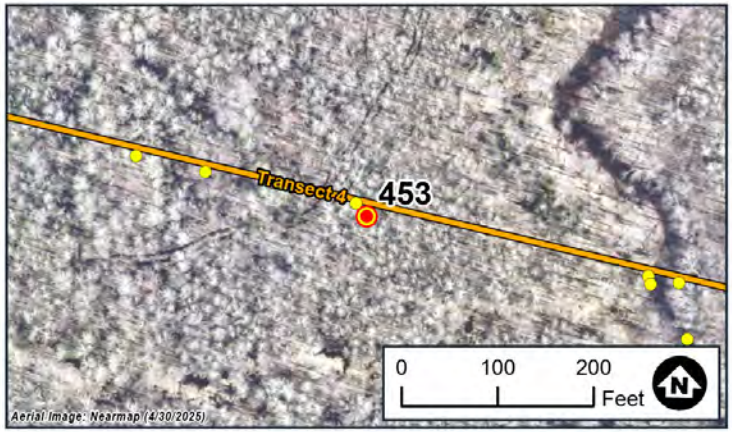
*Note: Photo locations are approximate*











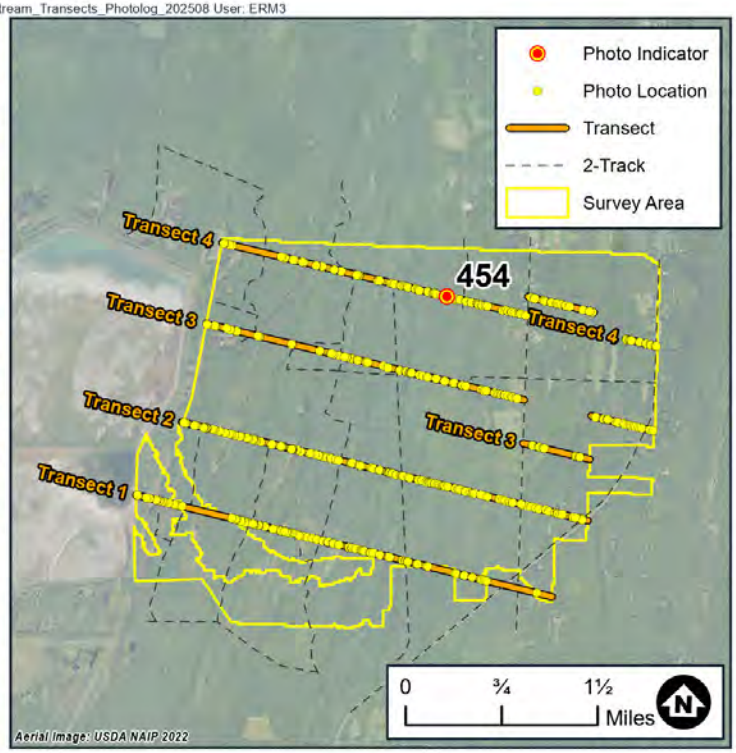

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP11-B, Wetland
**Photo 2 Caption:** T4E-BP11-B, Upland

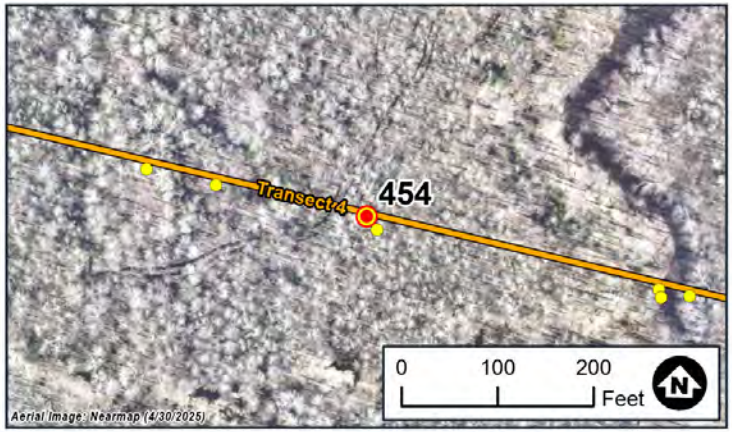
*Note: Photo locations are approximate*











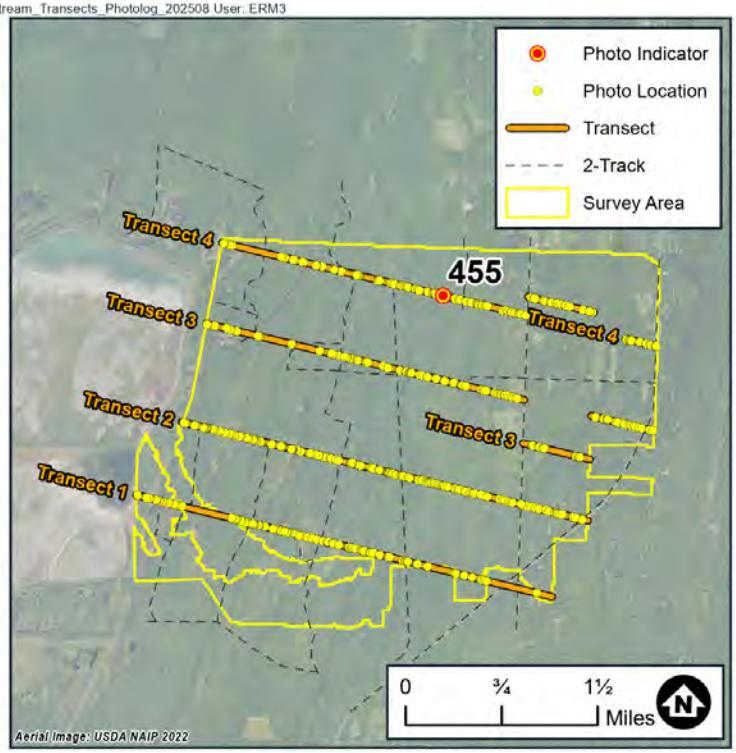

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP11-A, Wetland
**Photo 2 Caption:** T4E-BP11-A, Upland

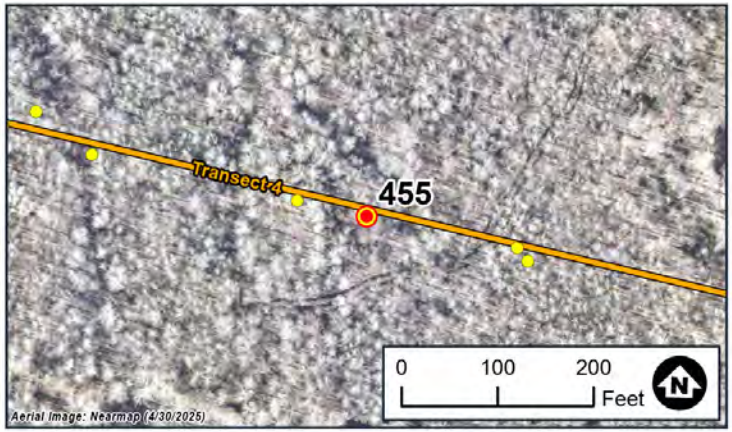
*Note: Photo locations are approximate*











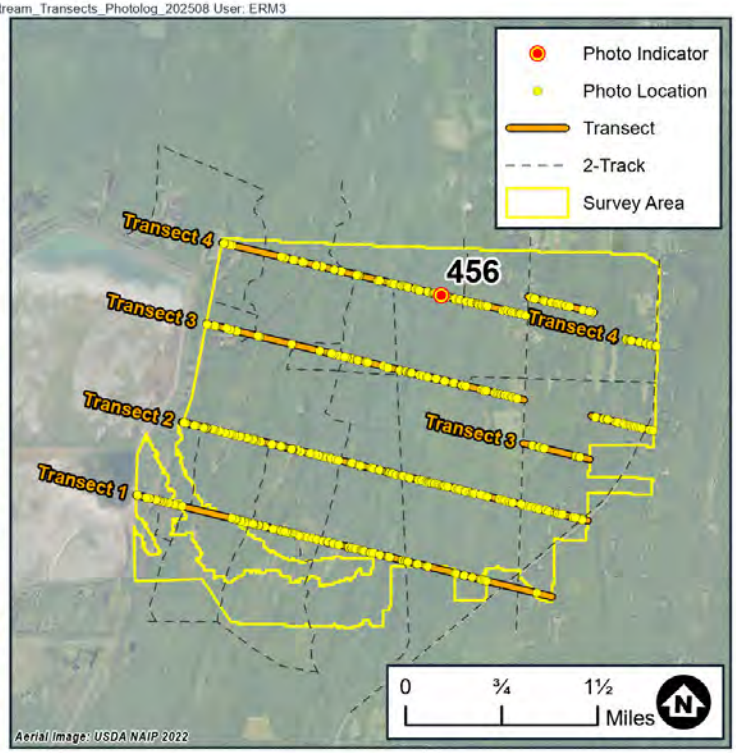

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP10-B, Wetland
**Photo 2 Caption:** T4E-BP10-B, Upland

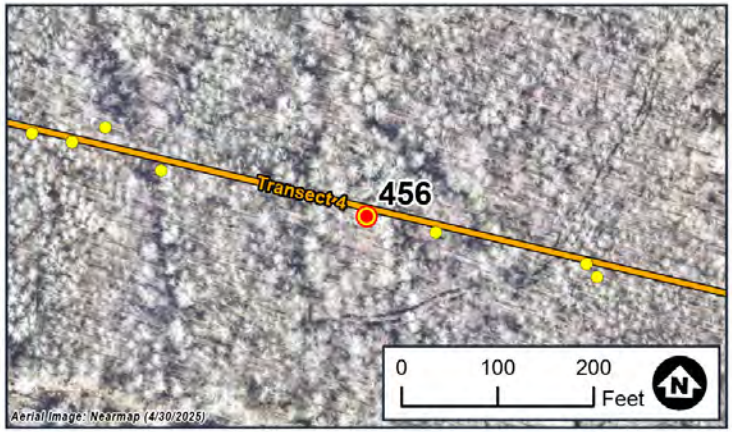
*Note: Photo locations are approximate*










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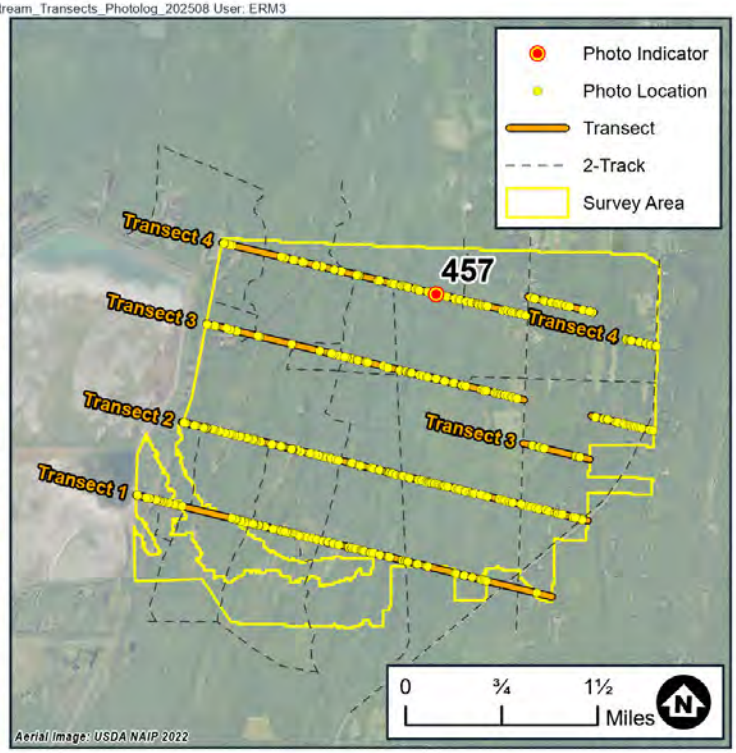
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP10-A, Wetland
**Photo 2 Caption:** T4E-BP10-A, Upland

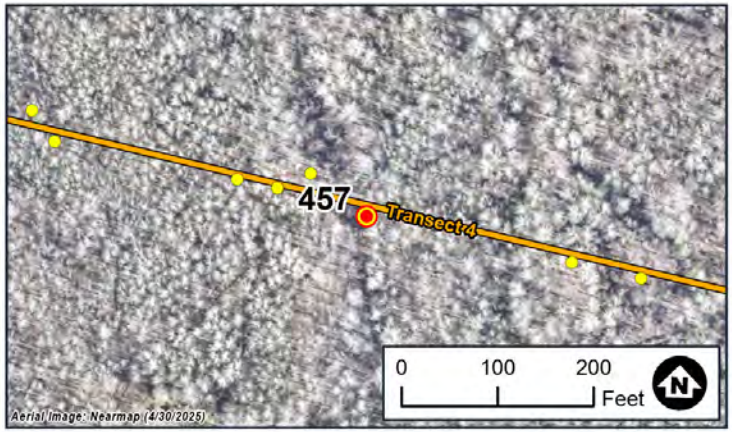
*Note: Photo locations are approximate*











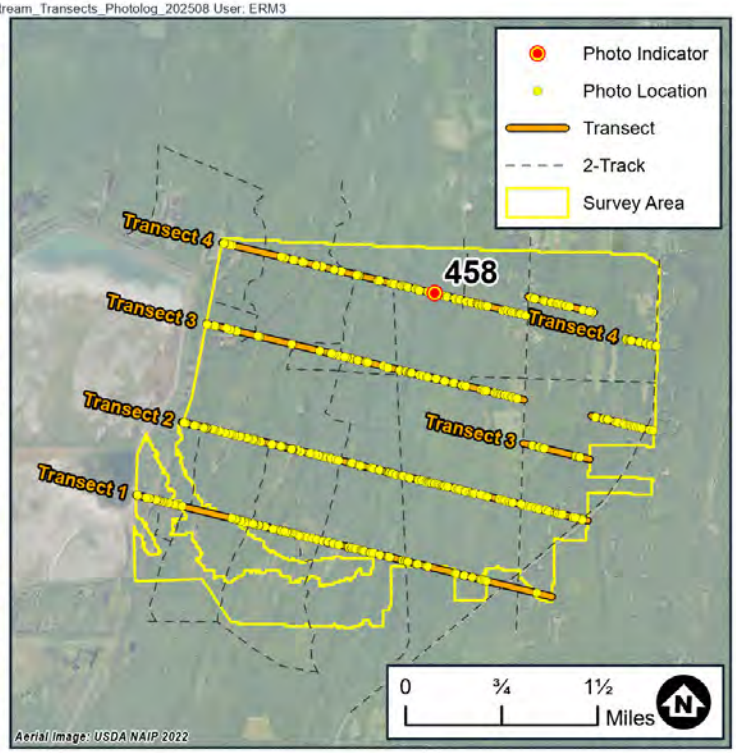

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP09-B, Wetland
**Photo 2 Caption:** T4E-BP09-B, Upland

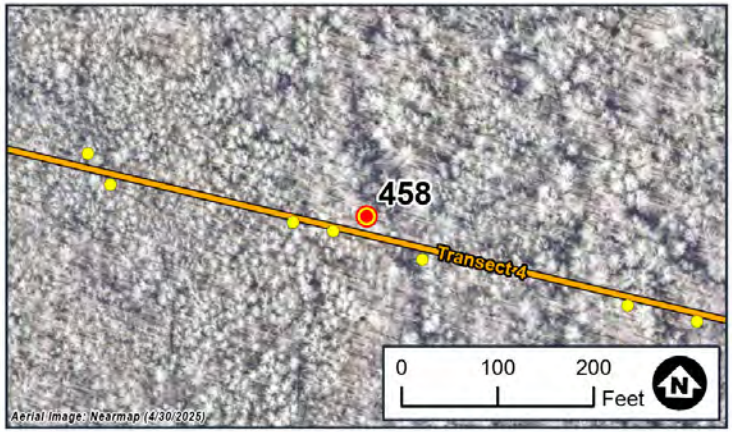
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP09-A, Wetland
**Photo 2 Caption:** T4E-BP09-A, Upland

*Note: Photo locations are approximate*

**Photo 459-1**



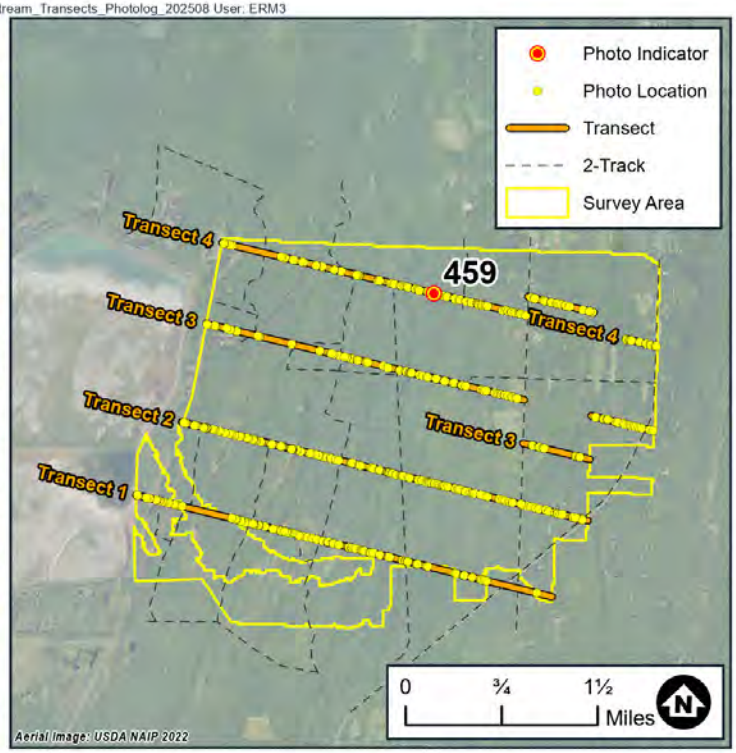
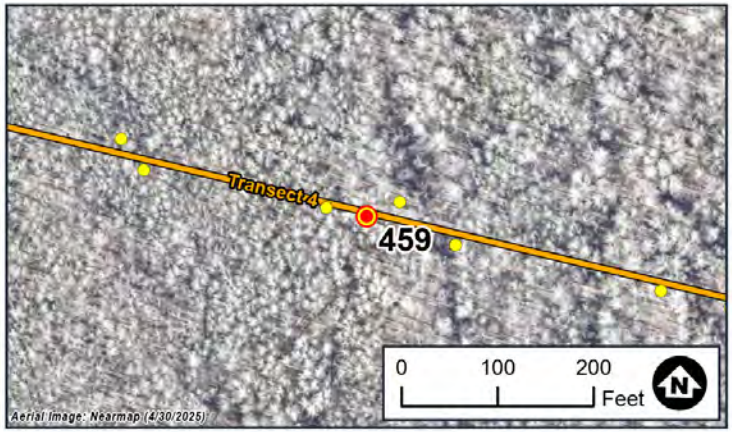



**Photo 459-2**






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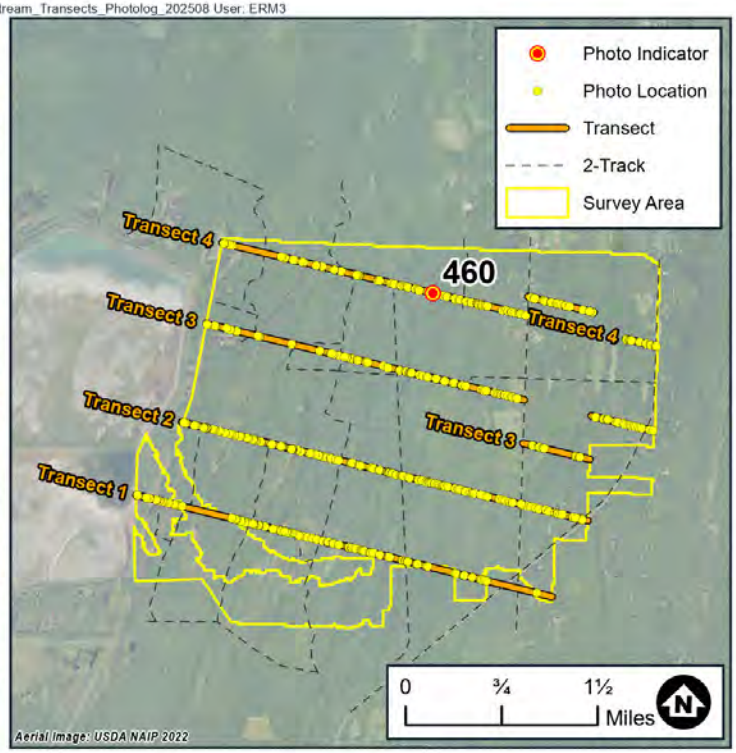
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP08-B, Wetland
**Photo 2 Caption:** T4E-BP08-B, Upland

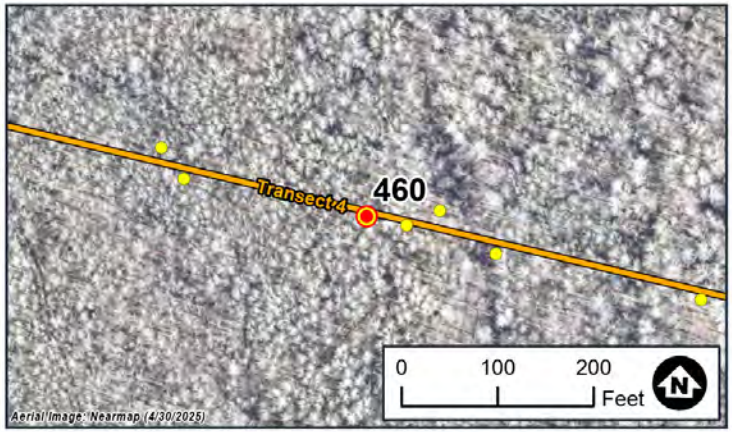
*Note: Photo locations are approximate*











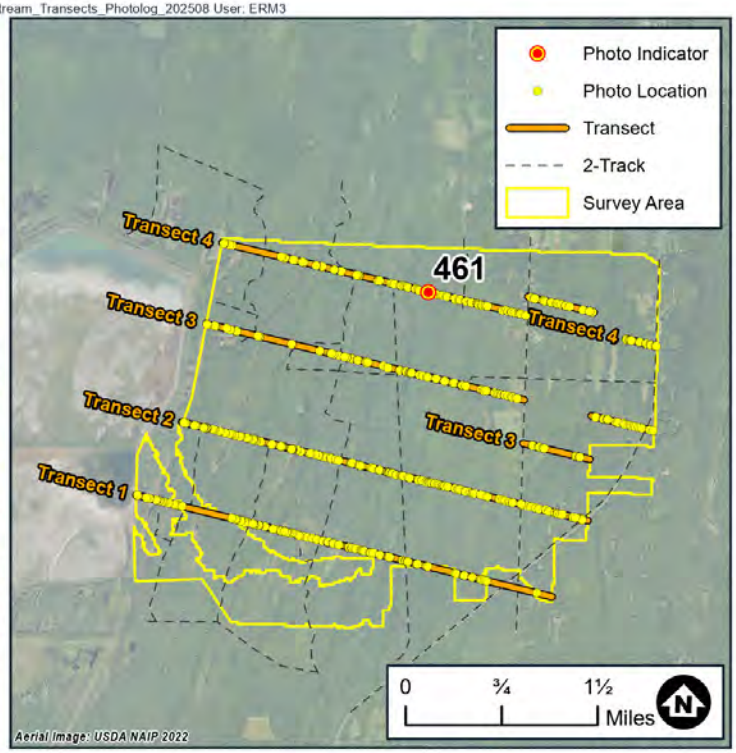

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP08-A, Wetland
**Photo 2 Caption:** T4E-BP08-A, Upland

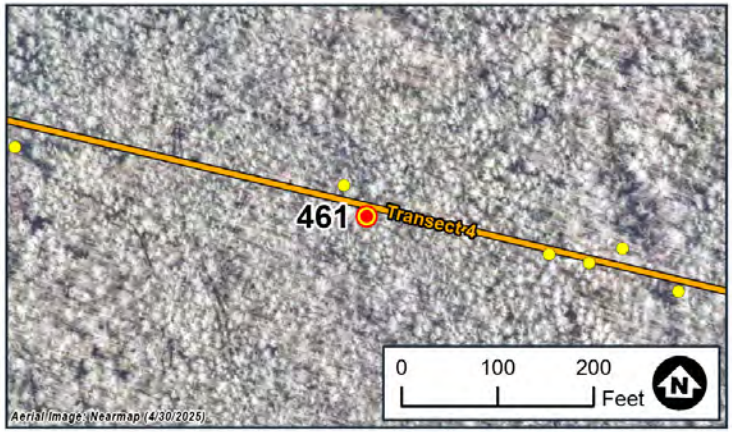
*Note: Photo locations are approximate*











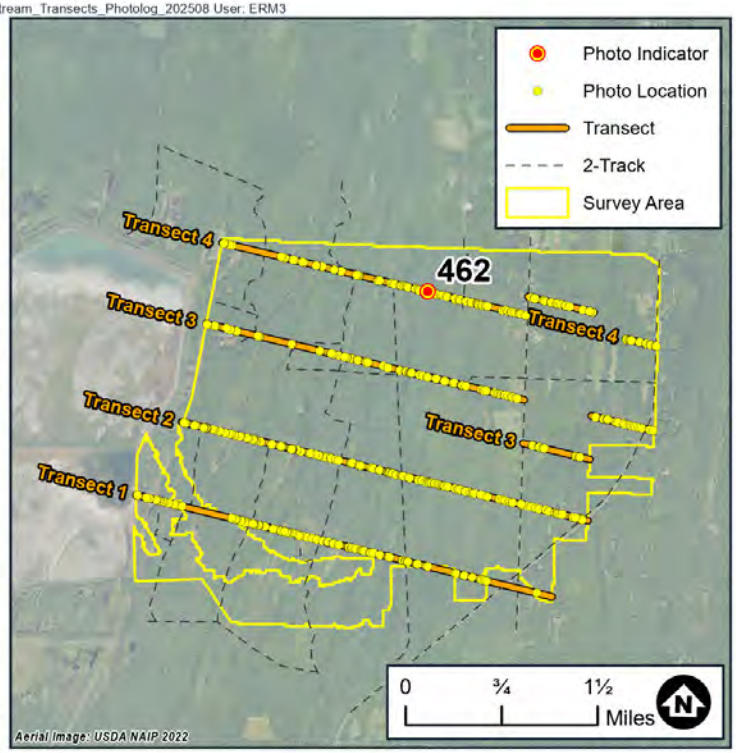

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP07-B, Wetland
**Photo 2 Caption:** T4E-BP07-B, Upland

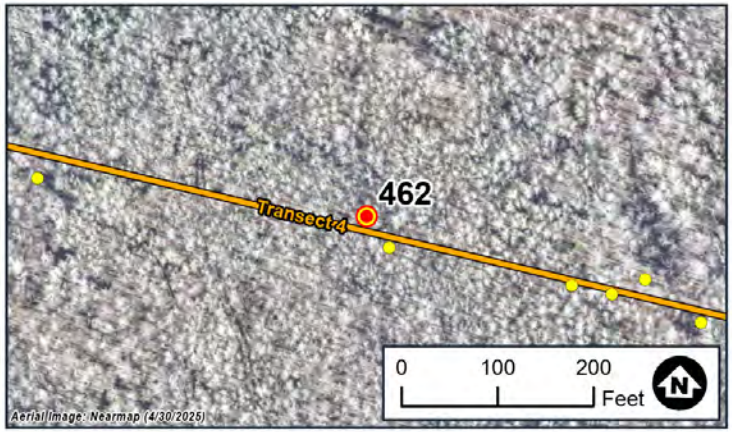
*Note: Photo locations are approximate*











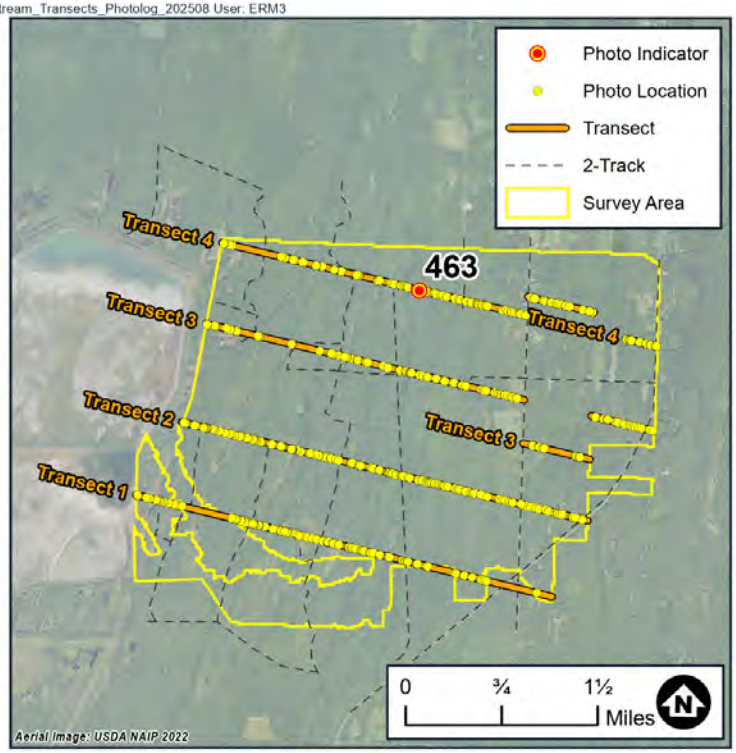

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP07-A, Wetland
**Photo 2 Caption:** T4E-BP07-A, Upland

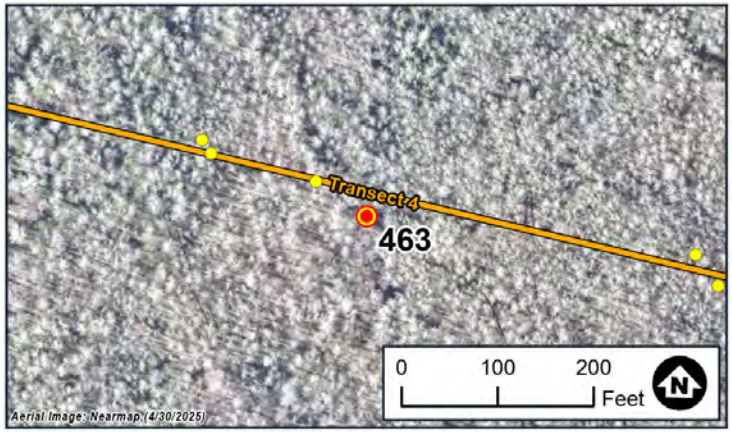
*Note: Photo locations are approximate*











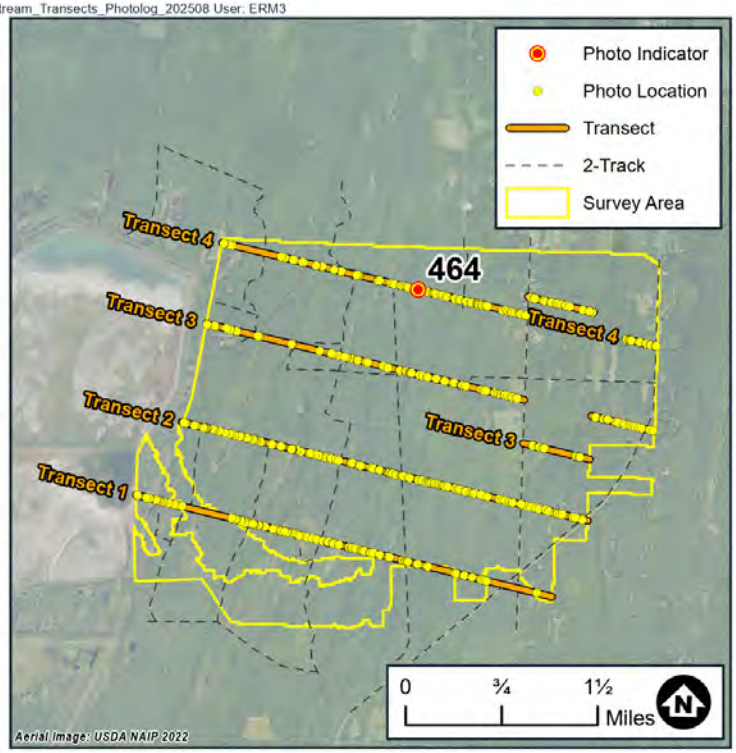

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP06-B, Wetland
**Photo 2 Caption:** T4E-BP06-B, Upland

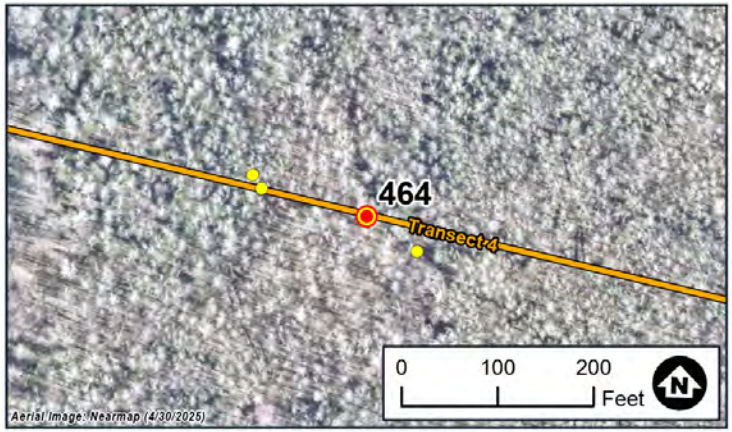
*Note: Photo locations are approximate*










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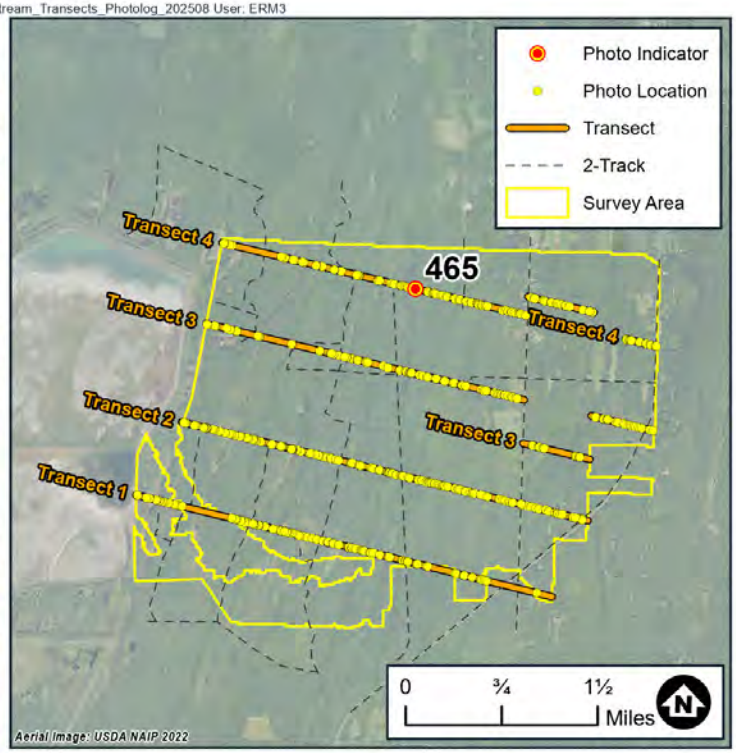
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP06-A, Wetland
**Photo 2 Caption:** T4E-BP06-A, Upland

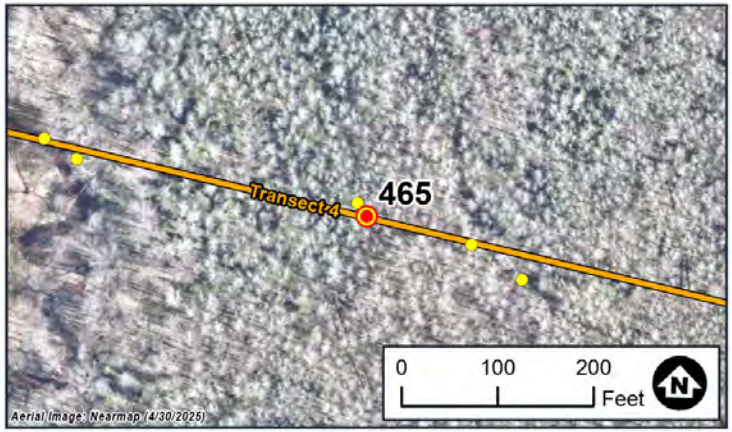
*Note: Photo locations are approximate*










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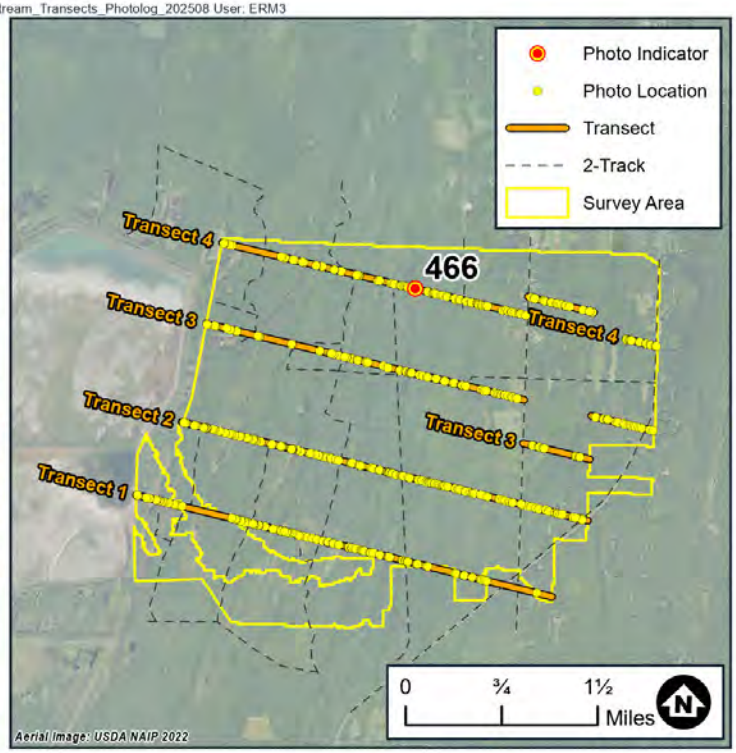
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP05-B, Wetland
**Photo 2 Caption:** T4E-BP05-B, Upland

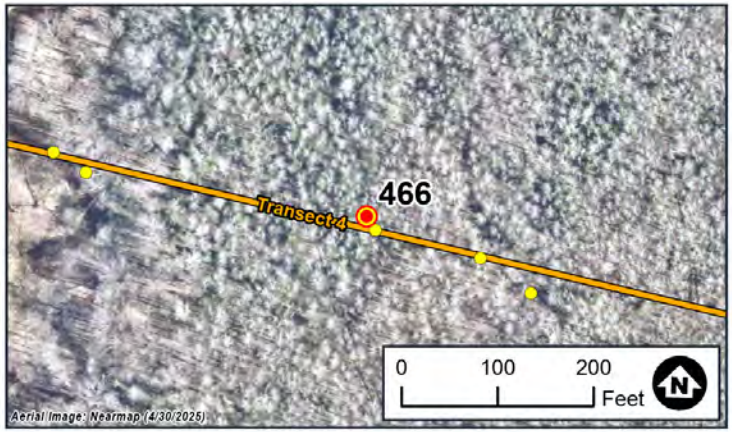
*Note: Photo locations are approximate*









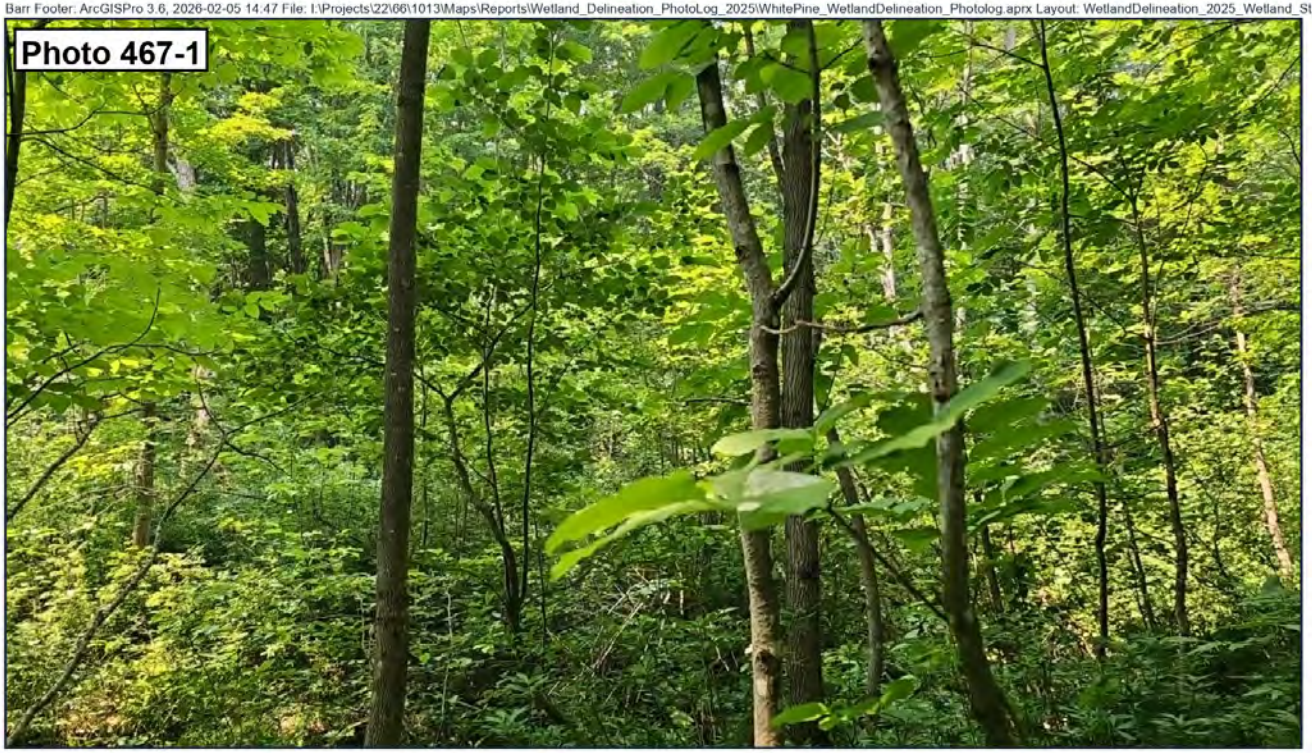


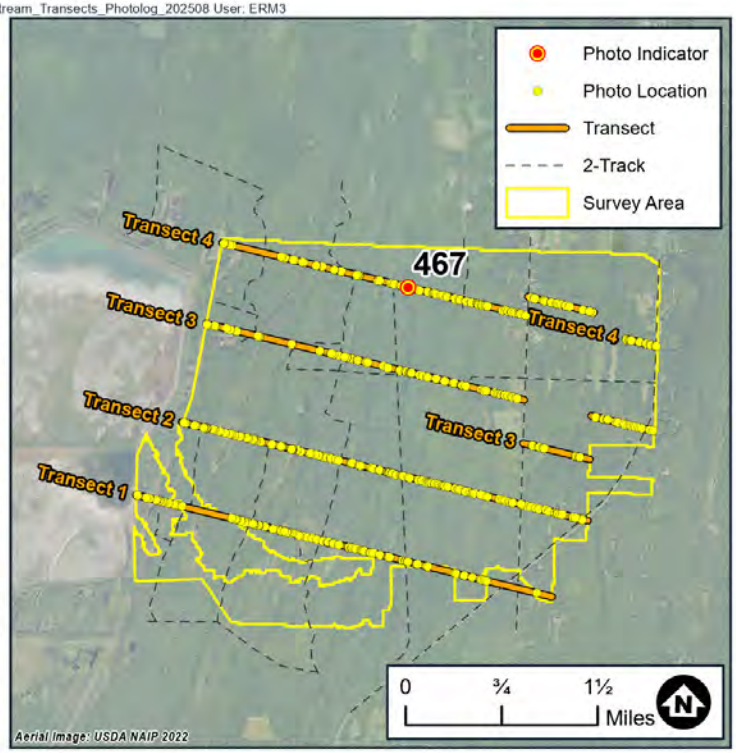

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP05-A, Wetland
**Photo 2 Caption:** T4E-BP05-A, Upland

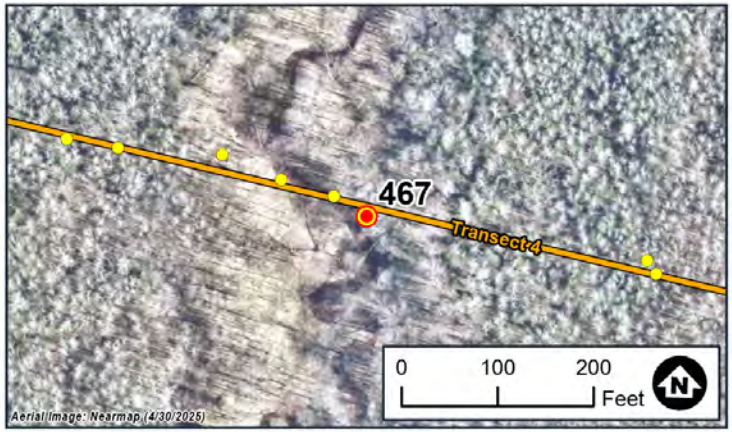
*Note: Photo locations are approximate*









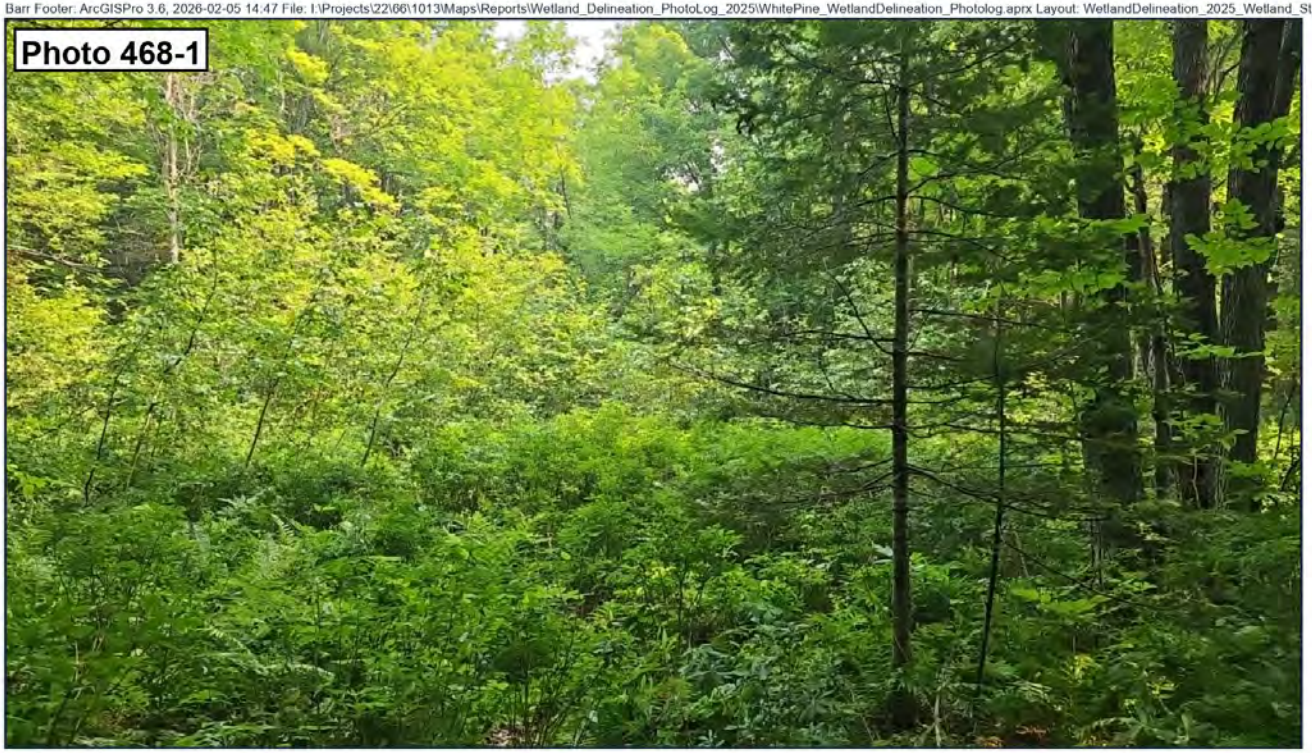


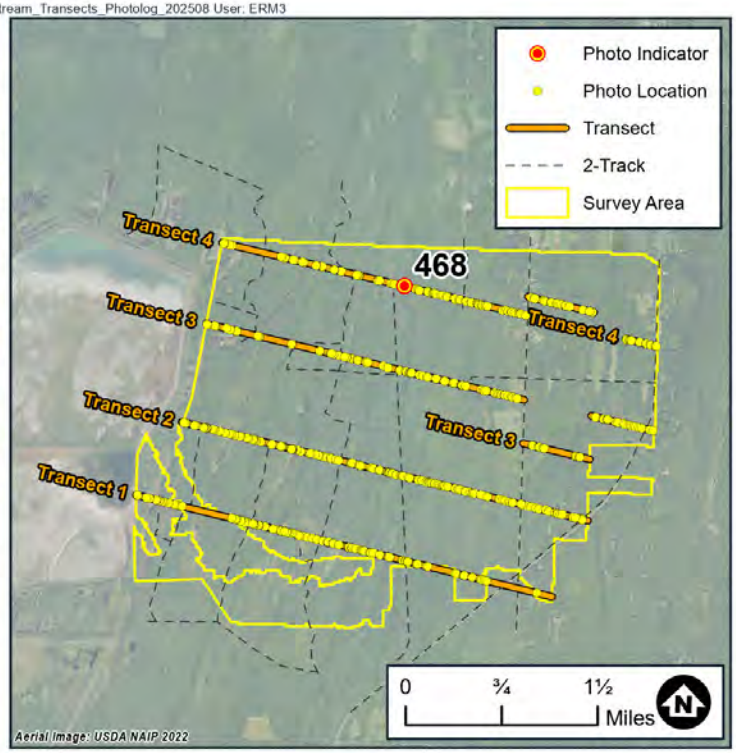

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP04-B, Wetland
**Photo 2 Caption:** T4E-BP04-B, Upland

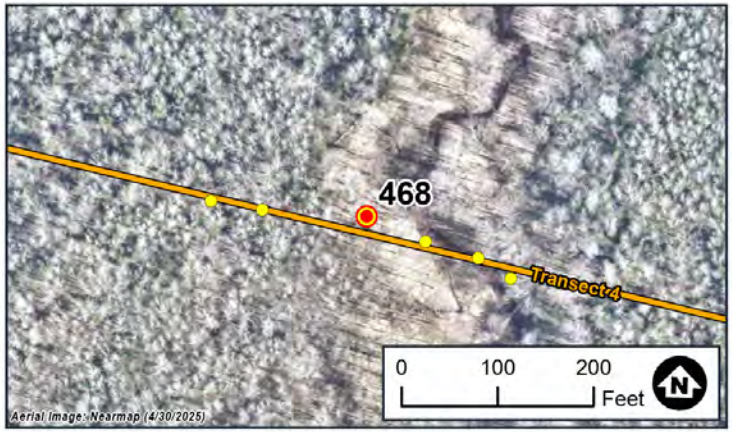
*Note: Photo locations are approximate*











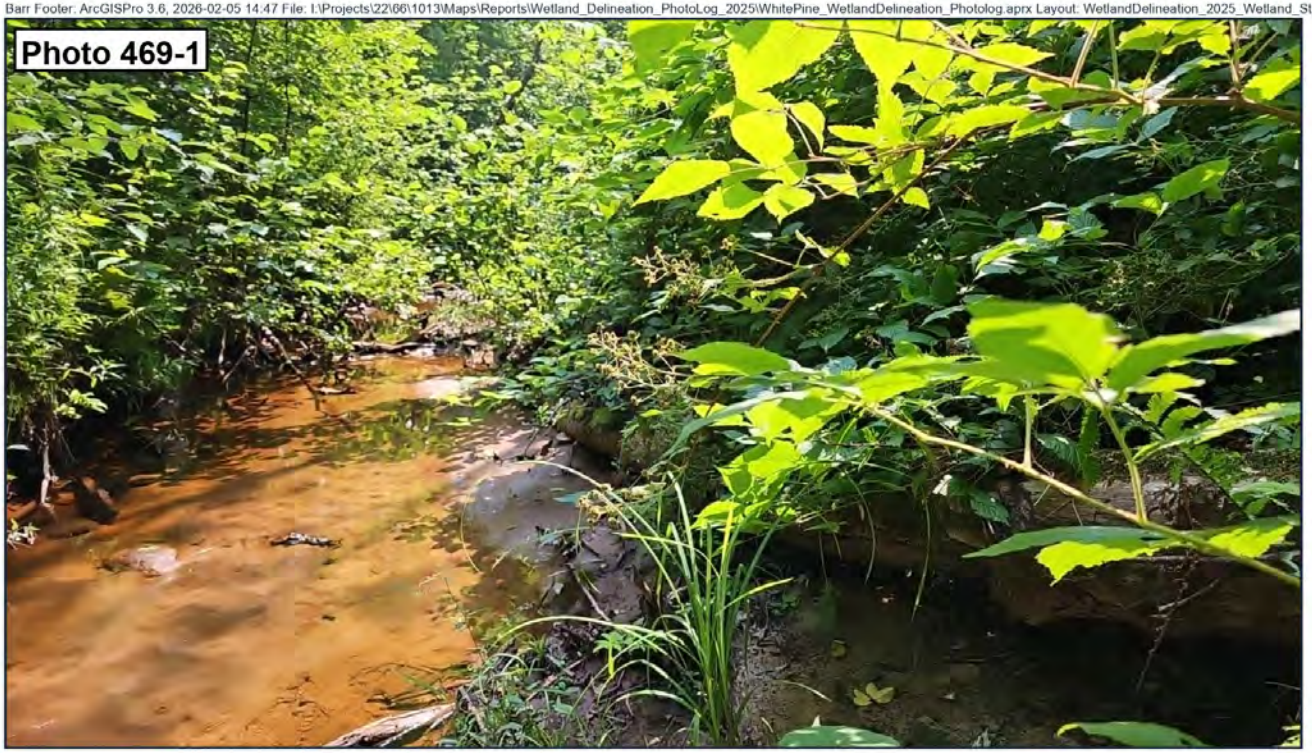

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

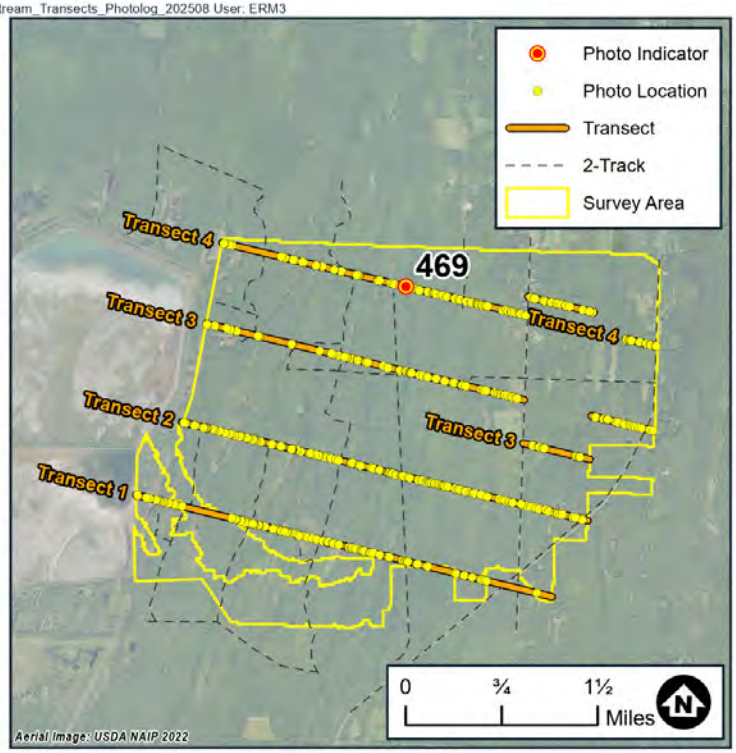
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP04-A, Wetland
**Photo 2 Caption:** T4E-BP04-A, Upland

*Note: Photo locations are approximate*

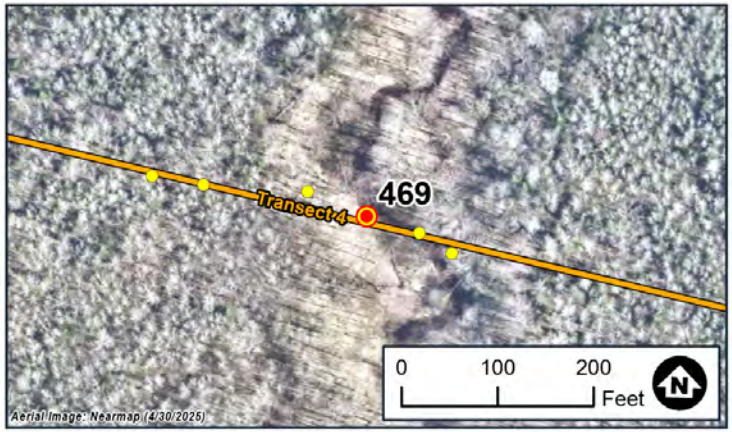
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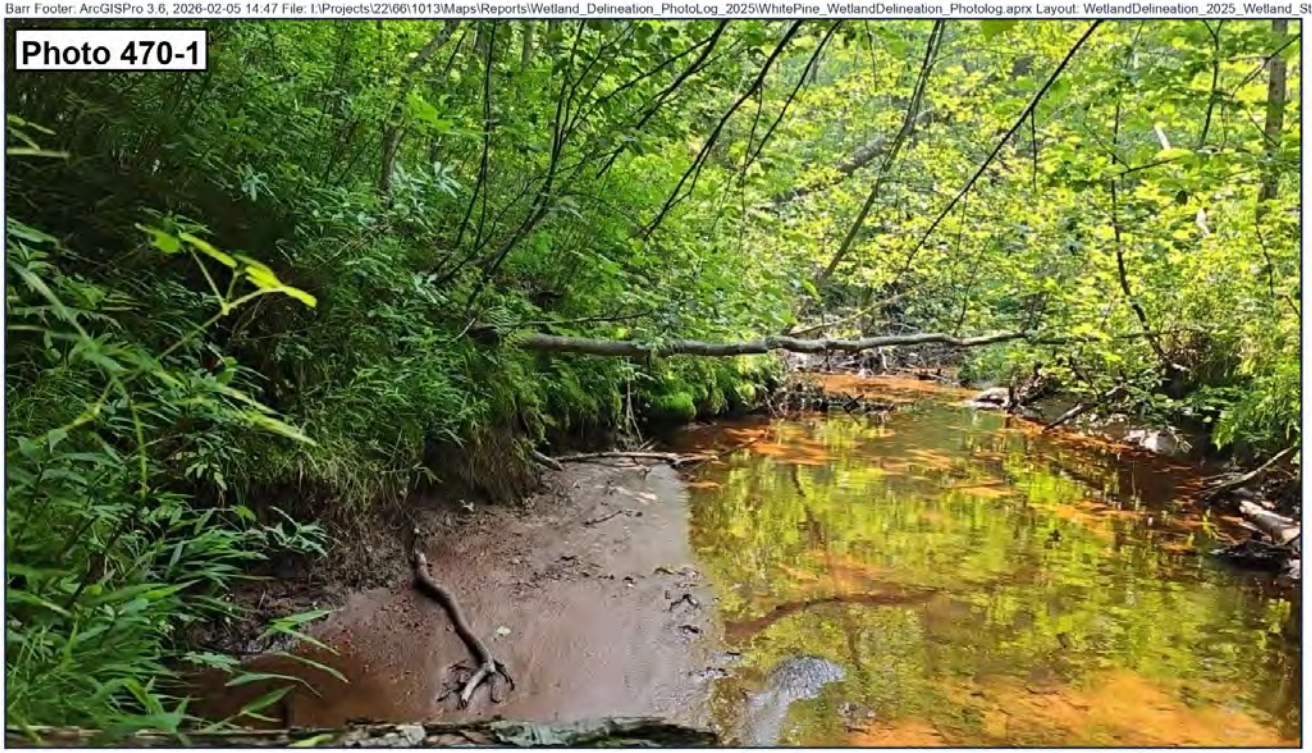


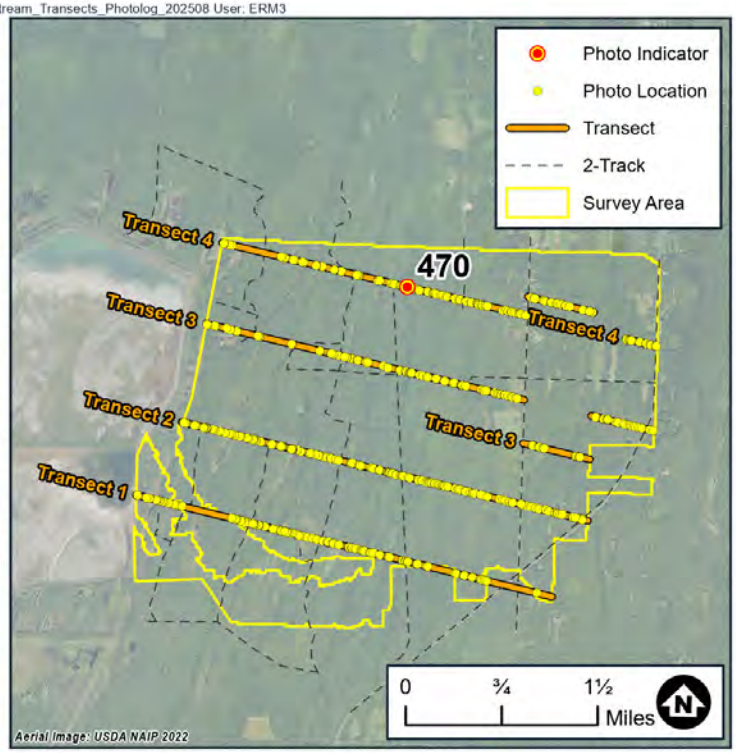

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S03-LB, Upstream
**Photo 2 Caption:** T4E-S03-LB, Downstream

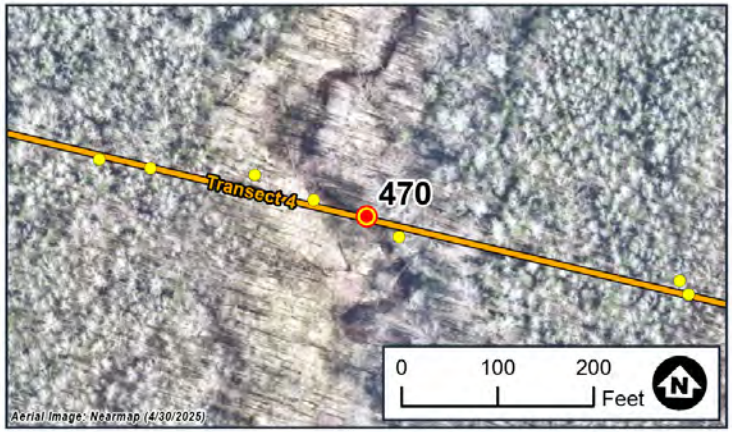
*Note: Photo locations are approximate*










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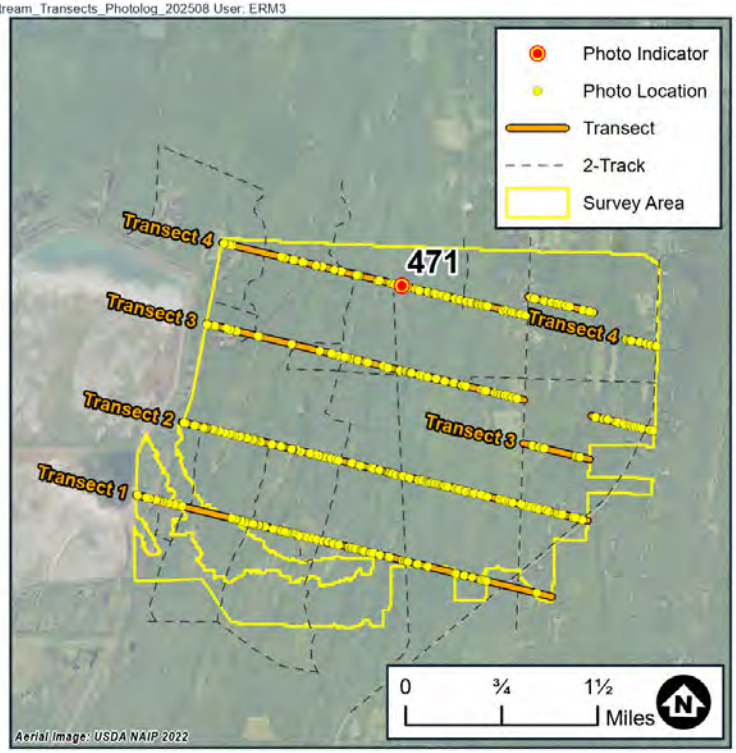
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-S03-RB, Upstream
**Photo 2 Caption:** T4E-S03-RB, Downstream

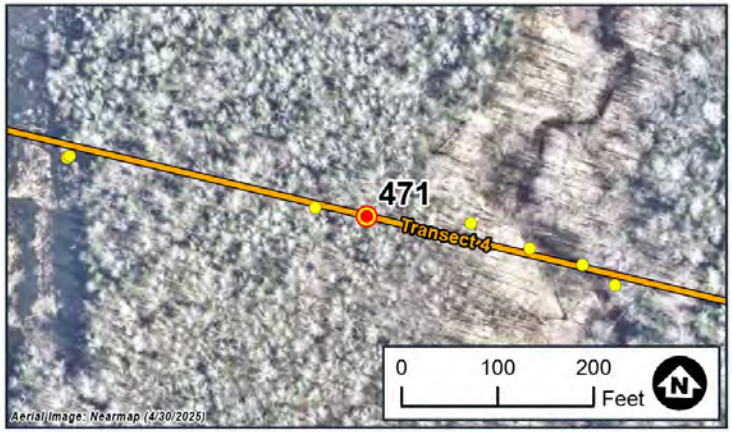
*Note: Photo locations are approximate*









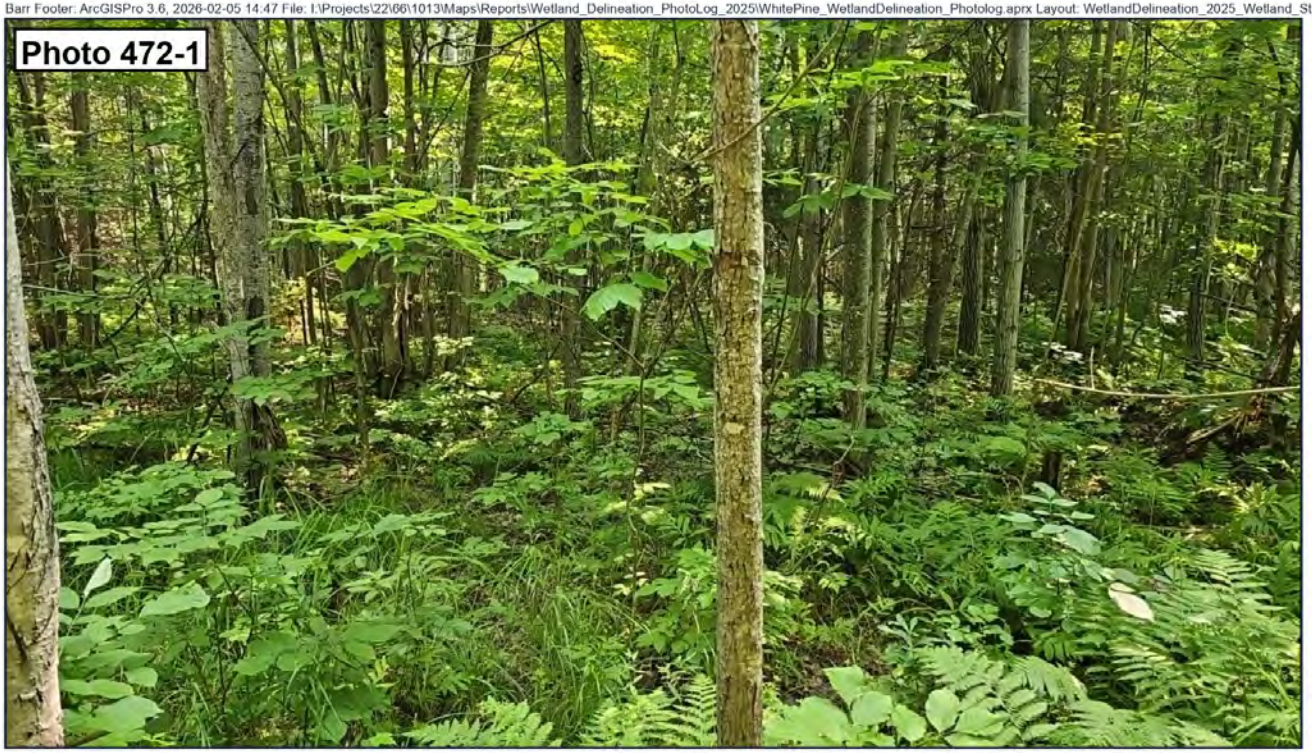


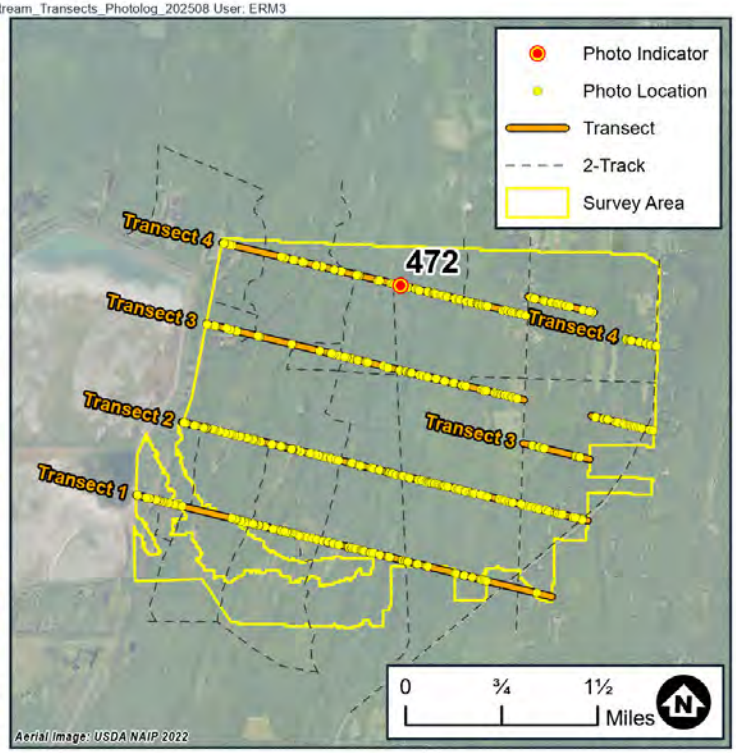

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP03-B, Wetland
**Photo 2 Caption:** T4E-BP03-B, Upland

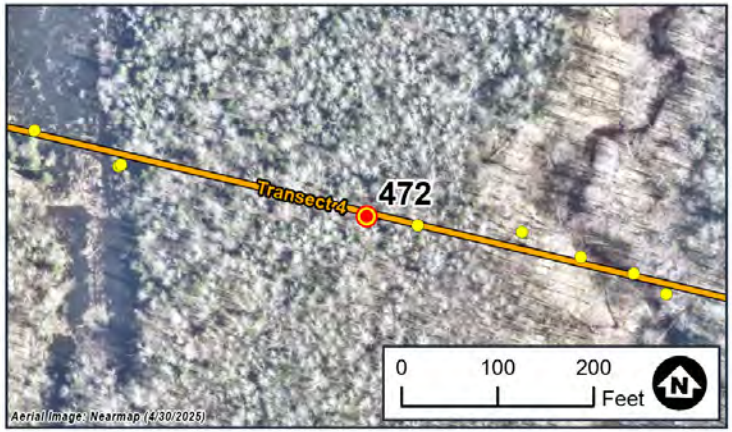
*Note: Photo locations are approximate*











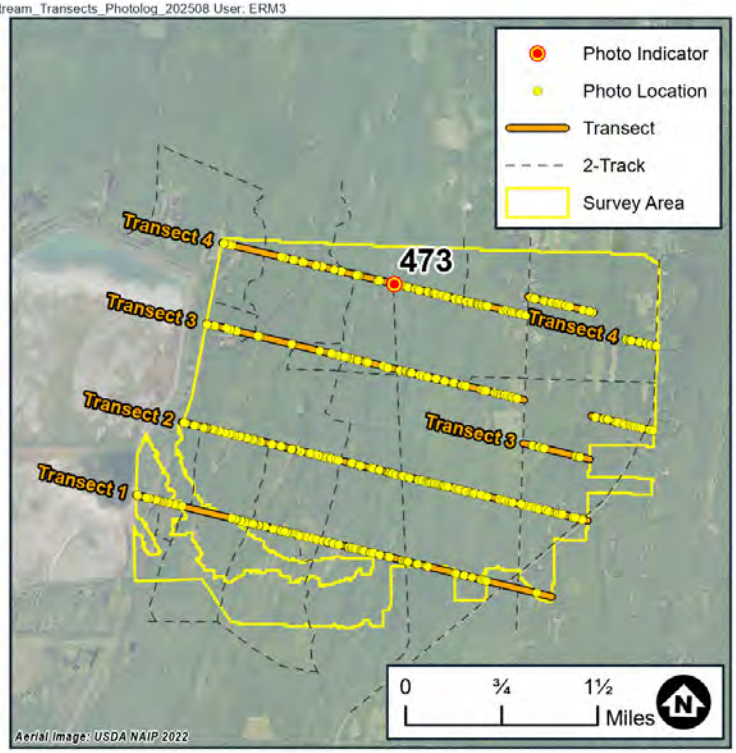

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4E-BP03-A, Wetland
**Photo 2 Caption:** T4E-BP03-A, Upland

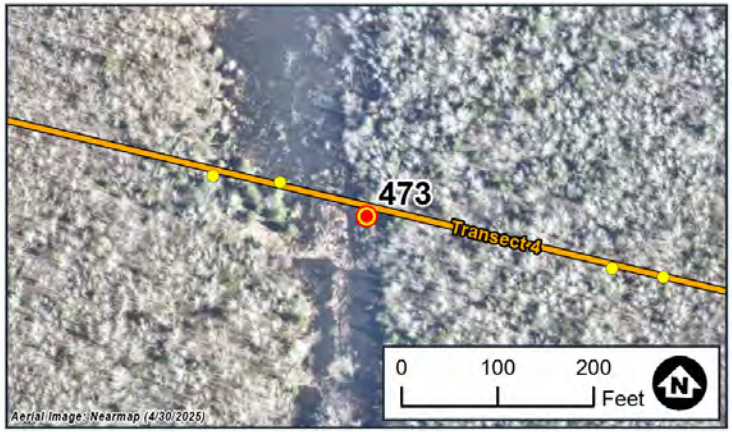
*Note: Photo locations are approximate*











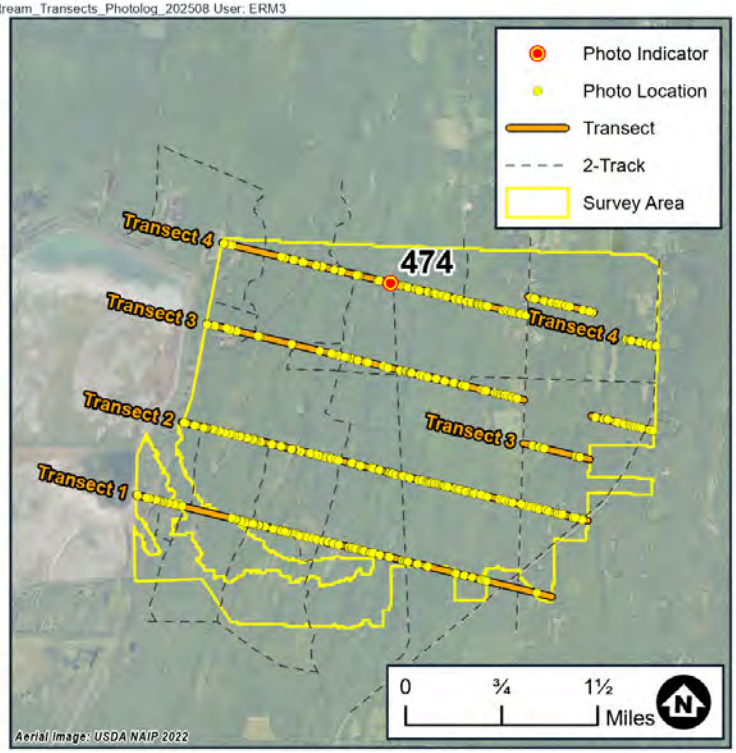

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-BP02-B, Wetland
**Photo 2 Caption:** T4E-BP02-B, Upland

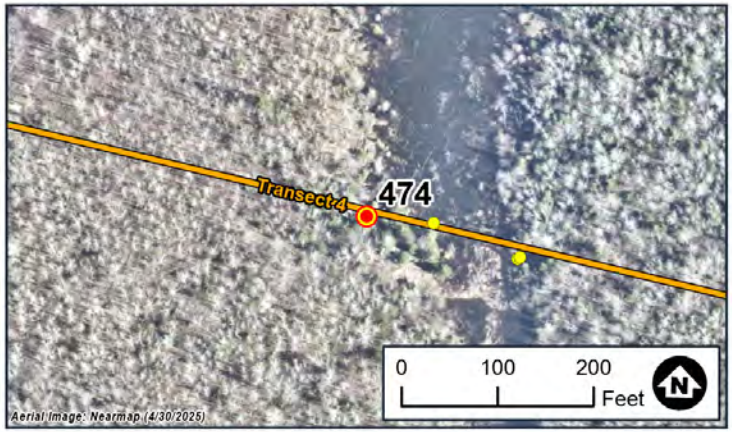
*Note: Photo locations are approximate*











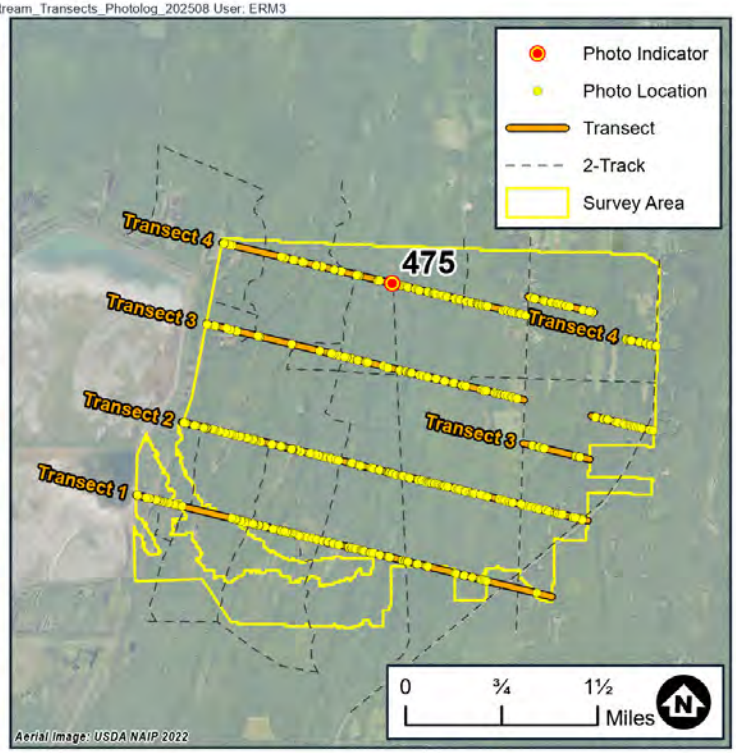

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-BP02-A, Wetland
**Photo 2 Caption:** T4E-BP02-A, Upland

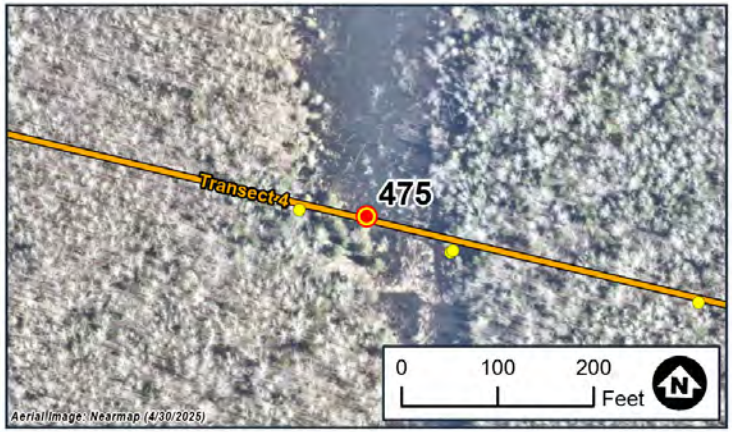
*Note: Photo locations are approximate*











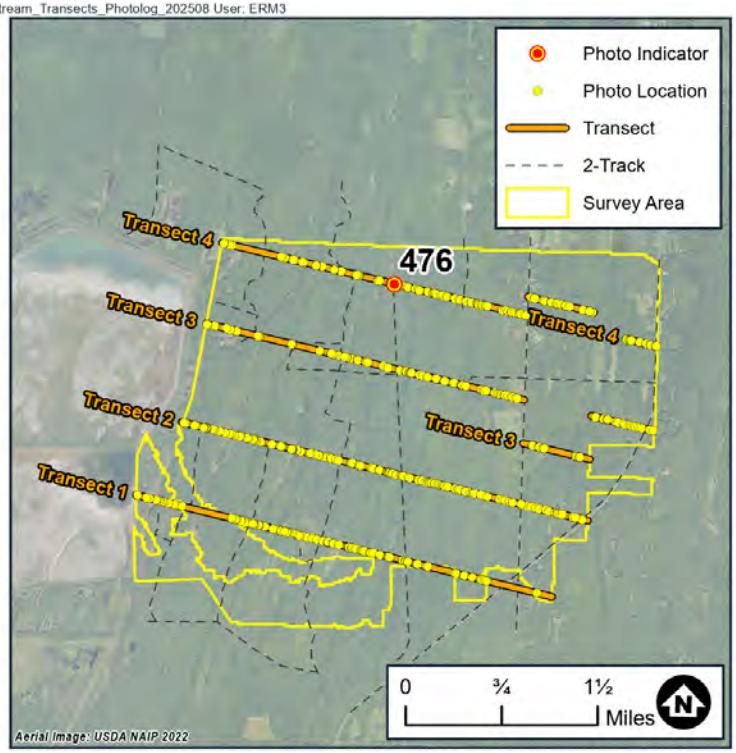

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-S02-LB, Upstream
**Photo 2 Caption:** T4E-S02-LB, Downstream

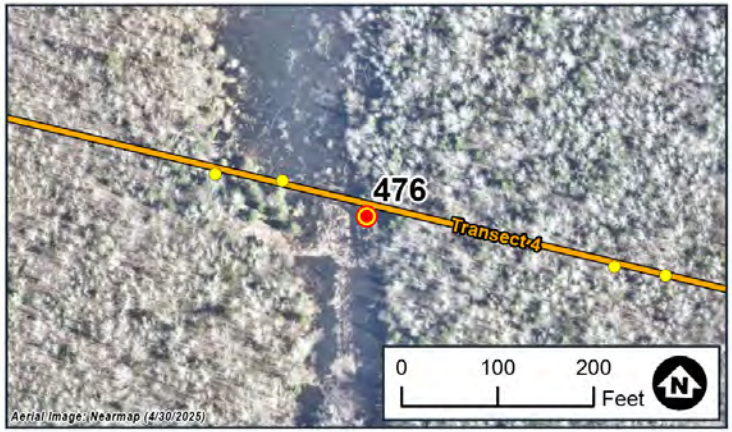
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

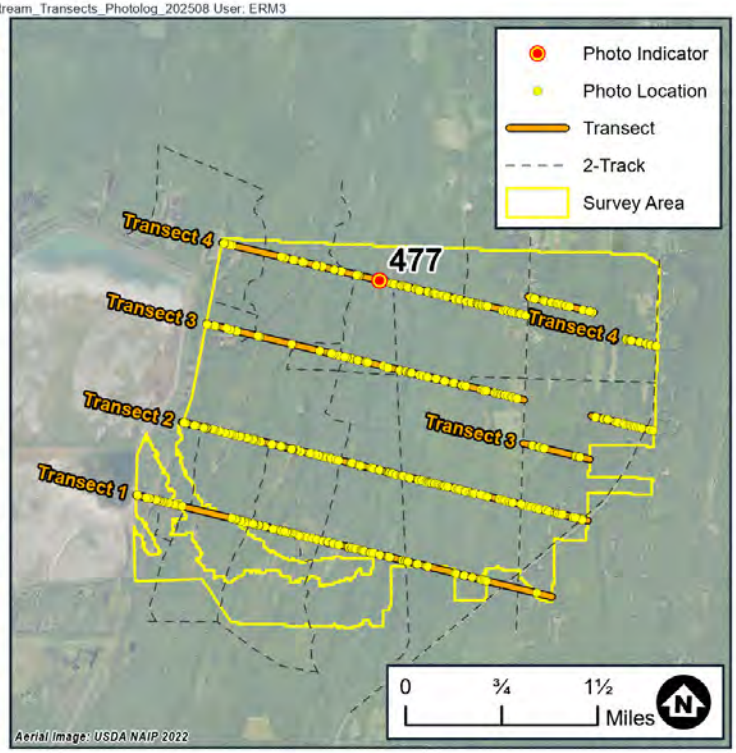
BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-S02-RB, Upstream
**Photo 2 Caption:** T4E-S02-RB, Downstream

*Note: Photo locations are approximate*

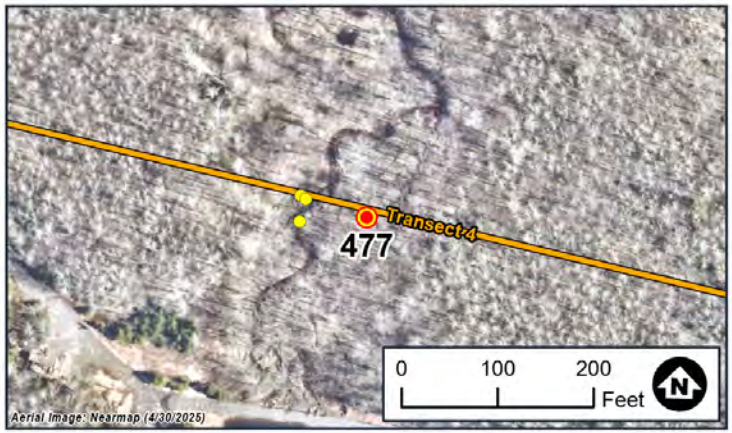
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3









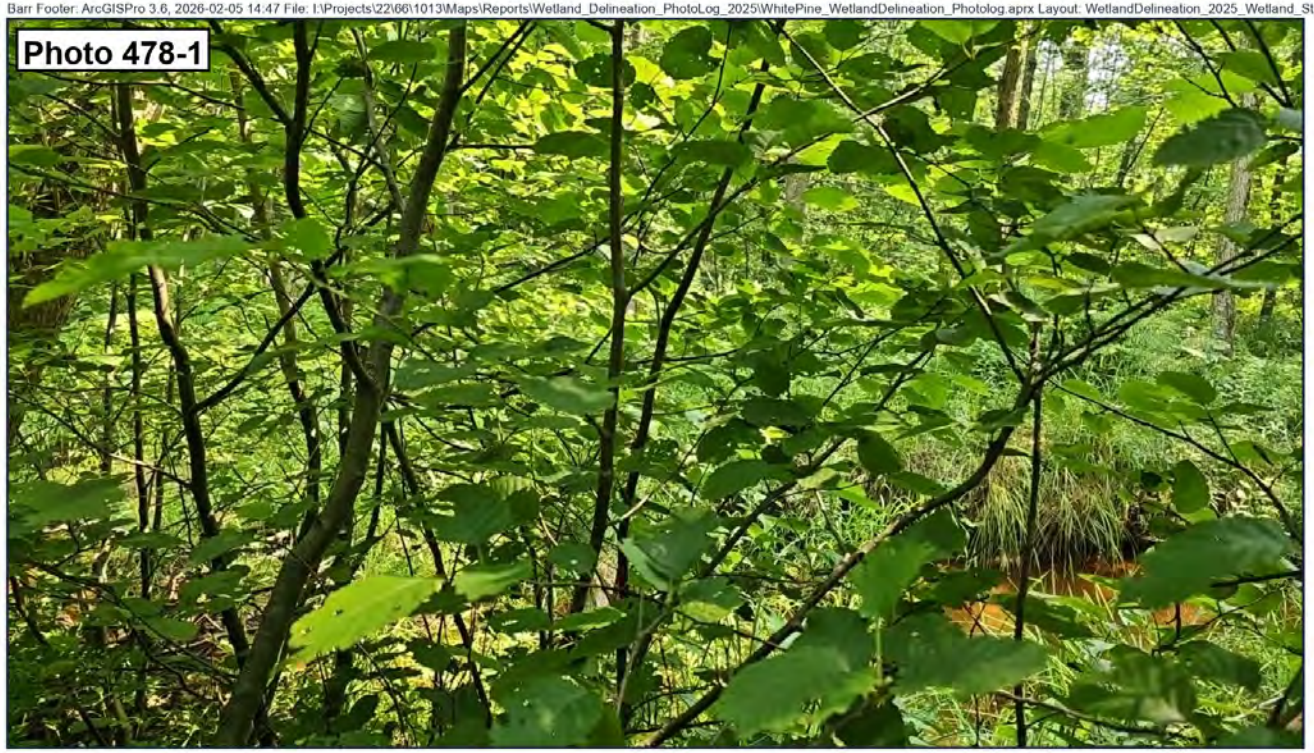

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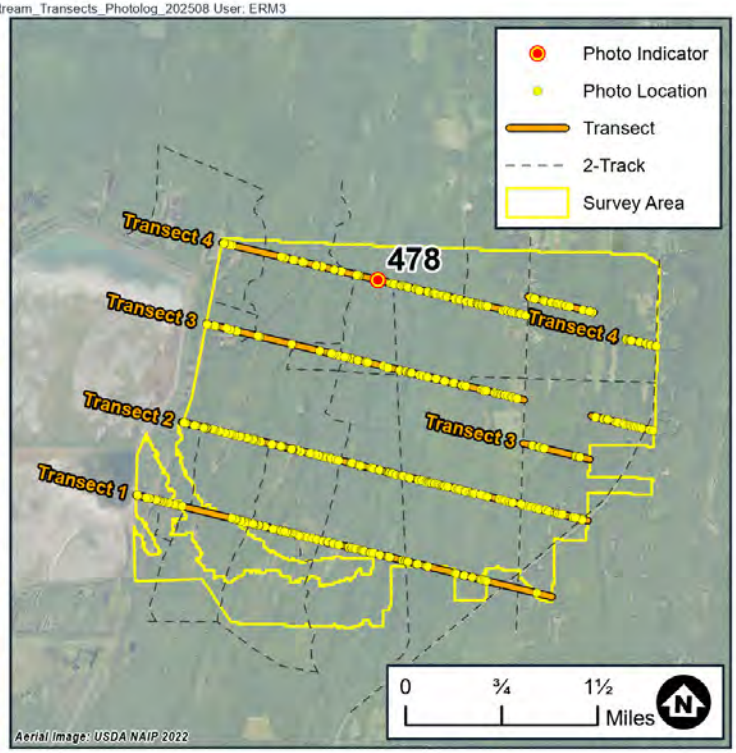
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-BP01-B, Wetland
**Photo 2 Caption:** T4E-BP01-B, Upland

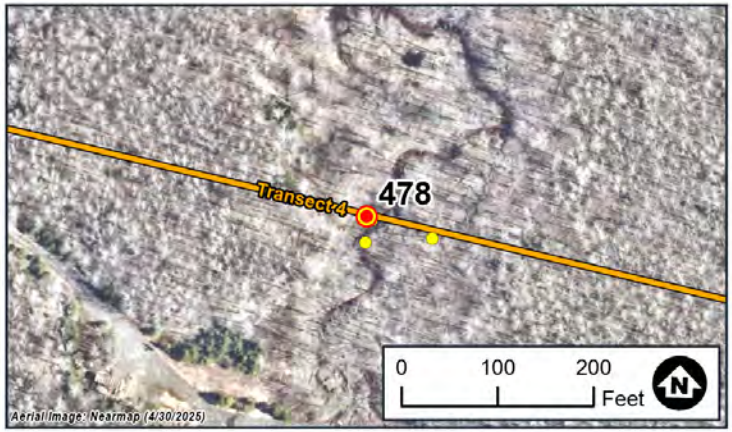
*Note: Photo locations are approximate*











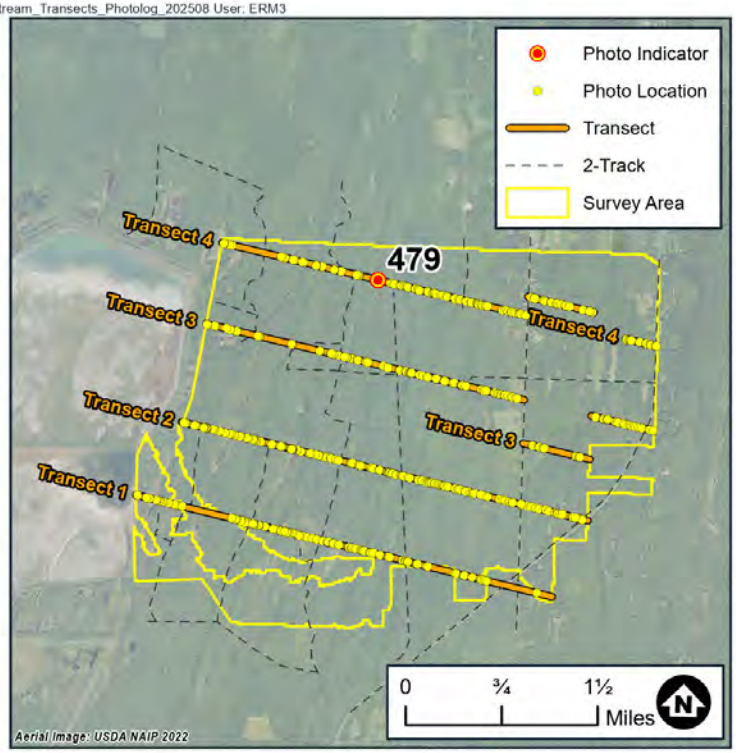

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-BP01-A, Wetland
**Photo 2 Caption:** T4E-BP01-A, Upland

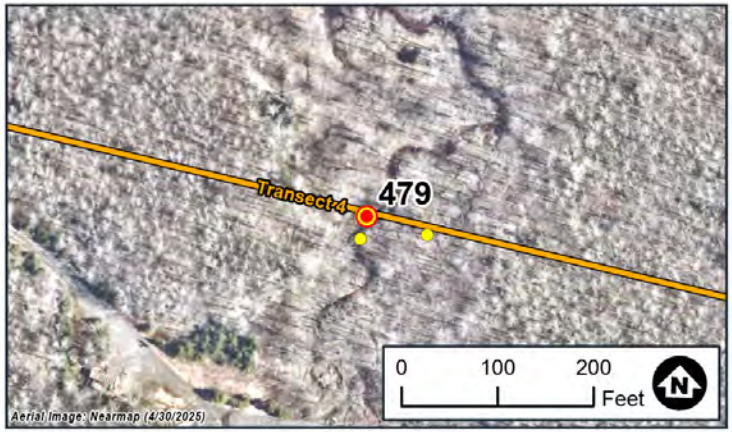
*Note: Photo locations are approximate*










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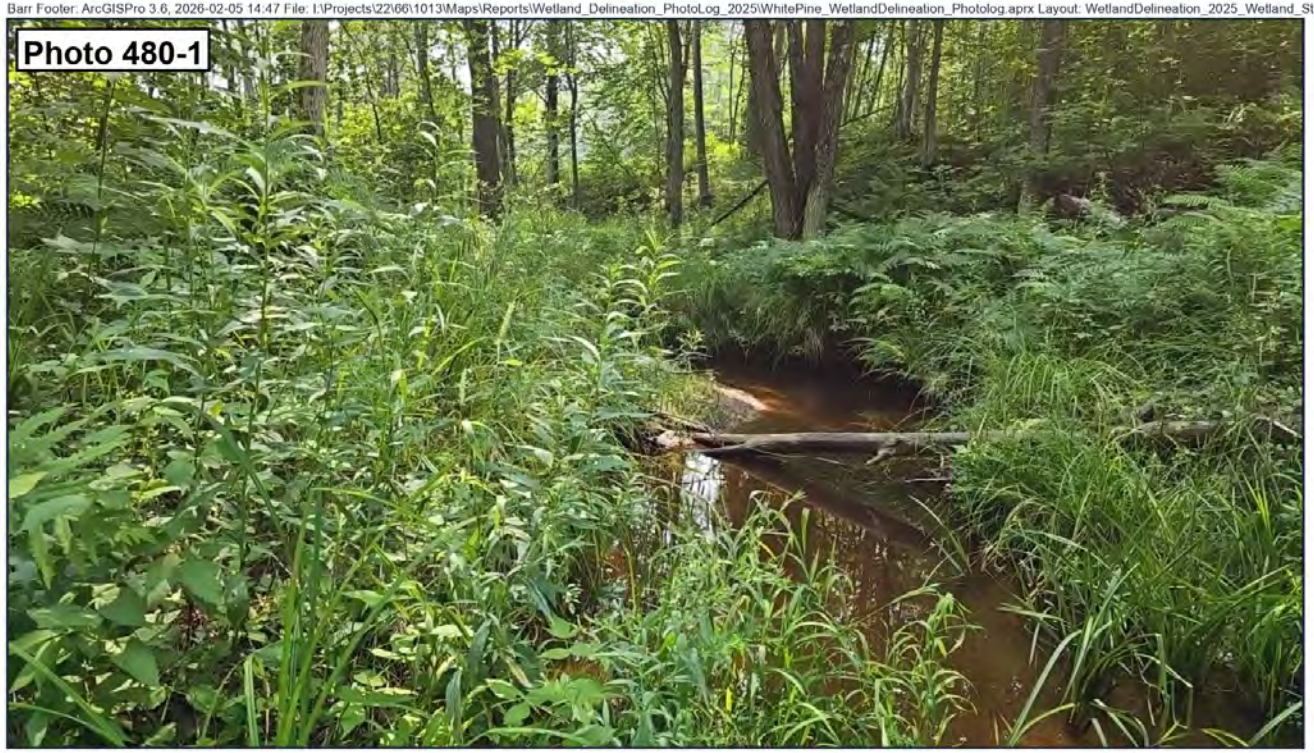
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-S01-LB, Upstream
**Photo 2 Caption:** T4E-S01-LB, Downstream

*Note: Photo locations are approximate*

**Photo 480-1**



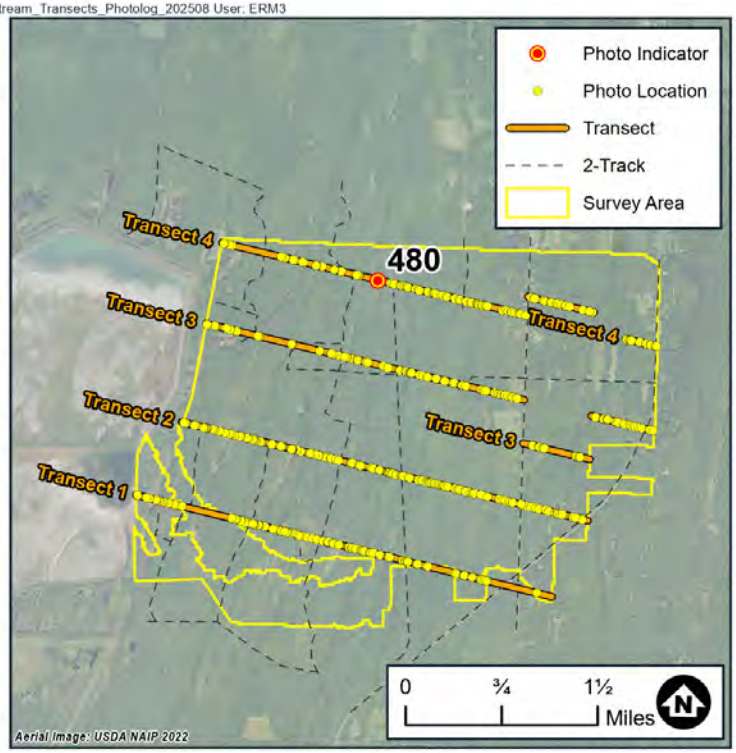
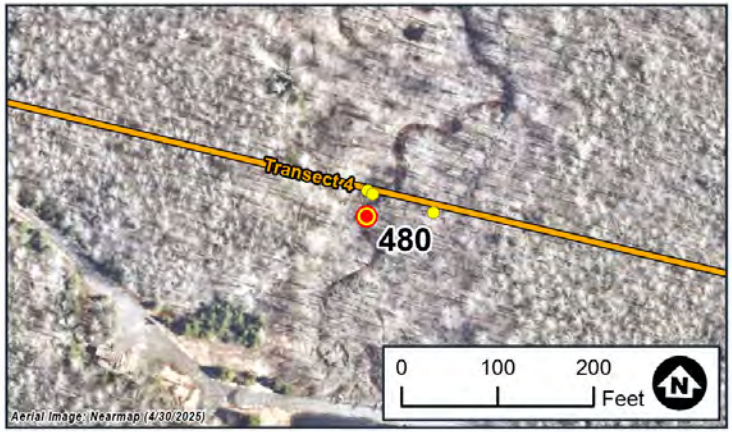



**Photo 480-2**







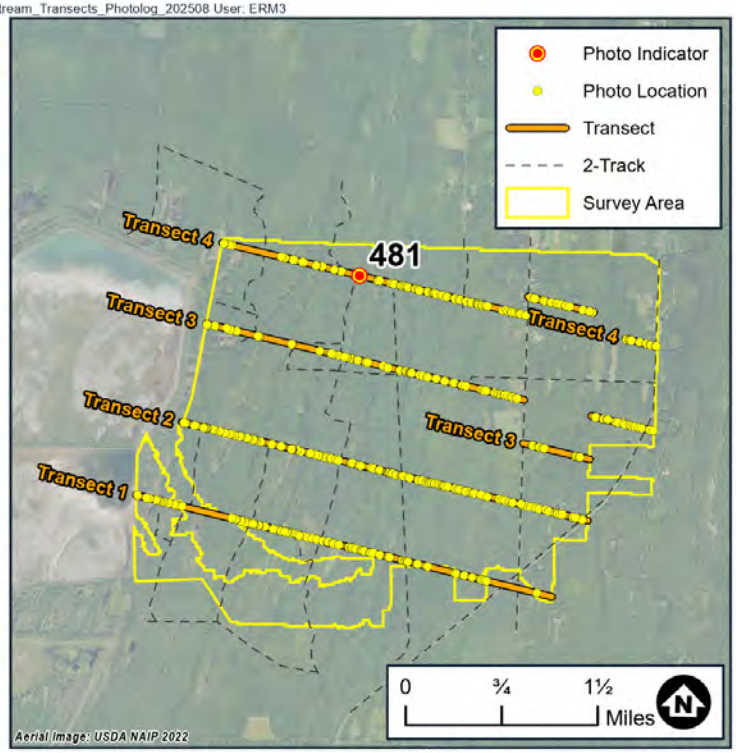

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4E-S01-RB, Upstream
**Photo 2 Caption:** T4E-S01-RB, Downstream

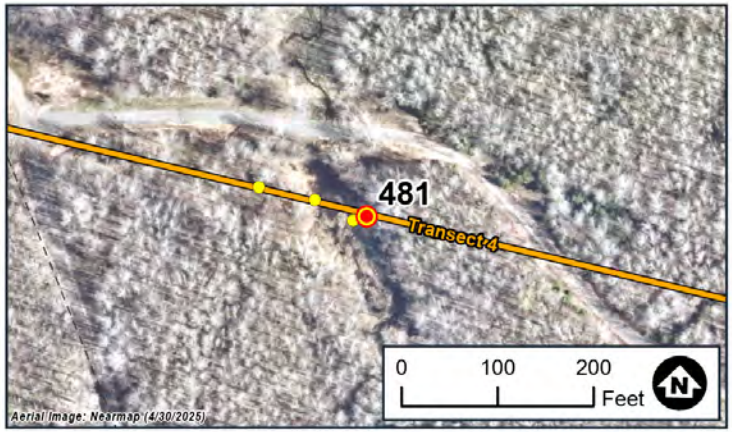
*Note: Photo locations are approximate*











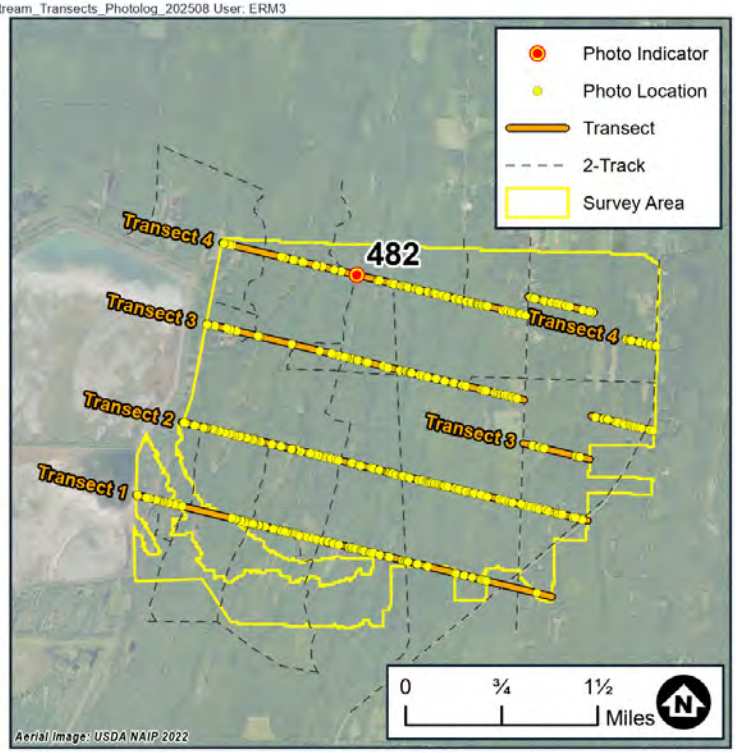

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4W-BP01-A, Wetland
**Photo 2 Caption:** T4W-BP01-A, Upland

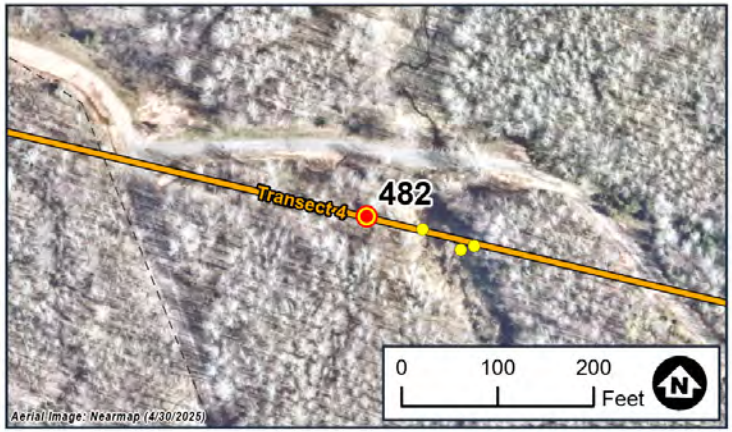
*Note: Photo locations are approximate*











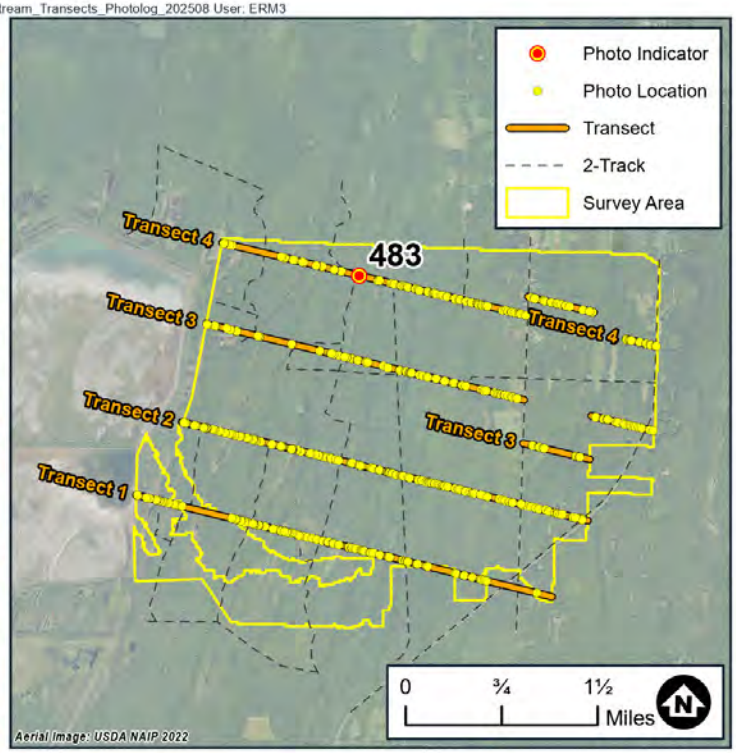

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4W-BP01-B, Wetland
**Photo 2 Caption:** T4W-BP01-B, Upland

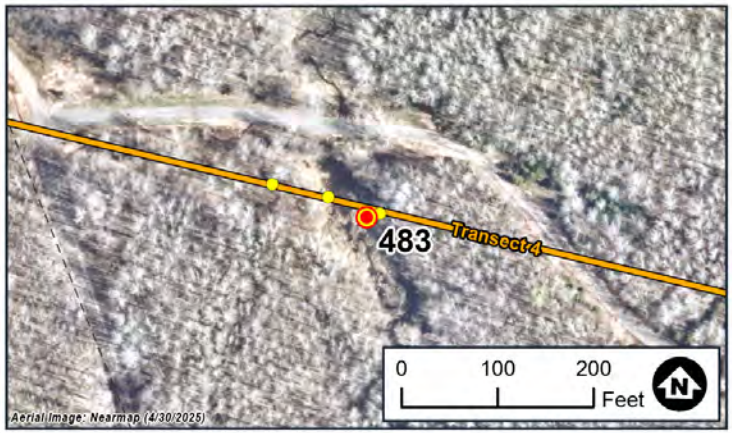
*Note: Photo locations are approximate*











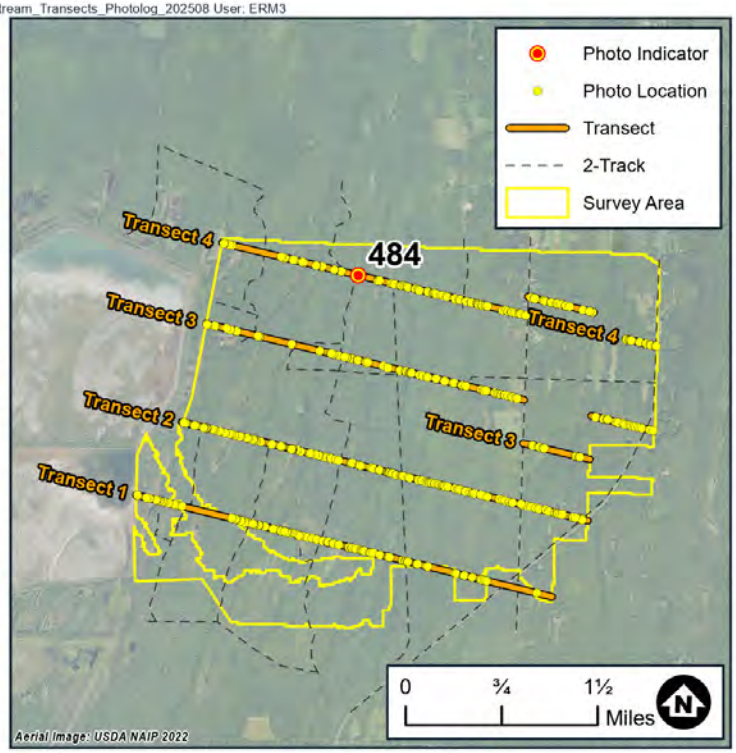

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4W-S01-RB, Upstream
**Photo 2 Caption:** T4W-S01-RB, Downstream

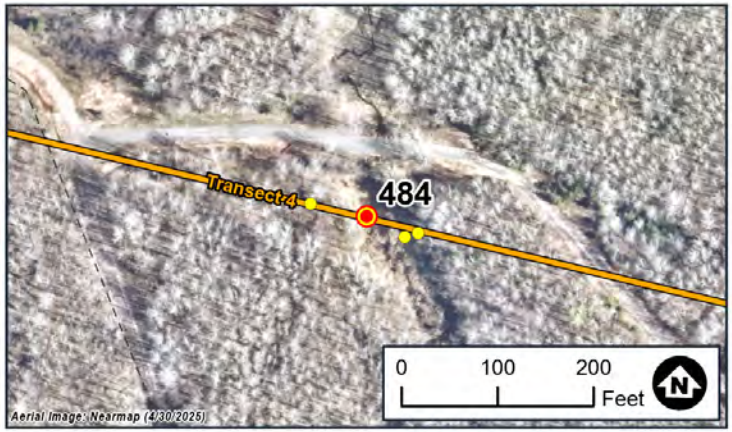
*Note: Photo locations are approximate*









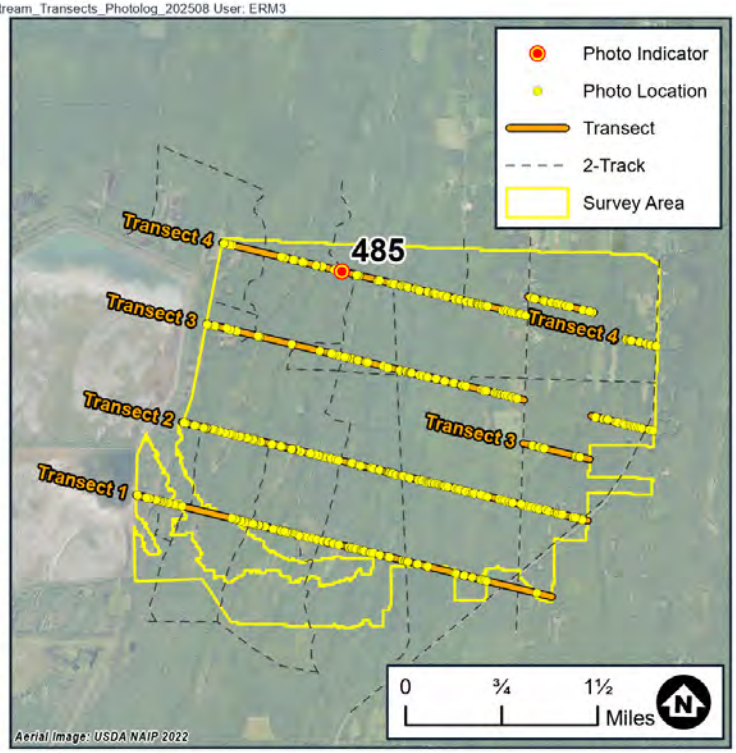

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/29/2025
**Photo 1 Caption:** T4W-S01-LB, Upstream
**Photo 2 Caption:** T4W-S01-LB, Downstream

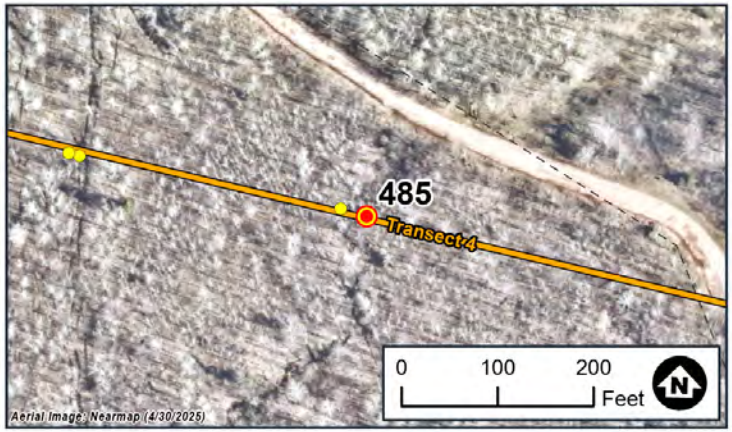
*Note: Photo locations are approximate*










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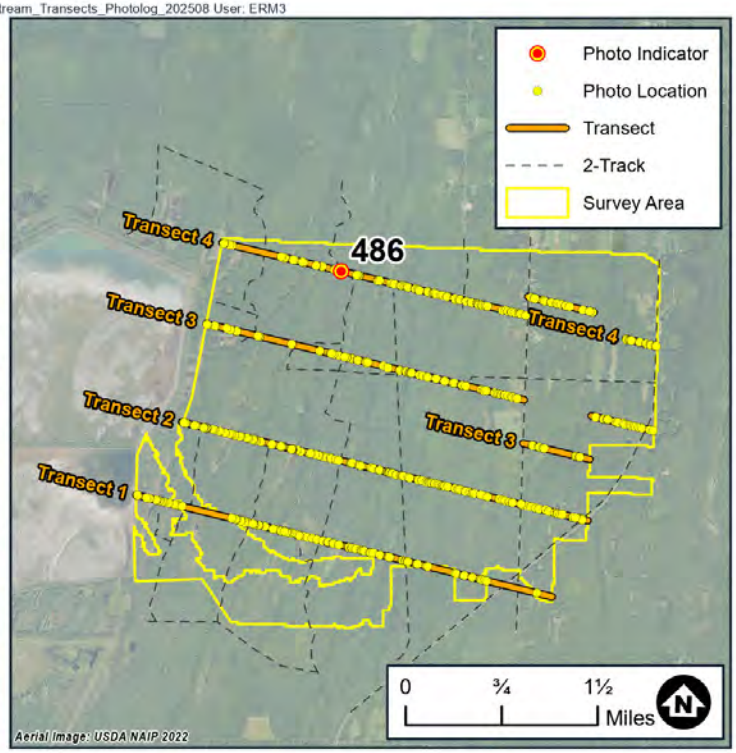
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP02-A, Wetland
**Photo 2 Caption:** T4W-BP02-A, Upland

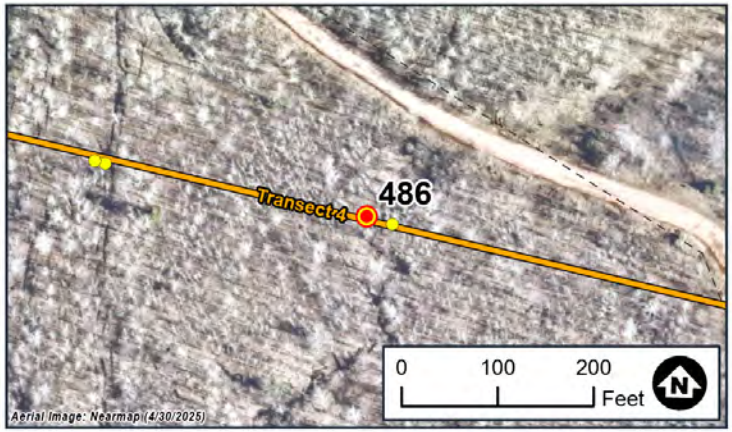
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

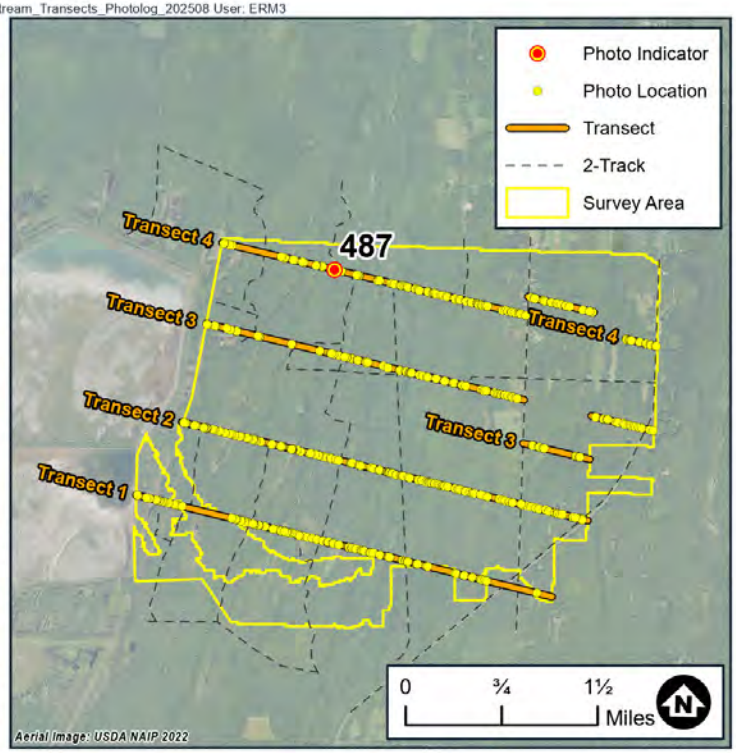
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP02-B, Wetland
**Photo 2 Caption:** T4W-BP02-B, Upland

*Note: Photo locations are approximate*

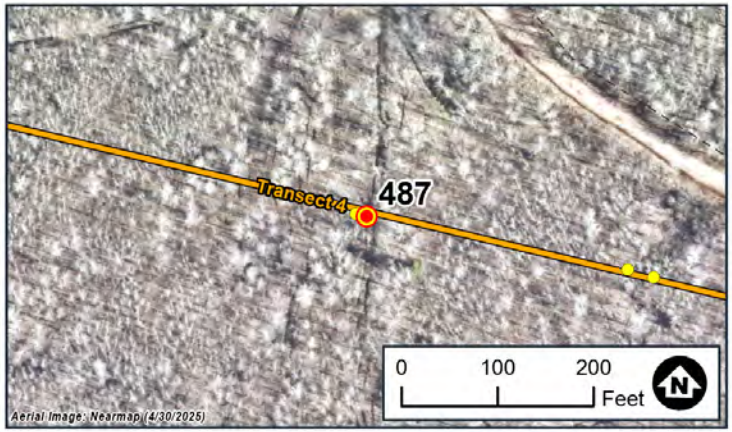
## Photo 487-1






## Photo 487-2







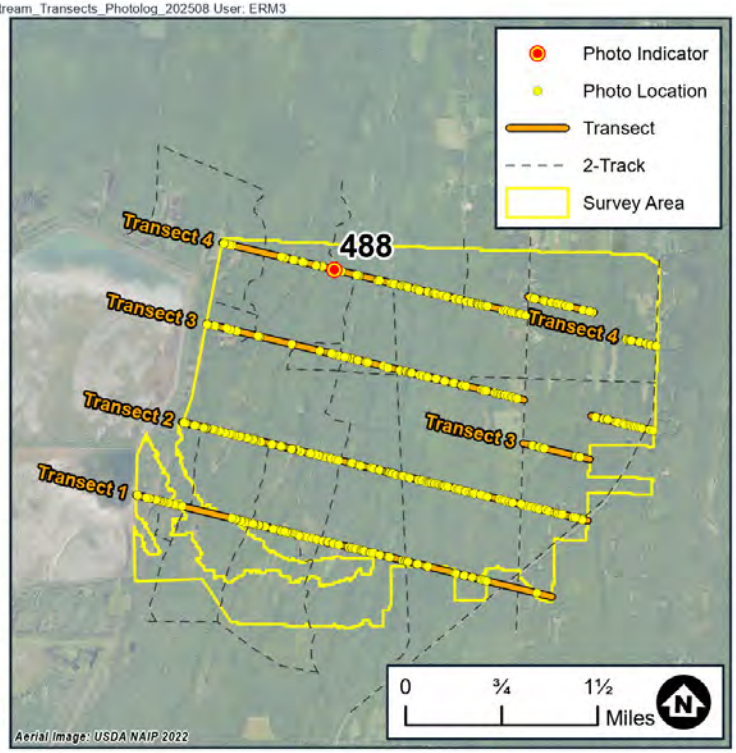

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP03-A, Wetland
**Photo 2 Caption:** T4W-BP03-A, Upland

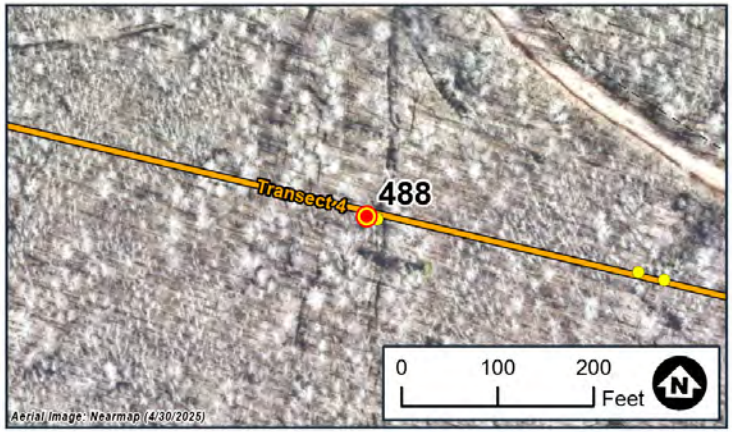
*Note: Photo locations are approximate*











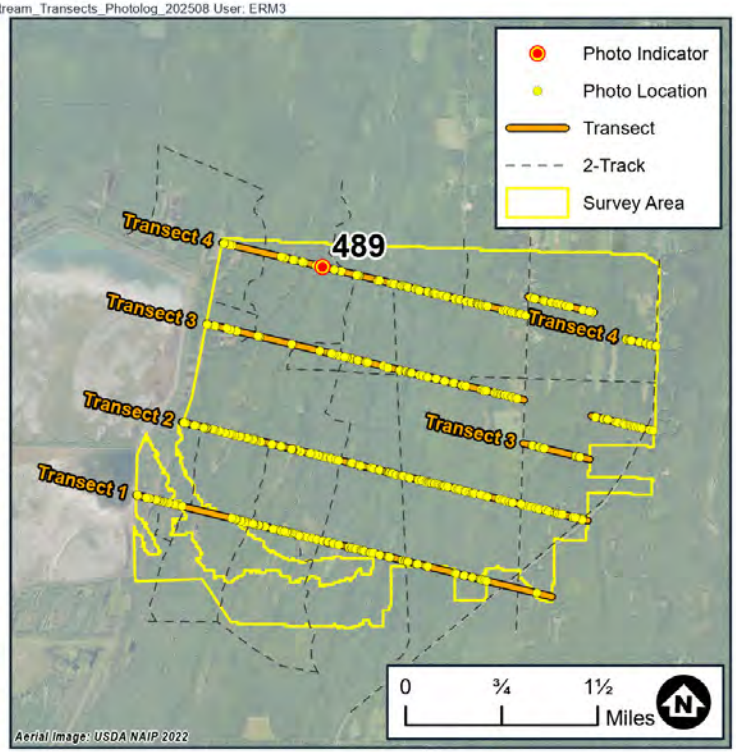

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP03-B, Wetland
**Photo 2 Caption:** T4W-BP03-B, Upland

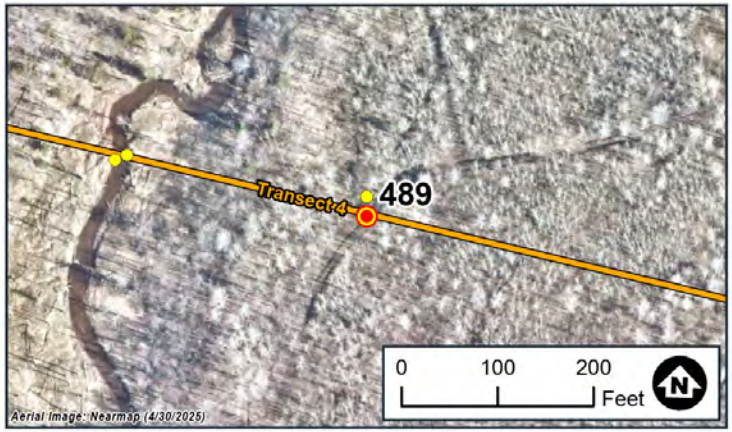
*Note: Photo locations are approximate*












**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

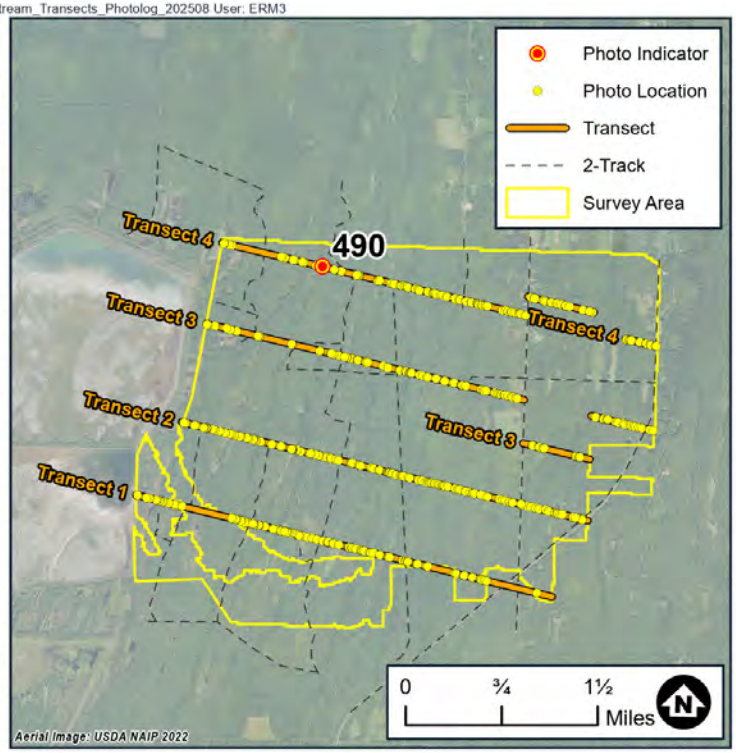
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP04-A, Wetland
**Photo 2 Caption:** T4W-BP04-A, Upland

*Note: Photo locations are approximate*

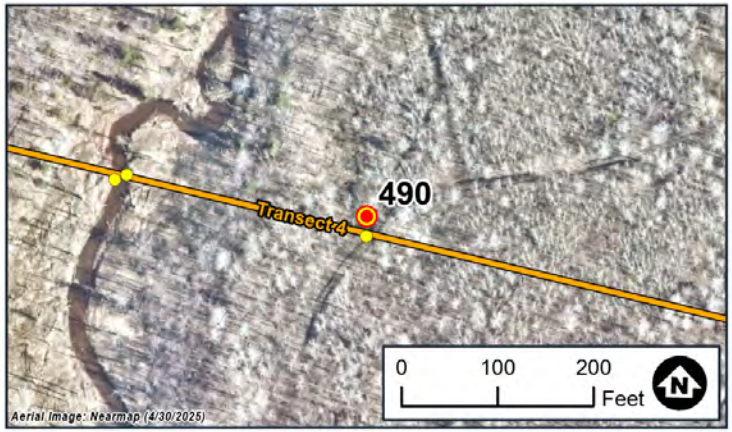
## Photo 490-1






## Photo 490-2







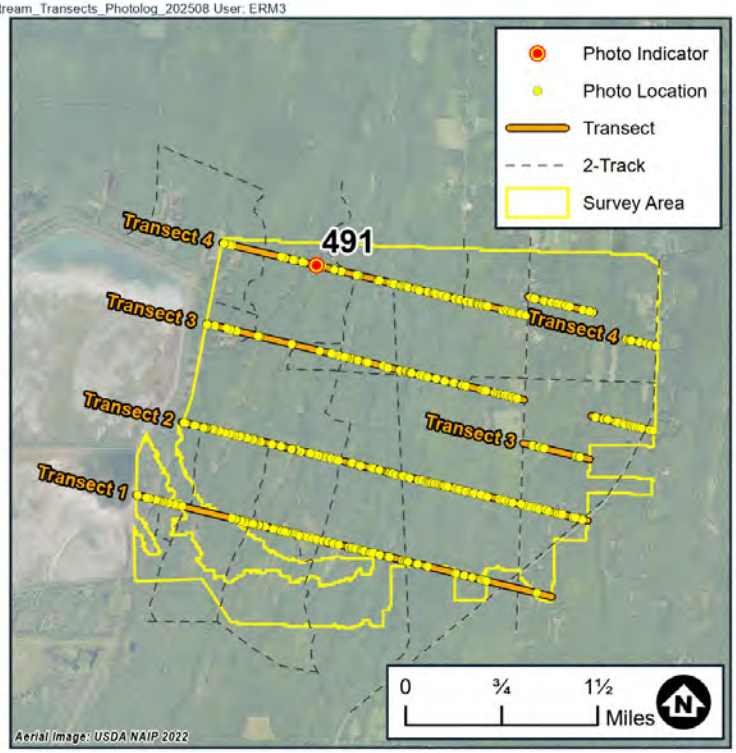

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP04-B, Wetland
**Photo 2 Caption:** T4W-BP04-B, Upland

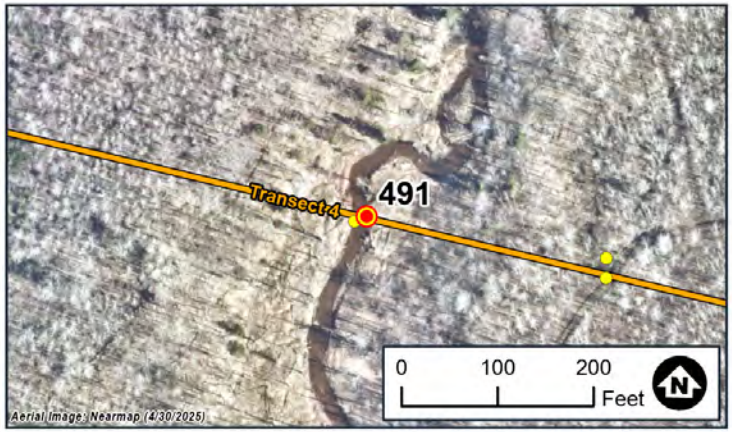
*Note: Photo locations are approximate*









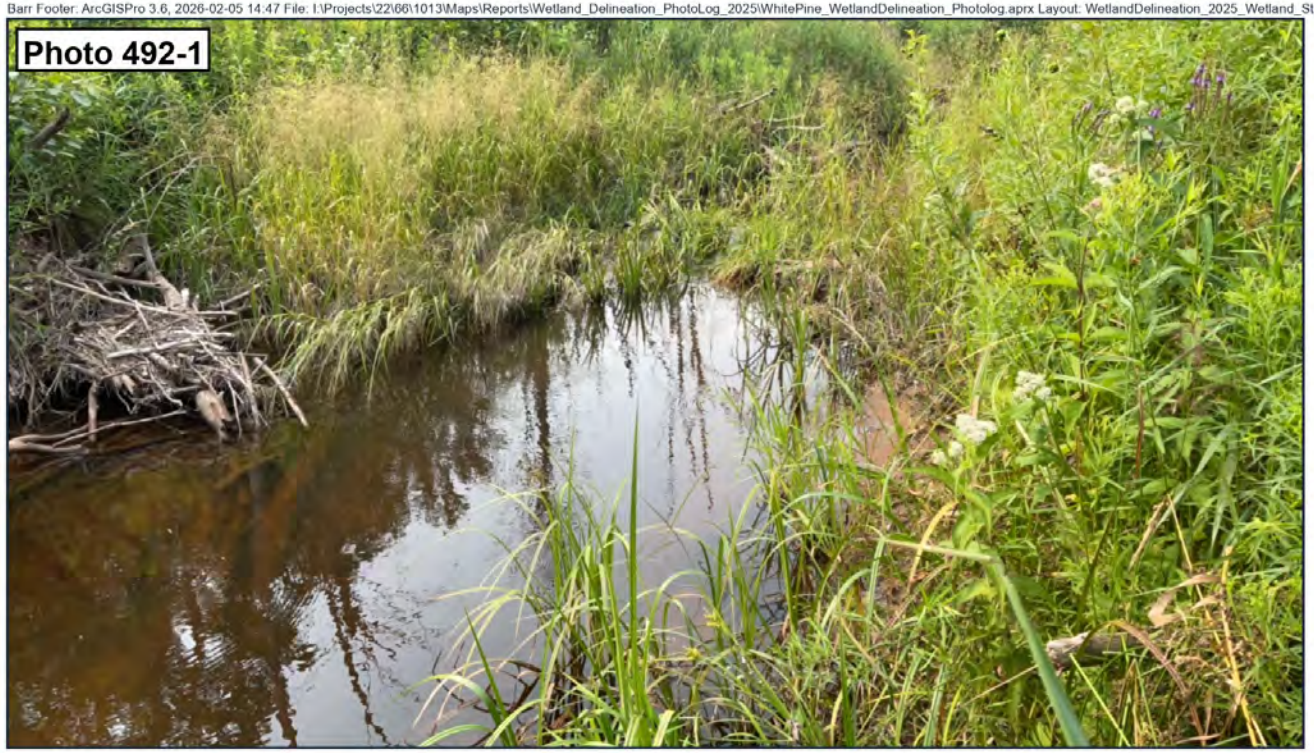

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

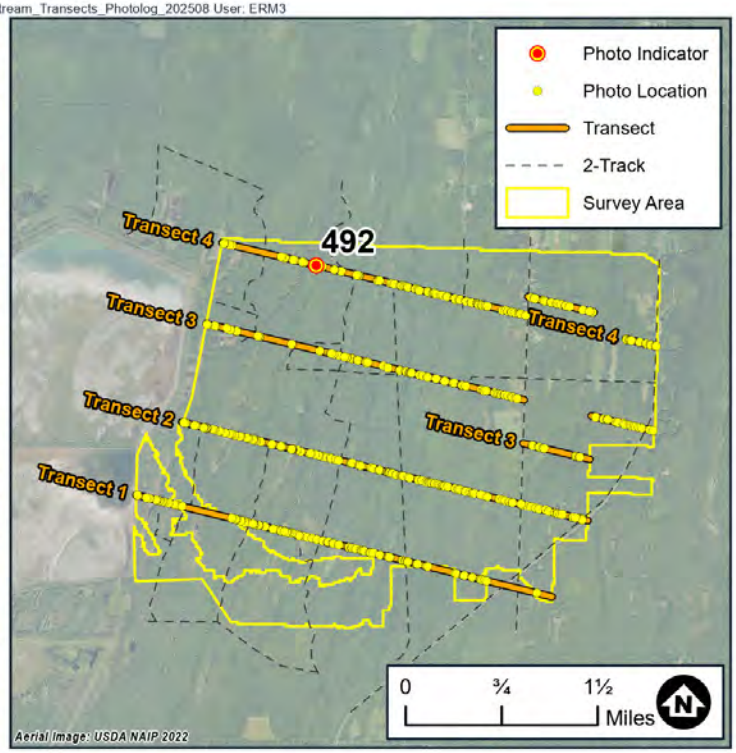
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-S02-RB, Upstream
**Photo 2 Caption:** T4W-S02-RB, Downstream

*Note: Photo locations are approximate*

## Photo 492-1






## Photo 492-2





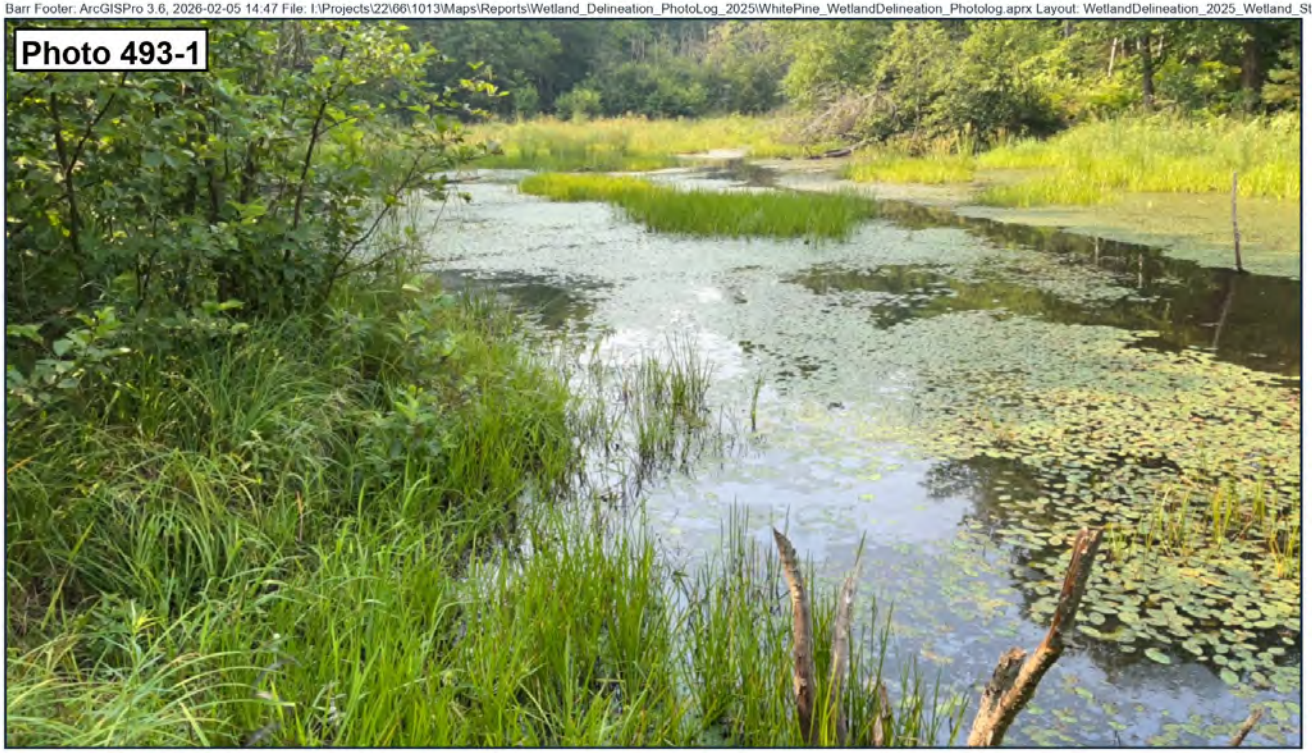


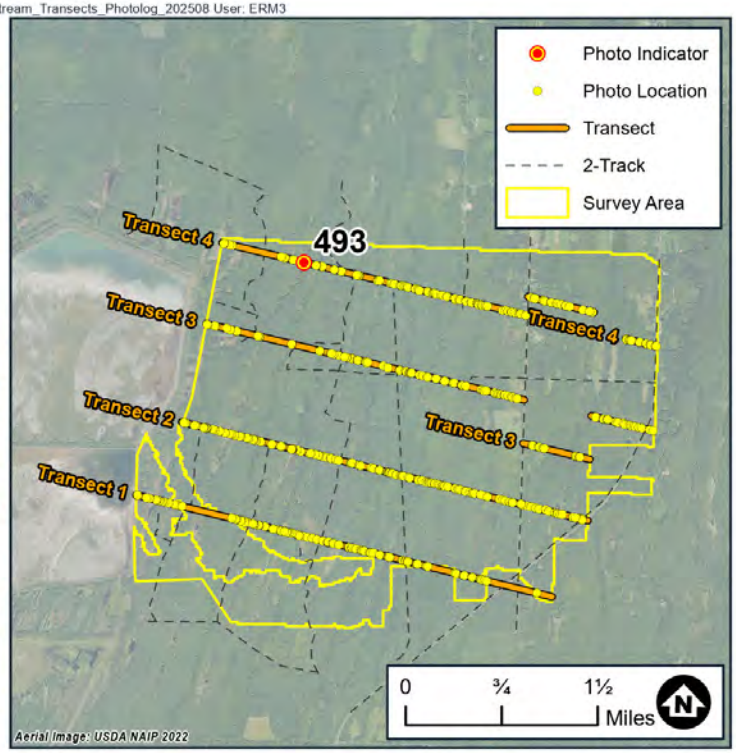

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-S02-LB, Upstream
**Photo 2 Caption:** T4W-S02-LB, Downstream

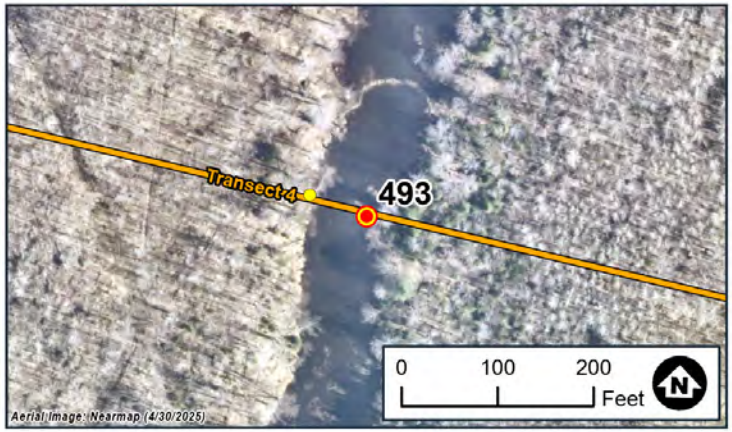
*Note: Photo locations are approximate*









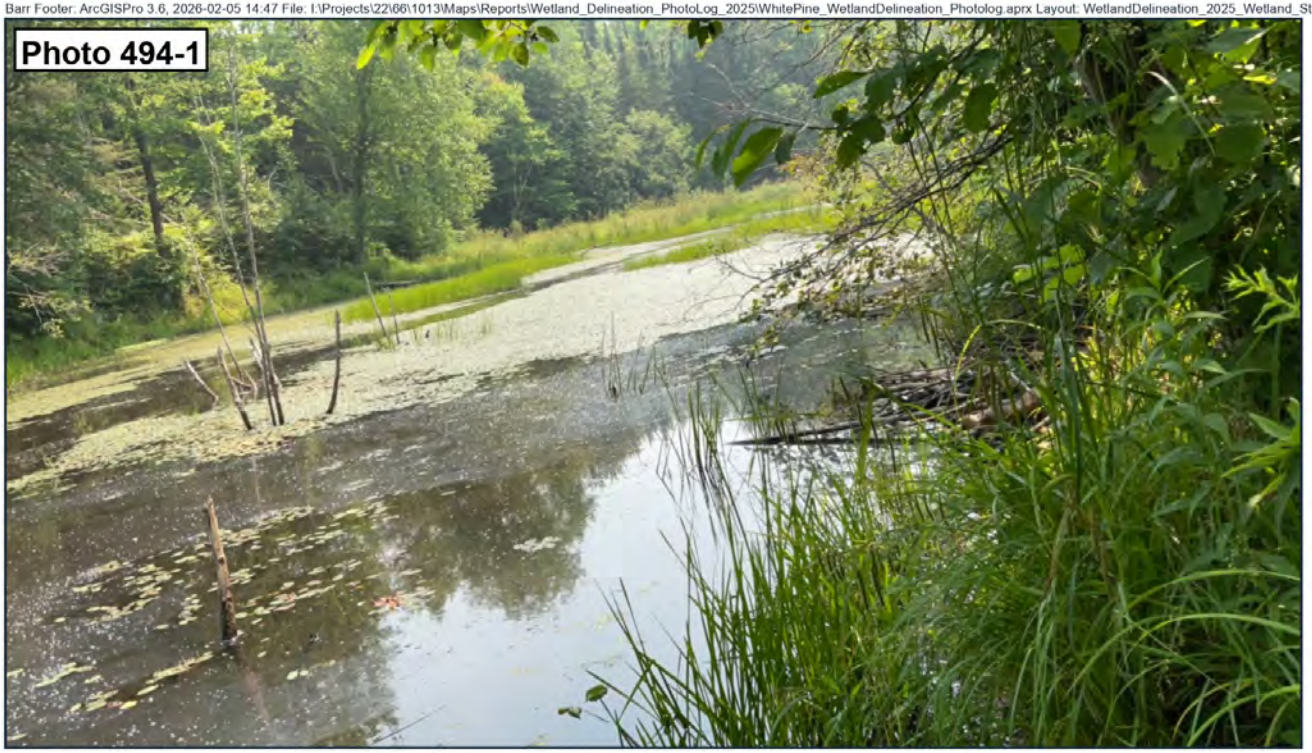

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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

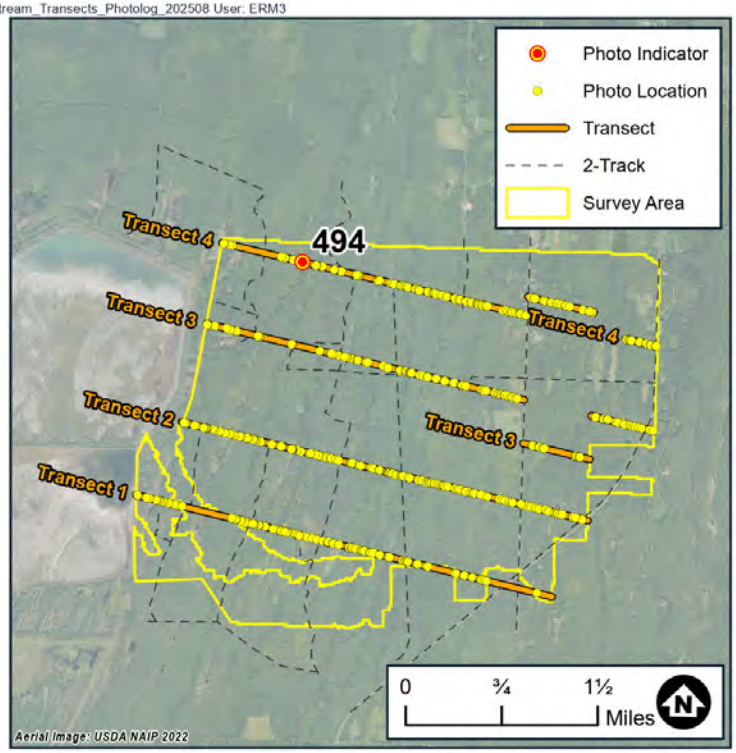
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-S03-RB, Upstream
**Photo 2 Caption:** T4W-S03-RB, Downstream

*Note: Photo locations are approximate*

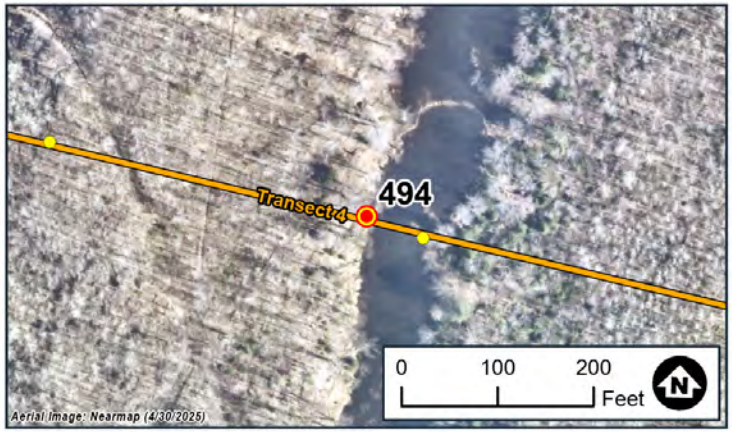
Barr Footer: ArcGISPro 3.6, 2026-02-05 14:47 File: I:\Projects\22\66\1013\Maps\Reports\Wetland_Delineation_PhotoLog_2025\WhitePine_WetlandDelineation_Photolog.aprx Layout: WetlandDelineation_2025_Wetland_Stream_Transects_Photolog_202508 User: ERM3










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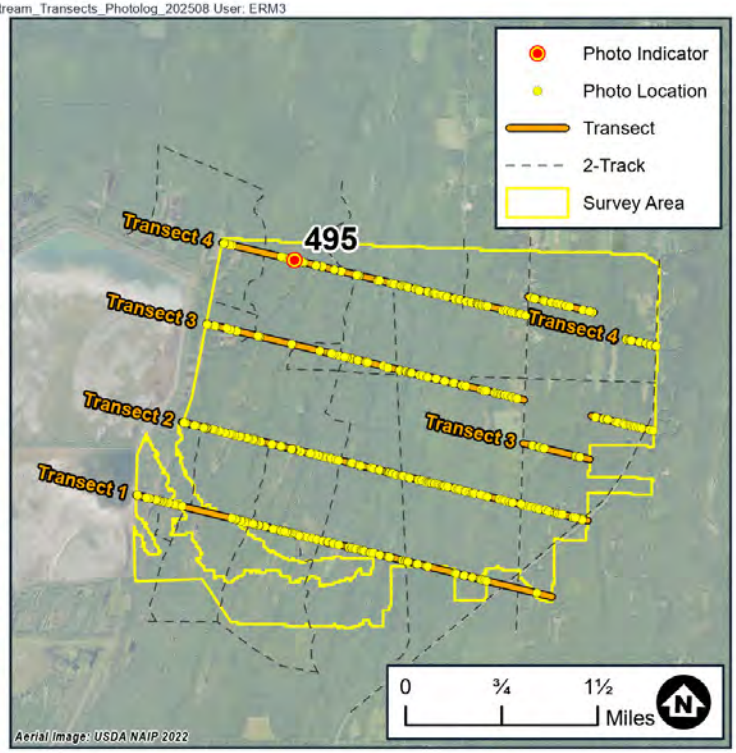
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-S03-LB, Upstream
**Photo 2 Caption:** T4W-S03-LB, Downstream

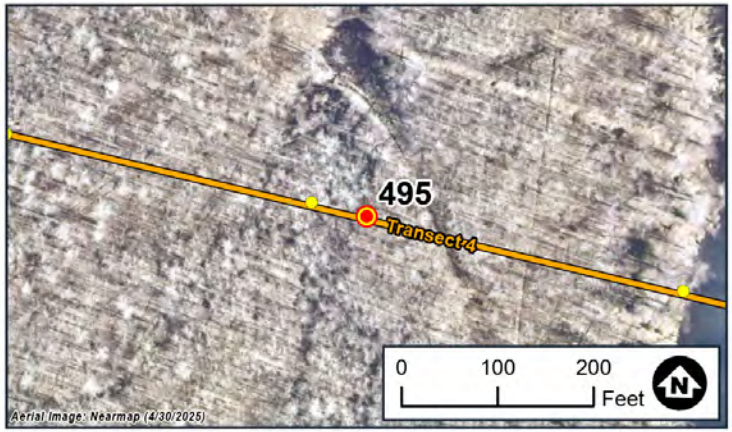
*Note: Photo locations are approximate*










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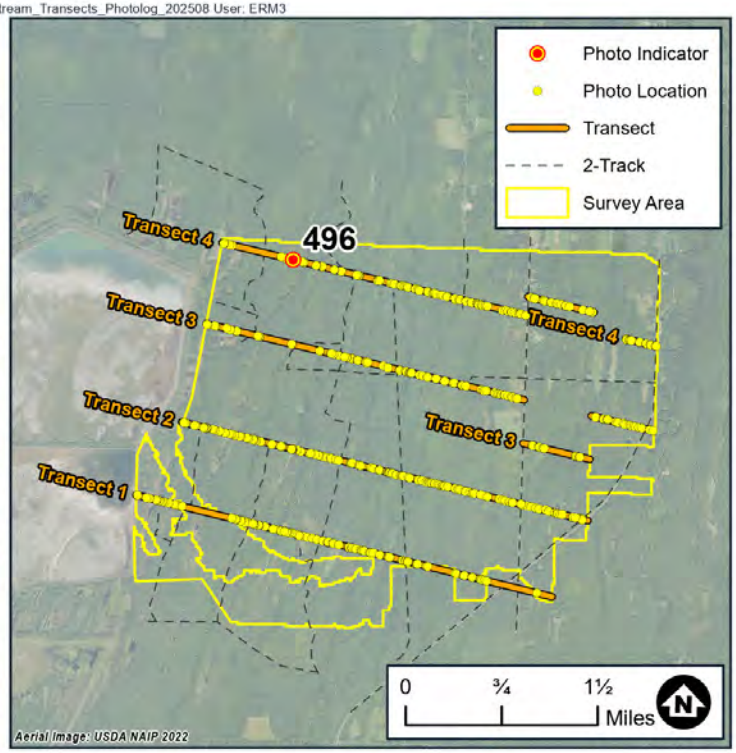
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP05-A, Wetland
**Photo 2 Caption:** T4W-BP05-A, Upland

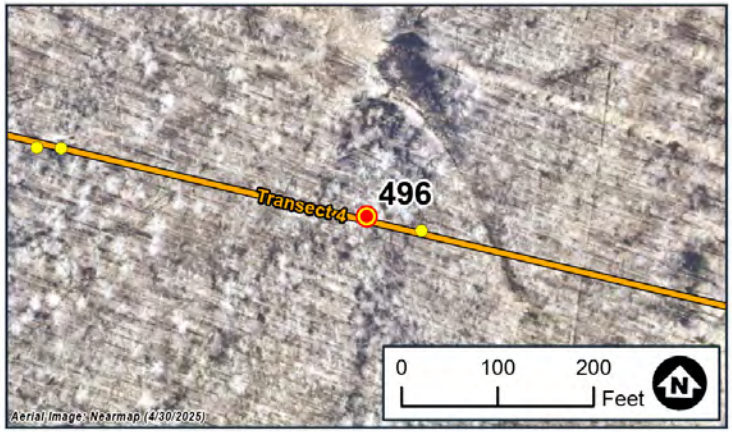
*Note: Photo locations are approximate*










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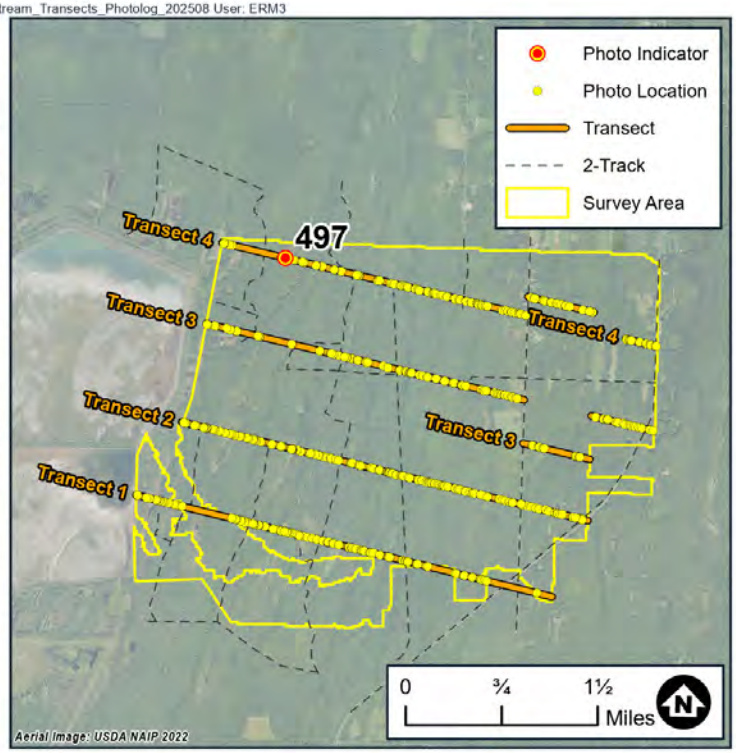
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP05-B, Wetland
**Photo 2 Caption:** T4W-BP05-B, Upland

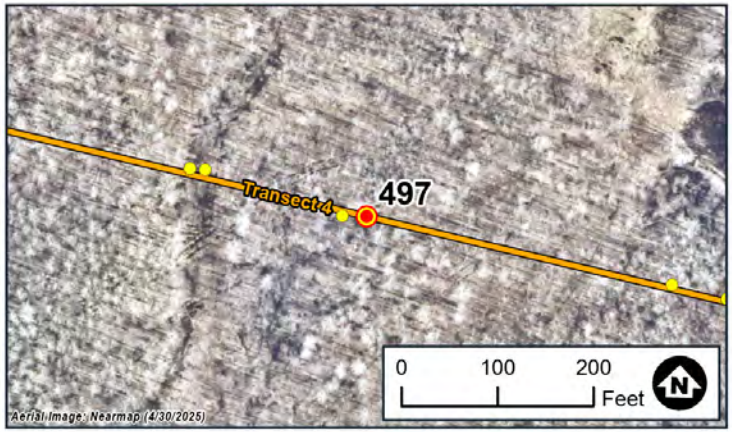
*Note: Photo locations are approximate*











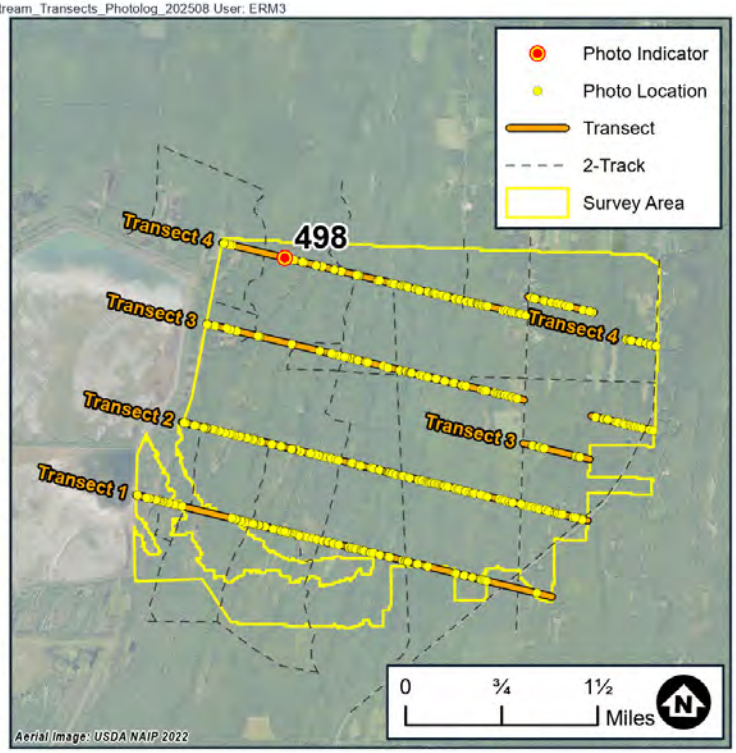

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP06-A, Wetland
**Photo 2 Caption:** T4W-BP06-A, Upland

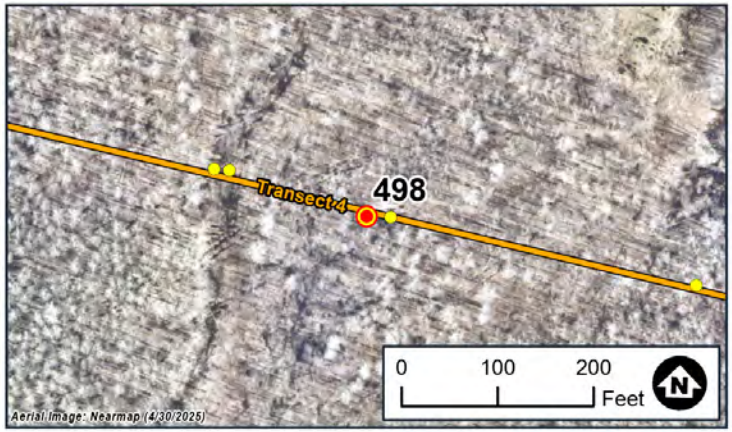
*Note: Photo locations are approximate*









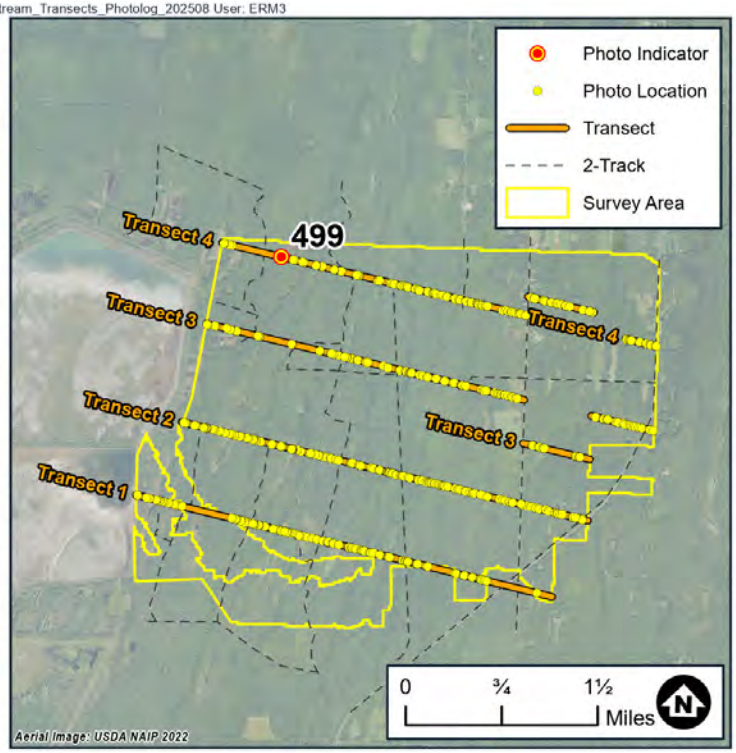

Page 498 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP06-B, Wetland
**Photo 2 Caption:** T4W-BP06-B, Upland

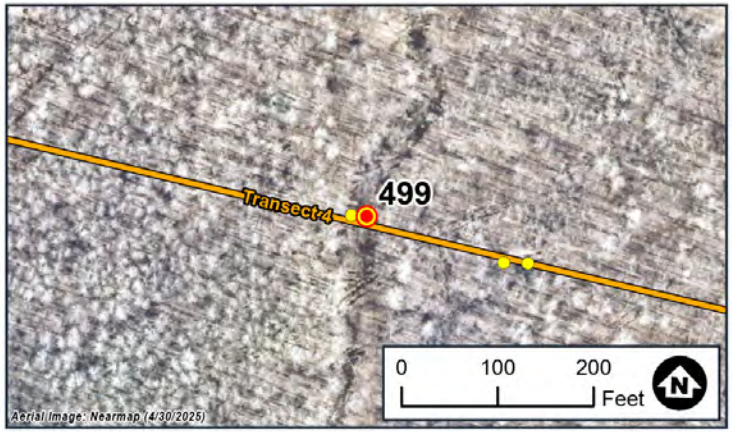
*Note: Photo locations are approximate*











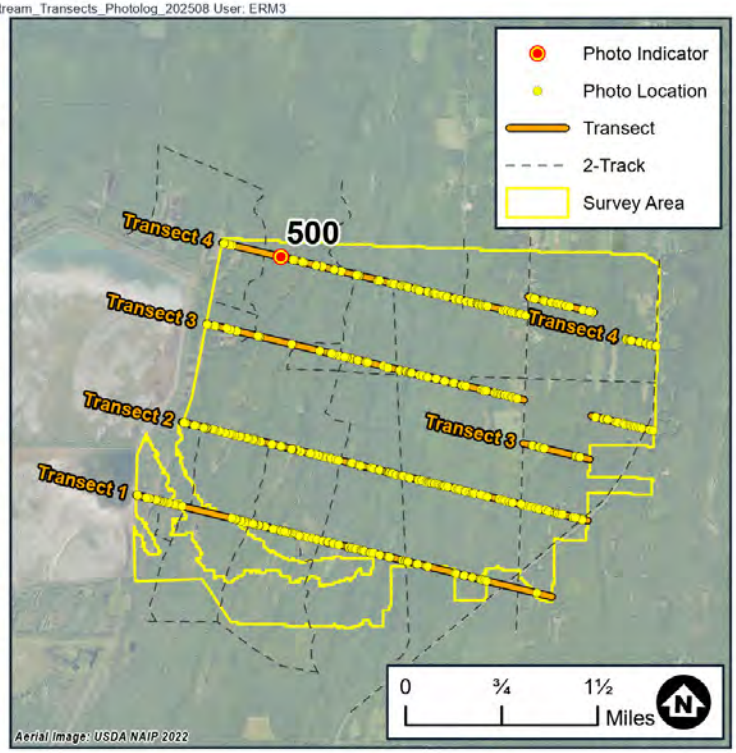

**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP07-B, Wetland
**Photo 2 Caption:** T4W-BP07-B, Upland

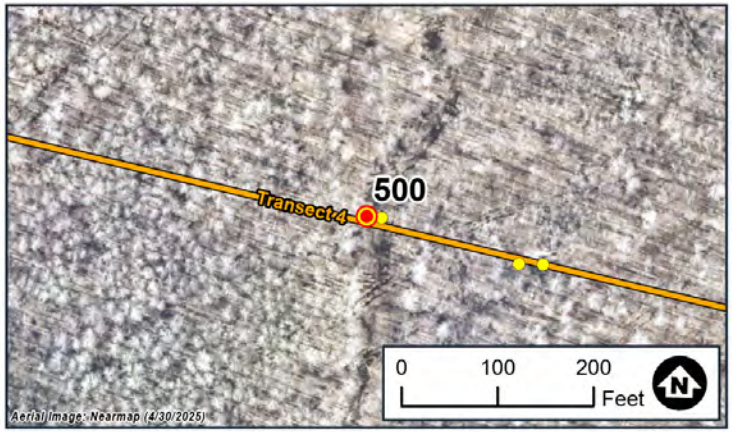
*Note: Photo locations are approximate*










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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP07-A, Wetland
**Photo 2 Caption:** T4W-BP07-A, Upland

*Note: Photo locations are approximate*

**Photo 501-1**



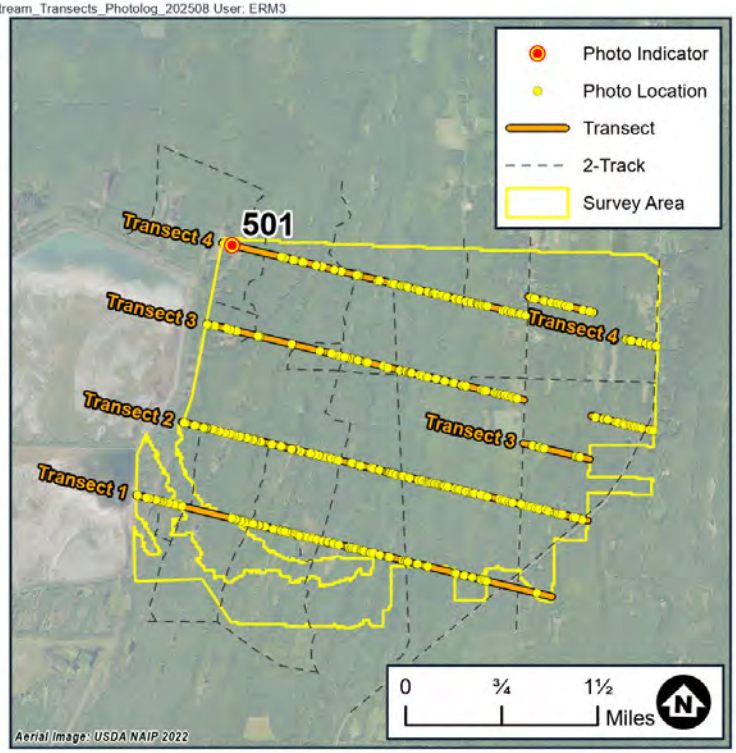
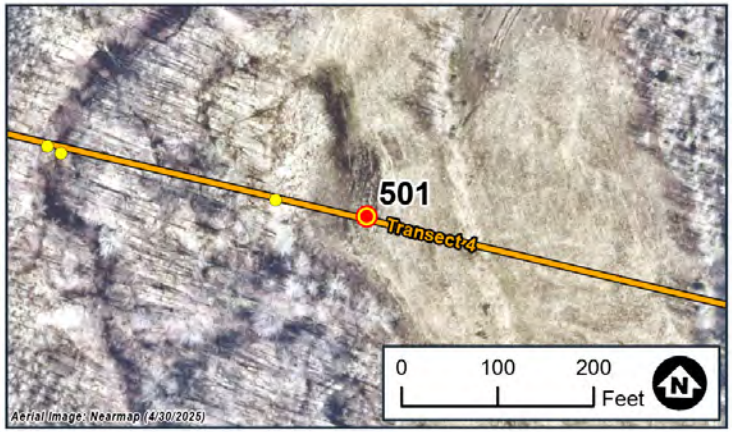



**Photo 501-2**






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**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

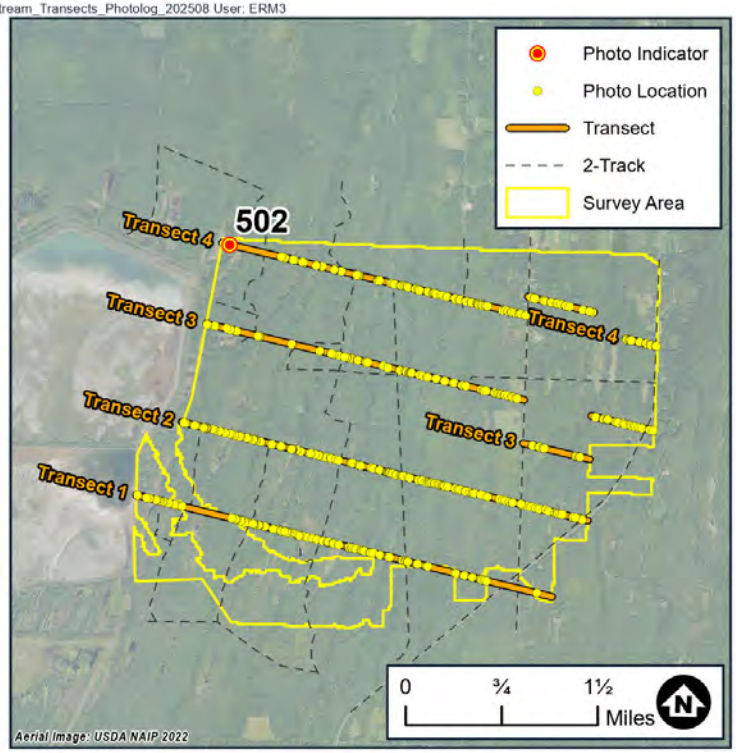
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP08-A, Wetland
**Photo 2 Caption:** T4W-BP08-A, Upland

*Note: Photo locations are approximate*

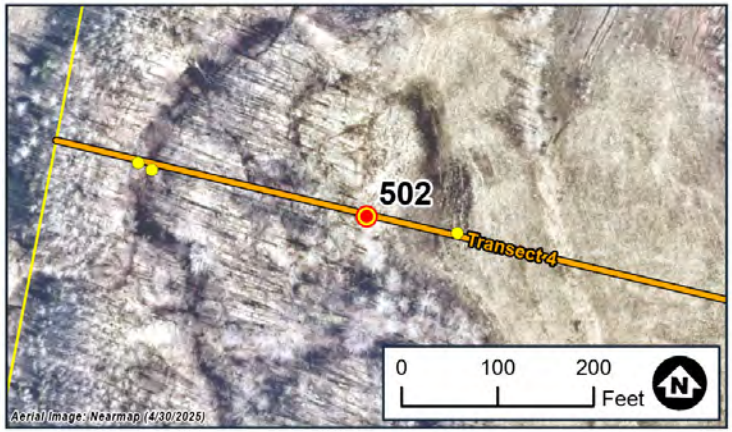
## Photo 502-1






## Photo 502-2






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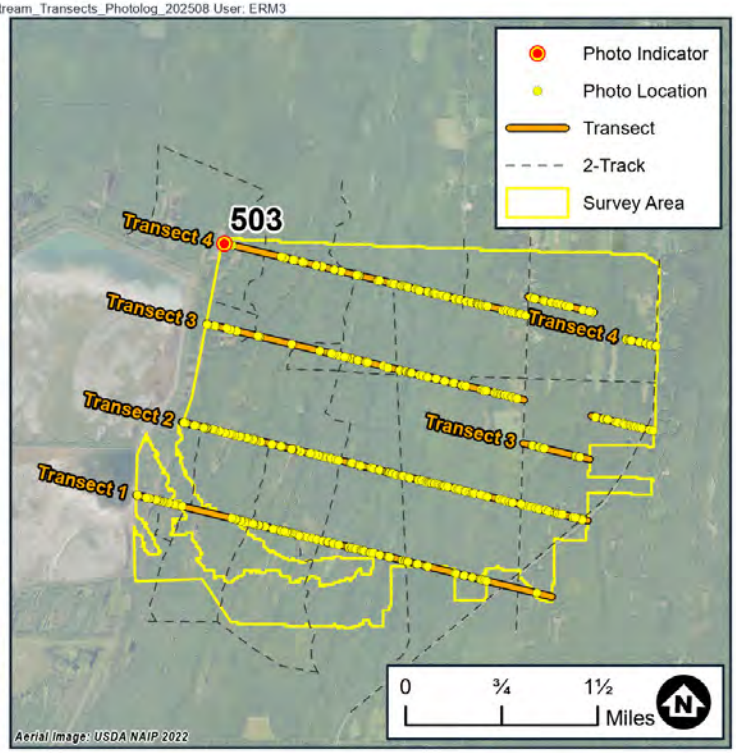
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-BP08-B, Wetland
**Photo 2 Caption:** T4W-BP08-B, Upland

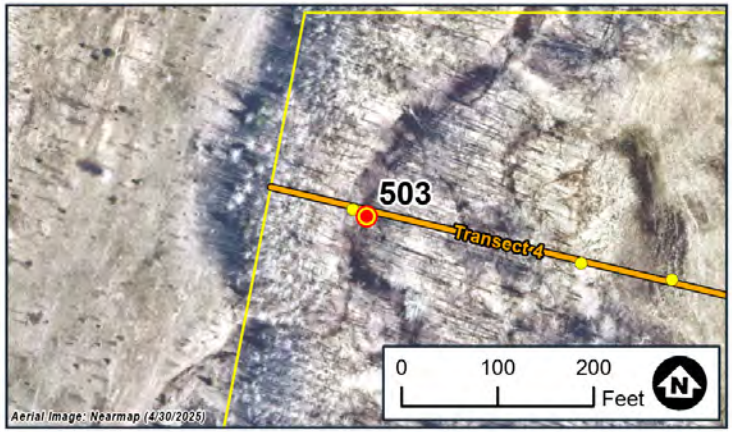
*Note: Photo locations are approximate*










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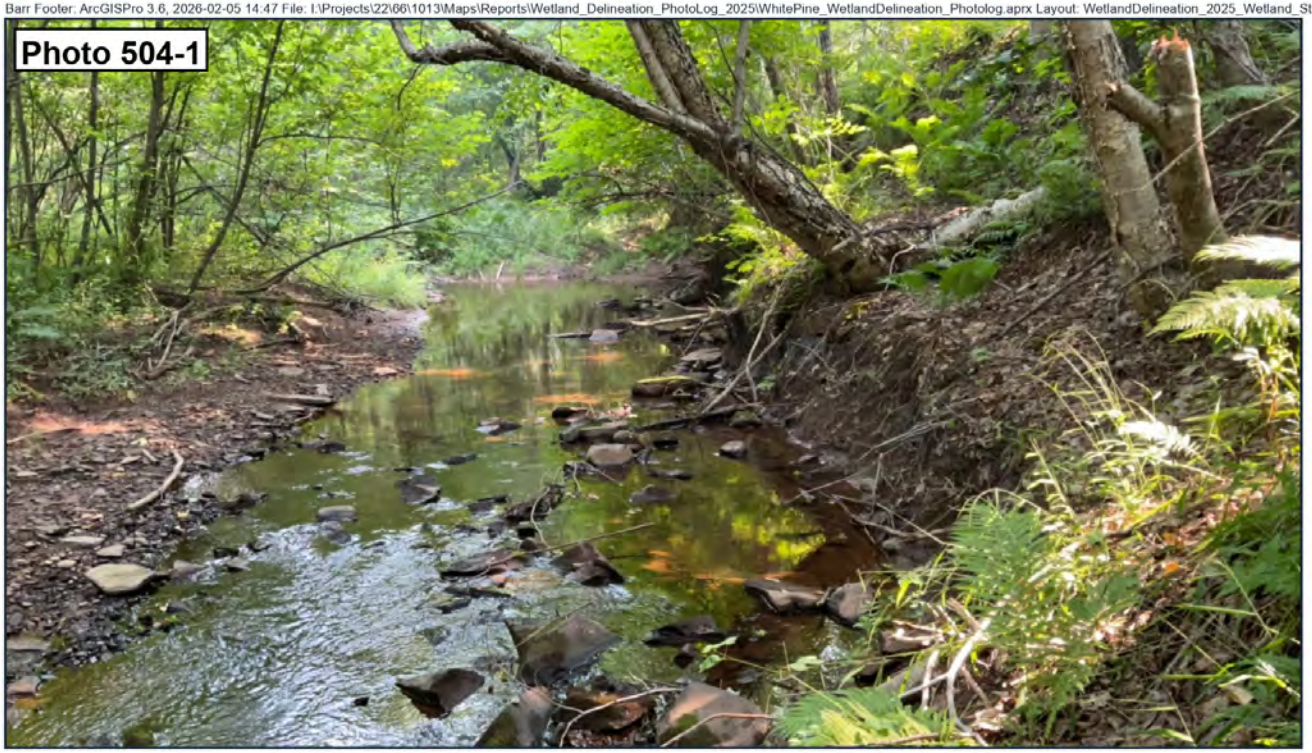
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

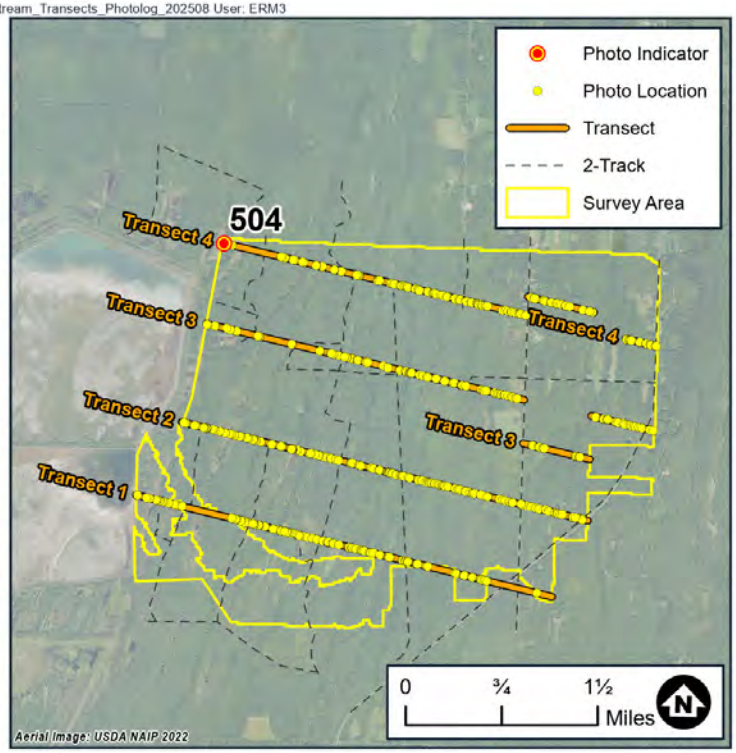
BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-S04-RB, Upstream
**Photo 2 Caption:** T4W-S04-RB, Downstream

*Note: Photo locations are approximate*

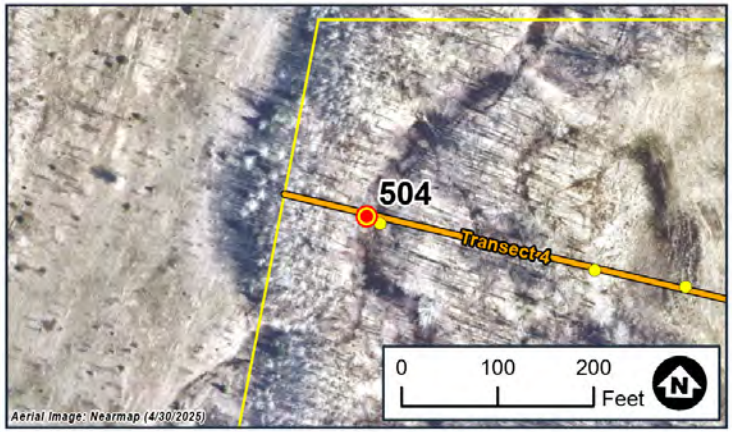
## Photo 504-1






## Photo 504-2






Page 504 of 504
**Wetland Delineation**
**Photo Locations**
White Pine North
White Pine Copper, LLC
Carp Lake & Ontonagon Township
Ontonagon County, MI

BARR

**Date:** 7/30/2025
**Photo 1 Caption:** T4W-S04-LB, Upstream
**Photo 2 Caption:** T4W-S04-LB, Downstream

*Note: Photo locations are approximate*

# Appendix D

## Wetland and Michigan Natural Feature Inventory Community Type Survey Data

# 2025 Underground Mining Area Wetland Community Types
## Appendix D

**Table 1**

| Wetland Name | Representative Data Point(s) | MNFI Community Type |
|---|---|---|
| T1E-BP01-A/B | T1E-DP01-W & T1E-DP02-W | Northern Wet Meadow/Other - P. tremuloides PFO/Emergent Marsh |
| T1E-BP02-A/B | T1E-DP01-W & T1E-DP02-W | Emergent Marsh/Northern Hardwood Swamp |
| T1E-BP03-A/B | T1E-DP01-W | Emergent Marsh |
| T1E-BP04-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1E-BP05-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1E-BP06-A/B | T1E-DP01-W & T1E-DP02-W | Emergent Marsh/Northern Hardwood Swamp |
| T1E-BP07-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1E-BP08-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T1E-BP09-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T1E-BP10-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1E-BP11-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1E-BP12-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1E-BP13-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1E-BP14-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T1E-BP15-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1E-BP16-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1E-BP17-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1E-BP18-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T1E-BP19-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T1E-BP20-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1E-BP21-A/B | T1E-DP04-W & T1E-DP09-W | Northern Shrub Thicket/Other - P. tremuloides PFO |
| T1W-BP01-A/B | T1W-DP01-W & T1W-DP02 | Northern Wet Meadow/ Other - P. tremuloides PFO/Emergent Marsh |
| T1W-BP02-A/B | T1W-DP02-W | Other - P. tremuloides PFO |
| T1W-BP03-A/B | T1W-DP02-W | Other - P. tremuloides PFO |
| T1W-BP04-A/B | T1W-DP04-W | Emergent Marsh |
| T1W-BP05-A/B | T1W-DP05-W | Emergent Marsh |
| T1W-BP06-A/B | T1W-DP01-W | Northern Wet Meadow |
| T1W-BP07-A/B | T1W-DP07-W | Emergent Marsh |
| T1W-BP08-A/B | T1W-DP08-W | Northern Hardwood Swamp |
| T1W-BP09-A/B | T1W-DP05-W | Emergent Marsh |
| T1W-BP10-A/B | T1W-DP11-W | Other - P. tremuloides PFO |
| T1W-BP11-A/B | T1W-DP11-W | Other - P. tremuloides PFO |
| T1W-BP12-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T1W-BP13-A/B | T1W-DP02-W | Other - P. tremuloides PFO |
| T1W-BP14-A/B | T1W-DP02-W | Other - P. tremuloides PFO |
| T1W-BP15-A/B | T1W-DP08-W | Northern Hardwood Swamp |
| T1W-BP16-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T1W-BP17-A/B | T1W-DP02-W | Other - P. tremuloides PFO |
| T1W-BP18-A/B | T1W-DP18-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1W-BP19-A/B | T1W-DP18-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1W-BP20-A/B | T1W-DP18-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1W-BP21-A/B | T1W-DP18-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T1W-BP22-A/B | T1W-DP18-W | Emergent Marsh |
| T2E-BP01-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP02-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP03-A/B | T1E-DP01-W & T1E-DP09-W | Emergent Marsh/Other -P. tremuloides PFO |
| T2E-BP04-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP05-A/B | T1E-DP01-W | Emergent Marsh |
| T2E-BP06-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP07-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T2E-BP08-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T2E-BP09-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T2E-BP10-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP11-A/B | T1E-DP09-W | Other - P. tremuloides PFO |

**Table 1**

| Wetland Name | Representative Data Point(s) | MNFI Community Type |
|---|---|---|
| T2E-BP12-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP13-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP14-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP15-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T2E-BP16-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP17-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP18-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP19-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP20-A/B | T1E-DP01-W | Emergent Marsh |
| T2E-BP21-A/B | T1E-DP01-W | Emergent Marsh |
| T2E-BP22-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP23-A/B | T1E-DP01-W, T1E-DP02-W, T1E-DP04-W | Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket |
| T2E-BP24-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP25-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP26-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP27-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP28-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP29-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP30-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP31-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2E-BP32-A/B | T1E-DP01-W | Emergent Marsh |
| T2E-BP33-A/B | T1E-DP01-W | Emergent Marsh |
| T2E-BP34-A/B | T1E-DP01-W | Emergent Marsh |
| T2E-BP35-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T2E-BP36-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T2W-BP01-A/B | T1W-DP18-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T2W-BP02-A/B | T1W-DP18-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T2W-BP03-A/B | T1W-DP02-W | Other - P. tremuloides PFO |
| T2W-BP04-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T2W-BP05-A/B | T1W-DP18-W & T2W-DP06-W | Emergent Marsh/Other -P. tremuloides PFO |
| T2W-BP06-A/B | T2W-DP06-W | Other - P. tremuloides PFO |
| T2W-BP07-A/B | T1W-DP18-W & T2W-DP06-W | Emergent Marsh/Other -P. tremuloides PFO |
| T2W-BP08-A/B | T1E-DP02-W & T2W-DP08-W | Northern Hardwood Swamp |
| T2W-BP09-A/B | T2W-DP09-W | Emergent Marsh |
| T2W-BP10-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T2W-BP11-A/B | T1E-DP04-W & T1E-DP02-W | Northern Hardwood Swamp/Northern Shrub Thicket |
| T2W-BP12-A/B | T2W-DP09-W | Emergent Marsh |
| T2W-BP13-A/B | T1E-DP01-W & T1E-DP02-W | Emergent Marsh/Northern Hardwood Swamp |
| T2W-BP14-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T2W-BP15-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T2W-BP16-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T2W-BP17-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T3E-BP001-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T3E-BP002-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T3E-BP003-A/B | T1E-DP01-W | Emergent Marsh |
| T3E-BP004-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T3E-BP005-A/B | T2W-DP09-W | Emergent Marsh |
| T3E-BP01-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3E-BP02-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3E-BP03-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T3E-BP04-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP05-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T3E-BP06-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3E-BP07-A/B | T1E-DP04-W | Northern Shrub Thicket |

**Table 1**

| Wetland Name | Representative Data Point(s) | MNFI Community Type |
|---|---|---|
| T3E-BP08-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T3E-BP09-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3E-BP10-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP11-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3E-BP12-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T3E-BP13-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T3E-BP14-A/B | T1E-DP01-W | Emergent Marsh |
| T3E-BP15-A/B | T1E-DP01-W, T1E-DP02-W, & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T3E-BP16-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T3E-BP17-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T3E-BP18-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T3E-BP19-A/B | T3E-DP19-W | Southern Shrub Carr |
| T3E-BP20-A/B | T3E-DP19-W | Southern Shrub Carr |
| T3E-BP21-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3E-BP22-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP23-A/B | T1E-DP01-W & T1E-DP04-W | Emergent Marsh/Northern Shrub Thicket |
| T3E-BP24-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP25-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP26-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP27-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3E-BP28-A/B | T3E-DP28-W | Floodplain Forest |
| T3E-BP29-A | T3E-DP28-W | Floodplain Forest |
| T3W-BP01-A/B | T1E-DP01-W | Emergent Marsh |
| T3W-BP02-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T3W-BP03-A/B | T2W-DP09-W | Emergent Marsh |
| T3W-BP04-A/B | T1E-DP01-W | Emergent Marsh |
| T3W-BP05-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T3W-BP06-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T3W-BP07-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T4E-BP01-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP02-A/B | T1E-DP01-W | Emergent Marsh |
| T4E-BP03-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T4E-BP04-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T4E-BP05-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T4E-BP06-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T4E-BP07-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T4E-BP08-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T4E-BP09-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP10-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP11-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T4E-BP12-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T4E-BP13-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T4E-BP14-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T4E-BP15-A/B | T1E-DP05-W | Other - Excavated/Compacted |
| T4E-BP16-A/B | T1E-DP04-W | Northern Shrub Thicket |
| T4E-BP17-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP18-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP19-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP20-A/B | T1E-DP09-W | Other - P. tremuloides PFO |
| T4E-BP21-A/B | T1E-DP01-W, T1E-DP02-W, & T1E-DP04-W | Emergent Marsh/Northern Hardwood Swamp/Northern Shrub Thicket |
| T4E-BP22-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP23-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4E-BP24-A/B | T4E-DP24-W | Emergent Marsh |
| T4E-BP25-A/B | T4E-DP25-W | Northern Shrub Thicket |

# 2025 Underground Mining Area Wetland Community Types
## Appendix D

**Table 1**

| Wetland Name | Representative Data Point(s) | MNFI Community Type |
|---|---|---|
| T4E-BP26-A/B | T4E-DP26-W | Northern Hardwood Swamp |
| T4E-BP27-A/B | T4E-DP26-W | Northern Hardwood Swamp |
| T4E-BP28-A/B | T4E-DP26-W | Northern Hardwood Swamp |
| T4E-BP29-A/B | T4E-DP29-W | Floodplain Forest |
| T4E-BP30-A/B | T4E-DP26-W | Northern Hardwood Swamp |
| T4E-BP31-A/B | T4E-DP29-W | Floodplain Forest |
| T4E-BP32-A/B | T4E-DP32-W | Northern Wet Meadow |
| T4E-BP33-A/B | T4E-DP26-W | Northern Hardwood Swamp |
| T4E-BP34-A/B | T4E-DP29-W | Floodplain Forest |
| T4E-BP35-A/B | T4E-DP29-W | Floodplain Forest |
| T4E-BP36-A/B | T4E-DP32-W | Northern Wet Meadow |
| T4W-BP01-A/B | T1E-DP01-W | Emergent Marsh |
| T4W-BP02-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4W-BP03-A/B | T1E-DP01-W | Emergent Marsh |
| T4W-BP04-A/B | T1E-DP01-W | Emergent Marsh |
| T4W-BP05-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4W-BP06-A/B | T1E-DP02-W | Northern Hardwood Swamp |
| T4W-BP07-A/B | T1E-DP01-W | Emergent Marsh |
| T4W-BP08-A/B | T4W-DP08-W & T1E-DP01-W | Northern Wet Meadow/Emergent Marsh |

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/21/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP01-W

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.774964 Long: -89.475500 Datum: WGS84

Soil Map Unit Name: Histosols & Aquents NWI classification: None [R/PEM obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)
PSS fringe

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP01-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 5 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 5 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Acer negundo* | 20 | Yes | FAC |
| 2. *Salix discolor* | 10 | Yes | FACW |
| 3. *Salix bebbiana* | 5 | No | FACW |
| 4. *Salix petiolaris* | 5 | No | FACW |
| 5. *Populus tremuloides* | 2 | No | FAC |
| 6. | | | |
| 7. | | | |
| | 42 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Calamagrostis canadensis* | 35 | Yes | OBL |
| 2. *Carex scoparia* | 25 | Yes | FACW |
| 3. *Salix discolor* | 25 | Yes | FACW |
| 4. *Solidago gigantea* | 10 | No | FACW |
| 5. *Carex gynandra* | 10 | No | OBL |
| 6. *Poa palustris* | 10 | No | FACW |
| 7. *Salix pedicellaris* | 5 | No | OBL |
| 8. *Scirpus cyperinus* | 5 | No | OBL |
| 9. *Verbena hastata* | 5 | No | FACW |
| 10. *Symphyotrichum lateriflorum* | 5 | No | FAC |
| 11. *Lotus corniculatus* | 5 | No | FACU |
| 12. *Juncus effusus* | 5 | No | OBL |
| | 145 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 60 | x 1 = | 60 |
| FACW species | 95 | x 2 = | 190 |
| FAC species | 32 | x 3 = | 96 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 192 (A) | | 366 (B) |

Prevalence Index = B/A = 1.91

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Other wetland vegetation includes asclepias incarnata, scirpus atrovirens, eupatorium perfoliatum, onclea sensibilis, impatiens capensis, cirsium muticum, carex lupuliformis, and conium maculatum.

## SOIL

Sampling Point: T1E-DP01-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-4 | 5YR 5/1 | 60 | 5YR 3/4 | 10 | C | M | Loamy/Clayey | Distinct redox concentrations |
| 4-12 | 5YR 4/2 | 60 | 5YR 4/6 | 40 | C | M | Loamy/Clayey | Prominent redox concentrations |
| 12-18 | 5YR 5/3 | 75 | 5YR 3/4 | 25 | C | M | Loamy/Clayey | Faint redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:
0-4: 5YR 5/3 30%

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/28/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP01-U

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Plain Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.774937 Long: -89.475690 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [UPL obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)
Previously cleared/disturbed

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP01-U

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Acer negundo* | 10 | Yes | FAC |
| 2. *Salix discolor* | 5 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Trillium cernuum* | 30 | Yes | FAC |
| 2. *Lotus corniculatus* | 25 | Yes | FACU |
| 3. *Phleum pratense* | 20 | Yes | FACU |
| 4. *Solidago altissima* | 10 | No | FACU |
| 5. *Poa pratensis* | 10 | No | FACU |
| 6. *Solidago gigantea* | 5 | No | FACW |
| 7. *Carex tenera* | 5 | No | FAC |
| 8. *Trifolium pratense* | 5 | No | FACU |
| 9. *Salix discolor* | 5 | No | FACW |
| 10. *Euthamia graminifolia* | 5 | No | FAC |
| 11. *Bromus ciliatus* | 5 | No | FACW |
| 12. *Carex gracillima* | 5 | No | FACU |
| | 130 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 20 | x 2 = | 40 |
| FAC species | 50 | x 3 = | 150 |
| FACU species | 75 | x 4 = | 300 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 145 (A) | | 490 (B) |

Prevalence Index = B/A = 3.38

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP01-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-6 | 7.5YR 2.5/2 | 100 | | | | | Loamy/Clayey | |
| 6-10 | 5YR 4/3 | 95 | 5YR 4/4 | 5 | C | M | Loamy/Clayey | Faint redox concentrations |
| 10-18 | 5YR 4/4 | 65 | 5YR 3/4 | 35 | C | M | Loamy/Clayey | Faint redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP02-W

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.774465 Long: -89.472427 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PSS/EM [PFO/EM obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)
Previously logged

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP02-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 45 | Yes | FAC |
| 2. *Acer rubrum* | 35 | Yes | FAC |
| 3. *Betula alleghaniensis* | 10 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 90 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Acer rubrum* | 10 | Yes | FAC |
| 2. *Carpinus caroliniana* | 10 | Yes | FAC |
| 3. *Abies balsamea* | 5 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 25 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Carex intumescens* | 25 | Yes | FACW |
| 2. *Coptis trifolia* | 10 | Yes | FACW |
| 3. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 4. *Maianthemum canadense* | 5 | No | FACU |
| 5. *Trientalis borealis* | 5 | No | FAC |
| 6. *Rubus pubescens* | 5 | No | FACW |
| 7. *Impatiens capensis* | 2 | No | FACW |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 62 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 52 | x 2 = | 104 |
| FAC species | 120 | x 3 = | 360 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 177 (A) | | 484 (B) |

Prevalence Index = B/A = 2.73

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Other wetland vegetation includes carex stipata.

## SOIL

Sampling Point: T1E-DP02-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-2 | 10YR 2/1 | 100 | | | | | Mucky Loam/Clay | |
| 2-6 | 10YR 4/2 | 95 | 10YR 3/4 | 5 | C | M | Loamy/Clayey | Distinct redox concentrations |
| 6-12 | 7.5YR 4/4 | 95 | 7.5YR 4/6 | 5 | C | M | Sandy | Distinct redox concentrations |
| 12-18 | 5YR 4/6 | 100 | | | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
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[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP02-U

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Concave Slope %: 2-4

Subregion (LRR or MLRA): LRR K Lat: 46.774523 Long: -89.472613 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [UPL obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP02-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 45 | Yes | FAC |
| 2. *Acer rubrum* | 25 | Yes | FAC |
| 3. *Fraxinus americana* | 5 | No | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 75 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Acer saccharum* | 20 | Yes | FACU |
| 2. *Acer rubrum* | 10 | Yes | FAC |
| 3. *Prunus virginiana* | 10 | Yes | FACU |
| 4. *Fraxinus americana* | 5 | No | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 45 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Acer saccharum* | 20 | Yes | FACU |
| 2. *Mitchella repens* | 15 | Yes | FACU |
| 3. *Aralia nudicaulis* | 10 | Yes | FACU |
| 4. *Maianthemum canadense* | 10 | Yes | FACU |
| 5. *Fraxinus americana* | 10 | Yes | FACU |
| 6. *Diervilla lonicera* | 5 | No | UPL |
| 7. *Pteridium aquilinum* | 5 | No | FACU |
| 8. *Carpinus caroliniana* | 5 | No | FAC |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 80 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 30.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 85 | x 3 = | 255 |
| FACU species | 110 | x 4 = | 440 |
| UPL species | 5 | x 5 = | 25 |
| Column Totals: | 200 (A) | | 720 (B) |

Prevalence Index = B/A = 3.60

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP02-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-4 | 7.5YR 2.5/1 | 100 | | | | | Loamy/Clayey | |
| 4-12 | 7.5YR 3/4 | 100 | | | | | Loamy/Clayey | |
| 12-18 | 5YR 4/4 | 100 | | | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP04-W

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Valley Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.773855 Long: -89.468197 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [R/PSS/EM obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes X | No ____ | Depth (inches): 6 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP04-W

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 5 | Yes | FAC |
| 2. *Fraxinus pennsylvanica* | 5 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Alnus incana* | 90 | Yes | FACW |
| 2. *Fraxinus pennsylvanica* | 5 | No | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 95 | =Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Onoclea sensibilis* | 35 | Yes | FACW |
| 2. *Athyrium filix-femina* | 25 | Yes | UPL |
| 3. *Alnus incana* | 10 | No | FACW |
| 4. *Thalictrum pubescens* | 10 | No | FACW |
| 5. *Rubus pubescens* | 10 | No | FACW |
| 6. *Fraxinus nigra* | 5 | No | FACW |
| 7. *Impatiens capensis* | 5 | No | FACW |
| 8. *Carex intumescens* | 5 | No | FACW |
| 9. *Caltha palustris* | 5 | No | OBL |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 110 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 5 | x 1 = | 5 |
| FACW species | 180 | x 2 = | 360 |
| FAC species | 5 | x 3 = | 15 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 25 | x 5 = | 125 |
| Column Totals: | 215 (A) | | 505 (B) |

Prevalence Index = B/A = 2.35

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP04-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-12 | 10YR 2/1 | 100 | | | | | Mucky Loam/Clay | |
| 12-18 | 7.5YR 6/2 | 95 | 7.5YR 3/4 | 5 | C | M | Loamy/Clayey | Distinct redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP04-U

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Concave Slope %: 3-4

Subregion (LRR or MLRA): LRR K Lat: 46.773899 Long: -89.468318 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [PEM obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP04-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 20 | Yes | FAC |
| 2. *Acer saccharum* | 10 | Yes | FACU |
| 3. *Populus tremuloides* | 10 | Yes | FAC |
| 4. *Ostrya virginiana* | 10 | Yes | FACU |
| 5. *Prunus serotina* | 10 | Yes | FACU |
| 6. | | | |
| 7. | | | |
| | 60 | =Total Cover | |
| Sapling/Shrub Stratum (Plot size: 15' ) | | | |
| 1. *Acer saccharum* | 10 | Yes | FACU |
| 2. *Ostrya virginiana* | 10 | Yes | FACU |
| 3. *Prunus serotina* | 5 | No | FACU |
| 4. *Fraxinus americana* | 5 | No | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 30 | =Total Cover | |
| Herb Stratum (Plot size: 5' ) | | | |
| 1. *Aralia nudicaulis* | 45 | Yes | FACU |
| 2. *Mitchella repens* | 25 | Yes | FACU |
| 3. *Carex pensylvanica* | 10 | No | UPL |
| 4. *Acer saccharum* | 10 | No | FACU |
| 5. *Prunus virginiana* | 5 | No | FACU |
| 6. *Prunus serotina* | 5 | No | FACU |
| 7. *Allium tricoccum* | 5 | No | FACU |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 105 | =Total Cover | |
| Woody Vine Stratum (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 22.2% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 30 | x 3 = | 90 |
| FACU species | 155 | x 4 = | 620 |
| UPL species | 10 | x 5 = | 50 |
| Column Totals: | 195 (A) | | 760 (B) |

Prevalence Index = B/A = 3.90

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP04-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-4 | 10YR 2/1 | 100 | | | | | Sandy | |
| 4-6 | 7.5YR 3/3 | 100 | | | | | Sandy | |
| 6-8 | 7.5YR 2.5/2 | 100 | | | | | Sandy | |
| 8-10 | 7.5YR 3/4 | 100 | | | | | Sandy | |
| 10-18 | 5YR 3/3 | 100 | | | | | Sandy | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP05-W

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 2-3

Subregion (LRR or MLRA): LRR K Lat: 46.773753 Long: -89.467756 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [PEM obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Logging disturbance

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP05-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 5 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 5 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Populus tremuloides* | 15 | Yes | FAC |
| 2. *Carpinus caroliniana* | 15 | Yes | FAC |
| 3. *Fraxinus pennsylvanica* | 5 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Carex intumescens* | 10 | Yes | FACW |
| 2. *Carpinus caroliniana* | 10 | Yes | FAC |
| 3. *Osmunda claytoniana* | 5 | No | FAC |
| 4. *Rubus pubescens* | 5 | No | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 30 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 20 | x 2 = | 40 |
| FAC species | 50 | x 3 = | 150 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 70 (A) | | 190 (B) |

Prevalence Index = B/A = 2.71

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP05-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-2 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | |
| 2-6 | 7.5YR 4/2 | 80 | 7.5YR 3/4 | 20 | C | M | Loamy/Clayey | Distinct redox concentrations |
| 6-12 | 7.5YR 5/2 | 60 | 7.5YR 4/4 | 40 | C | M | Loamy/Clayey | Distinct redox concentrations |
| 12-18 | 7.5YR 5/3 | 95 | 5YR 3/4 | 5 | C | M | Loamy/Clayey | Distinct redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP05-U

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Concave Slope %: 2-4

Subregion (LRR or MLRA): LRR K Lat: 46.773796 Long: -89.467816 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [UPL obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP05-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 35 | Yes | FAC |
| 2. *Acer rubrum* | 20 | Yes | FAC |
| 3. *Abies balsamea* | 10 | No | FAC |
| 4. *Acer saccharum* | 10 | No | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 75 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Acer saccharum* | 15 | Yes | FACU |
| 2. *Prunus serotina* | 10 | Yes | FACU |
| 3. *Acer rubrum* | 10 | Yes | FAC |
| 4. *Abies balsamea* | 5 | No | FAC |
| 5. *Ostrya virginiana* | 5 | No | FACU |
| 6. *Carpinus caroliniana* | 5 | No | FAC |
| 7. | | | |
| | 50 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Mitchella repens* | 25 | Yes | FACU |
| 2. *Brachyelytrum aristosum* | 10 | Yes | UPL |
| 3. *Carex gracillima* | 10 | Yes | FACU |
| 4. *Acer saccharum* | 5 | No | FACU |
| 5. *Trientalis borealis* | 5 | No | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 55 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 37.5% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 90 | x 3 = | 270 |
| FACU species | 80 | x 4 = | 320 |
| UPL species | 10 | x 5 = | 50 |
| Column Totals: | 180 (A) | | 640 (B) |

Prevalence Index = B/A = 3.56

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP05-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-3 | 7.5YR 3/2 | 100 | | | | | Loamy/Clayey | |
| 3-5 | 7.5YR 4/4 | 100 | | | | | Loamy/Clayey | |
| 5-18 | 5YR 4/4 | 100 | | | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP09-W

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K Lat: 46.773264 Long: -89.463994 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [PFO obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)
Recovering Northern Hardwood Swamp.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No X | Depth (inches): ____ |
| Water Table Present? | Yes X | No ____ | Depth (inches): 6 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 2 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP09-W

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 80 | Yes | FAC |
| 2. *Fraxinus nigra* | 5 | No | FACW |
| 3. *Acer rubrum* | 5 | No | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 90 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Aronia melanocarpa* | 55 | Yes | FAC |
| 2. *Alnus glutinosa* | 15 | Yes | FACW |
| 3. *Fraxinus nigra* | 5 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 75 | =Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Carex gynandra* | 15 | Yes | OBL |
| 2. *Equisetum arvense* | 15 | Yes | FAC |
| 3. *Rubus pubescens* | 10 | Yes | FACW |
| 4. *Caltha palustris* | 10 | Yes | OBL |
| 5. *Galium asprellum* | 10 | Yes | OBL |
| 6. *Aronia prunifolia* | 10 | Yes | FACW |
| 7. *Carex intumescens* | 5 | No | FACW |
| 8. *Thalictrum pubescens* | 5 | No | FACW |
| 9. *Acer rubrum* | 5 | No | FAC |
| 10. *Impatiens capensis* | 5 | No | FACW |
| 11. *Dryopteris carthusiana* | 5 | No | FACW |
| 12. | | | |
| | 95 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 35 | x 1 = | 35 |
| FACW species | 65 | x 2 = | 130 |
| FAC species | 160 | x 3 = | 480 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 260 (A) | | 645 (B) |

Prevalence Index = B/A = 2.48

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Other wetland vegetation includes onclea sensibilis, scutellaria lateriflora, symphyotrichum lateriflorum, calamagrostis canadensis, eutrochium purpureum.

## SOIL

Sampling Point: T1E-DP09-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-6 | 10YR 2/1 | 100 | | | | | Loamy/Clayey | |
| 6-10 | 7.5YR 4/2 | 90 | 7.5YR 3/4 | 10 | C | M | Loamy/Clayey | Distinct redox concentrations |
| 10-18 | 5YR 5/3 | 60 | 5YR 5/6 | 40 | C | M | Loamy/Clayey | Distinct redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:
Obvious wetland area. Soils previously disturbed.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1E-DP09-U

Investigator(s): Randall Phillips & Brynn Jackson Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Hillside Local relief (concave, convex, none): Concave Slope %: 4-6

Subregion (LRR or MLRA): LRR K Lat: 46.773237 Long: -89.464195 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None [UPL obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1E-DP09-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 20 | Yes | FAC |
| 2. *Acer saccharum* | 15 | Yes | FACU |
| 3. *Tilia americana* | 5 | No | FACU |
| 4. *Fraxinus pennsylvanica* | 5 | No | FACW |
| 5. *Abies balsamea* | 5 | No | FAC |
| 6. | | | |
| 7. | | | |
| | 50 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Ostrya virginiana* | 65 | Yes | FACU |
| 2. *Abies balsamea* | 5 | No | FAC |
| 3. *Fraxinus pennsylvanica* | 5 | No | FACW |
| 4. *Prunus serotina* | 5 | No | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 80 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Aralia nudicaulis* | 30 | Yes | FACU |
| 2. *Carex pedunculata* | 25 | Yes | FAC |
| 3. *Tilia americana* | 15 | Yes | FACU |
| 4. *Mitchella repens* | 15 | Yes | FACU |
| 5. *Acer saccharum* | 10 | No | FACU |
| 6. *Fraxinus pennsylvanica* | 5 | No | FACW |
| 7. *Maianthemum canadense* | 5 | No | FACU |
| 8. *Pteridium aquilinum* | 5 | No | FACU |
| 9. *Athyrium filix-femina* | 5 | No | UPL |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 115 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 15 | x 2 = | 30 |
| FAC species | 55 | x 3 = | 165 |
| FACU species | 170 | x 4 = | 680 |
| UPL species | 5 | x 5 = | 25 |
| Column Totals: | 245 (A) | | 900 (B) |

Prevalence Index = B/A = 3.67

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1E-DP09-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-6 | 7.5YR 2.5/1 | 100 | | | | | Loamy/Clayey | |
| 6-12 | 5YR 3/3 | 100 | | | | | Loamy/Clayey | |
| 12-18 | 5YR 5/3 | 95 | 5YR 4/4 | 5 | C | M | Loamy/Clayey | Faint redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/21/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP01-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Shoulder Local relief (concave, convex, none): Concave Slope %: 3

Subregion (LRR or MLRA): LRR K Lat: 46.774974 Long: -89.47879 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes X | No ____ | Depth (inches): 3 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP01-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 15 | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Salix bebbiana* | 15 | Yes | FACW |
| 2. *Populus tremuloides* | 15 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 30 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Scirpus cyperinus* | 20 | Yes | OBL |
| 2. *Carex gynandra* | 20 | Yes | OBL |
| 3. *Scirpus atrovirens* | 10 | Yes | OBL |
| 4. *Onoclea sensibilis* | 10 | Yes | FACW |
| 5. *Carex scoparia* | 5 | No | FACW |
| 6. *Solidago altissima* | 5 | No | FACU |
| 7. *Poa palustris* | 5 | No | FACW |
| 8. *Solidago gigantea* | 5 | No | FACW |
| 9. *Verbena hastata* | 5 | No | FACW |
| 10. *Lotus corniculatus* | 5 | No | FACU |
| 11. *Galium palustre* | 5 | No | OBL |
| 12. | | | |
| | 95 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 55 | x 1 = | 55 |
| FACW species | 45 | x 2 = | 90 |
| FAC species | 30 | x 3 = | 90 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 140 (A) | | 275 (B) |

Prevalence Index = B/A = 1.96

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP01-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-2 | 7.5YR 3/2 | 100 | | | | | Muck | |
| 2-8 | 5YR 4/2 | 60 | 2.5YR 4/6 | 40 | C | M | Loamy/Clayey | Prominent redox concentrations |
| 8-14 | 2.5YR 4/6 | 100 | | | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/21/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP01-U

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): hillside Local relief (concave, convex, none): convex Slope %: 2-3

Subregion (LRR or MLRA): LRR K Lat: 46.774979 Long: -89.475849 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP01-U

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Alnus incana* | 10 | Yes | FACW |
| 2. *Salix bebbiana* | 5 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Rubus canadensis* | 10 | Yes | UPL |
| 2. *Euthamia graminifolia* | 10 | Yes | FAC |
| 3. *Pteridium aquilinum* | 10 | Yes | FACU |
| 4. *Lotus corniculatus* | 10 | Yes | FACU |
| 5. *Phleum pratense* | 10 | Yes | FACU |
| 6. *Poa palustris* | 5 | No | FACW |
| 7. *Solidago canadensis* | 5 | No | FACU |
| 8. *Carex gracillima* | 5 | No | FACU |
| 9. *Carex gynandra* | 5 | No | OBL |
| 10. *Carex scoparia* | 5 | No | FACW |
| 11. *Rubus pubescens* | 5 | No | FACW |
| 12. | | | |
| | 80 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 5 | x 1 = | 5 |
| FACW species | 30 | x 2 = | 60 |
| FAC species | 10 | x 3 = | 30 |
| FACU species | 40 | x 4 = | 160 |
| UPL species | 10 | x 5 = | 50 |
| Column Totals: | 95 (A) | | 305 (B) |

Prevalence Index = B/A = 3.21

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP01-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-2 | 7.5YR 3/2 | 100 | | | | | Mucky Loam/Clay | |
| 2-14 | 2.5YR 2.5/4 | 55 | 2.5YR 4/6 | 35 | | | Loamy/Clayey | |
| | | | 5YR 3/1 | 10 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP02-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.775266 Long: -89.477747 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ____ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? Yes ____ No ____ Depth (inches): ____
(includes capillary fringe)

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP02-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 25 | Yes | FAC |
| 2. *Populus grandidentata* | 5 | No | FACU |
| 3. *Ostrya virginiana* | 5 | No | FACU |
| 4. *Acer saccharum* | 10 | Yes | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 45 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Ostrya virginiana* | 15 | Yes | FACU |
| 2. *Fraxinus pennsylvanica* | 20 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Fraxinus pennsylvanica* | 15 | Yes | FACW |
| 2. *Ostrya virginiana* | 10 | Yes | FACU |
| 3. *Glyceria striata* | 10 | Yes | OBL |
| 4. *Maianthemum canadense* | 5 | No | FACU |
| 5. *Cornus canadensis* | 5 | No | FAC |
| 6. *Carex gynandra* | 5 | No | OBL |
| 7. *Trientalis borealis* | 5 | No | FAC |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 55 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 15 | x 1 = | 15 |
| FACW species | 35 | x 2 = | 70 |
| FAC species | 35 | x 3 = | 105 |
| FACU species | 50 | x 4 = | 200 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 135 (A) | | 390 (B) |

Prevalence Index = B/A = 2.89

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP02-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-4 | 10YR 3/3 | 100 | | | | | Mucky Loam/Clay | |
| 4-8 | 7.5YR 5/4 | 60 | 5YR 5/6 | 20 | | | Loamy/Clayey | |
| | | | 7.5YR 4/3 | 20 | | | | |
| 8-14 | 5YR 4/4 | 100 | | | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/21/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP02-U

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope %: 0

Subregion (LRR or MLRA): LRR K Lat: 46.775176 Long: -89.477606 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP02-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer saccharum* | 20 | Yes | FACU |
| 2. *Populus grandidentata* | 10 | Yes | FACU |
| 3. *Populus tremuloides* | 10 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 40 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus pennsylvanica* | 15 | Yes | FACW |
| 2. *Ostrya virginiana* | 20 | Yes | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Carex pensylvanica* | 10 | Yes | UPL |
| 2. *Mitchella repens* | 5 | Yes | FACU |
| 3. *Fraxinus pennsylvanica* | 5 | Yes | FACW |
| 4. *Ostrya virginiana* | 5 | Yes | FACU |
| 5. *Brachyelytrum aristosum* | 5 | Yes | UPL |
| 6. *Pteridium aquilinum* | 5 | Yes | FACU |
| 7. *Anemone quinquefolia* | 5 | Yes | FACU |
| 8. *Cornus canadensis* | 5 | Yes | FAC |
| 9. *Maianthemum canadense* | 5 | Yes | FACU |
| 10. *Acer saccharum* | 5 | Yes | FACU |
| 11. *Rubus pubescens* | 5 | Yes | FACW |
| 12. *Trientalis borealis* | 5 | Yes | FAC |
| | 65 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 17 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 35.3% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 25 | x 2 = | 50 |
| FAC species | 20 | x 3 = | 60 |
| FACU species | 80 | x 4 = | 320 |
| UPL species | 15 | x 5 = | 75 |
| Column Totals: | 140 (A) | | 505 (B) |

Prevalence Index = B/A = 3.61

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP02-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-3 | 10YR 2/2 | 100 | | | | | Mucky Loam/Clay | |
| 3-14 | 7.5YR 4/3 | 75 | 7.5YR 4/6 | 25 | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP04-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope %: 3

Subregion (LRR or MLRA): LRR K Lat: 46.775441 Long: -89.478401 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 6 |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP04-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: 15')** | | | |
| 1. *Acer rubrum* | 10 | Yes | FAC |
| 2. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 20 =Total Cover | | |
| **Herb Stratum (Plot size: 5')** | | | |
| 1. *Carex lupulina* | 20 | Yes | OBL |
| 2. *Scirpus atrovirens* | 5 | Yes | OBL |
| 3. *Carex scoparia* | 5 | Yes | FACW |
| 4. *Impatiens capensis* | 5 | Yes | FACW |
| 5. *Bidens frondosa* | 5 | Yes | FACW |
| 6. *Fraxinus pennsylvanica* | 5 | Yes | FACW |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 45 =Total Cover | | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 25 | x 1 = | 25 |
| FACW species | 30 | x 2 = | 60 |
| FAC species | 10 | x 3 = | 30 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 65 (A) | | 115 (B) |

Prevalence Index = B/A = 1.77

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP04-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-5 | 10YR 2/2 | 100 | | | | | Muck | |
| 5-14 | 10YR 5/2 | 70 | 10YR 5/6 | 15 | C | M | Loamy/Clayey | Prominent redox concentrations |
| | | | 10YR 3/4 | 15 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP05-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope %: 2

Subregion (LRR or MLRA): LRR K Lat: 46.775460 Long: -89.478916 Datum: WGS84

Soil Map Unit Name: Flintsteel-Wanton-Gull Point NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes X | No ____ | Depth (inches): 2 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP05-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Onoclea sensibilis* | 50 | Yes | FACW |
| 2. *Fraxinus pennsylvanica* | 5 | No | FACW |
| 3. *Solidago gigantea* | 5 | No | FACW |
| 4. *Carex gynandra* | 5 | No | OBL |
| 5. *Impatiens capensis* | 5 | No | FACW |
| 6. *Prunella vulgaris* | 5 | No | FAC |
| 7. *Ranunculus hispidus* | 5 | No | FAC |
| 8. *Thalictrum dasycarpum* | 5 | No | FACW |
| 9. *Pteridium aquilinum* | 5 | No | FACU |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 90 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 5 | x 1 = | 5 |
| FACW species | 90 | x 2 = | 180 |
| FAC species | 10 | x 3 = | 30 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 110 (A) | | 235 (B) |

Prevalence Index = B/A = 2.14

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP05-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-12 | 10YR 2/1 | 100 | | | | | Mucky Loam/Clay | organic material present |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP07-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope %: 2-3

Subregion (LRR or MLRA): LRR K Lat: 46.775539 Long: -89.479706 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 1 |
| Water Table Present? | Yes X | No ____ | Depth (inches): 0 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP07-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Salix bebbiana* | 5 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 5 =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Onoclea sensibilis* | 10 | Yes | FACW |
| 2. *Carex lupulina* | 10 | Yes | OBL |
| 3. *Solidago gigantea* | 5 | Yes | FACW |
| 4. *Carex gynandra* | 5 | Yes | OBL |
| 5. *Typha X glauca* | 5 | Yes | OBL |
| 6. *Glyceria striata* | 5 | Yes | OBL |
| 7. *Juncus effusus* | 5 | Yes | OBL |
| 8. *Equisetum arvense* | 5 | Yes | FAC |
| 9. *Euthamia graminifolia* | 5 | Yes | FAC |
| 10. *Persicaria virginiana* | 5 | Yes | FAC |
| 11. | | | |
| 12. | | | |
| | 60 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 11 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 30 | x 1 = | 30 |
| FACW species | 20 | x 2 = | 40 |
| FAC species | 15 | x 3 = | 45 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 65 (A) | | 115 (B) |

Prevalence Index = B/A = 1.77

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP07-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-5 | 10YR 2/2 | 100 | | | | | Mucky Loam/Clay | |
| 5-12 | 7.5YR 4/3 | 100 | | | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP08-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.775662 Long: -89.480610 Datum: WGS84

Soil Map Unit Name: Histosols and Aquents NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes X | No ____ | Depth (inches): 2 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP08-W

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer saccharinum* | 30 | Yes | FACW |
| 2. *Ostrya virginiana* | 5 | No | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Ostrya virginiana* | 15 | Yes | FACU |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 | =Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Fraxinus pennsylvanica* | 15 | Yes | FACW |
| 2. *Equisetum arvense* | 10 | Yes | FAC |
| 3. *Ostrya virginiana* | 10 | Yes | FACU |
| 4. *Brachyelytrum aristosum* | 5 | No | UPL |
| 5. *Maianthemum canadense* | 5 | No | FACU |
| 6. *Anemone quinquefolia* | 5 | No | FACU |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 50 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 45 | x 2 = | 90 |
| FAC species | 10 | x 3 = | 30 |
| FACU species | 40 | x 4 = | 160 |
| UPL species | 5 | x 5 = | 25 |
| Column Totals: | 100 (A) | | 305 (B) |

Prevalence Index = B/A = 3.05

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP08-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-3 | 10YR 2/1 | 100 | | | | | Muck | |
| 3-14 | 7.5YR 5/4 | 75 | 5YR 4/4 | 15 | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- X 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP11-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope %: 0

Subregion (LRR or MLRA): LRR K Lat: 46.776063 Long: -89.483159 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes X | No ____ | Depth (inches): 8 |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP11-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 20 | Yes | FAC |
| 2. *Fraxinus pennsylvanica* | 15 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Osmunda claytoniana* | 20 | Yes | FAC |
| 2. *Carex gynandra* | 15 | Yes | OBL |
| 3. *Carex intumescens* | 15 | Yes | FACW |
| 4. *Onoclea sensibilis* | 5 | No | FACW |
| 5. *Acer saccharum* | 5 | No | FACU |
| 6. *Carex scoparia* | 5 | No | FACW |
| 7. *Rubus pubescens* | 5 | No | FACW |
| 8. *Ludwigia palustris* | 5 | No | OBL |
| 9. *Circaea canadensis* | 5 | No | FACU |
| 10. *Ranunculus hispidus* | 5 | No | FAC |
| 11. *Impatiens capensis* | 5 | No | FACW |
| 12. *Parthenocissus inserta* | 5 | No | FACU |
| | 95 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 20 | x 1 = | 20 |
| FACW species | 60 | x 2 = | 120 |
| FAC species | 45 | x 3 = | 135 |
| FACU species | 15 | x 4 = | 60 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 140 (A) | | 335 (B) |

Prevalence Index = B/A = 2.39

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP11-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-6 | 10YR 2/1 | 100 | | | | | Mucky Loam/Clay | |
| 6-14 | 5YR 2.5/2 | 70 | 10YR 2/1 | 30 | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP11-U

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S34 T51N R41W

Landform (hillside, terrace, etc.): Crest Local relief (concave, convex, none): Convex Slope %: 3-7

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.776050 Long: -89.483828 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ___ | No ✓ | **Is the Sampled Area within a Wetland?** Yes ___ No ✓ |
| Hydric Soil Present? | Yes ___ | No ✓ | If yes, optional Wetland Site ID: |
| Wetland Hydrology Present? | Yes ___ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in an upland. The corresponding wetland sample plot is T1W-DP11-W.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No ✓ | Depth (inches): ___ |

**Wetland Hydrology Present?** Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP11-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus grandidentata* | 30 | Y | FACU |
| 2. *Populus tremuloides* | 20 | Y | FAC |
| 3. *Acer saccharum* | 15 | Y | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 65 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus nigra* | 10 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Acer rubrum* | 25 | Y | FAC |
| 2. *Maianthemum canadense* | 25 | Y | FACU |
| 3. *Pteridium aquilinum* | 20 | Y | FACU |
| 4. *Aralia nudicaulis* | 15 | N | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 85 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.86 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 10 | x 2 = | 20 |
| FAC species | 45 | x 3 = | 135 |
| FACU species | 105 | x 4 = | 420 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 160 (A) | | 575.00 (B) |

Prevalence Index = B/A = 3.59

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

15 percent bare ground cover.

## SOIL

Sampling Point T1W-DP11-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 7.5YR 3/3 | | | | | | Loamy/Clayey | |
| 6-13 | 7.5R 4/3 | 100 | | | | | Loamy/Clayey | |
| 13-24 | 7.5R 6/3 | 90 | 7.5YR 4/4 | 10 | C | M | Loamy/Clayey | Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:
None.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/22/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP18-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.778002 Long: -89.496570 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PEM/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 2 |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP18-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 10 | Yes | FAC |
| 2. *Populus tremuloides* | 5 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Salix petiolaris* | 20 | Yes | FACW |
| 2. *Populus tremuloides* | 10 | Yes | FAC |
| 3. *Salix interior* | 5 | No | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Typha X glauca* | 20 | Yes | OBL |
| 2. *Calamagrostis canadensis* | 15 | Yes | OBL |
| 3. *Scirpus cyperinus* | 10 | Yes | OBL |
| 4. *Alnus incana* | 5 | No | FACW |
| 5. *Onoclea sensibilis* | 5 | No | FACW |
| 6. *Juncus effusus* | 5 | No | OBL |
| 7. *Acer rubrum* | 5 | No | FAC |
| 8. *Carex scoparia* | 5 | No | FACW |
| 9. *Equisetum arvense* | 5 | No | FAC |
| 10. *Galium aparine* | 5 | No | FACU |
| 11. | | | |
| 12. | | | |
| | 80 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 50 | x 1 = | 50 |
| FACW species | 40 | x 2 = | 80 |
| FAC species | 35 | x 3 = | 105 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 130 (A) | | 255 (B) |

Prevalence Index = B/A = 1.96

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP18-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-4 | 10YR 2/2 | 100 | | | | | Mucky Loam/Clay | |
| 4-6 | 10YR 2/1 | 100 | | | | | Mucky Loam/Clay | |
| 6-14 | 10YR 2/1 | 100 | | | | | Mucky Loam/Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- X Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/23/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T1W-DP18-U

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Shoulder Local relief (concave, convex, none): Convex Slope %: 3-4

Subregion (LRR or MLRA): LRR K Lat: 46.778000 Long: -89.46515 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T1W-DP18-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 20 | Yes | FAC |
| 2. *Abies balsamea* | 15 | Yes | FAC |
| 3. *Populus grandidentata* | 10 | No | FACU |
| 4. *Acer rubrum* | 10 | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 55 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Acer rubrum* | 15 | Yes | FAC |
| 2. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 25 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Pteridium aquilinum* | 10 | Yes | FACU |
| 2. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 3. *Fraxinus nigra* | 5 | Yes | FACW |
| 4. *Maianthemum canadense* | 5 | Yes | FACU |
| 5. *Carex pensylvanica* | 5 | Yes | UPL |
| 6. *Cornus canadensis* | 5 | Yes | FAC |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 40 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 70.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 25 | x 2 = | 50 |
| FAC species | 65 | x 3 = | 195 |
| FACU species | 25 | x 4 = | 100 |
| UPL species | 5 | x 5 = | 25 |
| Column Totals: | 120 (A) | | 370 (B) |

Prevalence Index = B/A = 3.08

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T1W-DP18-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-2 | | | | | | | | Organic material |
| 2-5 | 10YR 4/2 | 100 | | | | | Loamy/Clayey | |
| 5-14 | 2.5YR 3/4 | 90 | 2.5YR 4/4 | 10 | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/24/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T2W-DP06-W

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.785045 Long: -89.479712 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes X | No ____ | **within a Wetland?** **Yes** X **No** ____ |
| Wetland Hydrology Present? | Yes X | No ____ | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ____ High Water Table (A2)
- X Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes X | No ____ | Depth (inches): 1 |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes X | No ____ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T2W-DP06-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 25 | Yes | FAC |
| 2. *Acer rubrum* | 15 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 40 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus pennsylvanica* | 15 | Yes | FACW |
| 2. *Acer rubrum* | 10 | Yes | FAC |
| 3. *Acer saccharum* | 5 | No | FACU |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 30 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Onoclea sensibilis* | 5 | Yes | FACW |
| 2. *Fraxinus pennsylvanica* | 5 | Yes | FACW |
| 3. *Fraxinus nigra* | 5 | Yes | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 15 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 30 | x 2 = | 60 |
| FAC species | 50 | x 3 = | 150 |
| FACU species | 5 | x 4 = | 20 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 85 (A) | | 230 (B) |

Prevalence Index = B/A = 2.71

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T2W-DP06-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-3 | 10YR 2/1 | 100 | | | | | Muck | |
| 3-5 | 10YR 5/3 | 70 | 10YR 4/6 | 30 | | | Loamy/Clayey | |
| 5-14 | 5YR 4/4 | 70 | 5YR 5/3 | 30 | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- X 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** X **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-CO-R

*OMB Control #: 0710-0024, Exp: 11/30/2024*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/24/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T2W-DP06-U

Investigator(s): Alison McClear and Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope %: 1-2

Subregion (LRR or MLRA): LRR K Lat: 46.785022 Long: -89.479775 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ____ | **Is the Sampled Area** |
| Hydric Soil Present? | Yes ____ | No X | **within a Wetland?** **Yes** ____ **No** X |
| Wetland Hydrology Present? | Yes ____ | No X | If yes, optional Wetland Site ID: ____ |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ____ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ____ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T2W-DP06-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer rubrum* | 20 | Yes | FAC |
| 2. *Populus tremuloides* | 15 | Yes | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 35 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus pennsylvanica* | 10 | Yes | FACW |
| 2. *Fraxinus nigra* | 10 | Yes | FACW |
| 3. *Acer rubrum* | 10 | Yes | FAC |
| 4. *Acer saccharum* | 10 | Yes | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 40 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Brachyelytrum aristosum* | 15 | Yes | UPL |
| 2. *Acer saccharum* | 10 | Yes | FACU |
| 3. *Pteridium aquilinum* | 5 | Yes | FACU |
| 4. *Acer rubrum* | 5 | Yes | FAC |
| 5. *Mitchella repens* | 5 | Yes | FACU |
| 6. *Maianthemum canadense* | 5 | Yes | FACU |
| 7. *Ranunculus hispidus* | 5 | Yes | FAC |
| 8. *Fraxinus nigra* | 5 | Yes | FACW |
| 9. *Rubus pubescens* | 5 | Yes | FACW |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 60 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 15 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 30 | x 2 = | 60 |
| FAC species | 55 | x 3 = | 165 |
| FACU species | 35 | x 4 = | 140 |
| UPL species | 15 | x 5 = | 75 |
| Column Totals: | 135 (A) | | 440 (B) |

Prevalence Index = B/A = 3.26

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: T2W-DP06-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth | Matrix | | Redox Features | | | | | |
|---|---|---|---|---|---|---|---|---|
| (inches) | Color (moist) | % | Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
| 0-5 | 10YR 3/3 | 100 | | | | | Loamy/Clayey | |
| 5-14 | 10YR 5/3 | 70 | 7.5YR 4/4 | 30 | | | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** X

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/28/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T2W-DP09-W

Investigator(s): Kinnan Stauber and Collin Krochalk Section, Township, Range: S27 T51N R41W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.785595 Long: -89.483909 Datum: WGS84

Soil Map Unit Name: Flintsteel-Watton-Gull Point NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ | No ___ | If yes, optional Wetland Site ID: T2W-DP09W |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ✓ | No ___ | Depth (inches): 6 |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): 0 |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Inundated.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T2W-DP09-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Carex crinita* | 25 | Y | OBL |
| 2. *Carex lupulina* | 10 | Y | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 35 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 35 | x 1 = | 35 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 35 (A) | | 35.00 (B) |

Prevalence Index = B/A = 1.0

**Hydrophytic Vegetation Indicators:**

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Ponded/inundated, open water with no vegetation 70%.

## SOIL

Sampling Point T2W-DP09-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 10YR 2/1 | 100 | | | | | Peat | |
| 6-18 | 10YR 4/1 | 60 | 7.5YR 4/2 | 25 | | | Loamy/Clayey | Saturated |
| | | | 2.5YR 3/3 | 15 | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ✓ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:

Soils inundated.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/29/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T3E-DP19-W

Investigator(s): Matt Doneux, Randall Phillips Section, Township, Range: S19 T51 N R40W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.791444 Long: -89.442084 Datum: WGS84

Soil Map Unit Name: Big Iron silt loam NWI classification: None [PSS obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___ |
| Hydric Soil Present? | Yes ✓ | No ___ | If yes, optional Wetland Site ID: |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): 1 |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** **Yes** ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T3E-DP19-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 15 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Salix petiolaris* | 30 | Y | FACW |
| 2. *Salix bebbiana* | 15 | Y | FACW |
| 3. *Acer rubrum* | 5 | N | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 50 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Juncus filiformis* | 60 | Y | FACW |
| 2. *Scirpus cyperinus* | 10 | N | OBL |
| 3. *Juncus effusus* | 5 | N | OBL |
| 4. *Carex scoparia* | 3 | N | FACW |
| 5. *Poa alsodes* | 2 | N | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 80 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 15 | x 1 = | 15 |
| FACW species | 108 | x 2 = | 216 |
| FAC species | 22 | x 3 = | 66 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 145 (A) | | 297.00 (B) |

Prevalence Index = B/A = 2.05

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point T3E-DP19-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 10YR 2/2 | 100 | | | | | Peat | |
| 4-10 | 7.5YR 2.5/1 | 100 | | | | | Loamy/Clayey | |
| 10-18 | 10YR 5/2 | 75 | 10YR 4/6 | 25 | C | M | Loamy/Clayey | Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 07/29/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T3E-DP19-U

Investigator(s): Matt Doneux, Randall Phillips Section, Township, Range: S19 T51 N R40W

Landform (hillside, terrace, etc.): Undulating Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.791409 Long: -89.442233 Datum: WGS84

Soil Map Unit Name: Big Iron silt loam NWI classification: None [UPL obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✓ | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology were observed.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T3E-DP19-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 10 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 10 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Amelanchier arborea* | 20 | Y | FACU |
| 2. *Populus tremuloides* | 10 | Y | FAC |
| 3. *Acer rubrum* | 10 | Y | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 40 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Anthoxanthum odoratum* | 75 | Y | FACU |
| 2. *Rubus allegheniensis* | 25 | Y | FACU |
| 3. *Populus tremuloides* | 5 | N | FAC |
| 4. *Phleum pratense* | 3 | N | FACU |
| 5. *Carex granularis* | 1 | N | FACW |
| 6. *Euthamia graminifolia* | 1 | N | FAC |
| 7. *Agrimonia gryposepala* | 1 | N | FACU |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 111 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 1 | x 2 = | 2 |
| FAC species | 36 | x 3 = | 108 |
| FACU species | 124 | x 4 = | 496 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 161 (A) | | 606.00 (B) |

Prevalence Index = B/A = 3.76

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point T3E-DP19-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 7.5YR 3/4 | 100 | | | | | Loamy/Clayey | |
| 10-18 | 5YR 4/4 | 60 | 5YR 3/4 | 15 | C | M | Loamy/Clayey | |
| | | | 10YR 5/2 | 25 | C | M | Loamy/Clayey | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/31/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T3E-DP28-W

Investigator(s): Matt Doneux, Randall Phillips Section, Township, Range: S30 T51N R40W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.788306 Long: -89.419268 Datum: WGS84

Soil Map Unit Name: Rockland-Moquah NWI classification: None [PEM obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ____ | **Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ____ |
| Hydric Soil Present? | Yes ✓ | No ____ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ✓ | No ____ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ✓ Sediment Deposits (B2)
- ✓ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ✓ **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T3E-DP28-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 25 | Y | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 25 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus nigra* | 10 | Y | FACW |
| 2. *Fraxinus pennsylvanica* | 10 | Y | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 20 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Carex gynandra* | 15 | Y | OBL |
| 2. *Matteuccia struthiopteris* | 10 | Y | FAC |
| 3. *Carex intumescens* | 10 | Y | FACW |
| 4. *Fraxinus nigra* | 5 | N | FACW |
| 5. *Symphyotrichum lateriflorum* | 3 | N | FAC |
| 6. *Elymus virginicus* | 2 | N | FACW |
| 7. *Thalictrum dasycarpum* | 2 | N | FACW |
| 8. *Epipactis helleborine* | 1 | N | UPL |
| 9. *Carex tuckermanii* | 1 | N | OBL |
| 10. *Equisetum pratense* | 1 | N | FACW |
| 11. | | | |
| 12. | | | |
| | 50 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 16 | x 1 = | 16 |
| FACW species | 40 | x 2 = | 80 |
| FAC species | 38 | x 3 = | 114 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 1 | x 5 = | 5 |
| Column Totals: | 95 (A) | | 215.00 (B) |

Prevalence Index = B/A = 2.26

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point T3E-DP28-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 5YR 4/2 | 90 | 5YR 3/4 | 10 | C | M | Loamy/Clayey | Distinct redox concentrations |
| 4-10 | 5YR 3/3 | 95 | 2.5YR 2.5/4 | 5 | C | M | Loamy/Clayey | Faint redox concentrations |
| 10-18 | 5YR 4/3 | 90 | 5YR 3/4 | 10 | C | M | Loamy/Clayey | Faint redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/31/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T3E-DP28-U

Investigator(s): Matt Doneux, Randall Phillips Section, Township, Range: S30 T51N R40W

Landform (hillside, terrace, etc.): Sideslope Local relief (concave, convex, none): Convex Slope %: 20-60

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.788227 Long: -89.419420 Datum: WGS84

Soil Map Unit Name: Rockland-Moquah NWI classification: None [UPL obs.]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✓ | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology were observed.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T3E-DP28-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer saccharum* | 60 | Y | FACU |
| 2. *Populus grandidentata* | 40 | Y | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 100 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Acer saccharum* | 15 | Y | FACU |
| 2. *Fraxinus pennsylvanica* | 10 | Y | FACW |
| 3. *Prunus serotina* | 5 | N | FACU |
| 4. *Ostrya virginiana* | 5 | N | FACU |
| 5. *Tilia americana* | 3 | N | FACU |
| 6. | | | |
| 7. | | | |
| | 38 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Rubus pubescens* | 20 | Y | FACW |
| 2. *Ribes glandulosum* | 10 | Y | FACW |
| 3. *Maianthemum canadense* | 5 | N | FACU |
| 4. *Dryopteris intermedia* | 5 | N | FAC |
| 5. *Thalictrum dasycarpum* | 3 | N | FACW |
| 6. *Carex pedunculata* | 2 | N | FAC |
| 7. *Maianthemum stellatum* | 2 | N | FAC |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 47 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 43 | x 2 = | 86 |
| FAC species | 9 | x 3 = | 27 |
| FACU species | 133 | x 4 = | 532 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 185 (A) | | 645.00 (B) |

Prevalence Index = B/A = 3.49

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point T3E-DP28-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 2.5YR 3/4 | 100 | | | | | Loamy/Clayey | Dry |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:

Auger refusal at 12 inches due to coarse fragments.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: Michigan Sampling Point: T4E-DP24-W

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S35 T51N R41W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.802980 Long: -89.440313 Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ | No ___ | If yes, optional Wetland Site ID: T4E-24 |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in wetland T4E-24. The corresponding upland sample plot is T4E-DP24-U.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): 0 |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP24-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Alnus incana* | 10 | Y | FACW |
| 2. *Salix discolor* | 5 | Y | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Onoclea sensibilis* | 60 | Y | FACW |
| 2. *Equisetum palustre* | 20 | Y | FACW |
| 3. *Typha latifolia* | 15 | N | OBL |
| 4. *Impatiens capensis* | 5 | N | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 100 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 15 | x 1 = | 15 |
| FACW species | 100 | x 2 = | 200 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 115 (A) | | 215.00 (B) |

Prevalence Index = B/A = 1.87

**Hydrophytic Vegetation Indicators:**

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
None.

## SOIL

Sampling Point T4E-DP24-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10YR 3/2 | 100 | | | | | Mucky Loam/Clay | Saturated |
| 10-22 | 5YR 4/4 | 100 | | | | | Loamy/Clayey | Saturated |
| 22-24 | 5YR 4/4 | 100 | | | | | Loamy/Clayey | Saturated. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ✓ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:
None.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP24-U

Investigator(s): Charles Eckers and Collin Krochalk Section, Township, Range: S24 T51N R41W

Landform (hillside, terrace, etc.): Crest Local relief (concave, convex, none): Convex Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.802975 Long: -89.440302 Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✓ | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in an upland. The corresponding wetland sample plot is T4E-DP24-W.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP24-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Pinus strobus* | 40 | Y | FACU |
| 2. *Acer rubrum* | 5 | N | FAC |
| 3. *Populus tremuloides* | 5 | N | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 50 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' radius ) | | | |
| 1. *Fraxinus nigra* | 5 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 5 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' radius ) | | | |
| 1. *Malus domestica* | 15 | Y | UPL |
| 2. *Pteridium aquilinum* | 15 | Y | FACU |
| 3. *Athyrium angustum* | 10 | N | FAC |
| 4. *Carex penslyvanica* | 10 | N | UPL |
| 5. *Mentha arvensis* | 2 | N | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 52 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: 30' ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 7 | x 2 = | 14 |
| FAC species | 20 | x 3 = | 60 |
| FACU species | 55 | x 4 = | 220 |
| UPL species | 25 | x 5 = | 125 |
| Column Totals: | 107 (A) | | 419.00 (B) |

Prevalence Index = B/A = 3.92

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

48 percent bare ground.

## SOIL

Sampling Point T4E-DP24-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 7.5YR 3/3 | 100 | | | | | Loamy/Clayey | Dry |
| 6-13 | 7.5YR 4/3 | 97 | 5YR 4/6 | 3 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| 13-24 | 7.5YR 4/4 | 90 | 7.5YR 3/4 | 10 | C | M | Loamy/Clayeye | Dry, Faint redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:
None

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP25-W

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S24 T51N R41W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.802975 Long: -89.440302 Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point NWI classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ____ | **Is the Sampled Area within a Wetland?** Yes ✓ No ____ |
| Hydric Soil Present? | Yes ✓ | No ____ | If yes, optional Wetland Site ID: T4E-25 |
| Wetland Hydrology Present? | Yes ✓ | No ____ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in wetland T4E-25. The corresponding upland sample plot is T4E-DP25-U.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ✓ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP25-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. *Alnus incana* | 65 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 65 =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Carex intumescens* | 13 | Y | FACW |
| 2. *Thalictrum dioicum* | 2 | N | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 15 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 78 | x 2 = | 156 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 2 | x 4 = | 8 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 80 (A) | | 164.00 (B) |

Prevalence Index = B/A = 2.05

**Hydrophytic Vegetation Indicators:**

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

85 percent bare ground

## SOIL

Sampling Point T4E-DP25-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 7.5YR 3/2 | 95 | 5YR 4/6 | 5 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| 12-21 | 7.5YR 5/2 | 90 | 7.5YR 4/6 | 10 | C | M | Loamy/Clayey | Moist, Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:
None

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP25-U

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S24 T51N R41W

Landform (hillside, terrace, etc.): Crest Local relief (concave, convex, none): Convex Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.802985 Long: -89.440322 Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✓ | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in an upland. The corresponding wetland sample plot is T4E-DP25-W.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP25-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Pinus strobus* | 60 | Y | FACU |
| 2. *Acer rubrum* | 10 | N | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 70 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Cornus canadensis* | 30 | Y | FAC |
| 2. *Hieracium caespitosum* | 30 | Y | UPL |
| 3. *Fraxinus nigra* | 15 | N | FACW |
| 4. *Trientalis borealis* | 10 | N | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 85 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 15 | x 2 = | 30 |
| FAC species | 50 | x 3 = | 150 |
| FACU species | 60 | x 4 = | 240 |
| UPL species | 30 | x 5 = | 150 |
| Column Totals: | 155 (A) | | 570.00 (B) |

Prevalence Index = B/A = 3.68

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ___ **No** ✓

Remarks: (Include photo numbers here or on a separate sheet.)

15 percent bare ground.

## SOIL

Sampling Point T4E-DP25-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-6 | 7.5YR 3/3 | 100 | | | | | Loamy/Clayey | Dry |
| 6-13 | 7.5YR 4/3 | 97 | 5YR 4/6 | 3 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| 13-24 | 7.5YR 4/4 | 90 | 7.5YR 3/4 | 10 | C | M | Loamy/Clayey | Dry, Faint redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:
None

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP26-W

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S19 T51N R40W

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.802530 Long: -89.437622 Datum: WGS84

Soil Map Unit Name: Big Iron silt loam NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ | No ___ | If yes, optional Wetland Site ID: T4E-26 |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in wetland T4E-26. The corresponding upland sample plot is T4E-DP26-U

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No ✓ | Depth (inches): ___ |

**Wetland Hydrology Present?** Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP26-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 30 | Y | FAC |
| 2. *Fraxinus nigra* | 15 | Y | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 45 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Carex intumescens* | 25 | Y | FACW |
| 2. *Carex scoparia* | 25 | Y | FACW |
| 3. *Rubus pubescens* | 15 | Y | FACW |
| 4. *Acer rubrum* | 3 | N | FAC |
| 5. *Impatiens capensis* | 2 | N | FACW |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 70 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 82 | x 2 = | 164 |
| FAC species | 33 | x 3 = | 99 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 115 (A) | | 263.00 (B) |

Prevalence Index = B/A = 2.29

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
None.

**SOIL**

Sampling Point T4E-DP26-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-3 | 7.5YR 3/1 | 98 | 7.5YR 4/6 | 2 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| 3-9 | 7.5YR 5/1 | 85 | 7.5YR 5/6 | 15 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| 9-18 | 7.5YR 6/1 | 85 | 7.5YR 5/6 | 15 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:

None.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP26-U

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S19 T51N R40W

Landform (hillside, terrace, etc.): Crest Local relief (concave, convex, none): Convex Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.802817 Long: -89.437724 Datum: WGS84

Soil Map Unit Name: Big Iron silt loam NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ____ | **Is the Sampled Area within a Wetland?** Yes ____ No ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in an upland. The corresponding wetland sample plot is T4E-DP26-W.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ____ Surface Water (A1)
- ____ High Water Table (A2)
- ____ Saturation (A3)
- ____ Water Marks (B1)
- ____ Sediment Deposits (B2)
- ____ Drift Deposits (B3)
- ____ Algal Mat or Crust (B4)
- ____ Iron Deposits (B5)
- ____ Inundation Visible on Aerial Imagery (B7)
- ____ Sparsely Vegetated Concave Surface (B8)
- ____ Water-Stained Leaves (B9)
- ____ Aquatic Fauna (B13)
- ____ Marl Deposits (B15)
- ____ Hydrogen Sulfide Odor (C1)
- ____ Oxidized Rhizospheres on Living Roots (C3)
- ____ Presence of Reduced Iron (C4)
- ____ Recent Iron Reduction in Tilled Soils (C6)
- ____ Thin Muck Surface (C7)
- ____ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ____ Surface Soil Cracks (B6)
- ____ Drainage Patterns (B10)
- ____ Moss Trim Lines (B16)
- ____ Dry-Season Water Table (C2)
- ____ Crayfish Burrows (C8)
- ____ Saturation Visible on Aerial Imagery (C9)
- ____ Stunted or Stressed Plants (D1)
- ____ Geomorphic Position (D2)
- ____ Shallow Aquitard (D3)
- ____ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Sufficient indicators were not recorded.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP26-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 60 | Y | FAC |
| 2. *Fraxinus nigra* | 25 | Y | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 85 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus nigra* | 40 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 40 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Hieracium caespitosum* | 40 | Y | UPL |
| 2. *Fraxinus nigra* | 25 | Y | FACW |
| 3. *Rubus pubescens* | 20 | Y | FACW |
| 4. *Poa pratensis* | 15 | N | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 100 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 110 | x 2 = | 220 |
| FAC species | 60 | x 3 = | 180 |
| FACU species | 15 | x 4 = | 60 |
| UPL species | 40 | x 5 = | 200 |
| Column Totals: | 225 (A) | | 660.00 (B) |

Prevalence Index = B/A = 2.93

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
None

## SOIL

Sampling Point T4E-DP26-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 7.5YR 3/4 | 100 | | | | | Loamy/Clayey | Dry |
| 8-24 | 7.5YR 4/3 | 90 | 5YR 4/6 | 10 | C | M | Loamy/Clayey | Dry, Prominent redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:
None

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP29-W

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S19 T51N R40W

Landform (hillside, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.801906 Long: -89.433831 Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ✓ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ | No ___ | If yes, optional Wetland Site ID: T4E-29 |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in wetland T4E-29. The corresponding upland sample plot is T4E-DP29-U

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ✓ Water Marks (B1)
- ✓ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): 13 |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): 11 |

**Wetland Hydrology Present?** Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Floodplain for creek.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP29-W

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus tremuloides* | 20 | Y | FAC |
| 2. *Fraxinus nigra* | 15 | Y | FACW |
| 3. *Acer rubrum* | 10 | Y | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 45 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Alnus incana* | 15 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 15 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Matteuccia struthiopteris* | 70 | Y | FAC |
| 2. *Onoclea sensibilis* | 20 | Y | FACW |
| 3. *Carex intumescens* | 7 | N | FACW |
| 4. *Thalictrum dasycarpum* | 3 | N | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 100 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 60 | x 2 = | 120 |
| FAC species | 100 | x 3 = | 300 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 160 (A) | | 420.00 (B) |

Prevalence Index = B/A = 2.62

**Hydrophytic Vegetation Indicators:**

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ✓ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)
None.

## SOIL

Sampling Point T4E-DP29-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-11 | 7.5YR 4/3 | 95 | 7.5YR 5/4 | 5 | C | M | Loamy/Clayey | Moist, Faint redox concentrations |
| 11-24 | 5YR 4/3 | 90 | 5YR 5/6 | 10 | C | M | Loamy/Clayey | Saturated, Distinct redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ✓ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:

Soil is naturally problematic due to red parent materials near the Great Lakes.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP29-U

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S19 T51N R40W

Landform (hillside, terrace, etc.): Shoulder Local relief (concave, convex, none): Convex Slope %: 3-7

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.801899 Long: -89.433650 Datum: WGS84

Soil Map Unit Name: Big Iron-Flintsteel-Gull Point NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ____ | **Is the Sampled Area within a Wetland?** Yes ____ No ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in an upland. The corresponding wetland sample plot is T4E-DP29-W.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP29-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Populus grandidentata* | 50 | Y | FACU |
| 2. *Fraxinus americana* | 20 | Y | FACU |
| 3. *Acer rubrum* | 5 | N | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 75 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus nigra* | 15 | Y | FACW |
| 2. *Acer rubrum* | 5 | Y | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 20 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Pyrola americana* | 25 | Y | FAC |
| 2. *Acer rubrum* | 5 | N | FAC |
| 3. *Carex penslyvanica* | 5 | N | UPL |
| 4. *Thalictrum dasycarpum* | 2 | N | FACW |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 37 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 17 | x 2 = | 34 |
| FAC species | 40 | x 3 = | 120 |
| FACU species | 70 | x 4 = | 280 |
| UPL species | 5 | x 5 = | 25 |
| Column Totals: | 132 (A) | | 459.00 (B) |

Prevalence Index = B/A = 3.48

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
63 percent bare ground.

## SOIL

Sampling Point T4E-DP29-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 7.5YR 4/3 | 100 | | | | | Loamy/Clayey | Dry |
| 4-7 | 7.5YR 6/3 | 100 | | | | | Loamy/Clayey | Dry |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:

Auger refusal occurred 7 inches below the ground surface due to tree roots on multiple attempts.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonogan Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP32-W

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S19 T51N R40W

Landform (hillside, terrace, etc.): Slope Local relief (concave, convex, none): Convex Slope %: 3-7

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.798255 Long: -89.422781 Datum: WGS84

Soil Map Unit Name: Rockland-Moquah NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** Yes ✓ No ___ |
| Hydric Soil Present? | Yes ✓ | No ___ | If yes, optional Wetland Site ID: T4E-32 |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in wetland T4E-32. The corresponding upland sample plot is T4E-DP32-U.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): 0 |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Side hill seeps contribute to hydrology

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP32-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Onoclea sensibilis* | 40 | Y | FACW |
| 2. *Equisetum fluviatile* | 20 | Y | OBL |
| 3. *Impatiens capensis* | 20 | Y | FACW |
| 4. *Solidago gigantea* | 10 | N | FACW |
| 5. *Urtica dioica* | 10 | N | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 100 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: 30') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 20 | x 1 = | 20 |
| FACW species | 70 | x 2 = | 140 |
| FAC species | 10 | x 3 = | 30 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 100 (A) | | 190.00 (B) |

Prevalence Index = B/A = 1.9

**Hydrophytic Vegetation Indicators:**

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
None

## SOIL

Sampling Point T4E-DP32-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 5YR 4/3 | 100 | | | | | Mucky Loam/Clay | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ✓ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✓ **No** ___

Remarks:

Auger refusal occurred 4 inches below the ground surface due to coarse fragments.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 8/19/2025

Applicant/Owner: White Pine Copper LLC State: MI Sampling Point: T4E-DP32-U

Investigator(s): Charles Eckers & Collin Krochalk Section, Township, Range: S19 T51N R40W

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.798332 Long: -89.422965 Datum: WGS84

Soil Map Unit Name: Rockland-Moquah NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✓ | **Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓ |
| Hydric Soil Present? | Yes ____ | No ✓ | If yes, optional Wetland Site ID: ____ |
| Wetland Hydrology Present? | Yes ____ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)
This sample plot is located in an upland. The corresponding wetland sample plot is T4E-DP32-W.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Water Table Present? | Yes ____ | No ✓ | Depth (inches): ____ |
| Saturation Present? (includes capillary fringe) | Yes ____ | No ✓ | Depth (inches): ____ |

**Wetland Hydrology Present?** **Yes** ____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
None

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4E-DP32-U

| Tree Stratum (Plot size: 30' ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. *Acer saccharum* | 35 | Y | FACU |
| 2. *Tilia americana* | 25 | Y | FACU |
| 3. *Ostrya virginiana* | 10 | N | UPL |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 70 | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 15' ) | | | |
| 1. *Fraxinus nigra* | 5 | Y | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | 5 | =Total Cover | |
| **Herb Stratum** (Plot size: 5' ) | | | |
| 1. *Anemone quinquefolia* | 20 | Y | FACU |
| 2. *Onoclea sensibilis* | 20 | Y | FACW |
| 3. *Tilia americana* | 15 | Y | FACU |
| 4. *Adiantum pedatum* | 15 | Y | FACU |
| 5. *Trillium cernuum* | 5 | N | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 75 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A ) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.57 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 25 | x 2 = | 50 |
| FAC species | 5 | x 3 = | 15 |
| FACU species | 110 | x 4 = | 440 |
| UPL species | 10 | x 5 = | 50 |
| Column Totals: | 150 (A) | | 555.00 (B) |

Prevalence Index = B/A = 3.7

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)
Bare ground present at 25 percent.

## SOIL

Sampling Point T4E-DP32-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 5YR 3/3 | 100 | | | | | Loamy/Clayey | Moist |
| 8-24 | 5YR 3/3 | 98 | 5YR 4/6 | 2 | C | M | Sandy | Moist, Distinct redox concentrations |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:
None.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/30/2025

Applicant/Owner: White Pine Copper LLC State: Michigan Sampling Point: T4W-DP08-W

Investigator(s): Kinnan Stauber & Collin Krochalk Section, Township, Range: S22 T51N R41W

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.807614 Long: -89.488968 Datum: WGS84

Soil Map Unit Name: Udorthents-Alfic Udarents-Epiaquents complex, NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✓, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✓ | No ___ | **Is the Sampled Area within a Wetland?** Yes ___ No ✓ |
| Hydric Soil Present? | Yes ___ | No ✓ | If yes, optional Wetland Site ID: T4W-DP08-W |
| Wetland Hydrology Present? | Yes ✓ | No ___ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ✓ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ✓ | No ___ | Depth (inches): 4 |
| Saturation Present? (includes capillary fringe) | Yes ✓ | No ___ | Depth (inches): 0 |

**Wetland Hydrology Present?** Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4W-DP08-W

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | | =Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | | =Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Equisetum variegatum* | 90 | Y | FACW |
| 2. *Calamagrostis canadensis* | 10 | N | OBL |
| 3. *Eupatorium perfoliatum* | 5 | N | FACW |
| 4. *Lycopus americanus* | 2 | N | OBL |
| 5. *Salix discolor* | 2 | N | FACW |
| 6. *Lobelia siphilitica* | 1 | N | FACW |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 110 | =Total Cover | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | =Total Cover | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 12 | x 1 = | 12 |
| FACW species | 98 | x 2 = | 196 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 0 | x 4 = | 0 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 110 (A) | | 208.00 (B) |

Prevalence Index = B/A = 1.89

**Hydrophytic Vegetation Indicators:**

✓ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** **Yes** ✓ **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)
Moss present 25%

## SOIL

Sampling Point T4W-DP08-W

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-15 | 5YR 3/4 | 100 | | | | | Loamy/Clayey | Saturated |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ✓ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:

Problem soil. Hydric soil assumed due to presence of hydrology and hydric vegetation.

**U.S. Army Corps of Engineers**
**WETLAND DETERMINATION DATA SHEET – Northcentral and Northeast Region**
See ERDC/EL TR-12-1; the proponent agency is CECW-COR

*OMB Control #: 0710-0024, Exp: 09/30/2027*
*Requirement Control Symbol EXEMPT:*
*(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: White Pine North - Underground Area Baseline Assessment City/County: White Pine/Ontonagon Sampling Date: 7/30/2025

Applicant/Owner: White Pine Copper LLC State: Michigan Sampling Point: T4W-DP08-U

Investigator(s): Kinnan Stauber & Collin Krochalk Section, Township, Range: S22 T51N R41W

Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope %: 0-2

Subregion (LRR or MLRA): LRR K, MLRA 92 Lat: 46.807598 Long: -89.488835 Datum: WGS84

Soil Map Unit Name: Udorthents-Alfic Udarents-Epiaquents complex NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ✓, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ___ | No ✓ | **Is the Sampled Area within a Wetland?** **Yes** ___ **No** ✓ |
| Hydric Soil Present? | Yes ___ | No ✓ | If yes, optional Wetland Site ID: |
| Wetland Hydrology Present? | Yes ___ | No ✓ | |

Remarks: (Explain alternative procedures here or in a separate report.)

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

| | | | |
|---|---|---|---|
| Surface Water Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Water Table Present? | Yes ___ | No ✓ | Depth (inches): ___ |
| Saturation Present? (includes capillary fringe) | Yes ___ | No ✓ | Depth (inches): ___ |

**Wetland Hydrology Present?** **Yes** ___ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology were observed.

**VEGETATION** – Use scientific names of plants.

Sampling Point: T4W-DP08-U

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 15') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| | =Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. *Echinochloa crus-galli* | 20 | Y | FAC |
| 2. *Fragaria virginiana* | 20 | Y | FACU |
| 3. *Daucus carota* | 20 | Y | UPL |
| 4. *Achillea millefolium* | 10 | N | FACU |
| 5. *Lotus corniculatus* | 5 | N | FACU |
| 6. *Hieracium caespitosum* | 5 | N | NI |
| 7. *Leucanthemum vulgare* | 5 | N | UPL |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| | 85 =Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | =Total Cover | | |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 20 | x 3 = | 60 |
| FACU species | 35 | x 4 = | 140 |
| UPL species | 25 | x 5 = | 125 |
| Column Totals: | 80 (A) | | 325.00 (B) |

Prevalence Index = B/A = 4.06

**Hydrophytic Vegetation Indicators:**

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata:**

**Tree** – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ___ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)
Bare ground 15%

## SOIL

Sampling Point T4W-DP08-U

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 5YR 3/4 | 100 | | | | | Loamy/Clayey | Dry |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Iron Monosulfide (A18)
- ___ Mesic Spodic (A17) **(MLRA 144A, 145, 149B)**
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)
- ___ Red Parent Material (F21) **(MLRA 145)**

**Indicators for Problematic Hydric Soils[3]:**

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**) Thin
- ___ Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Red Parent Material (F21) **(outside MLRA 145)**
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ___ **No** ✓

Remarks:

Auger refusal at 8 inches, due to coarse fragments.

# Appendix E

## Stream Characterization Data

**Stream:** Bolo Road Creek **Location:** T1E-S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/21/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **10** | **Good Total =** | **0** | **Fair Total =** | **0** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **10** |
| **Existing Stream Type =** | **D5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 West Branch Halfway Creek **Location:** T1E-S02 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **8** | **Good Total =** | **0** | **Fair Total =** | **6** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **14** |
| **Existing Stream Type =** | **D5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | West Branch Halfway Creek | Location: T1E-S03 | Valley Type: Type X-Lacustrine | Observers: Barr | Date: 7/22/2025 |
|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | Excellent Total = | 10 | Good Total = | 0 | Fair Total = | 0 | Poor Total = | 4 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 14 |
| Existing Stream Type = | D5 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tributary 2 West Branch Halfway Creek **Location:** T1E-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **7** | **Good Total =** | **8** | **Fair Total =** | **0** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **15** |
| **Existing Stream Type =** | **E6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tolfrey Creek **Location:** T1E-S05 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 4 | | **Good Total =** 38 | | **Fair Total =** 36 | | **Poor Total =** 12 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 90 |
| **Existing Stream Type =** | C5 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Tributary 1 to Argentine Creek | Location: T1E-S06 | Valley Type: Type X-Lacustrine | Observers: Barr | Date: 7/22/2025 |
|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | Excellent Total = 9 | | Good Total = 36 | | Fair Total = 15 | | Poor Total = 20 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 80 |
| Existing Stream Type = | E6 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tributary 2 to Argentine Creek **Location:** T1E-S07 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/23/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | 8 |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **19** | **Good Total =** | **4** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **31** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to Town Line Creek **Location:** T1E-S08 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/23/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **26** | **Good Total =** | **20** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **54** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 to Town Line Creek **Location:** T1E-S09 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/23/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **0** | **Good Total =** | **28** | **Fair Total =** | **42** | **Poor Total =** | **16** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **86** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 3 to East Branch Duck Creek **Location:** T1W-S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/21/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | 6 | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | 16 |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | 24 |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** **2** | | **Good Total =** **4** | | **Fair Total =** **60** | | **Poor Total =** **56** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **122** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 to East Branch Duck Creek **Location:** T1W-S02 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | 3 | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 6 | | **Good Total =** 34 | | **Fair Total =** 36 | | **Poor Total =** 12 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 88 |
| **Existing Stream Type =** | E6 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 to East Branch Duck Creek **Location:** T1W-S03 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | 12 |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **5** | **Good Total =** | **4** | **Fair Total =** | **15** | **Poor Total =** | **12** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **36** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to East Branch Duck Creek **Location:** T1W-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | 6 | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | 16 |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 8 | | **Good Total =** 12 | | **Fair Total =** 39 | | **Poor Total =** 32 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **91** |
| **Existing Stream Type =** | **E5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to Each Branch Duck Creek **Location:** T1W-S05 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/22/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | 16 |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **6** | **Good Total =** | **20** | **Fair Total =** | **18** | **Poor Total =** | **28** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **72** |
| **Existing Stream Type =** | **E6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | West Branch Duck Creek | | Location: T1W-S06 | | | Valley Type: Type X-Lacustrine | | Observers: Barr | | | Date: 7/23/2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Key | Category | Excellent | | Good | | Fair | | Poor | | |
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating | |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | | |
| | | | | Excellent Total = | 5 | Good Total = | 28 | Fair Total = | 42 | Poor Total = | 16 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 91 |
| Existing Stream Type = | C3 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Pine Creek **Location:** T1W-S07 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/23/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **7** | **Good Total =** | **14** | **Fair Total =** | **21** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **50** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Pine Creek **Location:** T1W-S08 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/23/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | 8 |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **6** | **Good Total =** | **6** | **Fair Total =** | **27** | **Poor Total =** | **20** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **59** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Caribou Creek **Location:** T1W-S09 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 6 | | **Good Total =** 28 | | **Fair Total =** 3 | | **Poor Total =** 8 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 45 |
| **Existing Stream Type =** | D6 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 West Branch Halfway Creek **Location:** T2E - S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **35** | **Good Total =** | **0** | **Fair Total =** | **0** | **Poor Total =** | **12** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **47** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 West Branch Halfway Creek **Location:** T2E-S02 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **33** | **Good Total =** | **0** | **Fair Total =** | **0** | **Poor Total =** | **20** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **53** |
| **Existing Stream Type =** | **E6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tolfrey Creek **Location:** T2E-S03 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | 2 | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 12 | | **Good Total =** 42 | | **Fair Total =** 12 | | **Poor Total =** 0 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **66** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Unlabed Stream (suspected Tributary to Argetine Creek) **Location:** T2E-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | 1 | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **29** | **Good Total =** | **8** | **Fair Total =** | **12** | **Poor Total =** | **4** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **53** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to Argentine Creek **Location:** T2E-S05 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 15 | | **Good Total =** 30 | | **Fair Total =** 21 | | **Poor Total =** 0 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **66** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 to Argentine Creek **Location:** T2E-S06 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 7 | | **Good Total =** 52 | | **Fair Total =** 15 | | **Poor Total =** 0 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 74 |
| **Existing Stream Type =** | C4 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Halfway River **Location:** T2E-S07 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **4** | **Good Total =** | **42** | **Fair Total =** | **39** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **85** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Halfway River **Location:** T2E-S08 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **20** | **Good Total =** | **16** | **Fair Total =** | **3** | **Poor Total =** | **20** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **59** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Tributary 1 to Townline Creek | | Location: T2E-S09 | | Valley Type: Type X-Lacustrine | | Observers: Barr | | Date: 7/24/2025 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | Excellent Total = | 26 | Good Total = | 20 | Fair Total = | 6 | Poor Total = | 0 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 52 |
| Existing Stream Type = | C5 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tributary 3 to Townline Creek **Location:** T2E-S10 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **17** | **Good Total =** | **22** | **Fair Total =** | **6** | **Poor Total =** | **12** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **57** |
| **Existing Stream Type =** | **E6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to Little Cranberry River **Location:** T2E-S11 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **21** | **Good Total =** | **0** | **Fair Total =** | **0** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **21** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Tributary 2 to Little Cranberry River | Location: T2E-S12 | Valley Type: Type X-Lacustrine | Observers: Barr | Date: 7/28/2025 |
|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | Excellent Total = | 22 | Good Total = | 0 | Fair Total = | 0 | Poor Total = | 8 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 30 |
| Existing Stream Type = | D6 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tributary 3 to Little Cranberry River **Location:** T2E-S13 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **22** | **Good Total =** | **26** | **Fair Total =** | **3** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **59** |
| **Existing Stream Type =** | **E5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Bolo Road Creek **Location:** T2W-S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/13/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **13** | **Good Total =** | **26** | **Fair Total =** | **21** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **68** |
| **Existing Stream Type =** | **E6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 to East Branch Duck Creek **Location:** T2W-S02 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/13/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 1 | | **Good Total =** 38 | | **Fair Total =** 39 | | **Poor Total =** 16 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 94 |
| **Existing Stream Type =** | C5 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to East Branch Duck Creek **Location:** T2W-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/13/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **16** | **Good Total =** | **4** | **Fair Total =** | **0** | **Poor Total =** | **12** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **32** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to East Branch Duck River **Location:** T2W-S05 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/13/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **16** | **Good Total =** | **4** | **Fair Total =** | **0** | **Poor Total =** | **12** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **32** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | West Branch Duck Creek | | Location: T2W-S07 | | | Valley Type: Type X-Lacustrine | | Observers: Barr | | Date: 7/28/2025 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Key | Category | Excellent | | Good | | Fair | | Poor | | |
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating | |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | 12 | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | 1 | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 | |
| | | | Excellent Total = | 5 | Good Total = | 34 | Fair Total = | 30 | Poor Total = | 24 | |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 93 |
| Existing Stream Type = | C4 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tributary 1 to Duck Creek **Location:** T2W-S08 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **15** | **Good Total =** | **12** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **35** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** East Branch Duck Creek **Location:** T2W-S09 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **15** | **Good Total =** | **12** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **35** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Unlabeled Stream **Location:** T2W-S10 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/25

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | 3 | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | 16 |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **3** | **Good Total =** | **10** | **Fair Total =** | **39** | **Poor Total =** | **24** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **76** |
| **Existing Stream Type =** | **D6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Pine Creek | Location: T2W-S11 | Valley Type: Type X-Lacustrine | Observers: Barr | Date: 7/29/2025 |
|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | Excellent Total = | 10 | Good Total = | 30 | Fair Total = | 30 | Poor Total = | 12 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 82 |
| Existing Stream Type = | C4 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tributary 2 West Branch Halfway Creek **Location:** T3E-S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/28/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** **0** | | **Good Total =** **34** | | **Fair Total =** **51** | | **Poor Total =** **12** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **97** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tolfrey Creek **Location:** T3E-S02 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/29/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **4** | **Good Total =** | **34** | **Fair Total =** | **39** | **Poor Total =** | **4** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **81** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Argentine Creek **Location:** T3E-S03 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/29/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 3 | | **Good Total =** 56 | | **Fair Total =** 18 | | **Poor Total =** 4 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **81** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Halfway River **Location:** T3E-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/29/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** **2** | | **Good Total =** **16** | | **Fair Total =** **51** | | **Poor Total =** **20** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **89** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Tributary 1 to Townline Creek | Location: | T3E-S05 | Valley Type: | Type X-Lacustrine | Observers: | Barr | Date: | 7/29/2025 |
|---|---|---|---|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | 16 |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** **14** | | **Good Total =** **26** | | **Fair Total =** **0** | | **Poor Total =** **40** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

***Rating is adjusted to *potential* stream type, not existing stream type**

| | |
|---|---|
| **Grand Total =** | **80** |
| **Existing Stream Type =** | **E5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

**Stream:** Tributary 2 to Little Cranberry River **Location:** T3E-S06 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/31/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 1 | | **Good Total =** 56 | | **Fair Total =** 18 | | **Poor Total =** 8 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **83** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 4 to Little Cranberry River **Location:** T3E-S07 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/31/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 4 | | **Good Total =** 48 | | **Fair Total =** 27 | | **Poor Total =** 0 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 79 |
| **Existing Stream Type =** | C4 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Bolo Rd Creek | | Location: T3W-S01 | | | Valley Type: Type X-Lacustrine | | Observers: Barr | | Date: 7/29/2025 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Key | Category | Excellent | | Good | | Fair | | Poor | | |
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating | |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | | |
| | | | Excellent Total = | 34 | Good Total = | 0 | Fair Total = | 0 | Poor Total = | 12 | |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 46 |
| Existing Stream Type = | E6 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

| Stream: | East Branch Duck Creek | | Location: T3W-S02 | | | Valley Type: Type X-Lacustrine | | Observers: Barr | | Date: 7/29/2025 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Key | Category | Excellent | | Good | | Fair | | Poor | | |
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating | |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | | |
| | | | | Excellent Total = 11 | | Good Total = 30 | | Fair Total = 27 | | Poor Total = 8 | |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 76 |
| Existing Stream Type = | C5 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** West Branch Duck Creek **Location:** T3W-S03 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/29/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **24** | **Good Total =** | **18** | **Fair Total =** | **15** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **57** |
| **Existing Stream Type =** | **C3** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Tributary 1 to Duck Creek | Location: T3W-S04 | Valley Type: Type X-Lacustrine | Observers: Barr | Date: 7/30/2025 |
|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | Excellent Total = | 20 | Good Total = | 0 | Fair Total = | 0 | Poor Total = | 4 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 24 |
| Existing Stream Type = | D6 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Pine Creek **Location:** T3W-S05 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | 1 | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **4** | **Good Total =** | **38** | **Fair Total =** | **18** | **Poor Total =** | **4** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **64** |
| **Existing Stream Type =** | **C3** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 West Branch Halfway Creek **Location:** T4E-S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/29/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | 9 | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | 6 | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | 16 |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | 3 | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 1 | | **Good Total =** 14 | | **Fair Total =** 60 | | **Poor Total =** 40 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **115** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Unlabed Stream | | Location: T4E-S02 | | | Valley Type: Type X-Lacustrine | | Observers: Barr | | Date: 7/29/2025 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Key | Category | Excellent | | Good | | Fair | | Poor | | |
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating | |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | | |
| | | | Excellent Total = | 20 | Good Total = | 0 | Fair Total = | 0 | Poor Total = | 4 | |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 24 |
| Existing Stream Type = | D6 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Tolfrey Creek **Location:** T4E-S03 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | 4 |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | 18 | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | 1 | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **1** | **Good Total =** | **30** | **Fair Total =** | **63** | **Poor Total =** | **4** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **98** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Argentine Creek **Location:** T4E-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **22** | **Good Total =** | **0** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **30** |
| **Existing Stream Type =** | **D5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Halfway Creek **Location:** T4E-S05 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **20** | **Good Total =** | **30** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **58** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to Townline Creek **Location:** T4E-S06 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **12** | **Good Total =** | **8** | **Fair Total =** | **0** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **28** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 3 to Townline Creek **Location:** T4E-S07 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **22** | **Good Total =** | **18** | **Fair Total =** | **6** | **Poor Total =** | **20** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **66** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 1 to Little Cranberry River **Location:** T4E - S08 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | 6 | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | 3 | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **11** | **Good Total =** | **38** | **Fair Total =** | **15** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **72** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 4 to Little Cranberry River **Location:** T4E - S09 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | 6 | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **3** | **Good Total =** | **32** | **Fair Total =** | **45** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **88** |
| **Existing Stream Type =** | **C3** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 4 to Little Cranberry River **Location:** T4E - S10 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | 4 | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | 6 | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | 12 | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | 2 | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **3** | **Good Total =** | **32** | **Fair Total =** | **45** | **Poor Total =** | **8** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **88** |
| **Existing Stream Type =** | **C3** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 4 to Little Cranberry River **Location:** T4E - S11 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | 4 | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | 4 | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | 16 |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | 3 | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | 2 | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | 12 | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **1** | **Good Total =** | **50** | **Fair Total =** | **21** | **Poor Total =** | **20** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **92** |
| **Existing Stream Type =** | **C3** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 5 to Little Cranberry River **Location:** T4E - S12 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | 12 |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 18 | | **Good Total =** 22 | | **Fair Total =** 6 | | **Poor Total =** 28 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 74 |
| **Existing Stream Type =** | C4 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 5 to Little Cranberry River **Location:** T4E - S13 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 8/24/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | 2 | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | 6 | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | 6 | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | 12 | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | 2 | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | | **Excellent Total =** 23 | | **Good Total =** 22 | | **Fair Total =** 6 | | **Poor Total =** 8 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | 59 |
| **Existing Stream Type =** | C4 |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Bolo Road Creek **Location:** T4W-S01 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/29/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | **Excellent Total =** | **9** | **Good Total =** | **12** | **Fair Total =** | **0** | **Poor Total =** | **0** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **21** |
| **Existing Stream Type =** | **E6** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

**Stream:** Tributary 2 to Duck Creek **Location:** T4W-S02 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | 6 | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | 6 | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | | Moderate to heavy amounts, mostly larger sizes. | 6 | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | 8 |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | 4 | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | 4 |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | 8 |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | 4 | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **25** | **Good Total =** | **6** | **Fair Total =** | **12** | **Poor Total =** | **24** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **67** |
| **Existing Stream Type =** | **C5** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**

| Stream: | Tributary 1 to Duck Creek | Location: T4W-S03 | Valley Type: Type X-Lacustrine | Observers: Barr | Date: 7/30/2025 |
|---|---|---|---|---|---|

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | 2 | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | 3 | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | 3 | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | 2 | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | 4 | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | |
| | | | Excellent Total = | 12 | Good Total = | 6 | Fair Total = | 0 | Poor Total = | 0 |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| Grand Total = | 18 |
| Existing Stream Type = | D6 |
| *Potential Stream Type = | |
| Modified channel stability rating = | |

*Rating is adjusted to *potential* stream type, not existing stream type

**Stream:** Pine Creek **Location:** T4W-S04 **Valley Type:** Type X-Lacustrine **Observers:** Barr **Date:** 7/30/2025

| Location | Key | Category | Excellent | | Good | | Fair | | Poor | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Description | Rating | Description | Rating | Description | Rating | Description | Rating |
| Upper banks | 1 | Landform slope | Bank slope gradient <30%. | | Bank slope gradient 30–40%. | | Bank slope gradient 40–60%. | | Bank slope gradient > 60%. | 8 |
| | 2 | Mass erosion | No evidence of past or future mass erosion. | | Infrequent. Mostly healed over. Low future potential. | | Frequent or large, causing sediment nearly yearlong. | 9 | Frequent or large, causing sediment nearly yearlong OR imminent danger of same. | |
| | 3 | Debris jam potential | Essentially absent from immediate channel area. | | Present, but mostly small twigs and limbs. | 4 | Moderate to heavy amounts, mostly larger sizes. | | Moderate to heavy amounts, predominantly larger sizes. | |
| | 4 | Vegetative bank protection | > 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass. | | 70–90% density. Fewer species or less vigor suggest less dense or deep root mass. | | 50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass. | | <50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass. | 12 |
| Lower banks | 5 | Channel capacity | Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0. | 1 | Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1. | | Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3. | | Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3. | |
| | 6 | Bank rock content | > 65% with large angular boulders. 12"+ common. | | 40–65%. Mostly boulders and small cobbles 6–12". | | 20–40%. Most in the 3–6" diameter class. | 6 | <20% rock fragments of gravel sizes, 1–3" or less. | |
| | 7 | Obstructions to flow | Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed. | 2 | Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm. | | Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling. | | Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring. | |
| | 8 | Cutting | Little or none. Infrequent raw banks <6". | | Some, intermittently at outcurves and constrictions. Raw banks may be up to 12". | | Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident. | 12 | Almost continuous cuts, some over 24" high. Failure of overhangs frequent. | |
| | 9 | Deposition | Little or no enlargement of channel or point bars. | | Some new bar increase, mostly from coarse gravel. | 8 | Moderate depostion of new gravel and coarse sand on old and some new bars. | | Extensive deposit of predominantly fine particles. Accelerated bar development. | |
| Bottom | 10 | Rock angularity | Sharp edges and corners. Plane surfaces rough. | | Rounded corners and edges. Surfaces smooth and flat. | 2 | Corners and edges well rounded in 2 dimensions. | | Well rounded in all dimensions, surfaces smooth. | |
| | 11 | Brightness | Surfaces dull, dark or stained. Generally not bright. | 1 | Mostly dull, but may have <35% bright surfaces. | | Mixture dull and bright, i.e., 35–65% mixture range. | | Predominantly bright, > 65%, exposed or scoured surfaces. | |
| | 12 | Consolidation of particles | Assorted sizes tightly packed or overlapping. | | Moderately packed with some overlapping. | 4 | Mostly loose assortment with no apparent overlap. | | No packing evident. Loose assortment, easily moved. | |
| | 13 | Bottom size distribution | No size change evident. Stable material 80–100%. | | Distribution shift light. Stable material 50–80%. | 8 | Moderate change in sizes. Stable materials 20–50%. | | Marked distribution change. Stable materials 0–20%. | |
| | 14 | Scouring and deposition | <5% of bottom affected by scour or deposition. | 6 | 5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. | | 30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. | | More than 50% of the bottom in a state of flux or change nearly yearlong. | |
| | 15 | Aquatic vegetation | Abundant growth moss-like, dark green perennial. In swift water too. | | Common. Algae forms in low velocity and pool areas. Moss here too. | | Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick. | | Perennial types scarce or absent. Yellow-green, short-term bloom may be present. | 4 |
| | | | **Excellent Total =** | **10** | **Good Total =** | **26** | **Fair Total =** | **27** | **Poor Total =** | **24** |

| Stream type | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | B4 | B5 | B6 | C1 | C2 | C3 | C4 | C5 | C6 | D3 | D4 | D5 | D6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 38-43 | 38-43 | 54-90 | 60-95 | 60-95 | 50-80 | 38-45 | 38-45 | 40-60 | 40-64 | 48-68 | 40-60 | 38-50 | 38-50 | 60-85 | 70-90 | 70-90 | 60-85 | 85-107 | 85-107 | 85-107 | 67-98 |
| Fair (Mod. unstable) | 44-47 | 44-47 | 91-129 | 96-132 | 96-142 | 81-110 | 46-58 | 46-58 | 61-78 | 65-84 | 69-88 | 61-78 | 51-61 | 51-61 | 86-105 | 91-110 | 91-110 | 86-105 | 108-132 | 108-132 | 108-132 | 99-125 |
| Poor (Unstable) | 48+ | 48+ | 130+ | 133+ | 143+ | 111+ | 59+ | 59+ | 79+ | 85+ | 89+ | 79+ | 62+ | 62+ | 106+ | 111+ | 111+ | 106+ | 133+ | 133+ | 133+ | 126+ |

| Stream type | DA3 | DA4 | DA5 | DA6 | E3 | E4 | E5 | E6 | F1 | F2 | F3 | F4 | F5 | F6 | G1 | G2 | G3 | G4 | G5 | G6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Good (Stable) | 40-63 | 40-63 | 40-63 | 40-63 | 40-63 | 50-75 | 50-75 | 40-63 | 60-85 | 60-85 | 85-110 | 85-110 | 90-115 | 80-95 | 40-60 | 40-60 | 85-107 | 85-107 | 90-112 | 85-107 |
| Fair (Mod. unstable) | 64-86 | 64-86 | 64-86 | 64-86 | 64-86 | 76-96 | 76-96 | 64-86 | 86-105 | 86-105 | 111-125 | 111-125 | 116-130 | 96-110 | 61-78 | 61-78 | 108-120 | 108-120 | 113-125 | 108-120 |
| Poor (Unstable) | 87+ | 87+ | 87+ | 87+ | 87+ | 97+ | 97+ | 87+ | 106+ | 106+ | 126+ | 126+ | 131+ | 111+ | 79+ | 79+ | 121+ | 121+ | 126+ | 121+ |

| | |
|---|---|
| **Grand Total =** | **87** |
| **Existing Stream Type =** | **C4** |
| ***Potential Stream Type =** | |
| **Modified channel stability rating =** | |

***Rating is adjusted to *potential* stream type, not existing stream type**