

Appendix F

Threatened and Endangered Species

F-1

Threatened and Endangered Species Report

Threatened and Endangered Species Assessment

Kennecott Minerals Company
Eagle Project
Marquette County, Michigan

Prepared for:

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SUMMARY

Wetland and Coastal Resources, Inc. (WCR) was contracted by Golder Associates Inc. (Golder) to perform threatened and endangered species assessments within a 1600 acre project study area located northwest of Marquette, MI. Wetland and Coastal Resources, Inc. conducted field assessments during the 2004 growing season.

Information was obtained from Michigan Natural Features Inventory to identify endangered, threatened, and special concern species known to occur in the vicinity of the project area. Prior to the field assessments, WCR reviewed relevant technical literature to determine the optimal sampling periods for the target species.

A plant inventory was conducted by inspecting the entire project area, dividing the project area into specific habitat areas, and compiling a complete list of vascular plant species observed in each habitat area. Floristic Quality Indices were calculated for all habitat areas.

Bird and small mammal populations were sampled at twenty-one permanent sampling stations. Frog and toad populations were sampled at three permanent sample stations. Other wildlife species not observed at permanent sample stations were noted from direct observations or signs obtained during plant and habitat area inventory efforts.

Thirteen habitat areas were identified within the study area. One State-threatened plant species, narrow-leaved gentian (*Gentiana linearis*), and one State-threatened bird species, bald eagle (*Haliaeetus leucocephalus*), were observed within the project area. A plant specimen that resembles the State-endangered small yellow pond-lily (*Nuphar pumila*; a.k.a. *N. microphylla*) was observed, but could not be positively identified due to lack of flowers or fruit. In addition, although no evidence of the presence of the State and Federally threatened gray wolf (*Canis lupis*) was documented, the species is known to occur widely throughout Michigan's Upper Peninsula. While habitat is present that could support additional protected plant and animal species, none were observed.

1.0 INTRODUCTION

In July of 2002, Kennecott Minerals Company (KMC) discovered a high grade nickel and copper deposit approximately 28 miles (45 kilometers) northwest of Marquette in Michigan's Upper Peninsula. The discovery is known as the Eagle Project. Since this discovery, feasibility, economic, engineering and environmental baseline studies were initiated to determine the potential for developing an underground mine.

The purpose of this evaluation is to collect baseline environmental data and to document existing biological conditions related to the presence/absence of threatened or endangered (T&E) species. Furthermore, the purpose of collecting these data is to provide sufficient information to support future mine facility alternative analysis and design, environmental permitting, and potential project impact analysis.

Golder Associates Inc. (Golder) was chosen as the prime consultant to manage the baseline environmental study programs. On February 6, 2004, Golder authorized Wetland and Coastal Resources, Inc. (WCR) to perform baseline environmental studies including assessments for wetlands, wildlife, aquatic organisms and habitats, and T&E species. This report presents the findings of WCR's T&E species assessments. The work conducted on this site and the content of this report represent the opinions of WCR. Results of wildlife, aquatic, and wetlands assessments are presented in separate reports.

1.1 Project Area

KMC currently controls more than 1600 acres of mineral and surface rights in the project area. The project area is located in Sections 2, 3, 10, 11, 12, 14, 15, T50N, R29W of Michigamme Township, Marquette County, within the Yellow Dog Plains at the headwaters of the Salmon Trout River. **Figure 1.1 (Attachment A-1 of Appendix A)** shows the boundaries of the project area and study area.

1.2 Project Purpose

The purpose of conducting the T&E assessments was (1) to determine if threatened, endangered, and/or special concern plant or animal species are present within the study area and (2) to determine if habitat is present that could potentially support threatened, endangered, and/or special concern plant and animal species. This report is being presented to Golder to utilize as part of a baseline study to assist in developing and assessing project alternatives.

2.0 METHODS

2.1 Literature Review and Field Preparation

Prior to conducting field investigations, WCR obtained available information to provide initial direction and focus for field assessments. The United States Department of Agriculture (USDA) Soil Survey information for Marquette County, MDNR's Marquette County Element List, and United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps were obtained to assist with field assessments. Records and information on T&E species, species of concern, and unique or threatened plant communities within or near the project area were obtained from Michigan Natural Features Inventory (MNFI).

Specific target habitat and species were identified based on information received from MDNR and MNFI, and literature reviews conducted by WCR. Target species are those species listed as threatened, endangered, or species of concern by MDNR and MNFI, with documented occurrences near the study area. Target natural communities are those identified in correspondence from MNFI and target habitats are those habitats identified in the literature that support the target species. A letter from MDNR to WCR, identifying State-listed species and communities, is included in **Attachment B-1 of Appendix B**, and the Marquette County Element List is shown in **Attachment B-2 of Appendix B**.

To optimize WCR's ability to observe and assess T&E species and their habitats, a number of factors were considered when planning field assessments. These factors included, but were not limited to, target habitats, target species, assessment methods, number of wetland and upland complexes to be assessed, assessment times (day of the year) and weather conditions. Threatened, endangered, and special concern species that are not listed in the information provided by MDNR and MNFI were not assessed in detail and their presence within the study area is assumed unlikely. However, all plant and animal species observed on site were recorded and any additional T&E species that may be present were expected to be identified during field reviews.

Field assessments were scheduled to ensure that target habitats and species were assessed during optimum times for viewing and/or identification, whenever possible. Information regarding optimal sampling periods and habitats was obtained from professional experience and MNFI abstracts. Voss (1972, 1985, and 1996), Gleason and Cronquist (1991), Holmgren (1998) and MNFI abstracts were reviewed for diagnostic features associated with specific plants and plant communities identified in the Marquette County Element List. Descriptions of habitat and key species identification features were disseminated to all WCR biologists prior to conducting field assessments

Aerial photography (1998 MDNR), USDA Soil Survey information, and NWI maps of the project area were used to help identify habitats. Prior to conducting field assessments, sketches were produced from these sources to aid field biologists in identifying approximate locations and sizes of specific habitat areas.

2.2 Field Assessment Methodologies

Field assessments required a minimum of two biologists to visually inspect all of the project area and to record all observations and sightings of terrestrial and aquatic plant and animal species present. Assessments were conducted in accordance with Section 365, of the Natural Resources and Environmental Protection Act (NREPA), P.A. 451 of 1994, as amended, and “Guidelines for Conducting Endangered and Threatened Species Surveys”, as set forth by the MDNR Wildlife Division Endangered Species Coordinator.

2.2.1 Vascular Plant Assessments

Habitat types were identified and differentiated based on plant communities and physical features associated with each habitat. An exhaustive search was conducted in an attempt to document all plants species within each habitat type. Boundaries of each habitat were sketched on aerial photographs. The Geographic Information System (GIS) software ArcMap 8.3 (ESRI, Inc.) was used to develop habitat location maps by creating shapefiles for each habitat area based on field sketches.

Attachments B-1 and B-2 of Appendix B include a list of target species identified by the MDNR and MNFI as having the potential to occur within the project area. Information on preferred habitats, identification characteristics, and optimal time periods to assess target plant species were obtained from Penskar and Higman (1999), Voss (1972, 1985, and 1996), Gleason and Cronquist (1991), and Holmgren (1998). **Table 2.1 (Attachment C-1 of Appendix C)** shows the optimal assessment times for target species and **Table 2.2 (Attachment C-1)** shows the times in which surveys were conducted. Photographs were taken of many of the habitat areas to document the general quality of the habitat area, physical land features and the potential to either contain and/or support a listed T&E species.

The MDNR's Floristic Quality Assessment (FQA) program (Herman et al. 2001) was used to assess floristic quality. This program calculates several metrics based on the diversity of plant species present within a given area. These metrics are used to identify the significance of upland and wetland plant communities and their potential to harbor State or Federally threatened, endangered, candidate, or special concern plant species.

Floristic quality analysis requires inventory of all species present within each habitat area. Biologists meandered through each habitat, identifying all vegetation to the species level, when feasible. Plant species that could not be identified in the spring were noted, revisited, and identified during subsequent assessments later in the growing season. Plants with the same genus as listed threatened and endangered species were double-checked in the field and, when necessary, returned to the lab for positive identification.

Plant species present within each habitat area were entered into the FQA program database. This program was used to calculate and assess floristic metrics for each area using pre-assigned numeric values (i.e. coefficients for conservatism) to determine how representative a plant community is of native pre-settlement conditions (Herman et al. 2001). Coefficients of conservatism (C values), ranging from a low of 0 to a high of 10, are based upon the probability of that species occurring in a habitat representative of a pre-settlement condition. Non-native plant species are given no value and are denoted by CAPS. The more indicative a plant

community is of pre-settlement communities, the higher it's floristic quality index (FQI) and its likelihood of containing threatened, endangered, and/or species of concern. Conversely, plant communities that are subjected to human disturbances have greater numbers of invasive plant species, relatively lower FQI ratings, and less likelihood of containing threatened, endangered, and/or species of concern.

Floristic Quality Index (FQI) was calculated for each habitat area according to the criteria presented by Herman et al. (2001). FQI is calculated by multiplying the average coefficient of conservatism of all plant species occurring in an area by the square root of the total number of plant species occurring in the area. Coefficient of conservatism is the "... estimated probability that a plant is likely to occur in a landscape relatively unaltered from what is believed to be presettlement condition..."

2.2.2 Wildlife Assessments

Two animal species, the common loon (*Gavia immer*) and the bald eagle (*Haliaeetus leucocephalus*), were identified by MDNR and MNFI as having potential to exist within the project area (**Attachment B-1 of Appendix B**). Information on optimal time periods to assess these two target species was obtained from Whitefish Point Bird Observatory (2004). **Table 2.1 (Attachment C-1 of Appendix C)** shows the optimal assessment times for these species and **Table 2.2 (Attachment C-1)** shows the times which surveys were conducted by WCR.

During the initial site survey, seven permanent wildlife sampling transects were established and surveyed with a global positioning system (GPS) (**Figure 1.1 of Appendix A**). The transects were established to conduct wildlife assessments within a continuum of habitat types and to include assessment of the habitats types present throughout the site; including those areas where mining operations may be established. Transects were also established to sample known locations for comparison with potential future studies. Along each transect, three sampling stations were established, creating a total of twenty-one sampling stations. These stations were used to sample small mammals and birds.

In addition to the twenty-one sampling stations discussed above, three frog and toad survey stations were also established. These stations were separate from the twenty-one stations and seven transects, and were chosen based on the presence of specific habitat types preferred by species that may occur on site.

In addition to data collected at the sampling stations, wildlife data were collected throughout the site by recording visual signs of wildlife including direct observation, tracks, scat, or other evidence. These data were collected strictly through incidental observation and the general location of the observation was recorded.

A minimum of two WCR biologists were present during all sampling periods in May, June and October, 2004. Bird assessments were conducted during all three months to cover spring and fall migration and the summer nesting. Small mammals were assessed during the initial site investigations in May. Frogs and toads were sampled during spring breeding periods in May and June. Field assessments were scheduled so that the majority of bird and frog species with potential to use the property were assessed at least once during their optimal time periods.

Field sampling for birds was conducted using the Variable Circular Plot (VCP) assessment method. Small mammals were sampled using both live traps and snap traps at each sampling point. Frog and toad sampling was conducted in accordance with the MDNR "*Michigan Frog and Toad Survey Instructions*". As part of the protocol, sampling is to be conducted after dark. However, due to health and safety concerns, all sampling was completed prior to sunset during times when frogs and toads were active or weather conditions were favorable for increased activity. The frog and toad surveys were conducted twice per station during the breeding season in May and June 2004. Large mammals were identified by sight, sound, tracks, scat or other evidence, such as nesting cavities, rubs or feeding stations. Observations were recorded each time large mammal sign was encountered along the seven transects, or anywhere on the site during various assessments. Observations were recorded during bird surveys, small mammal surveys, frog and toad surveys, wetland delineations, threatened and endangered species assessments and aquatic assessments.

Additional amphibian sampling was proposed using fencing and pit traps around vernal ponds, where adjacent upland and wetland habitat is present for salamanders. Although additional amphibian species may occur on the project site, no vernal ponds with habitats conducive to effective sampling were located within the study area. Therefore, due to this lack of habitat suitable for sampling, pit trapping for amphibians was not conducted.

Wetland and Coastal Resources has prepared a separate report detailing methodologies and results of wildlife surveys (WCR 2005). This report should be referenced for greater detail.

3.0 RESULTS

Threatened and endangered species assessments commenced at the beginning of May 2004 and continued through the end of October 2004. **Table 2.2 (Attachment C-2 of Appendix C)** specifically identifies when surveys were conducted. One State-threatened plant species and one State-threatened animal species were positively identified within the project area.

3.1 Plant Communities and Habitat Area Descriptions

Thirteen habitat areas were identified within the project area, and based upon the presence of these habitats and the information obtained from MNFI, it was determined that several T&E species could potentially occur within the project area. **Figures 3.1 and 3.2 (Attachment A-2 of Appendix A)** show the location of the habitats identified and **Table 3.1 (Attachment C-2 of Appendix C)** lists the plant species identified within each area. **Appendix D** contains representative photographs of the habitat types identified. Each habitat area is described below.

Habitat Area A represents the river channel and wetland habitats associated with the Salmon Trout River. This habitat area extends from the northwest corner of the study area to the south-central portion of the study area. This habitat area is comprised mainly of submergent and floating-leaved aquatic plant communities.

The width of the river channel varies greatly throughout the habitat area. The upstream reaches of the river channel (southern portion of the property) are relatively wide, reaching over 10 feet (3 meters (m)) in width, while the downstream reaches (northern end) are as narrow as 2 ft (0.6 m). To better describe this habitat area, the upstream and downstream reaches are discussed separately. The dividing point between the upstream (A1) and downstream (A2) reaches is the culvert crossing at Triple A Road.

Habitat Area A1

The river channel in the upstream reach averages 8 ft (2.5 m) wide and 4 ft (1.2 m) deep. Numerous beaver dams are present, the terrace of the river valley is relatively wide, and the drop in elevation is quite small over the entire reach. Some beaver ponds within this section exceed

40 ft (12 m) in width. Accumulations of sediment and slower moving water account for an abundance of submergent and floating-leaved plant species. Several areas within the channel are blanketed with white water crowfoot (*Ranunculus longirostris*), which creates a mat of white flowers above the water surface. Below the water surface, eel grass (*Vallisneria americana*) is the dominant submergent plant species. In the outer edges of the channel, there are several areas where pondweeds (*Potamogeton gramineus* and *P. obtusifolius*), duckweed (*Lemna minor*), watercress (*Nasturtium officinale*), and flat leaved bladderwort (*Utricularia intermedia*) are present.

There was one yellow pond lily (*Nuphar spp.*) identified near the southern boundary of the study area. The specimen has characteristics of small yellow pond-lily (*Nuphar pumila*; a.k.a. *N. microphylla*), a State-listed endangered plant species. The specimen was delivered to Dr. Anton Reznicek, curator of the University of Michigan herbarium, for positive indication. However, due to the lack of flowers or fruit, the specimen could not be positively identified. For the purpose of calculating floristic quality index ratings, the plant was listed as the more common yellow pond lily (*Nuphar variegata*).

Habitat Area A2

The river channel in the downstream reach averages approximately 5 ft (1.5 m) wide and 6 inches (16 centimeters (cm)) deep. The floodplain is quite narrow and there is a significant drop in elevation over the length of the reach. The higher water velocity associated with A2 limits the abundance of submergent and floating-leaved plant species. While eel grass, bryophytes, and watercress are present, fewer plant species were observed in A2 than in A1.

Overall, Habitat Area A contains a relatively low diversity of plant species. Nineteen plant species were identified within the river channel and a FQI value of 26.4 (25.7 including adventives) was calculated for this habitat. If further assessments confirmed the presence of small yellow pond-lily, this habitat would yield a greater floristic quality index.

No threatened, endangered, or species of concern were identified in this habitat; however, there was no positive identification of the unknown yellow pond-lily.

Habitat Area B consists of the hillside slopes of the Salmon Trout River valley. Both wetland and upland habitats occur within this area. Forested wetlands extend up both sides of the river valley. In some areas, the wetland extends to the top of the slope, approximately 100 feet (30 m) above the river channel. The remaining portions of the hillside slopes contain a mixture of coniferous and deciduous woodland.

The forested wetland portions of this habitat area are dominated by northern white-cedar (*Thuja occidentalis*), red maple (*Acer rubrum*), and balsam fir (*Abies balsamea*). The understory of the forested wetland contains numerous herbaceous plant species. Some of the more common herbaceous plant species include goldthread (*Coptis trifolia*), bunchberry (*Cornus canadensis*), starflower (*Trientalis borealis*), wintergreen (*Gaultheria procumbens*), fowl manna grass (*Glyceria striata*), lady fern (*Athyrium filix-femina*), cinnamon fern (*Osmunda cinnamomea*), and interrupted fern (*Osmunda claytoniana*).

The coniferous and deciduous woodland portions of this habitat area are dominated by striped maple (*Acer pennsylvanicum*), sugar maple (*Acer saccharum*), and white pine (*Pinus strobus*). The understory contains numerous herbaceous plant species including, but not limited to, wild sarsaparilla (*Aralia nudicaulis*), trailing arbutus (*Epigaea repens*), bracken fern (*Pteridium aquilinum*), and partridge-berry (*Mitchella repens*).

Habitat Area B contains a relatively high diversity of plant species. Eighty-six plant species were identified within this habitat and a FQI value of 43.4 (42.9 including adventives) was calculated.

No State-listed threatened, endangered, or species of concern were identified in this habitat. However, the presence of forested wetland creates the potential for a State-listed threatened plant species, narrow-leaved gentian (*Gentiana linearis*) and two State-listed species of concern, the ram's head lady-slipper (*Cypripedium arietinum*) and blue wild-rye (*Elymus glaucus*), to be present in this habitat. There is an increased likelihood of narrow-leaved gentian being present, since numerous colonies of this species were observed in Habitat F, which is directly adjacent to Habitat B. The proximity of tall conifers and deciduous trees to the river channel also provides potential habitat for bald eagles to nest, perch, and feed, although no nests were observed.

Habitat Area C contains two different types of upland woodlands that have naturally revegetated following historic logging operations. There are minimal signs of planting or reforestation efforts in these areas; specifically, there are few areas of uniformly sized trees growing in straight rows. **Habitat Area C1** is dominated by coniferous tree species and **Habitat Area C2** contains a mixture of coniferous and deciduous tree species. These habitat areas will be discussed separately.

Habitat Area C1

This upland woodland habitat is present in the eastern portion of the study area and is dominated by coniferous tree species. Deciduous trees are interspersed in the coniferous woodland; however, they represent less than approximately 10 percent of the total number of trees. The dominant tree species within this habitat type are jack pine (*Pinus banksiana*), red pine (*P. resinosa*), and white pine. The herbaceous understory of this habitat type contains trailing arbutus, wintergreen, running ground pine (*Lycopodium clavatum*), and bunchberry, among others. The plant species identified in Habitat Area C1 yield a FQI of 23.5.

Habitat Area C2

This upland woodland habitat is present throughout the central and western portion of the study area and contains both coniferous and deciduous tree and shrub species. The dominant tree and shrub species within this habitat type are red maple, jack pine, paper birch (*Betula papyrifera*), beaked hazelnut (*Corylus cornuta*), and choke cherry (*Prunus virginiana*). The dominant plant species within the herbaceous understory of this habitat type are bunchberry and bracken fern. The plant species identified in Habitat Area C2 yield a FQI value of 17.4.

A total of thirty-five species were identified within Habitat C, of which all are native plant species. The woodland tree species and slash piles within this area provide good habitat for wildlife. However, they are not located in close proximity to the river or other larger bodies of water and, therefore, are not expected to provide nesting or perching habitat for bald eagles.

No threatened, endangered, or species of concern were identified in this habitat. Though coniferous upland is one of the habitats identified for the ram's head lady's-slipper, this species was not found during field assessments.

Habitat Area D is dominated by upland pine trees (*Pinus spp.*), which were planted and are in various stages of reforestation. This habitat type includes land areas that have been recently and historically cut-over as part of large-scale timbering operations. This habitat type is present throughout the study area and is the most abundant habitat type. Plant species include a few coniferous tree species, numerous upland weedy pioneer species, and a few floristically conservative upland grass species. The dominant tree species are jack pine and red pine. A few of the many herbaceous plant species identified in this habitat are quack grass (*Agropyron repens*), tickle grass (*Agrostis hyemalis*), Canadian thistle (*Cirsium arvense*), orchard grass (*Dactylis glomerata*), poverty grass (*Danthonia spicata*), hair grass (*Deschampsia flexuosa*), orange hawkweed (*Hieracium aurantiacum*), Canada bluegrass (*Poa compressa*), and sheep sorrel (*Rumex acetosella*).

Habitat Area D contains only thirty-six plant species, likely due to lumbering and reforestation activities. A low FQI value of 20.2 (17.2 including adventives) was calculated for this habitat area.

No threatened, endangered, or species of concern was identified in this habitat, nor are any expected to be present. Similar to Habitat Area C, the woodland tree species and slash piles within this area provide good habitat for wildlife. However, their distance from the river and other larger bodies of water limits their value to bald eagles. Despite the presence of conifer uplands, the ram's head lady's-slipper is not expected to be present due to the high level of disturbance.

Habitat Area E represents three different types of bogs that are in various states of disturbance and/or natural succession. **Habitat Area E1** represents a natural forested bog community with a coniferous woodland overstory and an understory dominated by ericaceous (typical acidic peat land) plant species. **Habitat Area E2** represents a bog community that has been impacted by the

removal of the overstory, which has resulted in the development of various types of wetlands within the bog. **Habitat Area E3** represents a bog community that has not developed an overstory, but contains a mixture of emergent, wet meadow, and scrub-shrub wetlands. Area E3 habitats are located primarily within the central portions of the other two bog types (Habitat Area E1 or Habitat Area E2).

Habitat Area E1

The forested wetland bogs contain deciduous trees but are dominated by coniferous tree species. Deciduous tree species include red maple and silver maple (*Acer saccharinum*). The dominant coniferous tree species are northern white-cedar, balsam fir, tamarack (*Larix laricina*), and black spruce.

The forested wetland bogs also contain woody and herbaceous ground cover plant species. The dominant woody and shrub species are leatherleaf (*Chamaedaphne calyculata*), tag alder (*Alnus rugosa*), Michigan holly (*Ilex verticillata*), swamp laurel (*Kalmia polifolia*), Labrador tea (*Ledum groenlandicum*), mountain holly (*Nemopanthus mucronatus*), and blueberry (*Vaccinium angustifolium* and *V. myrtilloides*). Herbaceous ground cover species include goldthread, bunchberry, wintergreen, starflower, small cranberry (*V. oxycoccos*), creeping snowberry (*Gaultheria hispida*), and numerous sedge species (*Carex paupercula*, *C. trisperma*, *C. disperma*, *C. canescens*, *C. interior*, *C. paucifolia*, and *C. leptalea*).

A floristic assessment of the plant communities associated with this habitat resulted in a very high FQI value (42.8 based on only the native plant species and 42.5 including adventive plant species).

Habitat Area E2

The removal of trees within the cut-over wetland bogs has allowed for the establishment of different wetland types and a mixture of early and late succession plant species. There are emergent, wet meadow, and scrub-shrub wetlands within this habitat area. The dominant plant species within the cut-over areas are soft stemmed rush (*Juncus effusus*), bluejoint grass (*Calamagrostis canadensis*), dark green bulrush (*Scirpus atrovirens*), blue flag iris (*Iris*

versicolor), woolgrass (*Scirpus cyperinus*), narrowleaf-goldenrod (*Euthamia graminifolia*), sedges (*C. blanda*, *C. intumescens*, *C. canescens*, and *C. gynandra*), and meadowsweet (*Spirea alba*). However, there still remain numerous later succession and/or more conservative species indicative of the habitat area's historic bog plant communities, including Labrador tea, bog willow, and bog rosemary (*Andromeda glaucophylla*).

Despite a diversity of wetland types, disturbances to this habitat area have apparently contributed to a relatively lower FQI value, when compared to Habitat Area E1. A FQI value of 28 was calculated for the plant communities of this habitat.

Habitat Area E3

Habitat Area E3 is composed of relatively undisturbed bogs. This habitat area also contains emergent and wet meadow wetland types. Portions contain plant species having high coefficients of conservatism, including pitcher plant (*Saracennia purpureum*), leatherleaf, Labrador tea, bog laurel, various sedges (e.g. *Carex lasiocarpa*, *C. trisperma*, *C. disperma*, *C. canescens*, *C. paupercula*), sheathed cottongrass (*Eriophorum spissum*), narrow leaved cottongrass (*E. angustifolium*), and black chokeberry (*Aronia prunifolia*). The dominant plant species within this habitat area are bluejoint grass, leatherleaf, Labrador tea, Canada blueberry, poor sedge (*Carex paupercula*), and bog willow (*Salix pedicellaris*).

Despite the greater number of unique plant species, this habitat also had a FQI value of 28. This value was the result of a lower overall number of plant species. Over time, and barring human disturbance, these habitat areas are expected to increase in floristic quality as they mature (continue to progress through normal vegetative succession).

In treating the three different wetland bog habitats as a single habitat type, the total number of species increased to 75 and the FQI value increased to 48.1 (47.8 when including only the one adventive species).

No species of threatened, endangered or species of concern were identified in this habitat. The existence of conifer forested and bog wetlands provides potentially good habitat for the ram's

head lady's-slipper. There is also the potential for narrow-leaved gentian to be present in this habitat, since bog wetlands are one of several preferred habitats of this species and numerous colonies were observed adjacent to Habitat Area E.

Habitat Area F contains emergent, sedge meadow, and scrub-shrub wetlands adjacent to the Salmon Trout River. This habitat area is located within the terrace of the river valley and contains the highest number of plant species and the highest FQI value of all habitat types found within the study area.

The sedge meadow and emergent wetlands abut the river channel and contain the majority of the plant species listed. A few of the dominant species within these wetlands include swamp thistle (*Cirsium muticum*), bluejoint grass, northern manna grass (*Glyceria borealis*), and numerous sedges (e.g. *Carex aquatilis*, *C. canescens*, *C. gynandra*, *C. lacustris*, *C. lasiocarpa*, *C. michiauxina*, *C. oligosperma*, *C. scabrata*, and *C. stricta*). Schweinitz's sedge (*C. schweinitzii*) was collected along the border of the sedge meadow and scrub-shrub wetland, north of Triple A Road. Dr. Anton Reznicek positively identified a pressed specimen that is now kept at the University of Michigan herbarium. Although this species is not listed as threatened or endangered, this is the first reported observation of this species in the western portion of Michigan's Upper Peninsula. Voss (1972) identifies the habitat for this species as being wet ground along cold spring-fed rivers and brooks, in mixed or coniferous cover, which is similar to the habitat in which the species was collected in the study area.

The scrub-shrub wetlands are generally located at the edge of the emergent and sedge meadow wetlands and the toe of the forested wetland slopes. The scrub-shrub wetlands are dominated by tag alder, black chokeberry, and Michigan holly. Mixed within the scrub-shrub wetland, and at the base of the forested wetland slopes, were several herbaceous wetland plant species typical of those found near groundwater seeps, including spotted touch-me-not (*Impatiens capensis*), wild mint (*Mentha arvensis*), hooked crowfoot (*Ranunculus recurvatus*), marsh marigold (*Caltha palustris*), and marsh violet (*Viola cucullata*).

Along the margins of the scrub-shrub and sedge meadow wetlands, numerous colonies of narrow-leaved gentian were identified and over one hundred individual plants were counted. Narrow-leaved gentian is a State-threatened plant species. **Figure 3.3 (Attachment A-3 of Appendix A)** identifies the GPS locations of the plant colonies.

Habitat Area F contains 130 different plant species, 126 of which are native to Michigan. This habitat area also yields the highest FQI value in the study area. A FQI value of 56.5 (55.6 including adventives) was calculated for this habitat. This habitat provides a high potential for harboring threatened, endangered, and species of special concern, as evidenced by the existence of numerous colonies of narrow-leaved gentian along the northern edges of this habitat. This species was not identified along the southern edges of this habitat.

The physical features, high diversity of biological communities, and various wetland types within this habitat provide excellent habitats for wildlife and aquatic biota.

Habitat Area G represents the vertical face of the peridotite rock outcropping in the northeastern portion of the study area. The habitat area extends from the base of the rock outcropping, up the near vertical walls of the rock formation, to the upper plateau of the outcrop, where various grasses cover the rock formation and merge into Habitat Area C1. The natural communities of interest are located on the near vertical walls of the peridotite outcrop.

The Michigan Natural Features Inventory identifies rock cliff natural communities as rare that have the potential to contain listed species (MNFI 2003). There are records of State-listed threatened, endangered, and special concern plant species growing within the rock outcrops of the Huron Mountain Club property and other similar rock outcroppings in the Upper Peninsula (John Fody, personal communication 2004; Dr. Anton Reznicek, personal communication 2004; and Gleason and Cronquist 1991). Therefore, an extensive amount of time was spent examining the rock outcropping with specific attention to genera that contain State-threatened, endangered or special concern species including: oak ferns (*Gymnocarpium spp.*), spleenworts (*Asplenium spp.*), cliff-brakes (*Cryptogramma spp.*), wood ferns (*Dryopteris spp.*), cliff ferns (*Woodsia spp.*), sandworts (*Arenaria spp.*), blue-eyed marys (*Collinsia spp.*), gooseberries (*Ribes spp.*) or rye

grasses (*Elymus spp.*). The majority of plant species identified by MNFI as being State-threatened, endangered or species of concern that may occur within or near the study area have rocky bluffs and crevices as their optimal habitat.

Within the rock fissures and near the top of the rock wall, maidenhair spleenwort (*Asplenium trichomanes*) is the dominant plant species. Within the crevices and in the middle portions of the rock wall, rusty woodsia (*Woodsia ilvensis*) is the dominant plant species. Other species in moderate abundance in the fissures and crevices are round leaved serviceberry (*Amelanchier sanguinea*), bush honeysuckle (*Diervilla lonicera*), wild rose (*Rosa blanda*), and common blackberry (*Rubus allegheniensis*).

Several plant species were taken to Dr. Anton Reznicek for verification. None of the species identified by Dr. Reznicek were determined to be State-threatened, endangered or species of concern. However, descriptions of the habitat and lists of plant species associated with this habitat indicate that there is a potential for the presence of listed species.

Despite the potential uniqueness of this habitat, the FQI value was relatively low. A FQI value of 31.5 (29.3 including adventives) was calculated for this habitat. As discussed, no T&E species were found despite extensive searches within this habitat type.

The vertical features of this outcropping limit its use to only a few species of wildlife. However, the physical features of the habitat do provide potential habitat for several of the plant species listed in **Table 2.1 (Attachment C-1 of Appendix C)**.

Habitat Area H represents a wetland/upland mosaic that, for purposes of this study, was termed a “bog mosaic”. The mosaic contains upland hummocks and ridges that are approximately 23 ft (7 m) apart and up to 1.5 ft (0.5 m) higher in elevation than adjacent meandering troughs and pockets of wetland. The wetlands pockets and troughs are sparse, scattered, and contain standing water, *Sphagnum*, and scattered plants typically found in emergent wetlands and bogs. Some hummocks may contain a dominance of wetland rated plant species such as balsam fir, Canada

blueberry, and Labrador tea, while others contain a dominance of upland rated plant species such as bracken fern, trailing arbutus, low bush blueberry, and jack pine.

Habitat Area H contains a wide variety of wetland and upland rated plant species. This habitat contains 34 native plant species and only one adventive plant species. A FQI value of 28.5 (28.1 including adventives) was calculated for this habitat.

This habitat contains bog wetland and ericaceous plant species. Ram's head lady's-slipper, is associated with these habitats. Although this species was not identified during this assessment, there is the potential for it to exist in this habitat. There is also the potential for narrow-leaved gentian to be present in this area, given the presence of preferred habitat and numerous colonies located in proximity to Habitat Area H.

Habitat Area I represents an emergent, wet meadow, and scrub-shrub wetland complex that is higher in elevation than the adjacent wetlands associated with the Salmon Trout River. This habitat area is specific to Wetland Complex 2, as identified in WCR's 2005 Wetland Delineation and Functional Assessment Report. The southwestern portions of the habitat area contain emergent and scrub-shrub wetland vegetation dominated by broadleaf cat-tail (*Typha latifolia*) and tag alder. In the northeastern portion of the habitat area, there are groundwater seeps that have created wet meadow wetlands that support several plant species with relatively high coefficients of conservatism and several different species of sedge (*Carex spp.*). A few of the unique and dominant plant species in this area are bluejoint grass, swamp thistle, round leaved sundew (*Drosera rotundifolia*), tawny cotton grass (*Eriophorum virginicum*), creeping snowberry, pale St. John's wort (*Hypericum ellipticum*), rush (*Juncus brevicaudatus*), ladies-tresses (*Spiranthes spp.*), and numerous sedge species.

Despite Habitat Area I being relatively small, it contains a high diversity of plant species. A total of 46 plant species was identified in this habitat and a FQI value of 31.8 (31.1 including adventives) was calculated.

The physical features, high diversity of biological communities, and various wetland types within this area provide a high diversity of habitats for wildlife. There is also the potential for narrow-leaved gentian to be present within the damp meadows. No threatened, endangered, or species of concern were identified in this habitat; however, conditions are conducive for their presence.

A member of the genus *Spiranthes* was observed in this habitat type but not identified to species. Of Michigan's nine species of ladies'-tresses, two appear on the State's "special plant" list. Yellow ladies'-tresses (*S. ochroleuca*) is listed as "special concern" and oval ladies'-tresses (*S. ovalis*) is listed as "threatened". These species are typical of prairie habitats, and the range maps in Flora of North America Editorial Committee (2003) show them to be restricted to the Lower Peninsula. It is unlikely that the *Spiranthes* species identified in Habitat Area I is either *S. ochroleuca* or *S. ovalis*.

3.2 Wildlife Assessments

3.2.1 Birds

A total of 950 birds representing 53 species were identified using the VCP assessment during the three sampling periods. The birds identified are typical of those found in cut-over areas and in coniferous and deciduous forests. Dark-eyed juncos (*Junco hyemalis*), yellow-rumped warblers (*Dendroica coronata*), and white-throated sparrows (*Zonotrichia albicollis*) were some of the most frequently observed species. No threatened, endangered or species of concern were identified during the VCP data collection.

3.2.2 Small Mammals

Three small mammal species were captured during the May 2004 sampling period, including the deer mouse (*Peromyscus maniculatus*), eastern chipmunk (*Tamias striatus*) and the southern red-backed vole (*Clethrionomys gapperi*). The number of individuals captured was greatest in the forested habitat. The number of small mammals captured during the short spring sampling period suggests that a good population of small mammals is present in the forested areas of the

parcel. Only one individual was trapped within the cut-over area during the sampling period. No threatened, endangered or species of concern were identified during small mammal sampling.

3.2.3 Frogs and Toads

Four species of frog were noted during the breeding surveys conducted in May and June 2004. No toads were identified during the sampling. However, Eastern American toads (*Bufo americanus*) were heard calling in May of 2004 near the eastern portion of the site, south of the study area. Northern spring peepers (*Pseudacris crucifer*) were most common, with full choruses. The green frog (*Rana clamitans*), western chorus frog (*Pseudacris triseriata triseriata*) and the mink frog (*R. septentrionalis*) were also noted on the site. No threatened, endangered or species of concern were identified during frog and toad sampling, although according to the MDNR, the western chorus frog is rare in the Upper Peninsula. Pit trapping for amphibians was not conducted due to a lack of available habitat suitable for effective sampling.

3.2.4 Large Mammals

Droppings and tracks of both white-tailed deer (*Odocoileus virginianus*) and moose (*Alces alces*) were observed on the parcel, primarily south of Triple A Road and east of the Salmon Trout River. American beaver (*Castor canadensis*) activity was noted on the Salmon Trout River south of Triple A Road, and eastern coyote (*Canis latrans*) scat was identified on the site. During the field work, no gray wolf (*Canis lupus*) signs were observed. However, it is feasible that wolves could cross the property during their travels within their home ranges. No threatened or endangered mammal species or species of concern were identified during large mammal sampling.

3.2.5 Other Wildlife and Habitat

Species noted in addition to surveys and transect reviews include northern saw-whet owl (*Aegolius acadicus*), sandhill crane (*Grus canadensis*), and spruce grouse (*Falcapennis canadensis*). Black bear (*Ursus americanus*) tracks, including sets of both adult and cub tracks, were also noted west of the Salmon Trout River, south of Triple A Road.

One mature bald eagle, a state-threatened species, was observed soaring over the north-central portion of the study area, near a rock outcropping north of Triple A Road. One juvenile bald or

golden eagle was seen perched near the Salmon Trout River at Triple A Road. Positive identification of the perched bird was not possible due to the great distance from the observer and the physical similarities between the two species. No eagle nests or nesting activity was noted within the study area. However, the beaver ponds on the Salmon Trout River have the potential to serve as a feeding area for bald eagles.

4.0 DISCUSSION

4.1 Plant Communities

One State-protected plant species (narrow-leaved gentian) was found within the project area. Any taking of this species would require a permit from the Michigan Department of Natural Resources. In addition, a plant specimen that resembles the State-endangered small yellow pond-lily (*Nuphar pumila*; a.k.a. *N. microphylla*) was observed, but could not be positively identified due to lack of flowers or fruit.

Habitat Areas B and E1 yield FQI values greater than thirty-five and the FQI value of Area F exceeds 50. Based on habitat characteristics, Areas B, E1, F and G have the greatest potential for the presence of protected plant species. It is possible that some plant species occurring on the site were not inventoried due to the large size of the project area. However, with the exception of the narrow-leaved gentian, no threatened or endangered species were observed during an exhaustive search of the area.

4.2 Wildlife Communities

One State-protected wildlife species (bald eagle) was observed flying within the project area, although no nests or nesting activity was observed. Any taking of this species would require a permit from the Michigan Department of Natural Resources.

The common loon, a threatened species, is also listed as potentially inhabiting the project area. However, no common loons were sighted or heard during the investigation periods. It is the opinion of WCR that loons are not likely to use the property, since the water bodies within the project area appear to be of insufficient size for use by loons.

The gray wolf is listed by the State as a threatened animal species. The USFWS recently changed the federal classification of the gray wolf from endangered to threatened. Wolf packs are known to occur throughout Michigan's Upper Peninsula and although no wolves or signs of wolves were observed, the potential exists for use of the property by gray wolves.

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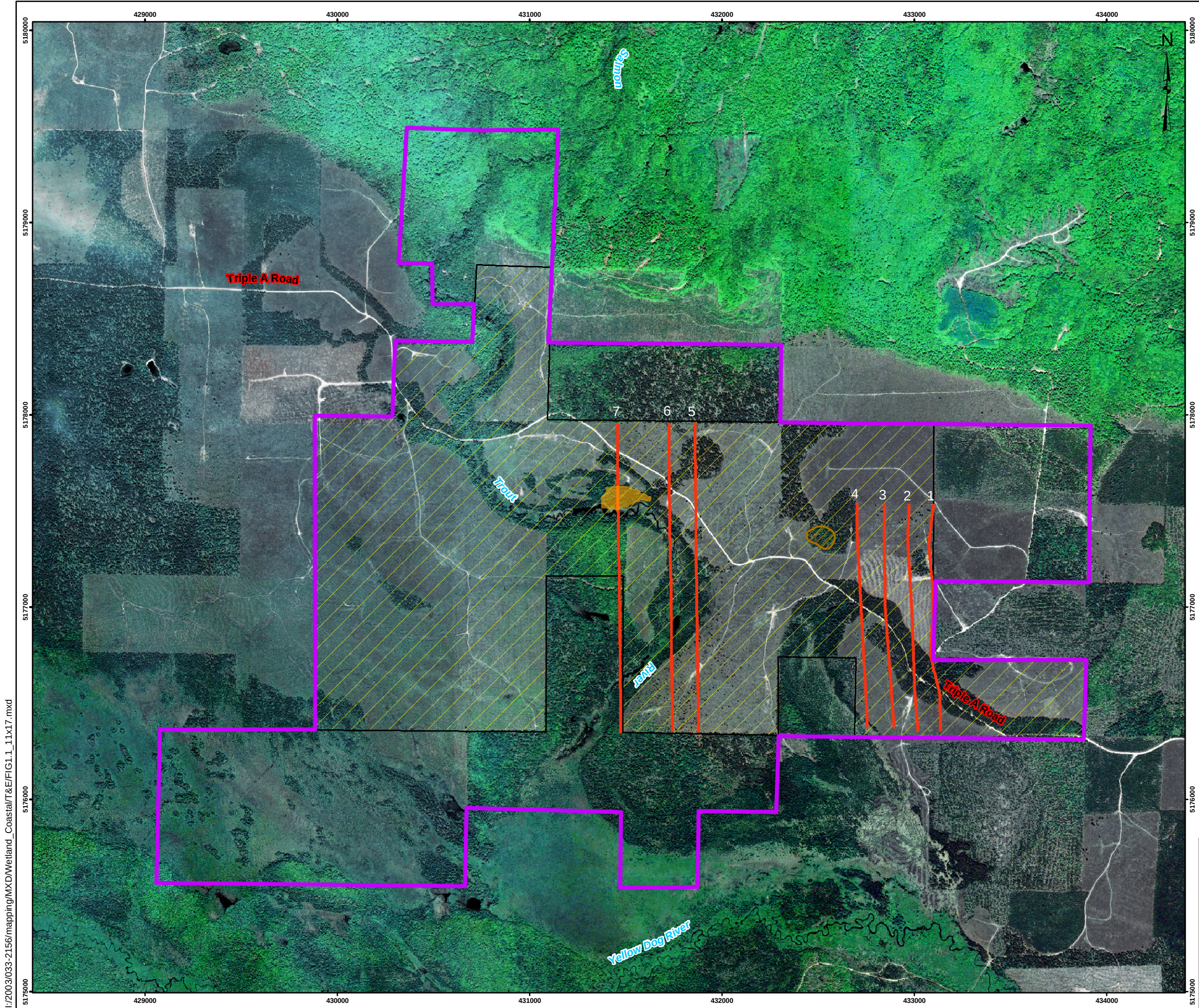
APPENDICES

APPENDIX A

FIGURES

Attachment A-1

Figure 1.1. Project Study Area



LEGEND

- ORE BODY
- OUTCROP
- KMC/MDNR PROPERTY
- STUDY AREA
- TRANSECT

REFERENCE

Quickbird image provided by Digital Globe. Transect data provided by Wetland and Coastal Resources, Inc.
Datum: NAD 83 Projection: Transverse Mercator Coordinate System: UTM Zone 16

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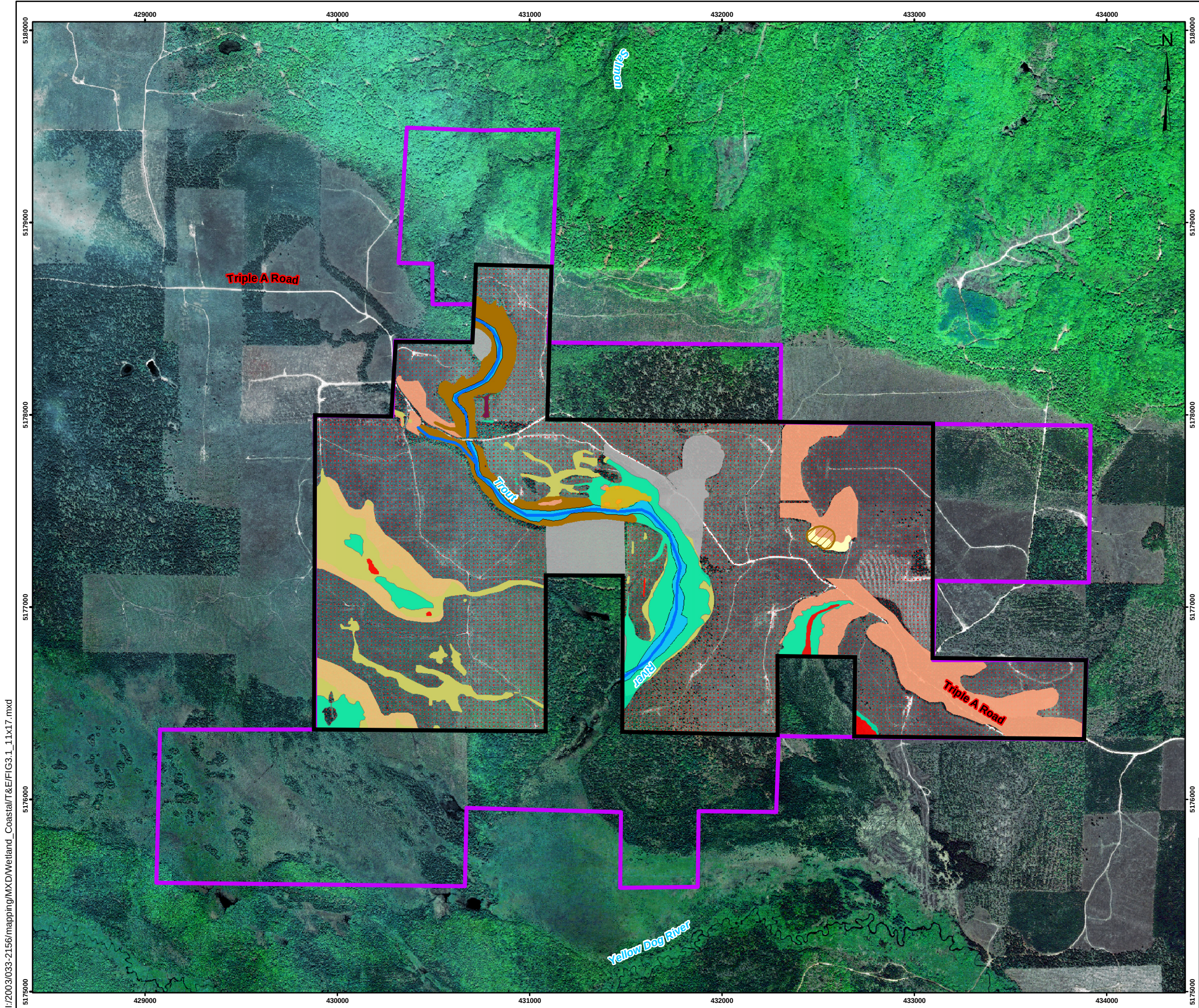
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TITLE				PROJECT STUDY AREA	
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DESIGN	SM	8 Apr. 2005		FIGURE 1.1	
GIS	TN	31 May 2005			
CHECK	JM	31 May 2005			
		REVIEW			



Attachment A-2

Figures 3.1-3.2

Location of Habitat Types Identified and Assessed within Study Area.



LEGEND

ORE BODY
OUTCROP
KMC/MDNR PROPERTY
STUDY AREA

HABITAT AREAS

A
B
C1
C2
D
E1
E2
E3
F
G
H
I

REFERENCE

Quickbird image provided by Digital Globe. Transect and habitat areas data provided by Wetland and Coastal Resources, Inc.
Datum: NAD 83 Projection: Transverse Mercator Coordinate System: UTM Zone 16

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SCALE: 1: 20,000 FEET

PROJECT



EAGLE PROJECT
BASELINE ENVIRONMENTAL STUDY
KENNECOTT MINERALS COMPANY

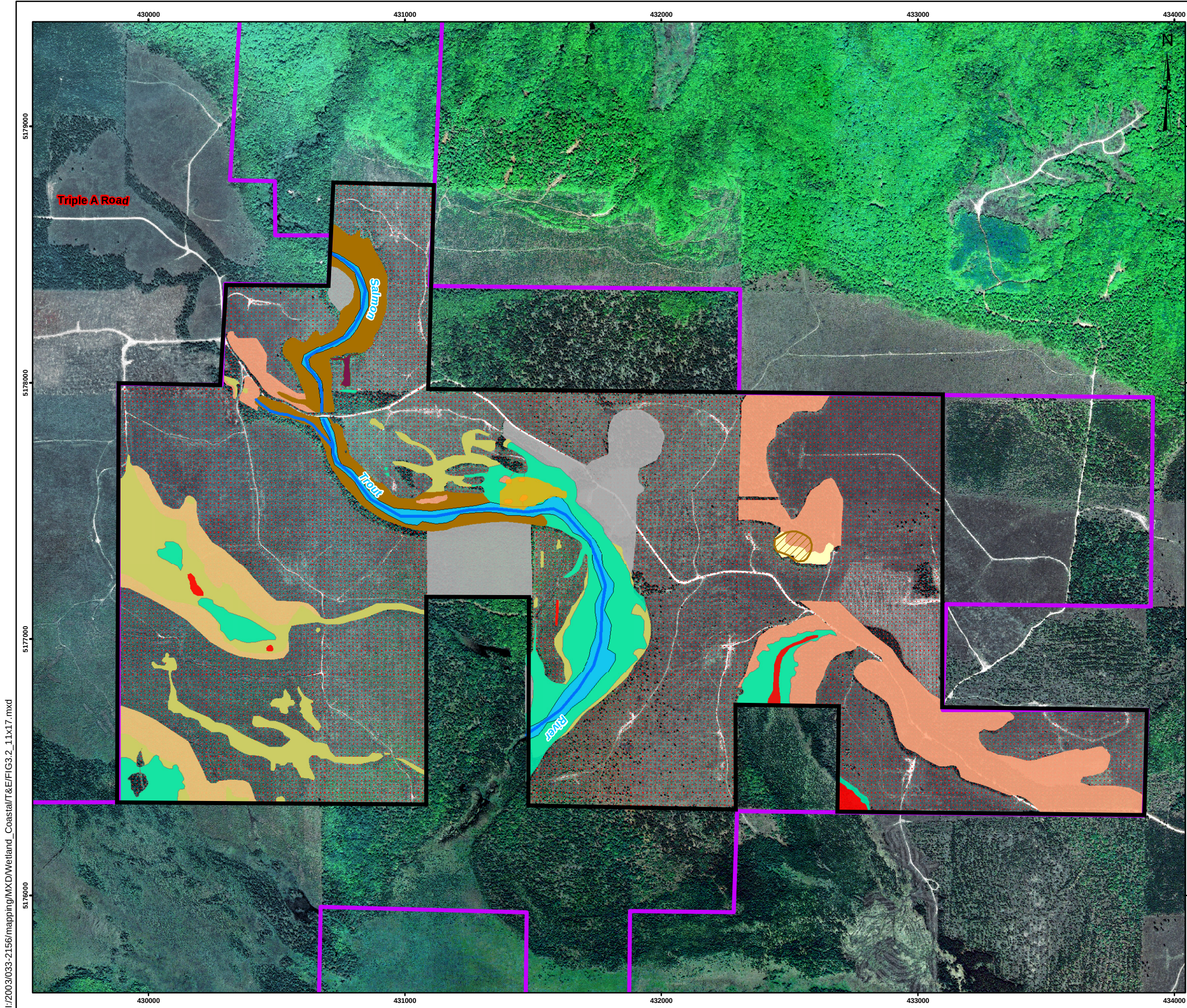
TITLE



HABITAT LOCATION MAP



PROJECT No. 033-2156C			SCALE AS SHOWN	REV. 0
DESIGN	SM	8 Apr. 2005	FIGURE 3.1	
GIS	TN	31 May 2005		
CHECK	JM	31 May 2005		
REVIEW				



LEGEND

ORE BODY
OUTCROP
KMC/MDNR PROPERTY
STUDY AREA

HABITAT AREAS

A
B
C1
C2
D
E1
E2
E3
F
G
H
I

REFERENCE

Quickbird image provided by Digital Globe. Habitat areas provided by Wetland and Coastal Resources, Inc.
Datum: NAD 83 Projection: Transverse Mercator Coordinate System: UTM Zone 16

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SCALE: 1: 15,000 FEET

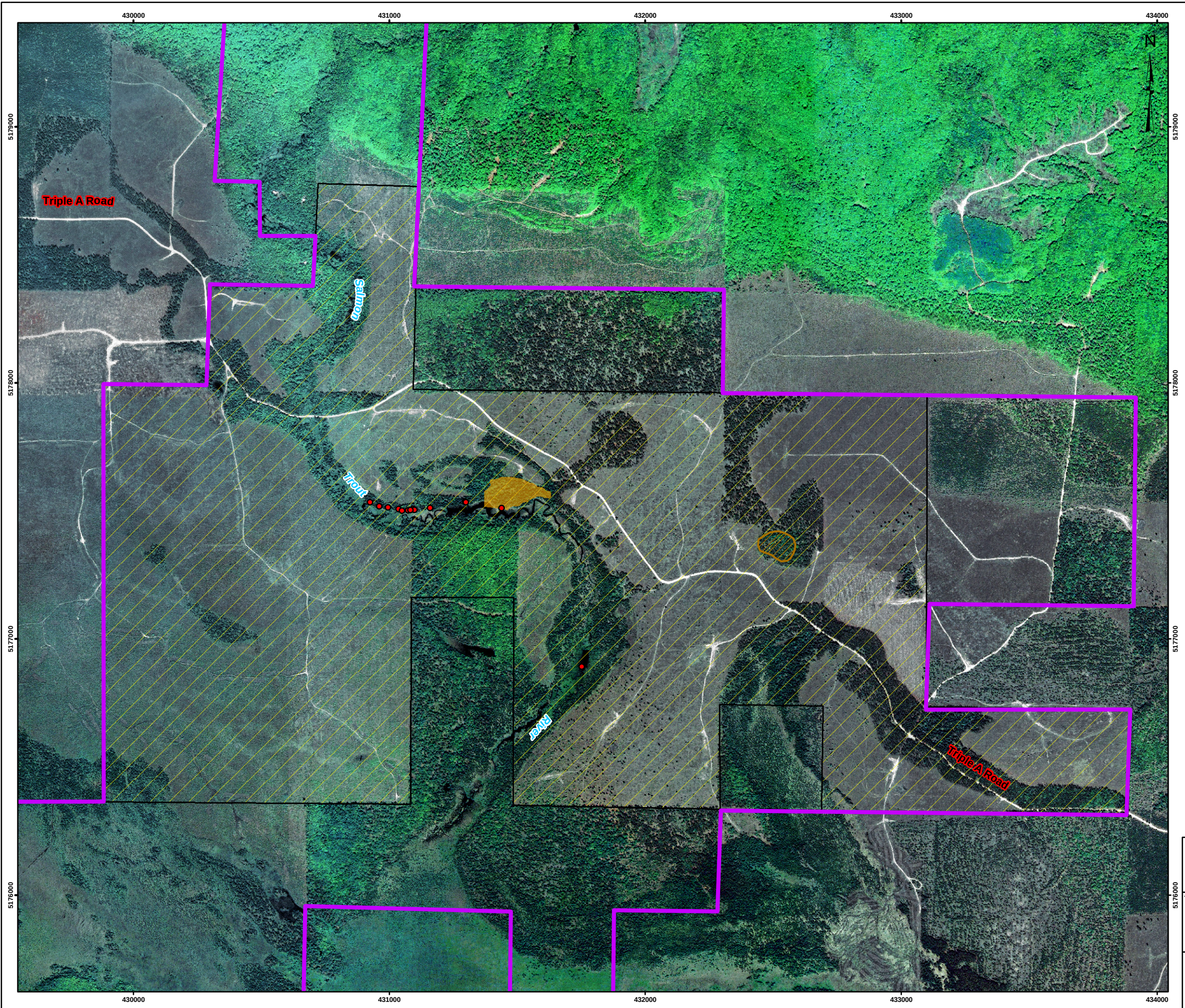
PROJECT				EAGLE PROJECT BASELINE ENVIRONMENTAL STUDY KENNECOTT MINERALS COMPANY	
TITLE				HABITAT LOCATION MAP (ENLARGEMENT)	
PROJECT No. 033-2156C		SCALE AS SHOWN		REV. 0	
DESIGN	SM	8 Apr. 2005		FIGURE 3.2	
GIS	TN	31 May 2005			
CHECK	JM	31 May 2005			
REVIEW					

Attachment A-3

Figure 3.3

GPS Points for Narrow-Leaf Gentian

I:/2003/033-2156/mapping/MXD/Wetland_Coastal/T&E/F/G3.3_11x17.mxd



LEGEND

- ORE BODY
- OUTCROP
- KMC/MDNR PROPERTY
- STUDY AREA
- NARROW-LEAVED GENTIAN

REFERENCE

Quickbird image provided by Digital Globe. Habitat areas provided by Wetland and Coastal Resources, Inc.
Datum: NAD 83 Projection: Transverse Mercator Coordinate System: UTM Zone 16

1,500 0 1,500
SCALE: 1: 15,000 FEET

PROJECT				EAGLE PROJECT BASELINE ENVIRONMENTAL STUDY KENNECOTT MINERALS COMPANY	
TITLE				GPS POINTS FOR NARROW-LEAF GENTIAN	
		PROJECT No. 033-2156C		SCALE AS SHOWN	REV. 0
DESIGN	SM	8 Apr. 2005		FIGURE 3.3	
GIS	TN	8 Apr. 2005			
CHECK	JM	8 Apr. 2005			
REVIEW					

APPENDIX B

CORRESPONDENCE

Attachment B-1

T&E Species, MDNR Letter

Bulldog Lake - 4608768								
<i>Scientific Name</i>	Common Name	Last Observed	Federal Status	State Status	Element Category	TOWN	RANGE	SECTION
<i>Gavia immer</i>	Common Loon	1985		T	Animal	49N	29W	7
<i>Gentiana linearis</i>	Narrow-leaved Gentian	1959-07-21		T	Plant	50N	29W	9
<i>Dryopteris filix-mas</i>	Male Fern	2000-08-14		SC	Plant	50N	29W	17
<i>Elymus glaucus</i>	Blue Wild-rye	1978-08-10		SC	Plant	50N	29W	19
<i>Cryptogramma stelleri</i>	Slender Cliff-brake	1963-07-14		SC	Plant	50N	29W	20
<i>Elymus glaucus</i>	Blue Wild-rye	1979-09-06		SC	Plant	50N	29W	20
<i>Arenaria macrophylla</i>	Big-leaf Sandwort	2000-06-13		T	Plant	50N	29W	20
Dry-mesic northern forest		1979			Community	50N	29W	29
Mesic northern forest		1979			Community	50N	29W	29
<i>Gavia immer</i>	Common Loon	1987-06-21		T	Animal	50N	29W	31
<i>Haliaeetus leucocephalus</i>	Bald Eagle	2000-06-03	LT,PDL	T	Animal	50N	30W	36
Mountain Lake - 4608778								
<i>Scientific Name</i>	Common Name	Last Observed	Federal Status	State Status	Element Category	TOWN	RANGE	SECTION
<i>Nuphar pumila</i>	Small Yellow Pond-lily	1981-07-18		E	Plant	51N	29W	1
<i>Ribes oxycanthoides</i>	Northern Gooseberry	1972-06-20		SC	Plant	52N	28W	30
<i>Cypripedium arietinum</i>	Ram's Head Lady's-slipper	1959-06-09		SC	Plant	52N	28W	31
<i>Gavia immer</i>	Common Loon	1998-06-14 1996		T	Animal	52N	28W	32
<i>Collinsia parviflora</i>	Small Blue-eyed Mary	1973-05-26		T	Plant	52N	28W	32
<i>Cryptogramma stelleri</i>	Slender Cliff-brake	1961-06-26		SC	Plant	52N	29W	25
<i>Gavia immer</i>	Common Loon	1996-06		T	Animal	52N	29W	36
Dry-mesic northern forest		1981-08-06			Community	52N	29W	36



Enclosed is the data requested from Michigan Natural Features Inventory (MNFI). This information is a list of Element Occurrences (EO) at the section level. The sections contain the centroid of the EO. In some cases, the extent of an animal's range or a community type may extend past the section containing the centroid.

This information is the best available regarding elements tracked by MNFI. This list, however, is not a definitive statement on the presence, absence, or condition of the natural features in any given locality. Plant and animal populations and natural communities change with time. Also, not every site has been specifically surveyed. Therefore, the information provided should not be regarded as a complete statement on the occurrence of special natural features of the area in question.

The recipient(s) of the information services understand that state endangered and threatened species are protected under state law (Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection). Any questions, observations, new findings, violations or clearance of project activities should be conducted with the Michigan Department of Natural Resources, Wildlife Division. Contact Lori Sargent or Todd Hogrefe at (517) 373-1263. The recipient(s) of the information services understand that federally endangered and threatened species are protected under federal law (Endangered Species Act of 1973). Any questions, observations, new findings, violations or clearance of project activities should be conducted with the U.S. Fish and Wildlife Service in East Lansing. Their phone number is (517) 351-2555. Recipients of the information are responsible for ensuring the protection of protected species and obtaining proper clearance before project activities begin.



This information is used to guide conservation and land management activities. Some of the element records are historical. While this information may not be important for regulatory purposes, it is important for management and restoration purposes and for scientific use.

The following codes are used for the Federal and State status:

Federal Status:

- C = Candidate - species being considered for federal status
- LE = Listed endangered
- LT = Listed threatened
- LELT = Listed endangered in part of the range, threatened in a different part.
- PE = Proposed endangered
- PT = Proposed threatened
- PS = Partial status - status in only a portion of the range

State status:

- E = Endangered (Legally protected)
- T = Threatened (Legally protected)
- SC = Special Concern (Rare or status uncertain; not legally protected)
- X = Presumed extirpated (Legally threatened if rediscovered)

For questions about MNFI and the data, contact Ed Schools, MNFI, (517) 373-0798, or schoolse@michigan.gov

**Michigan
Natural
Features
Inventory**

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Lansing, MI
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9566

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all without regard to
race, color, national
origin, gender, religion,
age, disability, political
beliefs, sexual

Attachment B-2

Marquette County Element List

Marquette County Element Data (Current as of 12/9/2004)							
SC=Special Concern; E=Endangered; T=Threatened; LT=Listed Threatened; LE=Listed Endangered; PS=Partial Status							
Scientific Name	Common Name	Federal Status	State Status	Scientific Name	Common Name	Federal Status	State Status
Abandoned shoreline	Geographical Feature			<i>Gymnocarpium jessoense</i>	Northern Oak Fern		E
Abrasion feature	Geographical Feature			<i>Gymnocarpium robertianum</i>	Limestone Oak Fern		T
<i>Accipiter gentilis</i>	Northern Goshawk		SC	<i>Haliaeetus leucocephalus</i>	Bald Eagle	LT,PDL	T
<i>Adlumia fungosa</i>	Climbing Fumitory		SC	Hardwood-conifer swamp			
<i>Allium schoenoprasum</i>	Wild Chives		T	<i>Huperzia selago</i>	Fir Clubmoss		SC
<i>Alvar</i>	Alkaline Scrub/grassland, Upper Midwest Type			Igneous bedrock glade	Igneous bedrock glade		
<i>Amerorchis rotundifolia</i>	Round-leaved Orchis		E	Intermittent wetland	Infertile Pond/marsh, Great Lakes Type		
<i>Arenaria macrophylla</i>	Big-leaf Sandwort		T	Intrusive igneous feature	Geographical Feature		
<i>Armoracia lacustris</i>	Lake Cress		T	<i>Juncus stygius</i>	Moor Rush		T
<i>Asplenium trichomanes-ramosum</i>	Green Spleenwort		T	<i>Lycaeides idas nabokovi</i>	Northern Blue		T
Bedrock Glade	Glade, Upper Midwest Type			Mesic northern forest			
Bog				Metamorphic bedrock lakeshore			
<i>Boloria frigga</i>	Frigga Fritillary		SC	Middle precambrian earth history	Geographical Feature		
<i>Calamagrostis lacustris</i>	Northern Reedgrass		T	Moraine	Geographical Feature		
<i>Calypso bulbosa</i>	Calypso or Fairy-slipper		T	<i>Myriophyllum alterniflorum</i>	Alternate-leaved Water-milfoil		SC
<i>Carex atratiformis</i>	Sedge		T	<i>Myriophyllum farwellii</i>	Farwell's Water-milfoil		T

Scientific Name	Common Name	Federal Status	State Status
<i>Clematis occidentalis</i>	Purple Clematis		SC
<i>Collinsia parviflora</i>	Small Blue-eyed Mary		T
<i>Coregonus hubbsi</i>	Ives Lake Cisco		SC
<i>Crataegus douglasii</i>	Douglas's Hawthorn		SC
<i>Cryptogramma stelleri</i>	Slender Cliff-brake		SC
<i>Cypripedium arietinum</i>	Ram's Head Lady's-slipper		SC
<i>Cystopteris laurentiana</i>	Laurentian Fragile Fern		SC
<i>Danthonia intermedia</i>	Wild Oat-grass		SC
<i>Dendroica kirtlandii</i>	Kirtland's Warbler	LE	E
<i>Dermatocarpon moulinsii</i>	Lichen		
<i>Draba arabisans</i>	Rock Whitlow-grass		SC
<i>Drosera anglica</i>	English Sundew		SC
Dry Acid Cliff	Dry Cliff, Upper Midwest Type		
Dry Non-Acid Cliff	Alkaline Dry Cliff, Upper Midwest Type		
Dry northern forest	Dry Woodland, Upper Midwest Type		
Dry-mesic northern forest			
<i>Dryopteris filix-mas</i>	Male Fern		SC
<i>Dryopteris fragrans</i>	Fragrant Cliff Woodfern		SC
Early precambrian earth history	Geographical Feature		

Scientific Name	Common Name	Federal Status	State Status
<i>Nicrophorus americanus</i>	American Burying Beetle	LE	E
<i>Nuphar pumila</i>	Small Yellow Pond-lily		E
<i>Opuntia fragilis</i>	Fragile Prickly-pear		E
Ordovician earth history	Geographical Feature		
<i>Oryzopsis canadensis</i>	Canada Rice-grass		T
Outwash	Geographical Feature		
<i>Pandion haliaetus</i>	Osprey		T
<i>Pinguicula vulgaris</i>	Butterwort		SC
Pitted outwash	Geographical Feature		
<i>Planorbella multivolvis</i>	Acorn Ramshorn		E
Primary sedimentary structural feature	Geographical Feature		
<i>Pterospora andromedea</i>	Pine-drops		T
<i>Rallus elegans</i>	King Rail		E
<i>Ribes oxycanthoides</i>	Northern Gooseberry		SC
Rich conifer swamp			
<i>Rumex occidentalis</i>	Western Dock		E
<i>Sagina nodosa</i>	Pearlwort		T
<i>Salix pellita</i>	Satiny Willow		SC
Sandstone lakeshore cliff			

Scientific Name	Common Name	Federal Status	State Status
<i>Elymus glaucus</i>	Blue Wild-rye		SC
<i>Elymus mollis</i>	American Dune Wild-rye		SC
<i>Erebia discaudalis</i>	Red-disked Alpine		SC
<i>Extrusive igneous feature</i>	Geographical Feature		
<i>Falci pennis canadensis</i>	Spruce Grouse		SC
<i>Falco peregrinus</i>	Peregrine Falcon	PS:LE	E
Fold	Geographical Feature		
Fossils	Geographical Feature		
<i>Gavia immer</i>	Common Loon		T
<i>Gentiana linearis</i>	Narrow-leaved Gentian		T
<i>Glyptemys insculpta</i>	Wood Turtle		SC
Granitic bedrock lakeshore			
<i>Great blue heron rookery</i>	Great Blue Heron Rookery		
Great lakes marsh			

Scientific Name	Common Name	Federal Status	State Status
<i>Scirpus clintonii</i>	Clinton's Bulrush		SC
Secondary sedimentary structural feature	Geographical Feature		
Special outcrop	Geographical Feature		
<i>Tanacetum huronense</i>	Lake Huron Tansy		T
<i>Thalictrum venulosum var. confine</i>	Veiny Meadow-rue		SC
Tilted bedrock	Geographical Feature		
<i>Trisetum spicatum</i>	Downy Oat-grass		SC
<i>Umbilicaria torrefacta</i>	Lichen		
Unconformity	Geographical Feature		
<i>Vaccinium cespitosum</i>	Dwarf Bilberry		T
<i>Viola novae-angliae</i>	New England Violet		T
<i>Weathering</i>	Geographical Feature		
Wooded dune and swale complex			
<i>Woodsia alpina</i>	Northern Woodsia		T
<i>Woodsia obtusa</i>	Blunt-lobed Woodsia		T

Table from:

http://web4.msue.msu.edu/mnfi/data/cnty_dat.cfm?h=&county=Marquette

APPENDIX C

TABLES

ATTACHMENT C-1

Tables 2.1 and 2.2

Survey Times

Table 2.1. Optimal assessment times for endangered, threatened, and special concern plant and animal species appearing in Michigan Natural Features Inventory records for the areas covered by the USGS Bulldog Lake, Michigan and Mountain Lake, Michigan.

Scientific Name	Common Name	Optimal Assessment Time
<i>Arenaria macrophylla</i>	Big-leaf Sandwort	May to August
<i>Collinsia parviflora</i>	Small Blue-eyed Mary	Mid May to Mid June
<i>Cryptogramma stelleri</i>	Slender Cliff-brake	June to September
<i>Cypripedium arietinum</i>	Ram's-head Lady's-slipper	Late May to Early June
<i>Dryopteris filix-mas</i>	Male Fern	July to August
<i>Elymus glaucus</i>	Blue Wild-rye	July to September
<i>Gavia immer</i>	Common Loon	May and September
<i>Gentiana linearis</i>	Narrow-leaved Gentian	July to Early September
<i>Haliaeetus leucocephalus</i>	Bald Eagle	April to May
<i>Nuphar pumila</i>	Small Yellow Pond-lily	July to August
<i>Ribes oxycanthoides</i>	Northern Gooseberry	June to July

Table 2.2. 2004 Survey Times Conducted by WCR.

Activity	Sample Times
Initial site reconnaissance and review for bald eagle	May 13
Bird Surveys (VCP)	May 19-20
	June 22-23
	October 9-10
Frog and Toad Surveys	May 20
	June 18-20
Vegetative Surveys	May 13
	May 17-23, 2004
	June 14-20, 2004
	August 2-7
	October 9-11
Small Mammal Surveys	May 17-23
Large Mammal Surveys	May 13
	May 17-23, 2004
	June 14-20, 2004
	August 2-7
	October 9-11

ATTACHMENT C-2

Table 3.1 Plant Species Lists for Habitat Areas

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS*
Habitat Area A	<i>Carex lasiocarpa</i>	SEDGE	8	OBL
	<i>Cicuta bulbifera</i>	WATER HEMLOCK	5	OBL
	<i>Eleocharis smallii</i>	SPIKE RUSH	5	OBL
	<i>Equisetum fluviatile</i>	WATER HORSETAIL	7	OBL
	<i>Glyceria borealis</i>	NORTHERN MANNA GRASS	6	OBL
	<i>Hippuris vulgaris</i>	MARE'S TAIL	10	OBL
	<i>Lemna minor</i>	SMALL DUCKWEED	5	OBL
	<i>Lysimachia terrestris</i>	SWAMP CANDLES	6	OBL
	<i>Najas gracillima</i>	NAIAD	8	OBL
	<i>NASTURTIUM OFFICINALE</i>	WATERCRESS	0	OBL
	<i>Polygonum amphibium</i>	WATER SMARTWEED	6	OBL
	<i>Potamogeton gramineus</i>	PONDWEED	5	OBL
	<i>Potamogeton obtusifolius</i>	PONDWEED	10	OBL
	<i>Ranunculus longirostris</i>	WHITE WATER CROWFOOT	4	OBL
	<i>Sagittaria latifolia</i>	COMMON ARROWHEAD	1	OBL
	<i>Scirpus atrovirens</i>	BULRUSH	3	OBL
	<i>Sparganium chlorocarpum</i>	GREEN FRUITED BUR REED	6	OBL
	<i>Utricularia intermedia</i>	FLAT LEAVED BLADDERWORT	10	OBL
	<i>Vallisneria americana</i>	EEL GRASS	7	OBL
Habitat Area B	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer pensylvanicum</i>	STRIPED MAPLE	5	FACU
	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer saccharinum</i>	SILVER MAPLE	2	FACW
	<i>Acer saccharum</i>	SUGAR MAPLE	5	FACU
	<i>Acer spicatum</i>	MOUNTAIN MAPLE	5	FACU
	<i>Actaea rubra</i>	RED BANEERRY	7	UPL
	<i>Alnus rugosa</i>	TAG ALDER	5	OBL
	<i>Anemone quinquefolia</i>	WOOD ANEMONE	5	FAC
	<i>Aralia nudicaulis</i>	WILD SARSAPARILLA	5	FACU
	<i>Aster lanceolatus</i>	EASTERN LINED ASTER	2	FACW
	<i>Aster macrophyllus</i>	BIG LEAVED ASTER	4	UPL
	<i>Athyrium filix-femina</i>	LADY FERN	4	FAC
	<i>Brachyelytrum erectum</i>	LONG AWNED WOOD GRASS	7	UPL
	<i>Calamagrostis canadensis</i>	BLUE JOINT GRASS	3	OBL
	<i>Carex aquatilis</i>	SEDGE	7	OBL
	<i>Carex blanda</i>	SEDGE	1	FAC
	<i>Carex canescens</i>	SEDGE	8	OBL
	<i>Carex debilis</i>	SWAMP SEDGE	6	FACW
	<i>Carex gynandra</i>	SEDGE	3	FACW+
	<i>Carex intumescens</i>	SEDGE	3	FACW+
	<i>Carex leptalea</i>	SEDGE	5	OBL

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area B cont.	<i>Carex scabrata</i>	SEDGE	4	OBL
	<i>Carex stricta</i>	SEDGE	4	OBL
	<i>Circaea alpina</i>	SMALL ENCHANTER'S NIGHTSHADE	4	FACW
	<i>Cirsium muticum</i>	SWAMP THISTLE	6	OBL
	<i>Clematis virginiana</i>	VIRGIN'S BOWER	4	FAC
	<i>Clintonia borealis</i>	BLUEBEAD LILY; CORN LILY	5	FAC+
	<i>Coptis trifolia</i>	GOLDTHREAD	5	FACW
	<i>Corallorhiza maculata</i>	SPOTTED CORAL ROOT	5	FACU-
	<i>Corallorhiza striata</i>	STRIPED CORAL ROOT	6	FACU-
	<i>Cornus canadensis</i>	BUNCHBERRY	6	FAC
	<i>Epigaea repens</i>	TRAILING ARBUTUS	7	UPL
	<i>Equisetum sylvaticum</i>	WOODLAND HORSETAIL	5	FACW
	<i>Galium asprellum</i>	ROUGH BEDSTRAW	5	OBL
	<i>Galium triflorum</i>	FRAGRANT BEDSTRAW	4	FACU+
	<i>Gaultheria procumbens</i>	WINTERGREEN	5	FACU
	<i>Glyceria striata</i>	FOWL MANNA GRASS	4	OBL
	<i>Goodyera oblongifolia</i>	MENZIES' RATTLESNAKE PLANTAIN	6	UPL
	<i>Goodyera tessellata</i>	TESSELATED RATTLESNAKE PLANTAIN	6	FACU
	<i>Gymnocarpium dryopteris</i>	OAK FERN	5	FAC
	<i>Ilex verticillata</i>	MICHIGAN HOLLY	5	FACW+
	<i>Impatiens capensis</i>	SPOTTED TOUCH ME NOT	2	FACW
	<i>Iris versicolor</i>	WILD BLUE FLAG	5	OBL
	<i>Listera cordata</i>	HEART LEAVED TWAYBLADE	10	FACW
	<i>Lonicera canadensis</i>	AMERICAN FLY HONEYSUCKLE	5	FACU
	<i>Lonicera oblongifolia</i>	SWAMP FLY HONEYSUCKLE	8	OBL
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Mentha arvensis</i>	WILD MINT	3	FACW
	<i>Mitchella repens</i>	PARTRIDGE BERRY	5	FACU+
	<i>Mitella nuda</i>	NAKED MITERWORT	8	FACW
	<i>Oryzopsis asperifolia</i>	ROUGH LEAVED RICE GRASS	6	UPL
	<i>Osmorhiza longistylis</i>	SMOOTH SWEET CICELY	3	FACU-
	<i>Osmunda cinnamomea</i>	CINNAMON FERN	5	FACW
	<i>Osmunda claytoniana</i>	INTERRUPTED FERN	6	FAC+
	<i>Panax trifolius</i>	DWARF GINSENG	8	UPL
	<i>Pinus strobus</i>	WHITE PINE	3	FACU
	<i>Prunus virginiana</i>	CHOKE CHERRY	2	FAC-
	<i>Pteridium aquilinum</i>	BRACKEN FERN	0	FACU
	<i>Quercus rubra</i>	RED OAK	5	FACU
	<i>RANUNCULUS ACRIS</i>	TALL or COMMON BUTTERCUP	0	FACW-
	<i>Ranunculus recurvatus</i>	HOOKEED CROWFOOT	5	FACW
	<i>Ribes americanum</i>	WILD BLACK CURRANT	6	FACW
	<i>Ribes cynosbati</i>	PRICKLY or WILD GOOSEBERRY	4	UPL

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area B cont.	<i>Ribes glandulosum</i>	SKUNK CURRANT	5	FACW
	<i>Ribes triste</i>	SWAMP RED CURRANT	6	OBL
	<i>Rubus pubescens</i>	DWARF RASPBERRY	4	FACW+
	<i>Rubus strigosus</i>	WILD RED RASPBERRY	2	FACW-
	<i>Sanicula marilandica</i>	BLACK SNAKEROOT	4	FACU
	<i>Schizachne purpurascens</i>	FALSE MELIC	5	FACU+
	<i>Senecio aureus</i>	GOLDEN RAGWORT	5	FACW
	<i>Smilacina racemosa</i>	FALSE SPIKENARD	5	FACU
	<i>Smilacina stellata</i>	STARRY FALSE SOLOMON SEAL	5	FAC-
	<i>Sorbus decora</i>	MOUNTAIN ASH	4	FACU
	<i>Streptopus roseus</i>	ROSE TWISTED STALK	5	FAC
	<i>Thuja occidentalis</i>	ARBOR VITAE	4	FACW
	<i>Trientalis borealis</i>	STARFLOWER	5	FAC+
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>Vaccinium corymbosum</i>	SMOOTH Highbush BLUEBERRY	6	FACW
	<i>Vaccinium myrtilloides</i>	CANADA BLUEBERRY	4	FACW-
	<i>Vaccinium oxycoccos</i>	SMALL CRANBERRY	8	OBL
	VERONICA OFFICINALIS	COMMON SPEEDWELL	0	UPL
	<i>Viola blanda</i>	SWEET WHITE VIOLET	5	FACW-
	<i>Viola cucullata</i>	MARSH VIOLET	5	OBL
	<i>Viola renifolia</i>	KIDNEY LEAVED VIOLET	6	FACW
	<i>Viola sororia</i>	COMMON BLUE VIOLET	1	FAC-
Habitat Area C1	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer spicatum</i>	MOUNTAIN MAPLE	5	FACU
	<i>Athyrium filix-femina</i>	LADY FERN	4	FAC
	<i>Brachyelytrum erectum</i>	LONG AWNED WOOD GRASS	7	UPL
	<i>Calamagrostis canadensis</i>	BLUE JOINT GRASS	3	OBL
	<i>Carex communis</i>	SEDGE	2	UPL
	<i>Cinna arundinacea</i>	WOOD REEDGRASS	7	FACW
	<i>Cornus canadensis</i>	BUNCHBERRY	6	FAC
	<i>Cypripedium acaule</i>	PINK LADY'S SLIPPER; MOCCASIN FLOWER	5	FACW
	<i>Deschampsia flexuosa</i>	HAIR GRASS	6	UPL
	<i>Epigaea repens</i>	TRAILING ARBUTUS	7	UPL
	<i>Epilobium angustifolium</i>	FIREWEED	3	FAC
	<i>Epilobium leptophyllum</i>	FEN WILLOW HERB	6	OBL
	<i>Gaultheria procumbens</i>	WINTERGREEN	5	FACU
	<i>Ledum groenlandicum</i>	LABRADOR TEA	8	OBL
	<i>Lycopodium clavatum</i>	RUNNING GROUND PINE	4	FAC
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Pinus banksiana</i>	JACK PINE	5	FACU
	<i>Pinus resinosa</i>	RED PINE	6	FACU

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area C1 cont.	<i>Pinus strobus</i>	WHITE PINE	3	FACU
	<i>Platanthera clavellata</i>	SM. GREEN WOOD ORCHID	6	FACW+
	<i>Poa saltuensis</i>	BLUEGRASS	5	UPL
	<i>Pteridium aquilinum</i>	BRACKEN FERN	0	FACU
	<i>Salix petiolaris</i>	SLENDER WILLOW	1	FACW+
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>Viola macloskeyi</i>	SMOOTH WHITE VIOLET	6	OBL
Habitat Area C2	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer spicatum</i>	MOUNTAIN MAPLE	5	FACU
	<i>Betula papyrifera</i>	PAPER BIRCH	2	FACU+
	<i>Carex communis</i>	SEDGE	2	UPL
	<i>Clintonia borealis</i>	BLUEBEAD LILY; CORN LILY	5	FAC+
	<i>Coptis trifolia</i>	GOLDTHREAD	5	FACW
	<i>Cornus canadensis</i>	BUNCHBERRY	6	FAC
	<i>Corylus cornuta</i>	BEAKED HAZELNUT	5	UPL
	<i>Cypripedium acaule</i>	PINK LADY'S SLIPPER; MOCCASIN FLOWER	5	FACW
	<i>Deschampsia flexuosa</i>	HAIR GRASS	6	UPL
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>Pinus banksiana</i>	JACK PINE	5	FACU
	<i>Poa saltuensis</i>	BLUEGRASS	5	UPL
	<i>Prunus virginiana</i>	CHOKE CHERRY	2	FAC-
	<i>Pteridium aquilinum</i>	BRACKEN FERN	0	FACU
	<i>Trientalis borealis</i>	STARFLOWER	5	FAC+
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
Habitat Area D	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer saccharum</i>	SUGAR MAPLE	5	FACU
	<i>Acer spicatum</i>	MOUNTAIN MAPLE	5	FACU
	<i>AGROPYRON REPENS</i>	QUACK GRASS	0	FACU
	<i>Agrostis hyemalis</i>	TICKLEGRASS	4	FAC-
	<i>Amelanchier interior</i>	SERVICEBERRY	4	UPL
	<i>Amelanchier sanguinea</i>	ROUND LEAVED SERVICEBERRY	5	UPL
	<i>Betula papyrifera</i>	PAPER BIRCH	2	FACU+
	<i>Betula populifolia</i>	GRAY BIRCH	4	FAC
	<i>Carex arctata</i>	SEDGE	3	UPL
	<i>CHRYSANTHEMUM XSUPERBUM</i>	SHASTA DAISY	0	UPL
	<i>CIRSIUM ARVENSE</i>	CANADIAN THISTLE	0	FACU
	<i>CIRSIUM VULGARE</i>	BULL THISTLE	0	FACU-
	<i>Corylus cornuta</i>	BEAKED HAZELNUT	5	UPL

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area D cont.	<i>DACTYLIS GLOMERATA</i>	ORCHARD GRASS	0	FACU
	<i>Danthonia spicata</i>	POVERTY GRASS; OATGRASS	4	UPL
	<i>Deschampsia flexuosa</i>	HAIR GRASS	6	UPL
	<i>Epigaea repens</i>	TRAILING ARBUTUS	7	UPL
	<i>Gaultheria procumbens</i>	WINTERGREEN	5	FACU
	<i>Gnaphalium macounii</i>	CLAMMY CUDWEED	2	UPL
	<i>HIERACIUM AURANTIACUM</i>	ORANGE HAWKWEED	0	UPL
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Panicum columbianum</i>	PANIC GRASS	7	UPL
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>Pinus banksiana</i>	JACK PINE	5	FACU
	<i>Pinus resinosa</i>	RED PINE	6	FACU
	<i>Pinus strobus</i>	WHITE PINE	3	FACU
	<i>PINUS SYLVESTRIS</i>	SCOTCH PINE	0	UPL
	<i>POA COMPRESSA</i>	CANADA BLUEGRASS	0	FACU+
	<i>Populus tremuloides</i>	QUAKING ASPEN	1	FAC
	<i>PRUNELLA VULGARIS</i>	LAWN PRUNELLA	0	FAC
	<i>Pteridium aquilinum</i>	BRACKEN FERN	0	FACU
	<i>Quercus rubra</i>	RED OAK	5	FACU
	<i>RUMEX ACETOSELLA</i>	SHEEP SORREL	0	FAC
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>VERBASCUM THAPSUS</i>	COMMON MULLEIN	0	UPL
Habitat Area E1	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer saccharinum</i>	SILVER MAPLE	3	FACW
	<i>Alnus rugosa</i>	TAG ALDER	5	OBL
	<i>Amelanchier sanguinea</i>	ROUND LEAVED SERVICEBERRY	5	UPL
	<i>Aronia prunifolia</i>	BLACK CHOKEBERRY	5	FACW
	<i>Athyrium filix-femina</i>	LADY FERN	4	FAC
	<i>Betula papyrifera</i>	PAPER BIRCH	2	FACU+
	<i>Brachyelytrum erectum</i>	LONG AWNED WOOD GRASS	7	UPL
	<i>Calamagrostis canadensis</i>	BLUE JOINT GRASS	3	OBL
	<i>Carex canescens</i>	SEDGE	8	OBL
	<i>Carex disperma</i>	SEDGE	10	OBL
	<i>Carex lasiocarpa</i>	SEDGE	8	OBL
	<i>Carex leptalea</i>	SEDGE	5	OBL
	<i>Carex oligosperma</i>	SEDGE	10	OBL
	<i>Carex paupercula</i>	SEDGE	8	OBL
	<i>Carex scabrata</i>	SEDGE	4	OBL
	<i>Carex stipata</i>	SEDGE	1	OBL
	<i>Carex stricta</i>	SEDGE	4	OBL
	<i>Carex trisperma</i>	SEDGE	9	OBL

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area E1 cont.	<i>Ceanothus americanus</i>	NEW JERSEY TEA	8	UPL
	<i>Chamaedaphne calyculata</i>	LEATHERLEAF	8	OBL
	<i>Clintonia borealis</i>	BLUEBEAD LILY; CORN LILY	5	FAC+
	<i>Coptis trifolia</i>	GOLDTHREAD	5	FACW
	<i>Cornus canadensis</i>	BUNCHBERRY	6	FAC
	<i>Cypripedium acaule</i>	PINK LADY'S SLIPPER; MOCCASIN FLOWER	5	FACW
	<i>Drosera rotundifolia</i>	ROUND LEAVED SUNDEW	6	OBL
	<i>Dryopteris carthusiana</i>	SPINULOSE WOODFERN	5	FACW-
	<i>Dryopteris cristata</i>	CRESTED SHIELD FERN	6	OBL
	<i>Dryopteris intermedia</i>	EVERGREEN WOODFERN	5	FAC
	<i>Epigaea repens</i>	TRAILING ARBUTUS	7	UPL
	<i>Epilobium ciliatum</i>	WILLOW HERB	3	FACU
	<i>Gaultheria hispidula</i>	CREEPING SNOWBERRY	8	FACW
	<i>Gaultheria procumbens</i>	WINTERGREEN	5	FACU
	<i>Glyceria striata</i>	FOWL MANNA GRASS	4	OBL
	<i>Ilex verticillata</i>	MICHIGAN HOLLY	5	FACW+
	<i>Iris versicolor</i>	WILD BLUE FLAG	5	OBL
	<i>Kalmia polifolia</i>	SWAMP LAUREL	10	OBL
	<i>Larix laricina</i>	TAMARACK	5	FACW
	<i>Ledum groenlandicum</i>	LABRADOR TEA	8	OBL
	<i>Lycopus uniflorus</i>	NORTHERN BUGLE WEED	2	OBL
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Melampyrum lineare</i>	COW WHEAT	6	FAC-
	<i>Nemopanthus mucronata</i>	MOUNTAIN HOLLY	7	OBL
	<i>Osmunda cinnamomea</i>	CINNAMON FERN	5	FACW
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>PINUS SYLVESTRIS</i>	SCOTCH PINE	0	UPL
	<i>Ribes americanum</i>	WILD BLACK CURRANT	6	FACW
	<i>Rubus hispidus</i>	SWAMP DEWBERRY	4	FACW
	<i>Salix discolor</i>	PUSSY WILLOW	1	FACW
	<i>Sarracenia purpurea</i>	PITCHER PLANT	10	OBL
	<i>Smilacina stellata</i>	STARRY FALSE SOLOMON SEAL	5	FAC-
	<i>Smilacina trifolia</i>	FALSE MAYFLOWER	10	OBL
	<i>Trientalis borealis</i>	STARFLOWER	5	FAC+
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>Vaccinium corymbosum</i>	SMOOTH Highbush BLUEBERRY	6	FACW
	<i>Vaccinium macrocarpon</i>	LARGE CRANBERRY	8	OBL
	<i>Vaccinium myrtilloides</i>	CANADA BLUEBERRY	4	FACW-
	<i>Vaccinium oxycoccos</i>	SMALL CRANBERRY	8	OBL
	<i>Viola cucullata</i>	MARSH VIOLET	5	OBL
Habitat Area E2	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer rubrum</i>	RED MAPLE	1	FAC

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area E2 cont.	<i>Agrostis hyemalis</i>	TICKLEGRASS	4	FAC-
	<i>Amelanchier bartramiana</i>	NORTHERN JUNE BERRY	8	FAC
	<i>Amelanchier spicata</i>	SHADBUSH SERVICE BERRY	4	FACU
	<i>Betula papyrifera</i>	PAPER BIRCH	2	FACU+
	<i>Betula pumila</i>	BOG BIRCH	8	OBL
	<i>Carex crawfordii</i>	SEDGE	4	FAC+
	<i>Carex foenea</i>	SEDGE	3	UPL
	<i>Carex pauciflora</i>	SEDGE	10	OBL
	<i>Carex pauperula</i>	SEDGE	8	OBL
	<i>Clintonia borealis</i>	BLUE BEAD LILY; CORN LILY	5	FAC+
	<i>Coptis trifolia</i>	GOLD THREAD	5	FACW
	<i>Cornus canadensis</i>	BUNCH BERRY	6	FAC
	<i>Cypripedium acaule</i>	PINK LADY'S SLIPPER; MOCCASIN FLOWER	5	FACW
	<i>Deschampsia flexuosa</i>	HAIR GRASS	6	UPL
	<i>Epigaea repens</i>	TRAILING ARBUTUS	7	UPL
	<i>Gaultheria procumbens</i>	WINTER GREEN	5	FACU
	<i>Kalmia polifolia</i>	SWAMP LAUREL	10	OBL
	<i>Larix laricina</i>	TAMARACK	5	FACW
	<i>Ledum groenlandicum</i>	LABRADOR TEA	8	OBL
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>Salix humilis</i>	PRAIRIE WILLOW	4	FACU
	<i>Salix petiolaris</i>	SLENDER WILLOW	1	FACW+
	<i>Solidago uliginosa</i>	BOG GOLDEN ROD	4	OBL
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>Vaccinium macrocarpon</i>	LARGE CRANBERRY	8	OBL
	<i>Vaccinium myrtilloides</i>	CANADA BLUEBERRY	4	FACW-
Habitat Area E3	<i>Aronia prunifolia</i>	BLACK CHOKEBERRY	5	FACW
	<i>Carex canescens</i>	SEDGE	8	OBL
	<i>Carex lasiocarpa</i>	SEDGE	8	OBL
	<i>Carex trisperma</i>	SEDGE	9	OBL
	<i>Chamaedaphne calyculata</i>	LEATHER LEAF	8	OBL
	<i>Eriophorum angustifolium</i>	NARROW LEAVED COTTON GRASS	10	OBL
	<i>Eriophorum spissum</i>	COTTON GRASS	10	OBL
	<i>Gaultheria procumbens</i>	WINTER GREEN	5	FACU
	<i>Iris versicolor</i>	WILD BLUE FLAG	5	OBL
	<i>Larix laricina</i>	TAMARACK	5	FACW
	<i>Ledum groenlandicum</i>	LABRADOR TEA	8	OBL
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>Sarracenia purpurea</i>	PITCHER PLANT	10	OBL
	<i>Scirpus atrovirens</i>	BULRUSH	3	OBL
	<i>Scirpus cyperinus</i>	WOOL GRASS	5	OBL

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area E3 cont.	<i>Trientalis borealis</i>	STARFLOWER	5	FAC+
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>Vaccinium myrtilloides</i>	CANADA BLUEBERRY	4	FACW-
Habitat Area F	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer spicatum</i>	MOUNTAIN MAPLE	5	FACU
	<i>Agrostis hyemalis</i>	TICKLEGRASS	4	FAC-
	<i>Alnus rugosa</i>	TAG ALDER	5	OBL
	<i>Aralia nudicaulis</i>	WILD SARSAPARILLA	5	FACU
	<i>Aronia prunifolia</i>	BLACK CHOKEBERRY	5	FACW
	<i>Aster lanceolatus</i>	EASTERN LINED ASTER	2	FACW
	<i>Aster puniceus</i>	SWAMP ASTER	5	OBL
	<i>Aster umbellatus</i>	TALL FLAT TOP WHITE ASTER	5	FACW
	<i>Athyrium filix-femina</i>	LADY FERN	4	FAC
	<i>Bidens cernuus</i>	NODDING BUR MARIGOLD	3	OBL
	<i>Bidens comosus</i>	SWAMP TICKSEED	5	FACW
	<i>Calamagrostis canadensis</i>	BLUE JOINT GRASS	3	OBL
	<i>Caltha palustris</i>	MARSH MARIGOLD	6	OBL
	<i>Campanula aparinoides</i>	MARSH BELLFLOWER	7	OBL
	<i>Carex aquatilis</i>	SEDGE	7	OBL
	<i>Carex blanda</i>	SEDGE	1	FAC
	<i>Carex brunnescens</i>	SEDGE	5	FACW
	<i>Carex canescens</i>	SEDGE	8	OBL
	<i>Carex echinata</i>	SEDGE	6	OBL
	<i>Carex gynandra</i>	SEDGE	3	FACW+
	<i>Carex hystericina</i>	SEDGE	2	OBL
	<i>Carex interior</i>	SEDGE	3	OBL
	<i>Carex intumescens</i>	SEDGE	3	FACW+
	<i>Carex lacustris</i>	SEDGE	6	OBL
	<i>Carex lasiocarpa</i>	SEDGE	8	OBL
	<i>Carex lupulina</i>	SEDGE	4	OBL
	<i>Carex michauxiana</i>	SEDGE	10	OBL
	<i>Carex paupercula</i>	SEDGE	8	OBL
	<i>Carex projecta</i>	SEDGE	3	FACW+
	<i>Carex retrorsa</i>	SEDGE	3	OBL
	<i>Carex scabrata</i>	SEDGE	4	OBL
	<i>Carex schweinitzii</i>	SEDGE	10	OBL
	<i>Carex scoparia</i>	SEDGE	4	FACW
	<i>Carex stipata</i>	SEDGE	1	OBL
	<i>Carex stricta</i>	SEDGE	4	OBL
	<i>Chamaedaphne calyculata</i>	LEATHERLEAF	8	OBL
	<i>Chelone glabra</i>	TURTLEHEAD	7	OBL
	<i>Cicuta bulbifera</i>	WATER HEMLOCK	5	OBL

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area F cont	<i>Circaea alpina</i>	SMALL ENCHANTER'S NIGHTSHADE	4	FACW
	<i>Cirsium muticum</i>	SWAMP THISTLE	6	OBL
	<i>Clematis virginiana</i>	VIRGIN'S BOWER	4	FAC
	<i>Clintonia borealis</i>	BLUEBEAD LILY; CORN LILY	5	FAC+
	<i>Coptis trifolia</i>	GOLDTHREAD	5	FACW
	<i>Cornus canadensis</i>	BUNCHBERRY	6	FAC
	<i>Diervilla lonicera</i>	BUSH HONEYSUCKLE	4	UPL
	<i>Drosera rotundifolia</i>	ROUND LEAVED SUNDEW	6	OBL
	<i>Dryopteris cristata</i>	CRESTED SHIELD FERN	6	OBL
	<i>Dulichium arundinaceum</i>	THREE WAY SEDGE	8	OBL
	<i>Eleocharis acicularis</i>	SPIKE RUSH	7	OBL
	<i>Eleocharis obtusa</i>	SPIKE RUSH	3	OBL
	<i>Eleocharis smallii</i>	SPIKE RUSH	5	OBL
	<i>Epilobium ciliatum</i>	WILLOW HERB	3	FACU
	<i>Epilobium leptophyllum</i>	FEN WILLOW HERB	6	OBL
	<i>Eriophorum virginicum</i>	TAWNY COTTON GRASS	8	OBL
	<i>Eupatorium maculatum</i>	JOE PYE WEED	4	OBL
	<i>Galium asprellum</i>	ROUGH BEDSTRAW	5	OBL
	<i>Galium tinctorium</i>	STIFF BEDSTRAW	5	OBL
	<i>Galium trifidum</i>	SMALL BEDSTRAW	6	FACW+
	<i>Gentiana linearis</i>	NARROW LEAVED GENTIAN	10	FACW-
	<i>Glyceria borealis</i>	NORTHERN MANNA GRASS	6	OBL
	<i>Glyceria canadensis</i>	RATTLESNAKE GRASS	8	OBL
	<i>Glyceria grandis</i>	REED MANNA GRASS	6	OBL
	<i>Glyceria striata</i>	FOWL MANNA GRASS	4	OBL
	<i>Hypericum ellipticum</i>	PALE ST. JOHN'S WORT	9	OBL
	<i>Ilex verticillata</i>	MICHIGAN HOLLY	5	FACW+
	<i>Impatiens capensis</i>	SPOTTED TOUCH ME NOT	2	FACW
	<i>Iris versicolor</i>	WILD BLUE FLAG	5	OBL
	<i>Juncus brevicaudatus</i>	RUSH	8	OBL
	<i>Juncus effusus</i>	SOFT STEMMED RUSH	3	OBL
	<i>Juncus nodosus</i>	JOINT RUSH	5	OBL
	<i>Larix laricina</i>	TAMARACK	5	FACW
	<i>Ledum groenlandicum</i>	LABRADOR TEA	8	OBL
	<i>Leersia oryzoides</i>	CUT GRASS	3	OBL
	<i>Lemna minor</i>	SMALL DUCKWEED	5	OBL
	<i>Linnaea borealis</i>	TWINFLOWER	6	FAC
	<i>Lycopus uniflorus</i>	NORTHERN BUGLE WEED	2	OBL
	<i>Lysimachia terrestris</i>	SWAMP CANDLES	6	OBL
	<i>Lysimachia thyrsiflora</i>	TUFTED LOOSESTRIFE	6	OBL
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Mentha arvensis</i>	WILD MINT	3	FACW
	<i>Mimulus ringens</i>	MONKEY FLOWER	5	OBL

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area F cont	<i>Mitella diphylla</i>	BISHOP'S CAP	8	FACU+
	<i>NASTURTIUM OFFICINALE</i>	WATERCRESS	0	OBL
	<i>Nemopanthus mucronata</i>	MOUNTAIN HOLLY	7	OBL
	<i>Onoclea sensibilis</i>	SENSITIVE FERN	2	FACW
	<i>Osmunda cinnamomea</i>	CINNAMON FERN	5	FACW
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>Platanthera clavellata</i>	SM. GREEN WOOD ORCHID	6	FACW+
	<i>Poa palustris</i>	FOWL MEADOW GRASS	3	FACW+
	<i>Polygonum amphibium</i>	WATER SMARTWEED	6	OBL
	<i>Polygonum punctatum</i>	SMARTWEED	5	OBL
	<i>Potentilla norvegica</i>	ROUGH CINQUEFOIL	0	FAC
	<i>Potentilla palustris</i>	MARSH CINQUEFOIL	7	OBL
	<i>RANUNCULUS ACRIS</i>	TALL or COMMON BUTTERCUP	0	FACW-
	<i>Ranunculus hispidus</i>	SWAMP BUTTERCUP	5	FAC
	<i>Ranunculus pensylvanicus</i>	BRISTLY CROWFOOT	6	OBL
	<i>Rubus hispidus</i>	SWAMP DEWBERRY	4	FACW
	<i>Rubus pubescens</i>	DWARF RASPBERRY	4	FACW+
	<i>Rubus strigosus</i>	WILD RED RASPBERRY	2	FACW-
	<i>Rumex orbiculatus</i>	GREAT WATER DOCK	9	OBL
	<i>Sagittaria latifolia</i>	COMMON ARROWHEAD	1	OBL
	<i>Salix pyrifolia</i>	BALSAM WILLOW	8	FACW+
	<i>Sambucus canadensis</i>	ELDERBERRY	3	FACW-
	<i>Scirpus atrovirens</i>	BULRUSH	3	OBL
	<i>Scirpus cyperinus</i>	WOOL GRASS	5	OBL
	<i>Scirpus microcarpus</i>	BULRUSH	5	OBL
	<i>Scutellaria galericulata</i>	COMMON SKULLCAP	5	OBL
	<i>Scutellaria lateriflora</i>	MAD DOG SKULLCAP	5	OBL
	<i>Solidago speciosa</i>	SHOWY GOLDENROD	5	UPL
	<i>Solidago uliginosa</i>	BOG GOLDENROD	4	OBL
	<i>Sparganium chlorocarpum</i>	GREEN FRUITED BUR REED	6	OBL
	<i>Spiraea alba</i>	MEADOWSWEET	4	FACW+
	<i>Thalictrum dasycarpum</i>	PURPLE MEADOW RUE	3	FACW-
	<i>Thuja occidentalis</i>	ARBOR VITAE	4	FACW
	<i>Triadenum fraseri</i>	MARSH ST. JOHN'S WORT	6	OBL
	<i>Trientalis borealis</i>	STARFLOWER	5	FAC+
	<i>TYPHA ANGUSTIFOLIA</i>	NARROW LEAVED CATTAIL	0	OBL
	<i>Typha latifolia</i>	BROAD LEAVED CATTAIL	1	OBL
	<i>Urtica dioica</i>	NETTLE	1	FAC+
	<i>Utricularia cornuta</i>	HORNED BLADDERWORT	10	OBL
	<i>Utricularia intermedia</i>	FLAT LEAVED BLADDERWORT	10	OBL
	<i>Vaccinium macrocarpon</i>	LARGE CRANBERRY	8	OBL
	<i>Vaccinium myrtilloides</i>	CANADA BLUEBERRY	4	FACW-
	<i>VERONICA BECCABUNGA</i>	BROOKLIME	0	OBL

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area F cont	<i>Veronica beccabunga</i> var. <i>americana</i>	AMERICAN BROOKLIME	10	OBL
	<i>Viola affinis</i>	LE CONTE'S VIOLET	2	FACW
	<i>Viola blanda</i>	SWEET WHITE VIOLET	5	FACW-
	<i>Viola cucullata</i>	MARSH VIOLET	5	OBL
Habitat Area G	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>Acer pensylvanicum</i>	STRIPED MAPLE	5	FACU
	<i>Acer rubrum</i>	RED MAPLE	1	FAC
	<i>Acer spicatum</i>	MOUNTAIN MAPLE	5	FACU
	<i>AGROPYRON REPENS</i>	QUACK GRASS	0	FACU
	<i>Agropyron trachycaulum</i>	SLENDER WHEAT GRASS	8	FAC
	<i>Agrostis hyemalis</i>	TICKLEGRASS	4	FAC-
	<i>Alnus rugosa</i>	TAG ALDER	5	OBL
	<i>Amelanchier sanguinea</i>	ROUND LEAVED SERVICEBERRY	5	UPL
	<i>Anaphalis margaritacea</i>	PEARLY EVERLASTING	3	UPL
	<i>Apocynum androsaemifolium</i>	SPREADING DOGBANE	3	UPL
	<i>Aralia nudicaulis</i>	WILD SARSAPARILLA	5	FACU
	<i>Asplenium trichomanes</i>	MAIDENHAIR SPLEENWORT	10	UPL
	<i>Aster macrophyllus</i>	BIG LEAVED ASTER	4	UPL
	<i>Betula papyrifera</i>	PAPER BIRCH	2	FACU+
	<i>Calystegia spithamea</i>	LOW BINDWEED	8	UPL
	<i>Chimaphila umbellata</i>	PIPSISSEWA	8	UPL
	<i>Corylus cornuta</i>	BEAKED HAZELNUT	5	UPL
	<i>Deschampsia flexuosa</i>	HAIR GRASS	6	UPL
	<i>Diervilla lonicera</i>	BUSH HONEYSUCKLE	4	UPL
	<i>Epigaea repens</i>	TRAILING ARBUTUS	7	UPL
	<i>Gaultheria procumbens</i>	WINTERGREEN	5	FACU
	<i>Gnaphalium macounii</i>	CLAMMY CUDWEED	2	UPL
	<i>Gymnocarpium dryopteris</i>	OAK FERN	5	FAC
	<i>HIERACIUM CAESPITOSUM</i>	KING DEVIL	0	UPL
	<i>Juniperus communis</i>	COMMON or GROUND JUNIPER	4	FACU
	<i>Lycopodium clavatum</i>	RUNNING GROUND PINE	4	FAC
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>Melampyrum lineare</i>	COW WHEAT	6	FAC-
	<i>Oryzopsis asperifolia</i>	ROUGH LEAVED RICE GRASS	6	UPL
	<i>Oryzopsis pungens</i>	RICE GRASS	9	UPL
	<i>Panicum xanthophysum</i>	PANIC GRASS	6	UPL
	<i>Pinus banksiana</i>	JACK PINE	5	FACU
	<i>Pinus strobus</i>	WHITE PINE	3	FACU
	<i>POA COMPRESSA</i>	CANADA BLUEGRASS	0	FACU+
	<i>POA PRATENSIS</i>	KENTUCKY BLUEGRASS	0	FAC-
	<i>Polygala paucifolia</i>	GAY WINGS	7	FACU

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area G cont.	<i>Polygonatum pubescens</i>	DOWNY SOLOMON SEAL	5	UPL
	<i>Prunus virginiana</i>	CHOKE CHERRY	2	FAC-
	<i>Pteridium aquilinum</i>	BRACKEN FERN	0	FACU
	<i>Quercus rubra</i>	RED OAK	5	FACU
	<i>Rosa blanda</i>	WILD ROSE	3	FACU
	<i>Rosa carolina</i>	PASTURE ROSE	4	FACU-
	<i>Rubus allegheniensis</i>	COMMON BLACKBERRY	1	FACU+
	RUMEX ACETOSA	GREEN SORREL	0	UPL
	RUMEX ACETOSELLA	SHEEP SORREL	0	FAC
	TARAXACUM OFFICINALE	COMMON DANDELION	0	FACU
	<i>Toxicodendron radicans</i>	POISON IVY	2	FAC+
	<i>Vaccinium angustifolium</i>	BLUEBERRY	4	FACU
	<i>Vaccinium myrtilloides</i>	CANADA BLUEBERRY	4	FACW-
	<i>Viola adunca</i>	SAND VIOLET	4	FAC-
	<i>Woodsia ilvensis</i>	RUSTY WOODSIA	10	UPL
Habitat Area H	<i>Agropyron trachycaulum</i>	SLENDER WHEAT GRASS	8	FAC
	<i>Agrostis hyemalis</i>	TICKLEGRASS	4	FAC-
	<i>Amelanchier sanguinea</i>	ROUND LEAVED SERVICEBERRY	5	UPL
	<i>Amelanchier spicata</i>	SHADBUSH SERVICEBERRY	4	FACU
	<i>Anaphalis margaritacea</i>	PEARLY EVERLASTING	3	UPL
	<i>Apocynum androsaemifolium</i>	SPREADING DOGBANE	3	UPL
	<i>Aralia hispida</i>	BRISTLY SARSAPARILLA	3	UPL
	<i>Asplenium trichomanes</i>	MAIDENHAIR SPLEENWORT	10	UPL
	<i>Aster ciliolatus</i>	NORTHERN HEART LEAVED ASTER	4	FACU-
	<i>Aster macrophyllus</i>	BIG LEAVED ASTER	4	UPL
	<i>Brachyelytrum erectum</i>	LONG AWNED WOOD GRASS	7	UPL
	<i>Calamagrostis canadensis</i>	BLUEJOINT	3	OBL
	<i>Calystegia spithamea</i>	LOW BINDWEED	8	UPL
	<i>Carex oligosperma</i>	SEDGE	10	OBL
	<i>Carex scabrata</i>	SEDGE	4	OBL
	<i>Chenopodium hybridum</i>	MAPLE LEAVED GOOSEFOOT	1	UPL
	<i>Danthonia spicata</i>	POVERTY GRASS; OATGRASS	4	UPL
	<i>Deschampsia flexuosa</i>	HAIR GRASS	6	UPL
	<i>Diervilla lonicera</i>	BUSH HONEYSUCKLE	4	UPL
	<i>Dryopteris intermedia</i>	EVERGREEN WOODFERN	5	FAC
	<i>Epilobium leptophyllum</i>	FEN WILLOW HERB	6	OBL
	<i>Gymnocarpium dryopteris</i>	OAK FERN	5	FAC
	<i>Juniperus communis</i>	COMMON or GROUND JUNIPER	4	FACU
	<i>Lycopodium clavatum</i>	RUNNING GROUND PINE	4	FAC
	<i>Melampyrum lineare</i>	COW WHEAT	6	FAC-
	<i>Oryzopsis pungens</i>	RICE GRASS	9	UPL

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HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area H cont.	<i>Panicum xanthophyllum</i>	PANIC GRASS	6	UPL
	<i>POA PRATENSIS</i>	KENTUCKY BLUEGRASS	0	FAC-
	<i>Prunus virginiana</i>	CHOKE CHERRY	2	FAC-
	<i>Rosa blanda</i>	WILD ROSE	3	FACU
	<i>Rubus allegheniensis</i>	COMMON BLACKBERRY	1	FACU+
	<i>Salix humilis</i>	PRAIRIE WILLOW	4	FACU
	<i>Solidago nemoralis</i>	OLD FIELD GOLDENROD	2	UPL
	<i>Viola adunca</i>	SAND VIOLET	4	FAC-
	<i>Woodsia ilvensis</i>	RUSTY WOODSIA	10	UPL
Habitat Area I	<i>Abies balsamea</i>	BALSAM FIR	3	FACW
	<i>AGROSTIS GIGANTEA</i>	REDTOP	0	FAC
	<i>Agrostis hyemalis</i>	TICKLEGRASS	4	FAC-
	<i>Alnus rugosa</i>	TAG ALDER	5	OBL
	<i>Athyrium filix-femina</i>	LADY FERN	4	FAC
	<i>Calamagrostis canadensis</i>	BLUE JOINT GRASS	3	OBL
	<i>Carex canescens</i>	SEDGE	8	OBL
	<i>Carex communis</i>	SEDGE	2	UPL
	<i>Carex debilis</i>	SWAMP SEDGE	6	FACW
	<i>Carex disperma</i>	SEDGE	10	OBL
	<i>Carex gynandra</i>	SEDGE	3	FACW+
	<i>Carex intumescens</i>	SEDGE	3	FACW+
	<i>Carex scabrata</i>	SEDGE	4	OBL
	<i>Carex scoparia</i>	SEDGE	4	FACW
	<i>Carex stipata</i>	SEDGE	1	OBL
	<i>Circaea alpina</i>	SMALL ENCHANTER'S NIGHTSHADE	4	FACW
	<i>Cirsium muticum</i>	SWAMP THISTLE	6	OBL
	<i>Coptis trifolia</i>	GOLDTHREAD	5	FACW
	<i>Cornus canadensis</i>	BUNCHBERRY	6	FAC
	<i>Drosera rotundifolia</i>	ROUND LEAVED SUNDEW	6	OBL
	<i>Dryopteris cristata</i>	CRESTED SHIELD FERN	6	OBL
	<i>Epilobium leptophyllum</i>	FEN WILLOW HERB	6	OBL
	<i>Equisetum sylvaticum</i>	WOODLAND HORSETAIL	5	FACW
	<i>Eriophorum virginicum</i>	TAWNY COTTON GRASS	8	OBL
	<i>Eupatorium perfoliatum</i>	COMMON BONESET	4	FACW+
	<i>Gaultheria hispidula</i>	CREeping SNOWBERRY	8	FACW
	<i>Hypericum ellipticum</i>	PALE ST. JOHN'S WORT	9	OBL
	<i>Ilex verticillata</i>	MICHIGAN HOLLY	5	FACW+
	<i>Juncus brevicaudatus</i>	RUSH	8	OBL
	<i>Juncus effusus</i>	SOFT STEMMED RUSH	3	OBL
	<i>Larix laricina</i>	TAMARACK	5	FACW
	<i>Maianthemum canadense</i>	CANADA MAYFLOWER	4	FAC
	<i>NASTURTIUM OFFICINALE</i>	WATERCRESS	0	OBL

WETLAND AND COASTAL RESOURCES, INC.

HABITAT AREA	SCIENTIFIC NAME	COMMON NAME	C	WETNESS
Habitat Area I cont.	<i>Osmunda cinnamomea</i>	CINNAMON FERN	5	FACW
	<i>Osmunda claytoniana</i>	INTERRUPTED FERN	6	FAC+
	<i>Picea mariana</i>	BLACK SPRUCE	6	FACW
	<i>Polygonatum biflorum</i>	SOLOMON SEAL	4	FACU
	<i>Ribes glandulosum</i>	SKUNK CURRANT	5	FACW
	<i>Ribes triste</i>	SWAMP RED CURRANT	6	OBL
	<i>Rubus strigosus</i>	WILD RED RASPBERRY	2	FACW-
	<i>Salix humilis</i>	PRAIRIE WILLOW	4	FACU
	<i>Scirpus atrovirens</i>	BULRUSH	3	OBL
	<i>Scirpus cyperinus</i>	WOOL GRASS	5	OBL
	<i>Typha latifolia</i>	BROAD LEAVED CATTAIL	1	OBL
	<i>Viola blanda</i>	SWEET WHITE VIOLET	5	FACW-
	<i>Viola sororia</i>	COMMON BLUE VIOLET	1	FAC-

* Wetness ratings from Wilhelm 1992

UPL	Upland	< 1% probability of occurrence in wetlands
FACU	Facultative Upland	1% - 33% probability of occurrence in wetlands
FAC	Facultative	34% - 66% probability of occurrence in wetlands
FACW	Facultative Wetland	67% - 99% probability of occurrence in wetlands
OBL	Obligate Wetland	>99% probability of occurrence in wetlands

Positive (+)	Indicates wet tendency
Negative (-)	Indicates dry tendency

ATTACHMENT C-3

Table 3.2
Floristic Quality Assessments for Habitat Areas

Table 3.2. Floristic Quality Index (FQI) values calculated from native taxa, and native and adventive taxa for habitat areas identified on the Eagle Project site.

Habitat Area	FQI (native plant species)	FQI (all plant species)
A1	26.4	25.7
A2		
B	43.4	42.9
C1	23.5	23.5
C2	17.4	17.4
D	20.2	17.2
E1	42.8	42.5
E2	28.0	28.0
E3	28.0	28.0
F	56.5	55.6
G	31.5	29.3
H	28.5	28.1
I	31.8	31.1

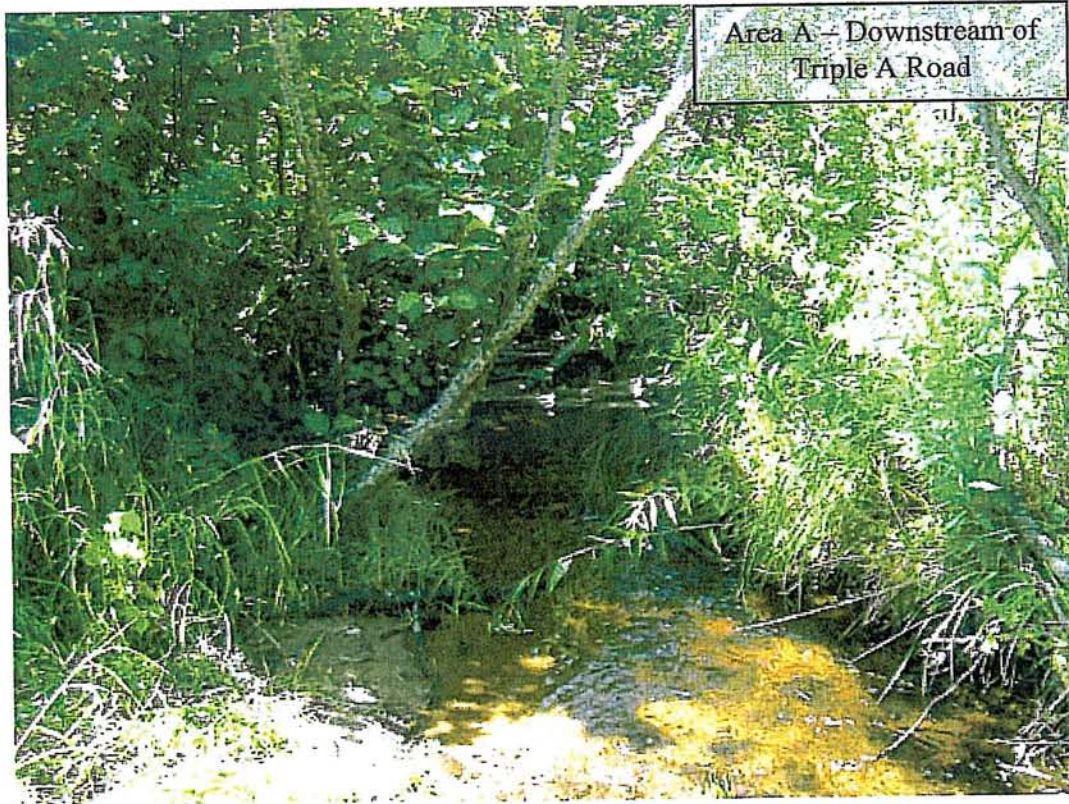
APPENDIX D

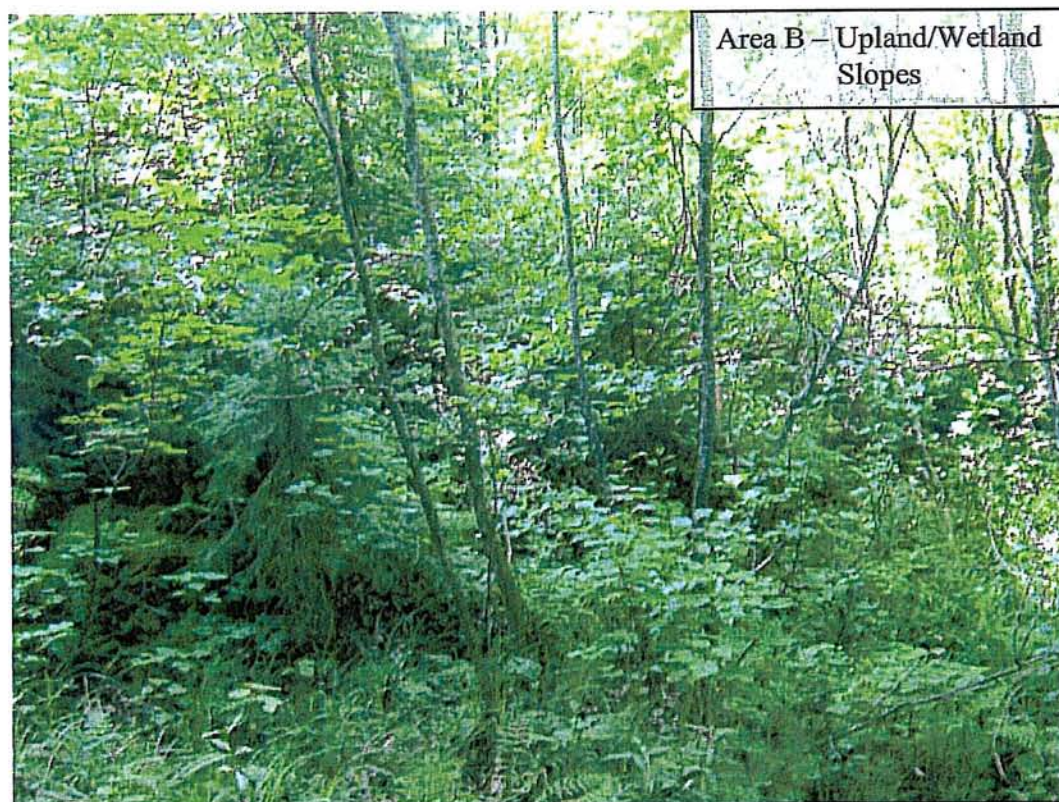
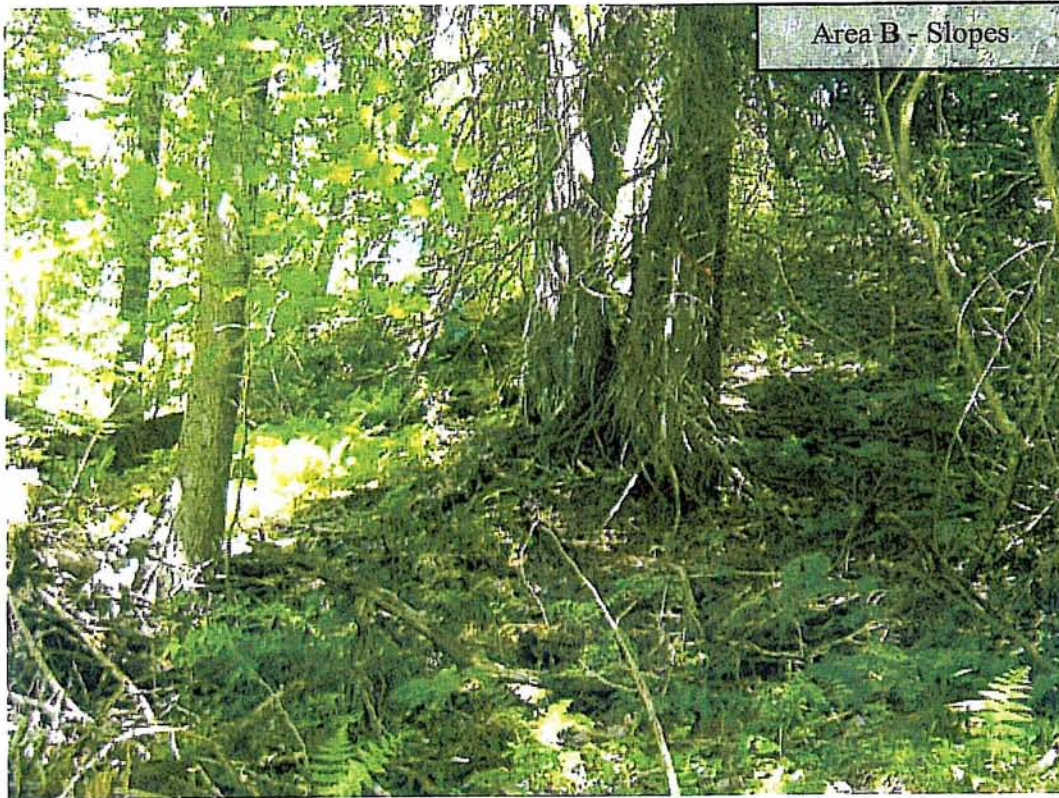
Photographs of Habitat Areas

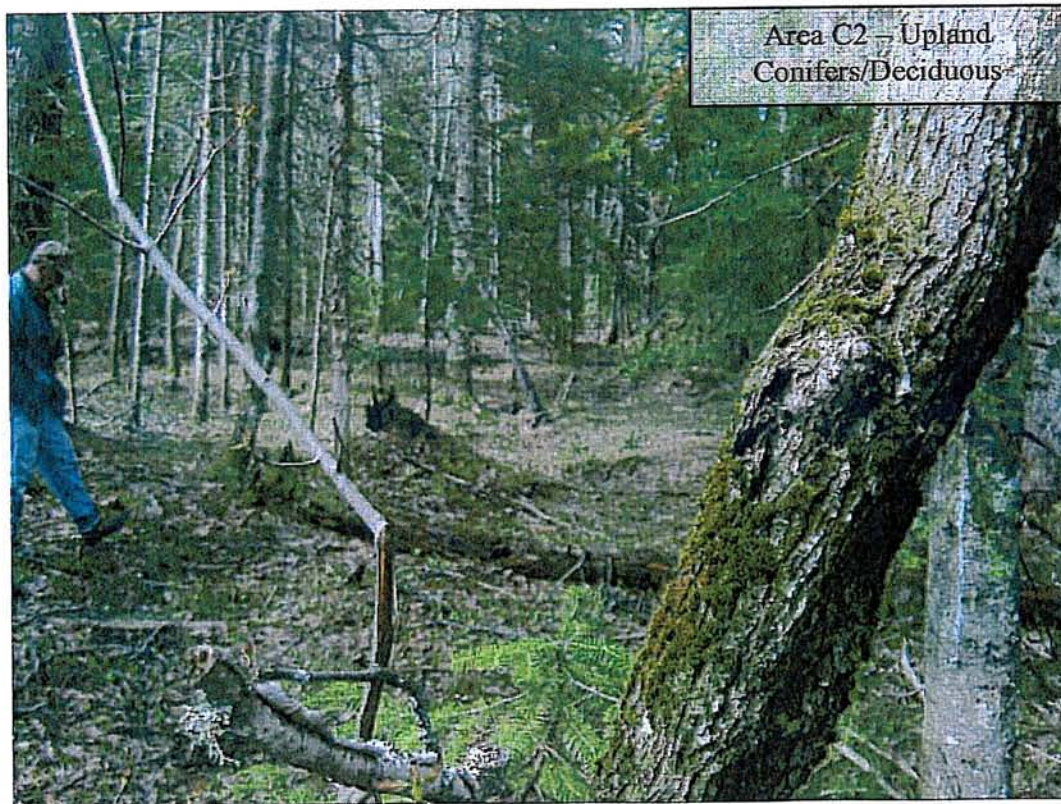
Area A – Upstream of
Triple A Road



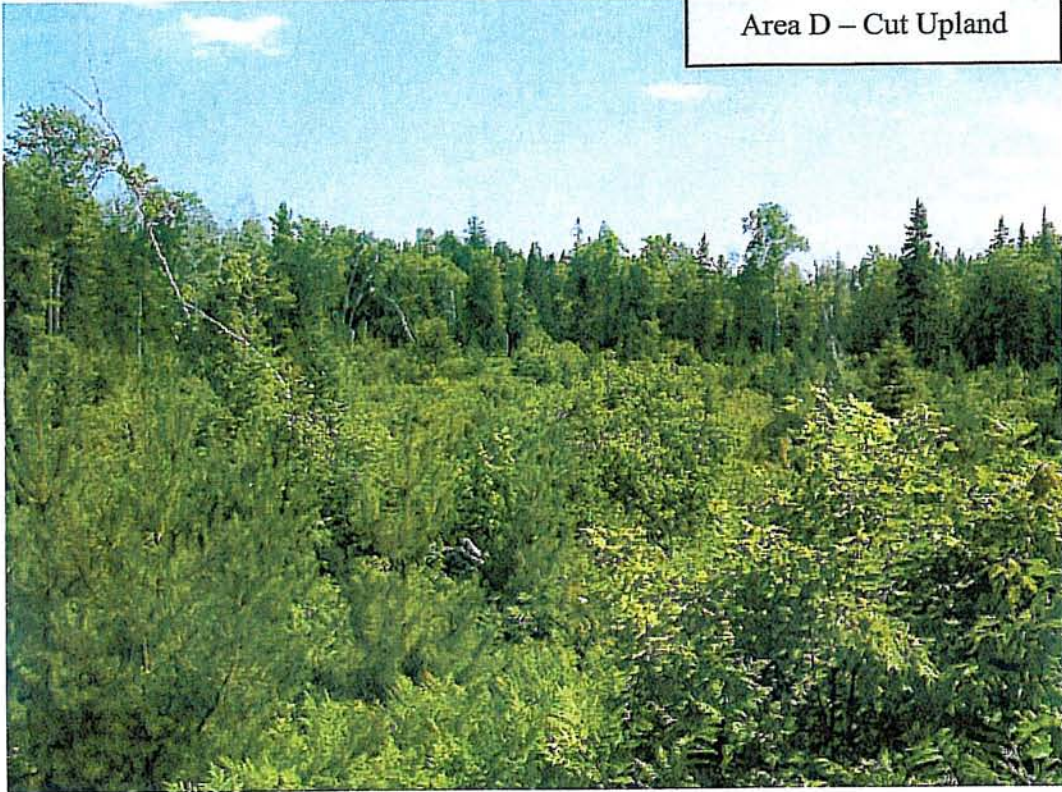
Area A – Downstream of
Triple A Road







Area D – Cut Upland



Area D – Recently Cut
Upland



