Draft Terrestrial Resources and Wetland Delineation Study
Plan/Scope of Work

Juneau Hydropower Inc.

Sweetheart Lake Hydroelectric Project P-13563

July 2011
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<th>Acronym</th>
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<tr>
<td>ADFG</td>
<td>Alaska Department of Fish and Game</td>
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<td>ADNR</td>
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<tr>
<td>af</td>
<td>Acre foot or feet</td>
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<td>Alaska Exotic Plants Information Clearinghouse</td>
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1.0 Introduction

In December 2010, the Federal Energy Regulatory Commission (FERC) in Washington D.C. issued to Juneau Hydropower Inc. (JHI) a Preliminary Permit (Permit) for the Sweetheart Lake Hydroelectric Project (FERC No. 13563, Project). This Botanical resources and Wetland delineation study plan addresses the Lower Sweetheart Lake, Sweetheart Creek, and immediate area and associated facilities Project and is based on Project details provided in the Preliminary Application Document issued July 2010 and prepared by JHI.

The operational proposal include a storage dam; the current proposal is to draw water from Lower Sweetheart Lake in such a way as to contain lake level fluctuations to 60 feet, with final drawdown prescriptions to be determined based on further economic and environmental considerations. The proposed Project consists of an intake structure at Lower Sweetheart Lake, a dam at Lower Sweetheart Lake, a power conduit consisting mostly of tunnels, and a steel penstock leading to a buried or partially buried powerhouse located above or adjacent to the barrier falls at Sweetheart Creek. An operators' house would be built either collocated at the powerhouse or built away from the powerhouse and situated toward the dock infrastructure on Gilbert Bay.

Transmission of electricity would occur either by a mix of submarine and overhead transmission traversing the west side of Gilbert Bay or through a submarine cable across Gilbert Bay to the Snettisham transmission line point of interconnection. (Figure 1).

Figure 1. Proposed Project Boundary and Transmission Line Alternatives.
During the initial consultation agency meeting of the Project, stakeholders, including entities representing the State of Alaska, the U.S. government, indicated the necessity to determine if there are potential Project effects on terrestrial resources stemming from land disturbances related to Project construction and operation. This study plan responds to study requests and issues made during the initial agency meeting held October 28, 2010 and subsequent written comments, while outlining work to comply with federal laws and regulations.

Wetland resource data gathering, field surveys and delineation discussed in this plan will be used by the US Army Corps of Engineers, the FERC and other state and federal resource agencies to help evaluate and resolve impacts of the Project prior to issuance of the Project license.

### 2.0 Terrestrial Resources Study: Goals and Objectives

Together with existing information, the goal of the study effort described in this plan is to provide baseline information, which will inform an assessment of potential Project impacts on terrestrial resources in the study report. The objectives of this study are to provide supporting information which will provide the basis for an assessment of the potential resource impacts of the proposed Project that were identified during development of the PAD, public comment, and FERC scoping for the License Application, as follows:

- Impact of Project construction and operation on wildlife distribution and abundance.
- Impact of Project construction and operation on wildlife during critical life stages.
- Impact of Project construction and operation (lake level fluctuations) on Lower Sweetheart Lake shoreline vegetation and/or habitats used by wildlife species.
- Impact of Project construction and operation (lake level fluctuations, Project roads, and facilities) on distribution and abundance of invasive plant species.
- Impact of Project construction and operation (lake level fluctuations, Project facilities) on distribution and abundance of rare plant species.
- Impact of Project construction and operation (lake level fluctuations, hydrologic changes in Sweetheart Creek, and facilities construction and maintenance) on wetland, forest/scrub, riparian, and shoreline habitats on Lower Sweetheart Lake (including at Upper Sweetheart Lake Creek) and Sweetheart Creek.
- Impact of Project construction and operation on wildlife use of wetland, riparian, and littoral habitats.
- Impact of Project operation on littoral habitats on Lower Sweetheart Lake.
3.0 Terrestrial and Wetlands: Existing Information and Need for Information

3.1 Existing Information
An investigation of botanical resources has been performed in the Project vicinity under the USDA Forest Service Alaska Region Final Environmental Impact Statement. Proposed Recreational Development and Independent Timber Sale Gilbert Bay/Holkham Bay Area Southeast Alaska and a study conducted related to the recreational carrying capacity conducted by the USFS in 2001.

Figure 2. 1980 FEIS Gilbert Bay Holkam Bay Study Area
Botanical Resources

The Sweetheart Lake watershed is dominated by rock and ice landforms. Primarily alpine tundra and coastal rainforest, with limited occurrences of muskeg dominate the remaining area. The lakes within the watershed are deep and have precipitous shorelines that provide almost no opportunity for the development of riparian or wetland vegetation.

At tidewater, near the proposed powerhouse, the general habitats (or plant communities) occurring in the area include coniferous forest, forest edge, rocky outcrops, and stream banks. The predominant vegetation is Sitka Spruce-Western Hemlock Forest. General habitats (or plant communities) occurring in the upper elevations near Lower Sweetheart Lake and Upper Sweetheart Lake include alpine, lake margins, and rock outcrops.

Common trees likely occurring in the Project area include Alaska cedar (Chamaecyparis nootkatensis), Sitka spruce (Picea sitchensis), Western hemlock (Tsuga heterophylla) and Mountain hemlock (Tsuga mertensiana). A variety of tall and low shrubs vegetate the Project area, including common types such as Sitka alder (Alnus sinuata), Devil's club (Oplopanax horridum), Thimble berry (Rubus parviflorus), Salmonberry (Rubus spectabilis), Alaska blueberry (Vaccinium alaskaense), Creeping willow (Salix stolonifera), Club-moss cassiope (Cassiope lycopodioides) and Dwarf blueberry (Vaccinium caespitosum).

An assortment of forbs, sedges, rushes, grasses, ferns and mosses also occur in the area. The only threatened, endangered, or proposed threatened or endangered plant in Alaska is Polystichum aleuticum, which is listed as endangered. It is only known from Adak Island and is not expected to occur in the Project area.

In the USFS Shoreline-Based Recreation Carrying Capacity Analysis 2001 for the Port Snettisham area: No rare or sensitive taxa were found after the completion of two surveys that covered 0.5 miles of shoreline.

National Wetlands Inventory (NWI) mapping exists for the Project vicinity (Figure 3,4).
Figure 3. Project Wetlands, northeast portion at proposed 600 foot elevation

Figure 4. USFWS Sweetheart Flats wetland types
3.2 Need for Additional Information

In addition to existing information, additional site specific data are needed to evaluate specific Project effects. Field studies will supplement existing information in the following areas:

- Refine existing vegetation mapping to support other vegetation and wildlife analyses by reviewing recent aerial photography.
- Identify the presence and location of any sensitive plant species, in accordance with Forest Service guidelines and practices, to develop a draft Biological Evaluation.
- Locate any populations of invasive plant species in accordance with Forest Service guidelines and practices.
- Identify and classify existing wetlands and other “waters of the U.S.” in accordance with US Army Corps of Engineers practices to define areas subject to federal regulation and policies.
4.0 Botanical Resources and Wetlands Study Methods

4.1 Study Area
The study area includes the area on east side of Gilbert Bay and the North side of Sweetheart Creek in the general facility of the proposed Project facilities. The study extends to the proposed project shoreline of Lower Sweetheart Lake to the east and the potential overland transmission route to the west. The study area includes all proposed Project facilities along Lower Sweetheart Lake, Sweetheart Creek and proposed transmission line routing (Figure 1).

4.2 Field Study Design
The Botanical Resources Study is comprised of three components that will include a combination of desk and field based efforts: Study Component #1 – General Vegetation Type Mapping; Study Component #2 – Sensitive Plant Survey and Invasive Plant Survey; and Study Component #3 – Wetland Mapping and ground truthing.

Background protocol from the USFS Tongass Land Management Plan Forest wide guidance on Plant Surveys and Vegetation Mapping: PLA3 (Page 4-42)

I. Plant Surveys and Vegetation Mapping
A. Plant survey protocols for National Environmental Policy Act (NEPA) and other projects should follow FSM 2670, R10 protocols, and Tongass Forest-wide Standards and Guidelines.
B. When implementing any invasive and sensitive species field surveys or inventories, a complete list of vascular plants found should be created for each survey.
C. For biological evaluations, consult FSM 2670 and R10 supplemental directions for Threatened, Endangered, and Sensitive.
D. Resource report should be prepared to document the findings or absence of rare plants during field surveys for NEPA projects.
E. Use the Existing Vegetation Classification and Mapping Technical Guide FSM 1940 and the most current and available methods to develop baseline vegetation types Forest-wide.
F. Identify vegetation inventory needs for all Wildernesses to meet the “minimum stewardship levels” per the Wilderness Act of 1964. Accomplish baseline vegetation inventory needs commensurate with other Forest inventory efforts.
G. Accomplish baseline vegetation inventory needs commensurate with other forest inventory efforts.

A review of existing information will be conducted for all three study components as an initial study task. The field work for the study components will include the following activities:

- Conduct a sensitive plant survey to produce the baseline information for a Biological Evaluation for Plants.
- Conduct an invasive plant survey (concurrent with sensitive plant survey).
- Conduct wetland delineations sufficient to determine the locations of resources subject to authority of the Clean Water Act and Executive Order 11990. The wetland survey will include a detailed survey of areas directly affected by the Project and a general survey of the larger Project vicinity.
4.2.1 Study Component #1 – General Vegetation Type Mapping

Vegetation Type Mapping

The purpose of this study is to prepare an accurate vegetation type map for the Project vicinity using existing GIS layers, existing USFS Vegetative GIS information, existing aerial photography, and available satellite imagery. The map will be used to plan routes for the sensitive and invasive plant surveys and to assist in delineating wetlands prior to field work.

Vegetation cover information is available for areas within the Project vicinity from the USFS from historical data compiled in the 1980 FEIS. Satellite imagery is available for part of the Project vicinity, as well as dated aerial photography sets from different years that can be used for interpretation of vegetation types.

The only Forest-wide vegetation map currently available and known is the Tongass Existing Veg map, a GIS-based data set that was derived from the former Timber Type database. In Existing Veg, forested stands are identified by broad forest canopy cover types. Information for forested stands includes dominant overstory species, type for low productivity stands, size class (e.g., seedling, sapling, young growth, or old growth), and volume class for productive stands. Generic non-forested types are also mapped (e.g., ice, shrub, muskeg, beach, alpine, and sand).

Methods

In order to prepare a vegetation type map for the study area, the following tasks will be performed:

- Acquire and compile existing GIS vegetation cover type layers from available sources, including the USFS and other governmental sources.
- Acquire and compile existing aerial photography and satellite imagery from the USFS, other governmental sources, and private sources to overlay on the existing cover type layers. Examine any visible vegetation boundaries in the photos or imagery to fix or update type polygon boundaries.
- Determine specific locations to conduct the sensitive and invasive plant surveys and the detailed wetland delineation. Specific areas for survey will be those that may experience physical disturbance during Project construction or operation. These areas include the perimeter of Lower Sweetheart Lake, which will be affected by changes in the water surface elevation; a corridor including the Lower Sweetheart Lake outlet and surrounding areas that will be in proximity of the Sweetheart Dam infrastructure, and Sweetheart Creek, which will encompass construction of an intake and diversion structure, a powerhouse, a tailrace, a switchyard located near the powerhouse, a road and power line traversing from the powerhouse and dock facilities.
- A corridor that includes a service road construction and an overhead transmission line corridor extending north on the west side of Gilbert Bay and may include electrical transmission line towers and anchor locations, if the transmission line is located overhead.
- Produce a final vegetation type map that displays vegetation type polygon boundaries, the study area, and specific Project components and impact areas.
• Use vegetation type map to produce a table of vegetation types and calculate the percent acres of each vegetation type present in the study area in general, in areas potentially affected by the Project, and in directly affected wildlife habitats.

4.2.2 Study Component #2 – Sensitive Plant Survey and Invasive Plant Survey

Sensitive Plant Survey

Sensitive plants, as referenced throughout this study plan, are plant species formally identified by Region 10 of the USFS in 2009. These plant species are listed in Appendix A. There are no federally listed threatened or endangered plant species known to occur in the study area. (TLMP 3-97) The USFS documents its protection of sensitive plant species in conjunction with Projects on lands under its jurisdiction through preparation of a Biological Evaluation for Plants. The objectives of the Biological Evaluation for Plants are specified in the Forest Service Manual Part 2672.41 (USFS 1995) as: (1) to ensure that actions do not contribute to loss of viability of any native or desired nonnative plant or animal species; (2) to incorporate concerns for sensitive species throughout the planning process; and (3) to ensure that activities will not cause a species to move toward federal listing as a threatened or endangered species.
In addition, the Tongass Land and Resource Management Plan (USFS 2008) directs the USFS to “Avoid, minimize, or mitigate adverse affects to rare plants and populations during project planning to maintain known distributions throughout the Tongass National Forest.” (page 4-41).
The purpose of this study is to develop the information necessary for Juneau Hydropower Inc. to meet USFS goals and objectives related to sensitive plant species. This study will determine the locations and abundance of sensitive plants on USFS lands in areas potentially affected by the Project to allow preparation of a Biological Evaluation for Plants. The findings from the baseline study will be presented in the form of the baseline portion of the Biological Evaluation for Plants.

The following tasks are necessary after the baseline study for completion of the Biological Evaluation:

- Determine the proposed Project’s potential effects on sensitive plant species (including possible PM&E measures).
- Develop appropriate mitigation measures if needed to avoid, minimize, reduce over time, and compensate for adverse effects on sensitive plants.
- Assess the risk the Project would pose to sensitive plants based on the consequence and likelihood of adverse effects.

After these analyses are documented in the Biological Evaluation, JHI will submit the draft Biological Evaluation for Plants to the USFS and FERC.

**Sensitive Plant Survey Methods**

The study will begin with a review of existing information on sensitive plants and their habitats, and conditions that may be found in the Project vicinity. The body of existing information includes:

- USFS protocols for sensitive plant surveys and Biological Evaluations; (see Appendix B).
- Known habitat preferences and general geographic distributions of listed sensitive plants (Forest Service sensitive plant manual).
- Known geographic locations of sensitive species in Southeast Alaska (USFS digital records; Alaska Natural Heritage Program database).
- Existing vegetation mapping of the Project vicinity (USFS GIS database).
- Existing aerial photography.
- Locations and results of past surveys for sensitive plants in the Port Snettisham, Gilbert Bay and Tracy Arms areas (USFS files).

The study methods are based on the Procedures for Sensitive Plant Biological Evaluations, March 2009 and included here as Appendix B. Prior to field work, the following tasks will be performed. Staff will compile and review existing information on known locations, habitat preferences, and general geographic distributions of sensitive vascular plant species. The records to be reviewed may be obtained from the Tongass National Forest Supervisor’s Office, the USFS Alaska Region Botanist, and the Alaska Natural Heritage Program. Based on the available information, staff will identify locations of habitats suspected to support sensitive species within the study area. Habitat may also be identified through interpretation of aerial photographs, existing GIS vegetation layers, known plant locations, consultation with USFS and other resource experts, and incidentally in conjunction with other ecological studies being performed for the licensing study program.
The following tasks will be performed:

- Conduct a Level 5 (intuitive controlled) intensity survey in areas potentially affected by the Project, specifically the Sweetheart Lake shoreline. This level allows intensive searches in those areas with the highest potential for finding sensitive plants. Areas of focus for the sensitive plant survey will be habitats known or suspected to support sensitive plants in the Tongass National Forest, as directed in the Procedures for Sensitive Plant Biological Evaluations within the USFS sensitive plant manual. These may include heath, alpine and subalpine areas, wet meadows, shallow fresh water, forest edges, rock outcrops, well drained open areas, open forests, waterfalls, and stream banks. The exact areas of focus will be determined after review of available information and based on professional judgment in the field.

- Keep records of field surveys according to current USFS protocols for sensitive species surveys, including use of the R10 2008 TES Plant Element Occurrence Form, the R10 2009 Pre-Field Review Worksheet, and the National 2008 USFS Plant Survey Field Form (Appendix C). Survey locations will be recorded with GPS. Habitats likely to support sensitive plants will be thoroughly searched. The searches will employ the concepts of the timed meander method (Goff et al. 1982) without following that method exactly; each area will be searched until the surveyors are comfortable that further searches would not find any sensitive species. Any sensitive plant populations discovered will be described according to current USFS protocols. A voucher specimen from each sensitive plant population will be collected, pressed, and submitted to the Herbarium, University of Alaska-Fairbanks, if the population includes over 20 individuals and if a voucher is needed for positive identification.

- Identify in the field, or collect for identification, any unknown plants observed in the field.

- Compile field data and develop GIS coverage of survey areas and any sensitive plant sightings.

- Submit voucher specimens and report sensitive plant locations to the USFS and Alaska Natural Heritage Program.

- Prepare draft Biological Evaluation for Plants.

- Incidental observations of large mammals, raptors and other wildlife will be recorded during field surveys.

Invasive Plant Survey

Compared to the lower 48 states, Alaska has a low level of invasive plants, but it is growing. As inventories have increased, more non-native species have been documented in Southeast Alaska on NFS lands (Schrader and Hennon 2005). Not all non-natives are invasive. Executive Order 13112 (1999) defines an “invasive species” as a species that is 1) non-native (or alien) to the habitat under consideration, and 2) whose purposeful or accidental introduction causes or is likely to cause economic or environmental harm or harm to human health. Executive Order
13112 directs all federal agencies to address invasive species concerns and refrain from actions likely to increase invasive species problems.

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Invasive plants, for the purposes of this study are those that fall under the definition of Executive Order 13112 (1999).

Many invasive species are known to exist on USFS lands and in the Tongass Forest. Survey results of all non-natives found on the Tongass are documented in the AKEPIC inventory. The 2008 TLMP FEIS identified 17 non-native species found in the Juneau Ranger District.

The Tongass Land Management Plan goal and objective (page2-4) is to: Manage the Forest in order to reduce, minimize, or eliminate the potential for introduction, establishment, spread, and impact of invasive species. Forest wide objectives and guidelines are identified on page 4-22 of the TLMP. The goal and objective of Project Planning is to:

A. For all proposed projects or activities, the responsible line officer will determine the risk of invasive species (flora and fauna) introduction or spread and the need to implement appropriate mitigation measures.

B. Ensure that contracts, permits, and project design documents contain appropriate provisions concerning the prevention and/or spread of invasive species.

A subset of invasive plants is designated as “noxious weeds”, which are plants that are especially destructive and difficult to control. Importation, labeling, and sale of their seed are legally controlled under Alaska Administrative Code 11 AAC 34.020. USFS guidance directs the USFS to manage and control noxious weeds (USFS 1995).

**Invasive Plant Survey Methods**

The survey will be conducted at the same time as the sensitive plant survey, and will take place within areas on USFS lands potentially affected by the Project (Figure 1). Areas of likely infestation for invasive species include roadsides, soil disturbance areas, motorized vehicle travel routes, boat traffic routes, exiting trails, lake and stream access points, developed or social recreation sites, and other disturbances and human use areas.

The following tasks will be performed:

- Compile and review existing information on any nearby known locations of invasive vascular plants.
- Identify and map potential disturbances caused by Project activities using available GIS layers for roads, trails, access points, cleared areas, or other infrastructure features.
• Identify previous data collection points in the GIS database from prior studies.
• While conducting the sensitive plant survey, observe any invasive species. If invasive species are identified, record the location with a GPS unit. If large populations of a particular species are found, record only one data point to represent the general area of infestation. If a particular species is found at many sites close to one another, record only one data point. Record at least one data point for each unique invasive species that is encountered. Use judgment in the field to decide if a population represents a unique infestation or is likely to have spread from an adjacent infestation.
• Complete the field form recommended by AKEPIC, which is also recommended for use by the USFS for invasive plant surveys on USFS land (Appendix D). Record GPS location information, data, observers, observer affiliation, detailed site information, detailed location information, and specific species information. This includes: exotic plant species code, infested area, canopy cover, disturbance age, stem count, collection information, control action, and aggressiveness. Details on what these field form terms mean is included on the field form. Not all fields must be filled out, but investigators will answer as many as possible. The important point in this study is to note location by GPS, species name, and approximate size of the infestation.
• Collect and preserve voucher specimens from populations that are not known from this area.
• Submit field form data copies to AKEPIC for the statewide database record.
• Prepare a brief technical memorandum for the study area that describes the current infestations of invasive species. Discuss briefly the impact that Project activities may have on existing populations. Discuss briefly the potential of Project activities to introduce new populations.

4.2.3 Study Component #3 – Wetland Mapping

Recognizing the potential for continued or accelerated degradation of the Nation's waters, the U.S. Congress enacted the Clean Water Act (hereafter referred to as the Act), formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344). The objective of the Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands.

For federal regulatory purposes, wetlands are considered a subclass of Special Aquatic Sites (40 Code of Federal Regulations [CFR] Section 230.3) and have been deemed Waters of the United States (33 CFR 328.3). All waters of the United States are subject to regulation through the Clean Water Act by the Corps and EPA. Sections 404 and 401 of the Clean Water Act were created specifically with the intent “to restore and maintain the chemical, physical, and biological integrity of our Nation’s waters.” Executive Order 11990, as amended (42 U.S.C. 4321 et. seq.), requires federal agencies “to avoid...adverse impacts associated with the destruction or modification of wetlands...wherever there is a practicable alternative” and to “include all practicable measures to minimize harm to wetlands.” Further, the agencies are required to preserve and enhance the natural and beneficial values of wetlands in carrying out their responsibilities.
The purpose of this study is to identify and describe wetlands and other potential “waters of the U.S.” in the Project vicinity (Figure 1), in order to prepare a wetland report sufficient to apply for a permit from the US Army Corps of Engineers (USACE). The wetland report will describe locations near the Project that are potentially subject to the authority of Section 404 of the Clean Water Act or Executive Order 11990.

**Wetland Study Plan Objectives**

The Wetlands study component information will be valuable in the preparation of the final license application and also provide the necessary baseline habitat descriptions for compliance with the National Environmental Policy Act and the Endangered Species Act. Additionally, the final products from the study component will provide a baseline from which project effects (e.g., water level fluctuation, etc.) can be assessed and mitigation options can be developed.

The objectives of the wetland inventory study are to:

- Develop a GIS database on the extent, classification, species composition, and plant community structure on wetland habitats within the Project;
- Collect information on the source of supporting hydrology for Project wetlands and determine the hydrologic interdependence of these habitats to the reservoirs so that the effects of Project operations can be more fully evaluated;
- Collect function and value information for the Project wetlands, preliminarily Identify habitat sensitive features and priority habitats that may be associated with Project wetlands, identify recreation-related impacts, etc.;
- Provide the necessary baseline data to support determination of potential project impacts; and
- Provide habitat-related information so that the studies of wetland-associated analysis species can be performed in a thorough, efficient manner.
- Develop potential alternatives.

The objectives of the aerial photograph interpretation are to:

- Provide an initial cover type map for use in the field verification of cover types.

**Methods**

Wetland mapping will include the following tasks:

- Prepare a preliminary wetland delineation map prior to field work using existing NWI mapping and interpretation of the most current aerial photography or satellite imagery and the vegetation type map.
- Conduct a field survey of areas potentially disturbed by Project activity. Collect detailed information on soil conditions, hydrology, and plant community composition in representative upland and wetland sites using guidelines from the 1987 wetland delineation manual (USACE 1987) and 2007 Alaska Regional Supplement (USACE 2007). Use standard 2007 Alaska Regional Supplement data sheets (Appendix E). This field survey will not include flagging, staking, or on-
site GPS collection of geographic coordinates for complete wetland boundaries. Rather, coordinates of representative boundaries will be collected by GPS in the field and complete boundaries will be drawn in the GIS. This level of on-site boundary data collection is assumed to meet the USACE’s requirements for jurisdictional determination.

- Prepare a final wetland map for areas potentially disturbed by Project activity using field delineation results.
- Prepare a general Project vicinity wetland map using results from aerial photograph and NWI map interpretation. Classify wetlands and other waters by NWI type. Show field data collection locations. Prepare a table of acres per NWI class using data and maps.
- Prepare a wetland report that will include a detailed map of areas potentially disturbed by Project activity, the general map of the entire study area, methods and findings, and copies of the field data forms.
- Incidental observations of large mammals, raptors and other wildlife will be recorded during any wetland study field work.
- Identify potential opportunities for resource protection, mitigation and enhancement (PM&E).

4.3 Data Analysis

The vegetation type mapping component will calculate the percent acres of each vegetation type present in the study area. Data will be presented in a summary table.

The sensitive and invasive plant surveys require no specific data analysis. However, the draft Biological Evaluation for Plants using results of the sensitive plant survey and a technical memorandum describing the results of the invasive plant survey will be produced. Locations of both types of plants will be noted and mapped. Records of daily surveys will be completed and filed per study plan direction.

The wetland delineation will include a calculation of acres of each NWI class of wetland and other types of “waters of the U.S.”. The calculated acres will be presented in a summary table as part of the wetland report.

Data from the results of vegetation type mapping and surveys of sensitive and invasive plants and wetlands will be used to briefly describe potential Project effects. Vegetation type mapping will also be used to support the Wildlife Resources Study.

5.0 Wildlife Resources Study: Goals and Objectives

Wildlife groups were identified for study based on a review of agency management goals and existing information. The primary objective of wildlife surveys for the Project is to provide existing baseline distribution and abundance information on target species. This information will be used to guide the impact evaluation and mitigation planning as a result of potential adverse impacts of the proposed Project. In addition, some study components are necessary to meet
specific resource agency requirements. The following objectives outlined below have been identified to assess potential impacts to wildlife in the study area:

- Document presence and distribution information to allow the Project to minimize or avoid impacts to protected species, including bald eagles and other raptors, and other birds of special interest;
- Characterize through existing information and survey the existing wildlife communities and quantify the distribution and abundance of target wildlife species during key seasons of activity in the study area;
- Classify and map wildlife habitat in the study area in conjunction with the Botanical Resources Study.
- Assess the effects of Project-related hydropower operations areas on these wildlife communities.
- Provide information to assist in developing any potential protection, mitigation, and enhancement (PM&E) measures.

6.0 Wildlife Resources: Existing Information and Need for Information

6.1 Wildlife Existing Information

The Sweetheart Lakes and Sweetheart Creek Basin wildlife resources are described in this document in three categories: 1) large mammals, 2) small mammals and furbearers; and 3) birds.

**Large Mammals**

Three species of large mammals are known to inhabit the Sweetheart Lake and Sweetheart Creek basin, including:

**Deer**

The **Sitka black-tailed deer** (*Odocoileus hemionus sitkensis*) is native to the wet coastal rain forests of Southeast Alaska and north-coastal British Columbia. Sitka black-tailed deer are unevenly distributed in Game Management Unit 1C (Juneau Area).
Figure 7. Winter Habitat for Sitka Black-tailed Deer
**Mountain Goat**

The **mountain goat** (*Oreamnos americanus*) is the single North American representative of a unique group of mountain ungulates called the Rupicaprinae, or “rock goats”.

In Alaska, mountain goats occur throughout the southeastern Panhandle and continue north and west along the coastal mountains to Cook Inlet. Mountain goats mate in November and December and kidding season is late May or early June. Mountain goats are both grazing and browsing animals, depending on the particular habitat and season of the year. They normally summer in high alpine meadows where they graze on grasses, herbs and low-growing shrubs.

Most goats migrate from alpine summer ranges to winter at or below tree line, but some remain on windswept ridges. Hemlock is an important winter diet item, but feeding habitats in winter are mainly a matter of availability.

Mountain goats are sensitive to disturbance by aircraft (especially helicopters) and ground activities (Foster and Rahs 1983, Côté 1996), which has led to recommendations that helicopters avoid goat habitat by a buffer distance of 2 km. However, goats also are able to habituate to well-managed activities that restrict behavioral disturbance, flight altitudes, and approach distances (Smith and Van Daele 1987, Goldstein et al. 2005).

Goldstein et al. (2005) found that goats on steep slopes near escape terrain in coastal Alaska showed milder responses to helicopter disturbance than did goats on less steep ridges inland in Alberta, but also suggested that goats in areas where hunting is legal would be more disturbed by helicopter landings that dropped off people in goat habitat.

Mountain goats around the Terror Lake Hydroelectric Project on Kodiak Island experienced relatively few project-related impacts, evidently because it was located in an area of spring and summer habitat that received low-density use, and they appeared to habituate to human facilities and activities (Smith and Van Daele 1987). The key to habituation is found that human activities be predictable and nonthreatening.

**Bear**

**Brown bears** (*Ursus arctos*), occur throughout Alaska except on islands south of Frederick Sound in Southeast Alaska. Coastal brown bears appear but are not the predominant bear specie in both the Project area. Brown bears occur in the Gilbert Bay and Sweetheart Creek areas.

**Black bears** (*Ursus americanus*) are the most abundant and widely distributed of the three species of North American bears. In Southeast Alaska, black bears occupy most of the mainland and some islands with the exceptions of Admiralty, Baranof, Chichagof, and Kruzof. Black bears occur in the Gilbert Bay and Sweetheart Creek areas. Two large mammal species are suspected to inhabit or traverse the project area: **Wolverines** (*Gulo gulo*) and **Wolves** (*Canis lupus*).
Figure 8. Southeast Alaska Black and Brown Bear Habitat
**Small Mammals and Furbearers**

Furbearers in the Project boundary area include marten, mink, and river otter. Populations might be high enough to sustain trapping, but travel distances and access difficulties likely reduce trapping effort in the area. Small mammals include red squirrel, deer mice, voles, and shrews. Most of these are important prey species for furbearers and raptors.

**Birds and Waterfowl**

The areas of concern within the proposed Project where avian species are likely to be affected are the forested shorelines along the transmission corridor and at the powerhouse area and access corridor. Within the Juneau area more than 270 species have been recorded. However, only 77 are commonly observed in the Juneau area. Fewer species may be observed in the Project boundary area, since the Project area does not contain the black cottonwood and shallow intertidal habitats present in the Juneau area.¹

Few if any directed bird surveys have been conducted in the Sweetheart Lake Gilbert Bay areas or their watersheds, although some studies have been conducted in Port Snettisham. The Project boundary area offers habitat for a number of raptor species including bald eagle, northern goshawk, and several owl species. Forest bird species would most likely be similar to the numerous ones found on the coastal mainland such as thrushes, sparrows, warblers, woodpeckers, crows and ravens. Waterfowl frequenting the lakes and bays include swans, geese, and various species of ducks.

In order to mitigate and help eliminate bird strikes, JHI will implement suggested state of the art avian protection practices as identified and promoted by the Avian Power Line Interaction Committee (APLIC) in 2006 for all prospective overhead transmission line segments for the project.

The USFWS has identified two bird candidates for listing as threatened or endangered that may be present. Kittlitz’s murrelet (*Brachyramphus brevirostris*) and Yellow-billed loon (*Gavia adamsii*) may use marine waters seasonally within the project area.

Kittlitz’s murrelet is a seabird that uses marine waters from Thomas Bay near Petersburg, north through coastal western Alaska. This species often feeds near tidewater glaciers and in areas affected by glacier streams and rivers, and typically nests in rocky recently glaciated landscapes.

Yellow billed loons are found throughout Southeast Alaska, especially during winter and during spring and fall migrations. Some non-breeding individuals may remain in Southeast Alaska.

As candidates, these species have no formal legal protection under the Endangered Species. Under this study plan we will identify if presence exists and if found take no activity that would compromise security of the species.

The Queen Charlotte goshawk (*Accipiter gentilis laingi*) is a large forest raptor that nests and hunts in mature and old growth forests throughout Southeast Alaska. The USFS has established

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¹ AELP Draft Environmental Assessment Lake Dorothy 2003
standard goshawk nesting protocols. All raptor and avian surveys will include as a goal, the detection of goshawk nesting stands and if detected, JHI will adjust project plans to mitigate impact on these birds and their nesting stands.

Bald eagles (*Haliaeetus leucocephalus*) are not listed as threatened or endangered in the State of Alaska; however, bald and golden eagles throughout the United States, including Alaska, are protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) and the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712). The Bald and Golden Eagle Protection Act restricts activities that may adversely affect eagles or their nests. Knowledge of where eagle nests occur in the Project boundary area will help resource managers and JHI avoid impacts to bald eagles and their nests.

There are three known and recorded bald eagle nests in the area near the proposed powerhouse as identified by the USFWS Alaska Bald Eagle Nest Map provided by the USFWS depicted in the map below.
There are no formally-listed species under the jurisdiction of the USFWS within the project area (USFWS 2010).

6.2 Need for Additional Information

Despite the existing information available for the Project vicinity, data is needed to fill gaps in available information on species presence, abundance, distribution, and habitat use in areas potentially affected by the Project. Previous baseline data collected for the 1980 Gilbert Bay/Holkam Bay EIS in the 1980s provide a general understanding of wildlife in the region of
the proposed Project, but area data is now almost 30 years old. Additional information on current wildlife use in the area is available from ADFG hunting and trapping records and any animal surveys that might have incorporated the Project area. However additional information is necessary to evaluate potential impacts of the proposed Project.

### 7.0 Wildlife Resources Study Methods

#### 7.1 Study Area

The wildlife study area includes the area on east side of Gilbert Bay and the North side of Sweetheart Creek in the general facility of the proposed Project facilities. The study extends to the proposed project shoreline of Lower Sweetheart Lake to the east and the potential overland transmission route to the west. The study area includes all proposed Project facilities along Lower Sweetheart Lake, Sweetheart Creek and proposed transmission line routing (Figure 1).

#### 7.2 Field Study Design

The Wildlife Resources Study is comprised of two main field based survey efforts: Study Component #1 – Raptor Nesting Surveys; Study Component #2 – Terrestrial Mammals, Study Component #3 PM&E. Provide information to assist in developing any potential protection, mitigation, and enhancement (PM&E) measures.

A review of existing information will be conducted for all three study components as an initial study task. The field work for the study components will include the following activities:

- Conduct an aerial survey for nesting raptors in suitable habitats near the Project.
- Conduct ground survey for nesting raptors in Project areas and infrastructure to be located on the east side of Gilbert Bay.
- Conduct an aerial survey for Brown and Black Bear spring den emergence in suitable habitat near the Project.
- Conduct an aerial survey for Goat and Wolves in suitable habitat near the Project.
- Document incidental observations of goat and other terrestrial mammal locations during other components of study.

All wildlife-related study plans will be developed in association with and in collaboration with Alaska state and federal resource agencies, including USFS, ADFG, USFWS, NGOs, and tribes. The objectives of the wildlife study are to: 1) Characterize through existing information and survey the existing wildlife communities of the Project boundary area; 2) Assess the effects of Project-related hydropower operations areas on these wildlife communities; and 3) Provide information to assist in developing any potential protection, mitigation, and enhancement (PM&E) measures.
7.2.1 Study Component #1 – Raptor Nesting Surveys

Raptor species are included in these studies because of their legal or conservation status, sensitivity to disturbance, and traditional use of nesting territories. All raptors are currently protected by the Migratory Bird Treaty Act (16 U.S.C. 703-712) and bald and golden eagles are afforded special protection under the Bald and Golden Eagle Protection Act (16 USC, Section 668). Additionally, the northern goshawk and osprey are listed as USFS SSI (USFS 2005). A 660-foot buffer around bald eagle nests is recommended to minimize the chances that eagles might abandon an active nest (USFWS). Table 1 Bald Eagle Nest Planning Table extracted from the USFWS National Bald Eagle Management Guidelines (May 2007) suggest the following buffers:

**Category A:**
Building construction, 1 or 2 story, with project footprint of ½ acre or less. 
Construction of roads, trails, canals, power lines, and other linear utilities. 
Agriculture and aquaculture – new or expanded operations. 
Alteration of shorelines or wetlands. 
Installation of docks or moorings. 
Water impoundment.

**Category B:**
Building construction, 3 or more stories. 
Building construction, 1 or 2 story, with project footprint of more than ½ acre. 
Installation or expansion of marinas with a capacity of 6 or more boats. 
Mining and associated activities. 
Oil and natural gas drilling and refining and associated activities.

<table>
<thead>
<tr>
<th>If the activity will be visible from the nest</th>
<th>If there is no similar activity within 1 mile of the nest</th>
<th>If there is similar activity closer than 1 mile from the nest</th>
</tr>
</thead>
<tbody>
<tr>
<td>660 feet. Landscape buffers are recommended.</td>
<td>660 feet, or as close as existing tolerated activity of similar scope. Landscape buffers are recommended.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1. Bald Eagle Nest Planning Table**

The numerical distances shown in the table are the closest the activity should be conducted relative to the nest.
These laws require any significant development project to identify and protect current nest sites because many raptor species are susceptible to human disturbance during the nesting season. Determining the location of raptor nests is a critical item that needs to be established to avoid impacts to nesting raptors from other field study events and Project development.

The primary objective of the raptor survey is to determine the distribution, abundance, and nesting status of large diurnal raptors near the Sweetheart Lake Hydroelectric Project. The survey effort will focus bald eagles and possible Queen Charlotte Goshawks although all raptor species and other avian species that are observed and identified will be recorded. The objectives of the 2011 raptor survey include the following:

- Locate, identify, and map tree and cliff-nesting raptor nest locations
- Compile a comprehensive list of raptor species nesting in the Project vicinity
- Briefly analyze potential Project effects and propose potential strategies to avoid and minimize impacts to raptors

**Raptor Survey Area**

The study area for raptors includes the proposed development footprint of the Project (access road, powerhouse, dock, and transmission line on east side of Gilbert Bay and the North side of Sweetheart Creek in the general facility of the proposed Project facilities. The study extends to the proposed project shoreline of Lower Sweetheart Lake to the east and the potential overland transmission route to the west. The study area includes all proposed Project facilities along Lower Sweetheart Lake, Sweetheart Creek and proposed transmission line routing (Figure 1).

Potential nesting habitat for eagles was surveyed in 2003 and 2009 and are shown on Figure 9.

**Raptor Nest Survey Methods**

A helicopter-based aerial survey will be conducted in all suitable cliff habitats and forested areas that could provide nesting habitat for cliff- and tree-nesting raptors near areas potentially affected by Project. The surveys will generally follow linear routes (i.e., along Sweetheart Creek, the Sweetheart Lake shoreline, Gilbert Bay proposed dock area shoreline and along powerhouse access road and transmission line alignments) and will include a 660-foot buffer around proposed Project facilities. The helicopter will fly a slow and low-level (<150 feet above ground level (agl) flight pattern during the aerial survey. Observers will be seated on the same side of the aircraft during the surveys. All suitable nesting habitat will be scrutinized for raptor nests and other signs of occupancy (e.g., aggressive or perched birds). Standard operating procedures for raptor surveys include searching suitable woodland stands in riparian areas, lakeshores and other suitable habitat. Cliffs and other suitable habitat areas may require multiple passes at different distances and angles to view them sufficiently.

When a nest or potential nesting pair is observed, observers will record the location on a USGS map and with a hand-held GPS. The following additional data will be recorded on a data sheet:

- Species (if determined, otherwise “unknown”)
- Number of adults and their behavior (particularly if defensive)
- Nest status (inactive or unoccupied, active or occupied, and undetermined)
- Tree species or substrate type (cliff, bluff top)
- Habitat type (riparian, broadleaf, coniferous)
- Nest condition and approximate location on substrate
- Height and exposure (for cliff nests)

A nest will be recorded as active (occupied) if an adult was observed to be incubating eggs, if eggs and/or young are observed, or if a pair of adults was closely associated with a nest (either exhibiting defensive behaviors near the nest or perched in or adjacent to the nest). A nest will be recorded as inactive (unoccupied) if the nest was located but no adults or signs of nesting activity are obvious.

A ground survey to confirm aerial observation will occur for all nests located near the proposed: dock, access road to powerhouse, and proposed powerhouse infrastructure.

Incidental observations of large mammals and other wildlife will be recorded during the raptor surveys.

### 7.2.2 Study Component #2 – Terrestrial Mammal Surveys

Several species of terrestrial mammals have been documented or are thought to occur in the Project vicinity. Mammal surveys for the 2011 studies will focus on brown and black bears and mountain goat, but observations of other species: deer, wolves and wolverines will be recorded during all wildlife surveys. Due to weather and cost constraints, aerial surveys may be limited. Target time periods to best utilize flight time will be discussed among consulting agencies. JHI may wish to coordinate aerial surveys with either ADFG or USFS to share personnel and expense.

Conduct a possible 2011 bear collaring program in conjunction with ADFG and conduct a 2012 aerial survey for brown and black bear spring den emergence in suitable habitat near the Project and baseline aerial survey for goat with possible collaring program.

**Bears.** Brown and black bears are found throughout the Project vicinity during the spring, summer, and fall. They may be found in a variety of habitat types, but brown bears tend to prefer open habitats, particularly shrub and tundra communities at higher elevations, while black bears tend to prefer forested habitats at lower elevations.

The distribution of both species of bears is affected strongly by food availability. Emerging grasses, forbs, and other herbaceous plants are critical foods in spring, whereas spawning salmon and berries are critical foods in late summer. Both species enter dens during October or November and remain there until April to mid-May, with maternal females entering dens before and emerging later than males.

Disturbance to denning bears could result in human/bear conflicts and abandonment of dens and/or cubs. The analysis for this study will include a discussion of the potential direct and indirect effects on brown bears resulting from construction of the access route and transmission line, as well as the anticipated effects of increased human-wildlife interaction due to use of the new access road.

The surveyors will fly at a low altitude of 200-400 feet agl with two observers and the pilot looking for bears, dens, and tracks. Recently vacated dens will be identified by the characteristic presence of soil over the snow in den entrances and the presence of fresh tracks around dens or
trails leading away. The location, species, and number of cubs and adults will be recorded as well as any prominent movement corridors that are visible in the snow.

Aircraft during bear surveys will also be dispatched to observe and record other non-bear habitats to incidentally observe and record mountain goats in the Project area. JHI will attempt to use Super Cub aircraft which can travel at slow speeds for better wildlife observation.

JHI will work with ADFG staff to determine any bear collaring program particulars.

**Goats.**

JHI will work with ADFG personnel to develop aerial survey program for possible goat that range over the Project boundary. Upon confirmation of Goat prevalence and density within Project boundary, JHI will work with ADFG staff to determine any successive goat collaring program.

### 7.2.3 Study Component #3 – PM&E.

Provide information to Project to assist in developing any potential protection, mitigation, and enhancement (PM&E) measures.

Whether human access, blasting, excavation or other activities might disturb wildlife during construction of Project generation and transmission facilities. Whether water regimes might disturb or enhance wildlife post construction.

Whether increased human access provided by access corridors or clearings would affect populations of wildlife subject to hunting or trapping. Impacts from increased public access into the Sweetheart Creek drainage area by way of the proposed access road and other Project features will be discussed in the technical memorandum.

Evaluate and provide an understanding of the effects of Project operations, both the current and any reasonable future water regimes, on the wildlife resources within the Project boundary area. Current condition of the existing wildlife community will be assessed through their vegetative structure, species composition, and distribution within the Project boundary area. These factors will be related to the existing water regime to assess potential Project effects. The analysis will incorporate use of GIS overlay maps of, topographic contours, water levels, and other relevant information.

### 7.3 Data Analysis

a. **Study Component #1 – Raptors** – Prepare a technical report that includes methodology, results, and figures showing the location of raptor nests, and briefly discusses potential Project effects.

b. **Study Component #2 – Terrestrial Mammals** – Prepare a technical report that includes methodology, results, and figures showing the location
and bear density in the study area, and will discuss potential Project effects related to increased public access.

c. **Study Component #3 – PM&E.**

Locations of sensitive wildlife and plants may be treated as confidential in accordance with management agency direction. Results of Wildlife Resource Surveys will be used to evaluate potential impacts of the proposed Project.

### 8.0 Agency Resource Management Goals

Management and land use plans relevant to terrestrial resources studies include:

- Juneau Coastal Management Plan. City and Borough of Juneau, Alaska Department of Natural Resources;
- Juneau State Land Plan, Alaska Department of Natural Resources.

### 9.0 Project Nexus

The proposed Project may have potential impacts on terrestrial resources within Sweetheart Creek and Lower Sweetheart Lake. The studies described above are intended to provide sufficient information regarding the nature of the existing terrestrial resources such that these potential impacts can be adequately assessed. A discussion of the data will be presented in the study report, and will be used to inform the development of protection, mitigation, and enhancement measures to be proposed in the draft and final License Applications.

### 10.0 Consistency with Generally Accepted Practices

#### 10.1 Botanical Resources

Mapping techniques will follow standard practice used by the USFS (Forest Service Handbook (FSH) 2409.12) and will employ staff with proven GIS expertise.

The sensitive plant survey and completion of a Biological Evaluation for Plants will follow guidelines and protocols established by the USFS.

The invasive plant survey will follow guidelines and protocols established by the Alaska Natural Heritage Program and the USFS.

Wetland delineation follows regulations and practices established by the US Army Corps of Engineers for the Alaska Region and the USFWS NWI.
10.2 Wildlife Resources
The Raptor nesting surveys will follow standard operating procedures for conducting raptor
nesting surveys as required by the USFS and the USFWS.
Mammal surveys will follow protocols established by the ADFG.

11.0 Schedule for Conducting the Study

11.1 Botanical Resources

Vegetation Mapping
Existing information will be acquired and preliminary maps prepared in late summer/fall 2011, prior to field work in 2011. The technical memorandum will be prepared in winter 2011.

Sensitive Plant Survey
Field surveys will be conducted fall 2011. Data will be compiled and the baseline sections of a draft Biological Evaluation for Plants will be prepared in winter 2011.

Invasive Plant Survey
Field surveys will be conducted between late summer and fall 2011. Data will be compiled and a technical memorandum of the results will be prepared in winter 2011.

Wetland Mapping
Field surveys will be conducted during the growing season in summer/fall 2011. Data will be compiled and a wetland report will be prepared in winter 2011.

11.2 Wildlife Resources

Raptor Nesting Surveys
The raptor nest surveys will be conducted in spring/summer 2012. The Raptor Nest Survey Report will be prepared in summer 2012.

Terrestrial Mammal Surveys
A bear den emergence aerial survey will be conducted in mid-May 2012. A Terrestrial Mammal Technical Report will be drafted in winter summer 2012 and will incorporate all incidental observations of terrestrial mammals and results from the bear denning survey.
Any mammal collaring program will be coordinated and administered in conjunction with ADFG management and personnel.

11.3 Field Logistics
Food, lodging and transportation for the field crew will be supplied by the M/V Lizzy J, a fully contained vessel to be anchored in Gilbert Bay for periods requiring overnight stay for the
duration of the 2011 survey and 2012 survey, if necessary. In the absence of the M/V Lizzy J, another suitable vessel will be supplied. A vessel with power will be supplied for reconnaissance and field crew transportation in and around Gilbert Bay. At no time will trash or waste of any kind be emitted from the vessel. A small power skiff will be used on Lower Sweetheart Lake. A helicopter or float plan will be necessary to access survey areas on Lower Sweetheart Lake. Logistics and timing of surveys will be closely coordinated with JHI.

Agency personnel and Tribal personnel may attend field visits upon approval of JHI, contractor and field logistic arrangements.

12.0 Provisions for Technical Review

Opportunities for a review of draft study plans by agencies and the public will be scheduled near the time of the FERC scoping meeting and in the fall for discussion of field study results. All study plans and reports will be reviewed by JHI for subsequent distribution for review by agencies and interested parties.

12.1 Quality Control

All field work will be performed to professional industry standards by qualified team members. Senior and experienced professional staff will conduct pre-field work reviews of all study plan components.

*Botanical Resources*

All field forms will be reviewed daily if possible or otherwise within a week of field work completion. Field forms will be reviewed by a qualified team member. Draft reports, maps, and calculations will be reviewed by a senior staff member.

The vegetation type map will be reviewed by a senior and qualified staff member.

The sensitive plant survey results, including the preparation of a draft Biological Evaluation for Plants, will be reviewed and approved by a senior scientist. Field forms will be checked for accuracy by a qualified team member. Unknown plants that are potentially sensitive will be collected and identified if the populations can support their collection.

The invasive plant survey results, including the preparation of a technical memorandum, will be reviewed and approved by a senior scientist. Field forms will be checked for accuracy after completion. Data entry will be checked for accuracy by a qualified team member.

Wetland field forms will be checked for accuracy by a qualified team member. Final reports and the delineation map will be reviewed by a senior scientist.

*Wildlife Resources*

The technical reports will be in a form suitable to support development of Exhibit E of the License Application for the proposed Project. All field forms will be checked for accuracy and completeness at the end of each survey effort. Field forms and data entry will be reviewed by a qualified team member. Draft reports, maps, and calculations will be reviewed by competent personnel approved by ADFG, a senior scientist is preferred.
13.0 References


AKHNP. 2000. Contingency Planning - Sensitive Areas, Rare Plant Species Map Series. Environment and Natural Resources Institute, University of Alaska Anchorage.


# Appendix A Alaska Region Sensitive Plant List

## Alaska Region Sensitive Plant List July 13, 2009

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>USDA Plant Code</th>
<th>Common Name</th>
<th>General Habitat</th>
<th>Ranger District</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aphragmus eschscholtzianus</strong></td>
<td><strong>APES</strong></td>
<td>Eschscholtz's little nightmare</td>
<td>Historic well drained, maritime beach, upper beach meadow, well-drained open areas, tall shrubland, beach/forest ecotone, forest edge, open forest, streamside, riverbank, bog, heath, dry meadow, wet meadow, alpine and subalpine talus slopes, rock outcrop, ultramafic, calcareous</td>
<td>SEWARD, GLACIER, COORDOVA, YAKUTAT, JUNEAU, ADMIRALTY, HOONAH, SITKA, PETERSBURG, WRANGELL, KETCHIKAN, CRAIG, THORNE BAY</td>
</tr>
<tr>
<td><strong>Botrychium spathulatum</strong></td>
<td><strong>BOSP</strong></td>
<td>Spatulate moonwort</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Botrychium tunux</strong></td>
<td><strong>BOTU</strong></td>
<td>Moosewort fern</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Botrychium yaaxudakeit</strong></td>
<td><strong>BOYA</strong></td>
<td>Moonwort fern, no common name</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cirsium edule</strong> var. <strong>macounii</strong></td>
<td><strong>CIED</strong></td>
<td>Edible thistle</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cochlearia sessilifolia</strong></td>
<td><strong>COSE</strong></td>
<td>Sessileleaf scurvygrass</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cypripedium gilliwii</strong></td>
<td><strong>CVGI</strong></td>
<td>Spotted lady's slipper</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cypripedium montanum</strong></td>
<td><strong>CYMO</strong></td>
<td>Mountain lady’s slipper</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cypripedium parviflorum</strong> var. <strong>pubescens</strong></td>
<td><strong>CYPAP</strong></td>
<td>Large yellow lady’s slipper</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ligusticum calderi</strong></td>
<td><strong>LICA</strong></td>
<td>Calder’s loveage</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lobaria amplissima</strong></td>
<td><strong>LAMO</strong></td>
<td>Lichen, no common name</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Papaver alboroseum</strong></td>
<td><strong>PAAL</strong></td>
<td>Pale poppy</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Papaver oreophorum</strong></td>
<td><strong>POAL</strong></td>
<td>Mountian poppy</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Polystichum kruckebergii</strong></td>
<td><strong>POKR</strong></td>
<td>Kruckeberg’s swordfern</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Romanzoffia unalascensis</strong></td>
<td><strong>ROUN</strong></td>
<td>Unalaska mist-maid</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tanacetum bipinnatum</strong> subsp. <strong>huronense</strong></td>
<td><strong>TABIH</strong></td>
<td>Dune tansy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Requesting code for variety from USDA PLANTS
** Requesting code for species from USDA PLANTS
Appendix B Guideline for Biological Evaluations

Tongass National Forest-
Guidance for Biological Evaluations:
Sensitive Plants

Drawing by Karl Urban, Umatilla National Forest

Karen L. Dillman, Ecologist
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1.0 Overview
The purpose of this guidance document is to provide information for those conducting Biological Evaluations for sensitive plants on the Tongass National Forest. It is available to help improve the quality and consistency of the Biological Evaluation process for plants across the Forest. Regional direction is also found in FSM 2600 R10 Supplement 2672.42 (Procedure for Conducting Biological Evaluations).

Conducting a Biological Evaluation (BE) is required for all projects (per FSM 2672.4) including those covered under Categorical Exclusions. The purpose of a BE is to analyze and document the possible effects of planned, funded, executed, or permitted programs and activities on sensitive species. There are no threatened or endangered plant species on the Tongass.

The 2008 Standards and Guidelines for sensitive plants of the Tongass Land Management Plan direct that project leaders consult with FS Manual (FSM) 2670 and R10 supplemental direction for sensitive plant guidelines. Additionally it calls for project leaders to “consider the protection around the plant population that meets the habitat needs of the species” (USDA 2008). The BE process will help the interdisciplinary team determine if sensitive plants or their habitats are adversely affected by a proposed project.

2.0 Project Initiation and Pre-field Review

The Project Initiation (PI) and Pre-field Review (PFR) are necessary to efficiently gather information to conduct a Biological Evaluation. They are available on the web at http://fsweb.r10.fs.fed.us/staffs/wfew/index_wfew.shtml.

The Project Initiation Form is given to the project leader by the botanist or ecologist to describe the scope of the project. This information will be used by the botanist or ecologist in the Pre-field review process. A copy of a completed PI is kept in the project files.

The Pre-field Review, prepared by a qualified botanist or ecologist, helps determine if field surveys are needed for a specific project. It also serves as a BE document in certain situations where field surveys were not recommended due to low or no risk to sensitive plants. In Section B of the Pre-field Review, there is space to add habitat information concerning each of the plant
taxa known or suspected in the project area. This information is found in the plant matrix for the sensitive taxa (available from Regional botanist, Tongass ecologist, or District botanist or at http://fsweb.r10.fs.fed.us/staffs/wfew/index_wfew.shtml). Habitat information is necessary in order to leave a trail of logic as to why surveys were or were not recommended. If the Pre-field Review form is used as a BE document, and the person preparing the document does not have the qualifications as stated in the manual (FSM 2672.42) then it must be reviewed and approved by a qualified Tongass botanist or ecologist. The signed, original Pre-field Review document is sent to the project leader and the botanist retains a copy.

2.1 Using the Pre-field Review as a BE

By completing the form and using professional botanical judgment, the botanist may determine that surveys are not necessary for a certain project. In this case the BE is complete with a signed Pre-field review document. Delete lines that give direction in filling out the form (such as “insert here”) that have nothing to do with the final document. The document is signed electronically for the planning record by using /s/ and botanist name and date. A hard copy is signed and dated and sent to the project leader, and a copy is retained by the botanist. The dates should be the same between the hard copy and the electronic copy. A header with the name of the project and the botanist name and date is recommended if the document is more than a few pages in length. If the pre-field review form is being used as a BE, state the plants being analyzed and why, and a statement as to why the other plants are excluded from further analysis as applicable. Use the same sensitive plant determination language in the document.

Some past projects on the Tongass that have conducted a Biological Evaluation and have used the Pre-field Review form as the BE document:

- construction projects on previously disturbed sites with no sensitive plant habitat
- small mine closures
- projects that have a very small footprint and botanical surveys have been completed nearby in the past
- renewals of Special- Use permits or new issuances with no change in use or any ground disturbing activities, and with little or no risk to sensitive plants or their habitat.
- rock-pit expansions adjacent to past harvest areas
- some pre-commercial thinning projects

If the location of the project is known or suspected to have sensitive plant habitat and the Pre-field Review is used as a BE document, the botanist must explain in detail why botanical surveys were not completed for the project. Cite any previous botanical surveys with the name of surveyor and the date if available. Past survey information is now available in NRIS.
3.0 Biological Evaluations
The Region 10 intranet website contains a template for a Biological Evaluation for Plants (See http://fsweb.r10.fs.fed.us/staffs/wfew/index_wfew.shtml). This template is updated periodically on the web and provides basic guidance for the elements outlined below (sections 3.1-3.15). The information below is essential to all BE’s unless the Pre-field Review form is determined to be adequate.

3.1 Cover Title Sheet and Table of Contents
Include within this title page the basic information identifying the botanist, date, the action the BE addresses, and the Forest and/or District (if a District project). Use this information in a header as well. Use table of contents for larger documents.

3.2 Introduction and Summary
Briefly describe the type of analysis done (BE), purpose of BE, basis for the action proposed and location of management actions being analyzed, so that the reader quickly understands the scope of the project being addressed. Describe for what type of analysis the BE supports, an Environmental Impact Statement (EIS) or Environmental Assessment (EA). If the BE is an addendum, then cite the previous BE here by author and date, and include it in the literature cited section. An addendum BE is prepared when there has been additional field work or analysis completed for a project that was not accounted for in the original BE. A new BE is conducted when the project scope or the sensitive species list has changed, or if a new decision will be made concerning a project. An example of an addendum rationale is shown below:

This document is an addendum to the 2001 Biological Evaluation (BE) (Shephard 2001) prepared for the Shoreline/Outfitter Guide (OG) Draft Environmental Impact Statement (DEIS). This addendum contains additional analyses for sensitive plants and their habitats pertaining to: 1) the proposed Large Group Areas identified as having high risk for sensitive plants and their habitats as identified in Shephard (2001) (Table 1); and 2) the 294 currently permitted OG activities in specific geographic locations of the northern Tongass (Appendix 2). In the 2001 BE, the proposed Large Group Areas were assessed as having low, moderate, or high risk to sensitive plants or their habitats due to project activities. Those determined to have low or moderate risk did not receive further analysis in this addendum.
Summarize the findings if it is a project with a lot of information. Mention the plants analyzed along with the risk analysis and determinations.

3.3 Project Description
Use the information gathered from the Project Initiation Form. State how many miles of roads are proposed, alternatives, units, miles of trail etc. Describe the exact location of the project.

3.4 Sensitive Plants
In this section, the document will clearly state the rationale for establishing which species are evaluated. Include the most recent R10 sensitive plant list and habitat matrix as an appendix and a reference to it. The plants that are included in the analysis are the only ones that will have determinations.

In brief, include,

- the list of sensitive plants that are known or suspected to occur on the unit (District or Forest).
- documentation that all species were considered.
- the species that are known or suspected to occur within the project area and potentially be affected by the proposed action.
- a description of any other sensitive species that will be evaluated based on project specific concerns (based on scoping etc).

3.5 Pre-field review of Existing Information
List any sources used in the review, including personal communication or meetings. Include the databases and the date they were used. All formal consultation documents should be identified, including related programmatic plans or assessments

3.6 Plants Known
Use the latitude and longitude (or general location) of the plant and distance from the project area. An example: *Botrychium tunuks*, Yakutat, Canon Beach, 10 miles from project area.
3.7 Sensitive Plants Suspected and Habitat within the project area
This section contains a list of the terrestrial habitats a botanist may encounter while conducting sensitive plant surveys or that are known to exist in the project area. Using aerial photos, GIS, other maps, field surveys, and the PI form, the botanist indicates which habitats are most likely found in the project area. After briefly listing the habitats, more detail can be provided for the habitats of each sensitive plant known or suspected in the project area.

3.8 Field Survey for Sensitive Plants
This section includes the sensitive plants encountered, if any, the botanist who did the surveys with their survey numbers (if applicable), job title and organization, and the dates of surveys.

List plants here if the project area has the appropriate habitat for the plants known or suspected but surveys were not completed in those habitats. Include additional survey recommendations for future dates if applicable.

The survey routes and plant locations are digitized into NRIS at the end of the calendar year for each field season. The BE document should state if the surveys and plant locations are entered into the appropriate database. If they are not entered at the time of the BE preparation, provide a proposed date of data entry and a contact person with the field data. All hard copy records should be filed in the project files and a copy retained by the botanist.
3.9 Sampling Methods

The Forest Service Manual (FSM) 2670 and R10 supplemental direction states that the survey intensity is related to the possible risks associated with the project, the species involved, and the level of knowledge at hand. Therefore, the surveys are commensurate with the risk involved to sensitive plants known or suspected in the project area and the amount of sensitive plant habitat in the project area that may be impacted. The proportion of the project area surveyed and the intensity (levels 1-6) is not based on how much time a botanist has to do surveys or the amount of time an Interdisciplinary Team (IDT) leader for a NEPA project considers adequate. The botanist uses professional judgment to determine the amount and timing of surveys needed for a project after completing the Pre-field Review analysis.

3.10 Determination of Effects

The BE template states: “If the survey levels 5 and 6 were conducted by a qualified botanist at the proper time of year and no sensitive plants were found, then a risk assessment is not warranted and the project as described will not adversely effect any sensitive plants”. If the surveys were not done at the 5 or 6 level, the BE requires a risk assessment (FSM 2672.43).

To complete a risk assessment, direct and indirect effects are examined to determine the level of consequence (Factor 1), and level of likelihood that sensitive plants will be impacted due to project activities (Factor 2) (Figure 1).

3.11 Direct and Indirect Effects

This section identifies the expected effects or threats the proposed action has on each sensitive species evaluated. Describe what and where activities will affect sensitive plants or their habitat and how. If possible, quantify the direct effects. The plants mentioned in the direct and indirect effects section are the same plants that were documented as plants known or suspected for the project area. General statements should be avoided.

The difference between direct and indirect effects is based on when the proposed impacts will occur. Direct effects occur immediately or soon after the implementation of the action (such as...
churning of soils, crushing plants, sedimentation on plants etc.). Indirect effects are those effects that are “reasonably likely” to occur at a later point in time after a project implementation (such as changes in hydrology or intensified or decreased of solar radiation).

3.12 Cumulative Effects

This section includes a list of projects from the past, present and reasonably foreseeable future in the cumulative effects area for sensitive plants. The botanist assesses the effects the proposed actions have had or will have on a species, and then summarize how these effects in relation to the proposed project may cumulatively impact a species. Always provide the reasoning behind the conclusions that are drawn. By using the appropriate database, the botanist may find that surveys have already been done in the same area. District personnel in other resources are also sources of information concerning past projects.

A cumulative effects analysis for sensitive plants includes:

1) a determination of which direct and indirect effects warrant an in-depth assessment of cumulative effects (i.e., which effects could be significant and/or important to the decision maker, if direct effects are minor, then state that cumulative effects are minor). 2) the initial extent for the spatial and temporal bounding for each sensitive plant that is ecologically driven, such as the range of the plant on the Tongass.

3) the past, present, and reasonably foreseeable actions/disturbances within the cumulative effects area.

4) an estimate of the effects (individually, collectively) of the past, present, and reasonably foreseeable actions within the project’s spatial and temporal boundaries on each sensitive plant analyzed.

5) a clear documentation of the rationale used. It may be that information on private land is not available. If this is the case, then state so.

3.13 Risk Assessment

This part of the BE process requires critical thinking and the botanist should present all the rationale behind the decisions made of the risks to sensitive plants or their habitats. The risk assessment is required for each plant known or suspected to occur in the sensitive plant habitats of the project area. The BE process requires the botanist to determine if sensitive plant habitat exists and surveys were not completed for a project, what are the risks to the possible
populations of sensitive plants due to the project activities. Similarly, if sensitive plants were
discovered in the project area, the botanist must consider any adverse impacts. In order to
determine the risks associated with the project on sensitive plants or their habitats the botanist
must consider the consequences of adverse effects and their likelihood.

Appendix C included in the BE Boiler Plate document on the web should always be included in a
BE. http://fsweb.r10.fs.fed.us/staffs/wfew/index_wfew.shtml

The process of identifying the consequences and the likelihood of effects only serves to
document the rationale for arriving at the conclusions for each sensitive plant in the analysis in
the Determination section as per the WO letter dated May 15, 1992.

Both factors are evaluated for each sensitive plant in the analysis. An example of a risk
assessment for a plant found in the project area could be the following: , “Factor 1: The
consequences of adverse effects to *Botrychium tunux* due to project activities are *high* because
this plant has only been found one place in Yakutat. There are approximately 100 acres of
preferred habitat that this plant may occupy where surveys were not conducted. The area
receives other uses such as off-road recreation. An electrical power line runs across one portion
of this habitat. Factor 2: The likelihood of adverse effects from this project is *moderate* because
the boundary of the units can be altered to exclude any edges that reach the preferred habitat of
this plant. The overall risk to *Botrychium tunux* due to project activities is *moderate to high*
because it is not well distributed on the island and there is a chance that the preferred habitat
could occur within the unit boundaries”.

If a sensitive plant has *not* been found in the project area, but is known or suspected, and its
habitat exists in the project area the risk analysis could read: “The consequences of adverse
impacts to *Botrychium tunux* due to project activities is *moderate* because 10 miles of road will
be built through middle to high elevation edge habitat, of which only 10% was surveyed for
sensitive plants. The likelihood of adverse effects from this project is *moderate to high* because
the road construction is permanent, and is not controllable by seasonal or spatial restrictions.
The overall risk to *Botrychium tunux* is *moderate to high* because only a small portion of the
preferred habitat was surveyed and work is not controllable by seasonal or spatial restrictions”.

<table>
<thead>
<tr>
<th>Criteria for Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1. Consequence of Adverse Effect From a Particular Activity</strong></td>
</tr>
<tr>
<td><strong>LOW:</strong> None, or questionable adverse effect on habitat or population. No cumulative effects expected.</td>
</tr>
<tr>
<td><strong>MODERATE:</strong> Possible adverse effects in habitat or on population. Cumulative effects possible.</td>
</tr>
</tbody>
</table>
HIGH: Obvious adverse effects on habitat or population. Cumulative effects probable.

**Factor 2. Likelihood of Adverse Effect From a Particular Activity**

NONE: Activity will not affect habitat or population. (no further risk assessment needed).

LOW: Activity controllable by seasonal or spatial restrictions. and not likely to affect habitat or populations.

MODERATE: Activity not completely controllable or intense administration of project needed to prevent adverse effects on habitat or population. Adverse effects may occur.

HIGH: Activity not controllable and adverse effects on habitat or populations likely to occur.

Figure 1. Text taken from Appendix C of an R10 Biological Evaluation. These criteria should be addressed if sensitive plants and their habitats are known or suspected in a project area and the required level of survey 5 or 6 was not conducted.

### 3.14 Determinations

This section lists the determination for each plant, based on the analysis. The BE document states that these determinations should already take into account standards and guidelines. Any further mitigation measures proposed by the botanist are documented *after* the botanist makes the determination for the plants. The project may negatively impact individual plants as proposed. However, with mitigation measures advised by the botanist, the project may not impact those plants. However, it is never guaranteed that the mitigation measures recommended by the botanist are incorporated in the final EIS.

Use appropriate determination language as stated in FSM R10 Supplement 2672.42 Standards for Biological Evaluations for sensitive species. The determinations should be part of the decision memo for the project.

### 3.15 Summary of essential information to include in a BE document

- District Name
- Name and title of preparer, date of signature
- Location of project-township and range or lat and long
- Description of project-how many acres it will occupy or alter
- Alternatives, if applicable
- Names of surveyors, dates of surveys, and levels of surveys
Determine to the best of your knowledge how much of the project area by sensitive plant habitat was surveyed. Example (10% of the calcareous fens in the project area were surveyed); or how much of a specific proposed action was surveyed (example: 50% of the proposed 20 miles of road were surveyed).

The kinds of sensitive plant habitats expected or known in and around the project area; if there are none, then state this.

Names of sensitive plants that are documented closest to the project area, the date of search, and where the information was found.

If sensitive plant habitat does not exist in the project area, and no surveys were done, then the BE document should state this. This type of project may only need a BE conducted in the form of a Pre-field Review stating why surveys were not done and no impacts to sensitive plants are expected.

Determination language should be consistent with the manual direction (FSM 2672.42) (see Appendix C).

If the botanical surveys were not done at the 5 or 6 levels, then the determination of effects to sensitive plants must also include direct, indirect, and cumulative effects to the plants and their habitats from the proposed project as well as past projects in the area.

If the botanical surveys were not done at the 5 or 6 levels, a risk assessment is warranted for those sensitive plants whose habitats are present in and around the project area.

If a thorough survey (Level 5 or 6) was conducted by qualified botanists at the proper time of year and no sensitive plants were found, a risk assessment is not warranted for the plants suspected in the project (see FSM 2672.43). The determination should read: *This project, as described, is not expected to adversely impact sensitive plants.* The BE ends here.

Determinations for sensitive plants *must not be linked* to the assumption that the recommended mitigation measures will be implemented. The mitigation and monitoring section should be after determinations are stated.

### 3.16 Other writing tips for BE preparation

- A BE addresses only sensitive species, and not those that are considered special interest on the Forest or by Alaska Natural Heritage Program as rare. If special interest plants were found in a project area, they are addressed in a resource report. This report will also go into the planning record for the project.
- Use the term “significant” with caution. Usually this word is reserved for usage within a NEPA document such as an EA or EIS. It has different meanings under ESA and in statistical analysis.
- “Effect” is a noun, and ‘affect” is a verb. These words are often used interchangeably (and often incorrectly). Be sure to spell check thoroughly.
- Acronyms: spell out acronyms when first used in the document.
- Use page headers or footers (with page numbers and the name of the document) to make the document easier to read, review and comment. It is also useful for the planning record to have the header/footer included in the document.
- Spell out months rather than using numbers (e.g. July 2003 versus 7/2003).
Numbers less than 10 are spelled out unless used in combination with numbers greater than 10.

Names of species should be consistently used throughout the text. By including the scientific name the first time a species is mentioned ensures that the reader knows what species or subspecies is being discussed. Put the common name in parenthesis after the first time the scientific name is used.

The word “sensitive” does not have to be capitalized when referring to “sensitive plants”. Be consistent throughout.

For inserted tables and figures: the text is inserted above the table and inserted below a figure.

If you reference a map, and it is not attached to the BE, then reference in detail where to find the map. Ideally the photos with the exact route you traveled should be scanned in and electronically attached to the BE, or made with ArcGis.

If a certain project area has an official name, (i.e. Crystal Creek Project Area or Analysis Area), then use capital letters in “Project Area”, or “Analysis Area” throughout the document when referring to it.

When discussing or describing information that is not considered common knowledge or includes data not collected by the author, always provide a citation to the reference from which the data were obtained.

Literature Cited

USDA 2008. Tongass Land Management Plan. USDA Forest Service Alaska Region

R10-MB-603b

Procedures for Sensitive Plant Biological Evaluations

PRE-FIELD REVIEW WORKSHEET FOR SENSITIVE PLANTS

Biological Evaluation for Sensitive Plants USDA Forest Service, Alaska Region (Revised Feb. 2009)
In some cases this document can serve as a Biological Evaluation (BE) **PROJECT NAME** (from Project Initiation Form, insert here): PROJECT

**DESCRIPTION** (from Project Initiation Form, include description of vegetation types, insert here):

**LOCATION** (from Project Initiation Form, insert here):

**SENSITIVE PLANTS KNOWN:** Check maps (GIS, herbarium databases, ANHP records, floras, hand-made), contact the Regional Botanist, Forest/District Botanists/Ecologists. Document sources of information. Record the plant's habitat, location and distance from the Project area:

Species: Location:
Date of records search:

**SENSITIVE PLANT HABITAT & SENSITIVE PLANTS SUSPECTED IN THE PROJECT AREA:**

A) Obtain habitat information from people familiar with the Project area, Project proponent, GIS (eg. soil map units, timber types, channel type covers), aerial photo interpretation, and/or site visits. Highlight methods used.

**Highlight or underline the following habitats that are likely to occur in the Project area:**

Coniferous forest, deciduous forest, mixed conifer/deciduous forest, dwarf tree forest, forest edge, tall shrublands, low shrublands, rocky areas, rock outcrops, ridgetops, cliffs, serpentine, calcareous areas, gravel, scree, talus, boulder fields, seeps, wet areas, riparian areas (give channel type, if known), streambanks, waterfalls, lake margins, ponds, shallow freshwater, marshes, swamps, estuaries, sphagnum bogs, fens, heath, subalpine meadows, alpine, area dominated by moss or lichen, dry meadows, moist-wet meadows, upper beach meadows, grasslands, maritime beaches, sandy areas, other (describe here).

B) Using your knowledge of sensitive plant habitat needs, or any other sources, indicate the plants (R-10 sensitive plants listed below) suspected that correspond to the above habitats (highlight them below):

<table>
<thead>
<tr>
<th><strong>Botrychium eschscholtzianus</strong></th>
<th><strong>Ligusticum calderi</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Botrychium spathulatum</strong></td>
<td><strong>Lobaria amplissima</strong></td>
</tr>
<tr>
<td><strong>Botrychium tunux</strong></td>
<td><strong>Papaver alboroseum</strong></td>
</tr>
<tr>
<td><strong>Botrychium yaaxudakeit</strong></td>
<td><strong>Piperia unalascensis</strong></td>
</tr>
<tr>
<td><strong>Cochlearia sessilifolia</strong></td>
<td><strong>Platanthera orbiculata</strong></td>
</tr>
<tr>
<td><strong>Cirsium edule var. macounii</strong></td>
<td><strong>Polystichum kruckebergii</strong></td>
</tr>
<tr>
<td><strong>Cypripedium guttatum</strong></td>
<td><strong>Romanzoffia unalaschcensis</strong></td>
</tr>
<tr>
<td>Cyripedium montanum</td>
<td>Sidalcea hendersonii</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Cyripedium parviflorum var. pubescens</td>
<td>Tanacetum bipinnatum subsp. huronense</td>
</tr>
</tbody>
</table>
PROJECT NAME: Lower Sweetheart Lake Hydro Project

PROJECT DESCRIPTION: Juneau Hydropower Inc. proposes to develop a hydropower facility on Lower Sweetheart Lake and Sweetheart Creek in Gilbert Bay. A concrete and rock-faced dam (500 feet long, 90 feet high) would be built at the outlet of Lower Sweetheart Lake. A 9 foot diameter/1,650 foot long penstock would connect to a powerhouse built below the Sweetheart Creek Falls. Water would be returned to the creek at this point via a tailrace. A power transmission line will be either 8.9 miles overhead, or 0.4 miles overhead to Gilbert Bay, and 8.0 miles submerged.

The present surface elevation of the lake is 544 feet; surface area is 1414 acres. Results of the dam construction would raise the lake level by 85 feet and increase the surface area to 1635 acres. Several low-lying areas on colluvial and alluvial deltas, including the drainage from Upper Sweetheart Lake, would be inundated.

Transport of personnel and materials may occur along the shoreline where Sweetheart Creek joins Gilbert Bay. Other disturbance will occur along the penstock route, at the powerhouse/tailrace site, and along the transmission line corridor.

The project area, particularly lake- and streamside, comprises steep forested slopes dissected by numerous incised mass wasting and avalanche chutes. Several streams enter the lake. Shoreline at the mouth of Sweetheart Creek is a combination of intertidal, beach meadow and estuarine habitats.

LOCATION: Quad: Sumdum D5 Dam Infrastructure; Sect. 20 & 29 T 45S R 73E Copper R. Meridian
Quad Sumdum D6 Power House: Sections 24 & 25 T 45S R 72E Copper R. Meridian
SENSITIVE PLANTS KNOWN: Check maps (AKNHP 2008; Hultén 1968; NRIS 2010, UAMNH 2010), contact the Regional Botanist, Forest/District Botanists/Ecologists. Document sources of information. Record the plant's habitat, location and distance from the project area:

*Sidalcea hendersonii* - In the meadow/forest ecotone of the estuary at the head of Howard Bay, approx. 54 miles northwest of the Project area; the only known population in Alaska.

*Cypripedium montanum* - In upper beach meadow/forest ecotone just north of the mouth of Endicott River, approx. 83 miles north-northwest of the project area. Also known in the Haines area, Glacier Bay, the Stikine R., and Etolin Is.

*Botrychium tunux* - Among rocks and gravel in alpine, ridge north of Greens Creek Mine, north Admiralty Is., approx. 30 miles west-northwest of the project area. Also known on Dall Island, ne & w Chichagov Island.

Date of records search: 12 November 2010

SENSITIVE PLANT HABITAT & SENSITIVE PLANTS SUSPECTED IN THE PROJECT AREA:

A) Obtain habitat information from people familiar with the project area, project proponent, GIS (eg. existing vegetation, soil map units, timber types, channel type covers), satellite images, aerial photo interpretation, low elevation aerial photos, snapshot photos, and/or site visits. Highlight methods used.

Highlight or underline the following habitats that are likely to occur in the project area:

- coniferous forest
- deciduous forest
- mixed conifer/deciduous forest
- dwarf tree forest
- forest edge
- tall shrublands
- low shrublands
- rocky areas
- rock outcrops
- ridgetops
- cliffs
- serpentine
- calcareous areas
- gravel
- scree
- talus
- boulder fields
- seeps
- wet areas
- riparian areas (give channel type, if known)
- streambanks
- waterfalls
- lake margins
- ponds
- shallow freshwater
- marshes
- swamps
- estuaries
- sphagnum bogs
- fens
- heath
- subalpine meadows
- alpine area
dominated by moss or lichen, dry meadows, moist-wet meadows, upper beach meadows, grasslands, maritime beaches, sandy areas, other (describe here)

B) Using your knowledge of sensitive plant habitat needs, or any other sources, indicate the plants (R-10 sensitive plants listed below) suspected that correspond to the above habitats (highlight them below):

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Habitat Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aphragmus eschscholtzianus</em></td>
<td>Alpine and subalpine, heath. The nearest known population is on the Seward RD, Chugach National Forest.</td>
</tr>
<tr>
<td><em>Ligusticum caldert</em></td>
<td>Alpine and subalpine, forest edge, wet meadows. Known on s Prince of Wales Is., Dall and Suemez Islands.</td>
</tr>
<tr>
<td><em>Botrychium spathulatum</em></td>
<td>Human disturbance/historic well drained, maritime beach, upper beach meadow, well drained open areas, alpine/subalpine, calcareous. Known on Kruzof Island and w Chichagov Island.</td>
</tr>
<tr>
<td><em>Lobaria amplissima</em></td>
<td>Beach/old-growth forest ecotone facing large bodies of ocean. Known on Mitkof, Kuiu, Baranof, and Prince of Wales Islands, Misty Fiords NM, and Yakutat.</td>
</tr>
<tr>
<td><em>Botrychium tunux</em></td>
<td>Human disturbance/historic well drained, maritime beach, upper beach meadow, well drained open areas, alpine/subalpine, calcareous. This species is known in Yakutat, Dall Island, ne &amp; w Chichagov Island.</td>
</tr>
<tr>
<td><em>Papaver alboroseum</em></td>
<td>Alpine and subalpine, well drained open areas, dry meadows. Known on Seward &amp; Glacier Ranger Districts on the Chugach NF, and e side of Juneau Icefields in British Columbia.</td>
</tr>
<tr>
<td><em>Botrychium yaaxudekeit</em></td>
<td>Human disturbance/historic well drained, maritime beach, upper beach meadow, well drained open areas, calcareous. Known in Yakutat, Glacier Bay, Inian Is (Hoonah RD), and Haines.</td>
</tr>
<tr>
<td><em>Piperia unalascensis</em></td>
<td>Open forest, streamside/riverbank, bog, heath, ultramafic. Known from Duke Is., n Chichagov Is. (Doolth Mt.), Gravina Is., Baranof Is (Red Bluff Bay), Prince of Wales Is. (Rio Roberts).</td>
</tr>
<tr>
<td><em>Cochlearia sessilifolia</em></td>
<td>Maritime beach. Suspected in Chugach NF only.</td>
</tr>
<tr>
<td><em>Platanthera orbiculata</em></td>
<td>Forest edge, forest, open forest, bog. Known on Etolin, Prince of Wales, Gravina, Duke and Revillagigedo Islands, and Cleveland Peninsula. Not suspected in northern Tongass.</td>
</tr>
<tr>
<td><em>Cirsium edule var. macounii</em></td>
<td>Dry meadow, alpine/subalpine, talus slopes. Known in Misty Fiords National Monument. Not suspected in</td>
</tr>
<tr>
<td><em>Polystichum kruckebergii</em></td>
<td>Talus slope, rock outcrop, ultramafic. Known from Baranoff Is. (Red Bluff Bay), Cleveland Peninsula (Redtop</td>
</tr>
<tr>
<td>Species</td>
<td>Habitat/Location</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cypripedium guttatum</td>
<td>Tall shrubland, open forest, wet meadow. Known in Glacier Ranger District, Chugach NF. Not expected in Tongass NF.</td>
</tr>
<tr>
<td>Romanzoffia unalaschcensis</td>
<td>Forest edge, streamsides, rock faces. Known on Hecata Island, near Bering Glacier and Sitka</td>
</tr>
<tr>
<td>Cypripedium montanum</td>
<td>In upper beach meadow/forest ecotone. Known just north of the mouth of Endicott River, Chilkat Peninsula, in the Haines area, Glacier Bay, the Stikine R., and Etolin Is.</td>
</tr>
<tr>
<td>Sidalcea hendersonii</td>
<td>Estuarine meadow/forest ecotone. Known in Howard Bay; the only known population in Alaska.</td>
</tr>
<tr>
<td>Cypripedium parviflorum var. pubescens</td>
<td>Bog, dry and wet meadow, calcareous. Known on n Prince of Wales Is. and Klukwan, near Haines.</td>
</tr>
<tr>
<td>Tanacetum bipinnatum subsp. huronense</td>
<td>Upper beach meadow. Known on Shelikof Bay on Kruzof Is., Sitka RD.</td>
</tr>
</tbody>
</table>
DETERMINATIONS POSSIBLE PRIOR TO FIELD SURVEY

1) Does the evidence indicate that no sensitive plants or possible habitat exists within the project area (e.g. parking lot)?

☐ YES. Explain exactly why (insert here) and sign and date this document. BE is complete.

X NO. Go on to question 2.

2) Based on knowledge of the proposed project and the species involved, can a "no impact" statement be made?

☐ YES. Explain exactly why (insert here) and sign and date this document. BE is complete.

X NO. Go on to question 3.

3) Based on knowledge of the project and the species involved, can a statement be made that "implementation of the proposed project, including mitigation measures, May adversely impact individuals, but not likely to result in a loss of viability in the Planning area, nor cause a trend toward federal listing?"

☐ YES. Explain exactly why (insert here) and explain the mitigation measures that are part of the proposed project.

Sign and date this document. BE is complete.

X CANNOT BE DETERMINED WITH AVAILABLE INFORMATION. Go to the Field Reconnaissance step of the BE process. Make survey recommendations (insert here), check one of the boxes below, sign and date this document.

X Field surveys are recommended to be performed during the months of late June to late August in order to identify all of the species indicated above that could potentially occur within the project area. These should include deltas around the lake, the rocky area around the falls, open areas along the creek, beach meadow and upper
beach fringe, and estuary bordering the mouth of the creek and in the bay where activities will occur.

Prepared By:_____________________________________

_____________________________________

/s/ Ellen Anderson, Botanist JRD/ANM/YRD

November 12, 2010

References


Enclosure 1

USDA FOREST SERVICE 2008
PLANT SURVEY FIELD FORM
(© = Required Fields © = Alaska Required)
DECEMBER 2008

General Information

<table>
<thead>
<tr>
<th>1) Survey ID: ©</th>
<th>2) Survey Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3) Survey Status: ©</td>
<td>4) Target: © TESP, INPA, BOTH</td>
</tr>
<tr>
<td>5) Source of Work:</td>
<td></td>
</tr>
<tr>
<td>7) Survey Focus: ©</td>
<td></td>
</tr>
<tr>
<td>8) Estimate of Survey Area Size (acres):</td>
<td>9) No. of Traverses:</td>
</tr>
<tr>
<td>10) Elevation: Min:</td>
<td>Max:</td>
</tr>
<tr>
<td>Average:</td>
<td>11) Elevation UOM:</td>
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<tr>
<td>12) State: ©</td>
<td>13) County: ©</td>
</tr>
<tr>
<td>14) Region: ©</td>
<td>15) Forest: ©</td>
</tr>
<tr>
<td>16) District: ©</td>
<td></td>
</tr>
</tbody>
</table>

17) Parameters of Survey (Describe any ecological parameters, survey criteria or combinations of these used to focus the survey. (i.e., north slopes, specific habitat types, certain soils within certain forest conditions, survey timing, etc.):)

18) Survey Comments (Directions, area description, specific comments by visit date, etc.):

Survey Visits

Required Enter a Date (MM/DD/YYYY) and Examiners for each visit made.

<table>
<thead>
<tr>
<th>13) Visit Date ©</th>
<th>20) Last Name © and First Name © of Examiners for Each Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

September 2008
Enclosure 2
R10 TES PLANT ELEMENT OCCURRENCE - FIELD FORM - USDA FOREST SERVICE 12/08

General Information

1) SITE ID: ☐
2) DATE: ☐
3) SITE NAME:
4) NRCS PLANT CODE: ☐
5) SCIENTIFIC NAME: ☐
6) RECORD SOURCE: ☐
7) SURVEY ID: ☐
8) Survey Name:
9) EXAMINER(s) - LAST: ☐
   FIRST: ☐
   MIDDLE INITIAL:
10) OWNERSHIP: ☐
11) Loc. Uncert: ☐
12) Uncert. Dist: ☐
13) E.O. #: ☐
14) STATE: ☐
15) COUNTY: ☐
16) REGION: ☐
17) FOREST: ☐
18) DISTRICT: ☐
19) Area (Est): ☐
20) Area UOM: ☐
21) Canopy Cover Method ☐ (circle one): COVER PERCENT, DAUBER, NIRMCOV

Element Occurrence Data

22) EO Canopy Cover: ☐%Cov or Cover Class Code:
23) Lifeform:
24) Number of subpopulations:
25) Plant Found (Revisit): Yes or No
26) Plant Count: ☐
27) Count Type: ☐Genets/Ramets/Undetermined ☐
28) Count: ☐Actual or Estimate
29) Revisit needed - Yes or No
30) Revisit Date:
31) Revisit Justification:
32) Phenology by ☐
   (Sum to 100%):
   Vegetative . . . . . .
   Flower/Bud . . . . .
   Fruit/Dispersed . . .
   Seedlings/ . . . .
   Juvenile . . . . .
33) Population Comments: (e.g., distribution, vigor, density, phenology, dispersal)
34) Evidence of disease, competition, predation, collection, trampling, or herbivory: Yes ___ or No ___
35) Evidence Comments:
36) Pollinator observed – Yes or No
37) Pollinator type(s):
38) Pollinator comments:

Site Morphometry

39) Percent Slope: ☐
40) Slope position: ☐
41) Aspect: ☐ azimuth or cardinal:
42) Elev.: Ave: Min: Max:
43) Elev UOM: ☐

Soil Characteristics and Light Conditions

44) Substrate on which EO occurs:
45) Parent Material:
46) Soil Moisture:
47) Soil Texture:
48) Soil Type:
49) Light Exposure: ☐

06/18/2008

Page 1 of 5
A. Site Information

**Site Code:**
Visit Type (circle one): Reconnaissance Monitoring Research Control
Is this a Revisit (circle one): Yes No
**Study Type (circle one): Exhaustive species inventory Highest priority species Single species study
**Area Surveyed: _______ (acres)
(Note: 1/10 acre = 37 ft radius, 1/2 acre = 83 ft radius, 1 acre = 118 ft radius)
Site Vegetation Community Description (level IV Viereck et al. 1992):
Disturbance Type (see instructions below):

B. Location Information

**Latitude:** ____________ (Decimal Degrees, NAD83)
**Longitude:** ____________ (Decimal Degrees, NAD83)
Elevation: _______ (ft)
**Collection Method (circle one): GPS Topographic Map Aerial Photo
**GPS precision: _______ (ft; 0-5, 0-30, 0-100, 0-1000, 1000+)
Topographic Map Source: _______ Scale: _______ Date: _______
Quad name: ____________ Quad number: _______ (i.e. A-1, B-2, C-3, D-4)
Notes (location):

C. Survey Information

<table>
<thead>
<tr>
<th><strong>Species Code</strong> (see below)</th>
<th><strong>Infested Area</strong> (acres)</th>
<th><strong>Canopy Cover</strong> (% cover)</th>
<th><strong>Disturbance Age</strong> (yrs.)</th>
<th><strong>Stem Count</strong> (see below)</th>
<th><strong>Herbarium</strong> (see below)</th>
<th><strong>Control Action</strong> (see below)</th>
<th>Aggressiveness (see below)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

D. Notes (species):

---

---
**Disturbance Type:**
- Fill Importation (e.g. Road or Railroad Grade)
- Material Extraction (e.g. Rock Quarry or Gravel Pit)
- ORV Disturbance
- Mowing
- Trampling
- Logging
- Mining
- Grazing
- Plowing
- Mechanical Brush/Tree Cutting
- Herbicide Application
- Other Mechanical Substrate Alteration or Removal
- Abandoned Homestead
- River Action (i.e., Flooding/Erosion-Ice Scour/Deposition)
- Stream Action
- Forest Fire
- Land Slide/Avalanche
- Caribou/moose/animal related disturbed site
- Windthrow
- Wind Erosion/Deposition
- Thermal Disturbance (Solifluction, Thermokarst, Permafrost Melt, etc.)
- Glaciation
- Volcanic Action
- Coastal/Beach

**Plant Species Code:** Use the USDA alphanumeric (http://plants.usda.gov), or find it at http://akweeds.uaa.alaska.edu

<table>
<thead>
<tr>
<th>Infested Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.001 acre</td>
<td>(3.7 ft or ~1 m radius)</td>
</tr>
<tr>
<td>0.01 acre</td>
<td>(12 ft or ~4 m radius)</td>
</tr>
<tr>
<td>0.1 acre</td>
<td>(37 ft or ~11 m radius)</td>
</tr>
<tr>
<td>0.5 acre</td>
<td>(83 ft or ~25 m radius)</td>
</tr>
<tr>
<td>1 acre</td>
<td>(118 ft or ~36 m radius)</td>
</tr>
</tbody>
</table>

**Canopy Cover:** recommended breaks 1%, 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 95%, 100%

**Stem Count:** 1-5, 6-25, 26-50, 51-150, 151-500, 500+

**Collection Location:** ALA, TNFS, UAA, Not Collected, Not Curated, Other, None

**Control Action:**
- Manual (Pulling/Digging)
- Mechanical (Mowing/Weedwacking)
- Broadcast Herbicide
- Spot Herbicide
- Aerial Herbicide
- Herbicide Injection
- Covering
- Multiple Actions
- Other
- None

**Aggressiveness:** Low, Medium, High
Appendix  E  Wetland Determination Form – Alaska Region
**WETLAND DETERMINATION DATA FORM – Alaska Region**

Project/Site: ____________________________ Borough/City: ____________________________ Sampling Date: ________________

Applicant/Owner: ____________________________ Sampling Point: ____________________________

Investigator(s): ____________________________ Landform (hillside, terrace, hummocks, etc.): ________________

Local relief (concave, convex, none): ____________________________ Slope (%): ________________

Subregion: ____________________________ Lat: ________________ Long: ________________ Datum: ________________

Soil Map Unit Name: ____________________________ NVI classification: ____________________________

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ______ Soil ______ or Hydrology ______ significantly disturbed? Are “Normal Circumstances” present? Yes ____ No ____

Are Vegetation ______ Soil ______ or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS** – Attach site map showing sampling point locations, transects, important features, etc.

<table>
<thead>
<tr>
<th>Hydrophytic Vegetation Present?</th>
<th>Yes ____ No ____</th>
<th>Is the Sample Area within a Wetland?</th>
<th>Yes ____ No ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydric Soil Present?</td>
<td>Yes ____ No ____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland Hydrology Present?</td>
<td>Yes ____ No ____</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remains:

**VEGETATION** – Use scientific names of plants. List all species in the plot.

**Tree Stratum**

<table>
<thead>
<tr>
<th>1.</th>
<th>Absolute % Cover</th>
<th>Dominant Species?</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3.</td>
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<tr>
<td>4.</td>
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</tr>
</tbody>
</table>

Total Cover: ________________

50% of total cover: ________________

20% of total cover: ________________

**Sapling/Shrub Stratum**

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
6. ____________________________

Total Cover: ________________

50% of total cover: ________________

20% of total cover: ________________

**Herb Stratum**

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
6. ____________________________
7. ____________________________
8. ____________________________
9. ____________________________
10. ____________________________

Total Cover: ________________

50% of total cover: ________________

20% of total cover: ________________

Plot size (radius, or length x width): ________________ % Bare Ground ________________

% Cover of Wetland Bryophytes ________________ Total Cover of Bryophytes ________________

Remains:

**Dominance Test worksheet:**

- Number of Dominant Species That Are OBL, FACW, or FAC: ________________ (A)
- Total Number of Dominant Species Across All Strata: ________________ (B)
- Percent of Dominant Species That Are OBL, FACW, or FAC: ________________ (A/B)

**Prevalence Index worksheet:**

- Total % Cover of OBL species x 1 = ________________
- Total % Cover of FACW species x 2 = ________________
- Total % Cover of FAC species x 3 = ________________
- Total % Cover of FACU species x 4 = ________________
- Total % Cover of UPL species x 5 = ________________
- Column Totals: ________________ (A) ________________ (B)

Prevalence Index = B/A = ________________

**Hydrophytic Vegetation indicators:**

- Dominance Test is >50%
- Prevalence Index is ≥3.0
- Morphological Adaptations? (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation? (Explain)

**Hydrophytic Vegetation Present?** Yes ____ No ____
SOIL

Profile Description: [Describe to the depth needed to document the indicator or confirm the absence of indicators.]

<table>
<thead>
<tr>
<th>Depth (inches)</th>
<th>Matrix</th>
<th>Color (moist)</th>
<th>%</th>
<th>Redox Features</th>
<th>Color (moist)</th>
<th>%</th>
<th>Type</th>
<th>Loc*</th>
<th>Texture</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
# Appendix F  Point Count Data Form

## Point Count Data Form

Point Count - Area Search Data Form

<table>
<thead>
<tr>
<th>Surveyors:</th>
<th>Date/Time:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point #:</td>
<td>Tide Cycle:</td>
</tr>
</tbody>
</table>

### Site Conditions

<table>
<thead>
<tr>
<th>Precipitation (none, approx. in/hour)</th>
<th>Air Temperature (° F)</th>
<th>Habitat Description (Viereck Veg. Type):</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Cloud Cover:</td>
<td>Wind:</td>
<td></td>
</tr>
<tr>
<td>0=no clouds, 1=less than 50%, 2=50%, 3=more than 50%, 4=100%</td>
<td>0=calm, 1=light breeze, 2=moderate breeze, 3=strong breeze, 4=too windy for survey</td>
<td></td>
</tr>
</tbody>
</table>

### Observations

| Species | Number of Individuals | Distance from observer | Detection status: Singing (S), Calling (C), Visual (V), Drumming (D) | Breeding Status: Confirmed (c), Probable (p) | Flyover Status: F=Flying over or through site, FA=Flew away, FI=flew in, FS=Soaring | Comments: (include information such as sex, adults with food, mobbing behavior, pair interactions, nest building activity, feeding, resting and, predator avoidance) |
|---------|-----------------------|------------------------|------------------------------------------------|=-------------------------------------|=-----------------------------------------------|=--------------------------------------------------------------------------------|
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
|         |                       |                        |                                                 |                                     |                                               |                                                                                   |
The purpose of this list is to help you to provide the Corps of Engineers with the necessary information for your application to be considered complete. This information will be used to facilitate evaluation of your permit application and for public dissemination as required by regulation. Failure to provide complete information may result in your application being declared incomplete for processing, thereby delaying processing timeframes.

Please provide complete answers to all questions below which are relevant to your project. Any answers may be continued on separate sheet(s) of paper to be attached to this form.

Please see Attachment I for mailing instructions, addresses and contact information.

For Standard Department of the Army Permits use the Application for Department of the Army Permit (ENG FORM 4345 - Attachment 2).

For Nationwide Permit Applications, use the form in Attachment 3. If you are unsure, use Attachment 2.
1. LANDOWNER’S NAME (IF DIFFERENT FROM PERMIT APPLICANT)

2. E-MAIL ADDRESSES OF APPLICANT/AGENT

3. PROJECT LOCATION MAP AND: (to the best of your ability)

   - USGS Quad Map Name: _______________________
     (please provide an 8.5 by 11” photocopy of quad map with site location clearly marked)
   - Meridian, Township, Range, Section (MTRS):
     ___________________________________________
   - Block No.: ________________________________
   - Lot No.: _________________________________
   - Latitude & Longitude (or UTM Coordinates): __________________________
   - City (or nearest City): _______________________

4. COLOR PHOTOGRAPHS OF THE PROJECT SITE

   - Taken during the growing season if possible.
   - Feel free to draw on the pictures outlines of project fill areas or structures.

5. EXPLAIN THE NEED FOR, AND PURPOSE OF, THE PROPOSED WORK.
6. A DELINEATION OF ALL WATERS OF THE UNITED STATES WITHIN THE PROJECT AREA.

Waters of the United States include those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, all navigable waters, and other waters adjacent to those waters, including wetlands, ponds, and perennial and intermittent streams.

7. DRAWINGS OF PROPOSED ACTIVITY:

(At least 8.5 by 11-inch, reproducible copies)

**Site plan**, including all applicable:

- Entire project site and activity areas

- Existing and proposed contours

- Location of ordinary high water, wetland boundaries or other jurisdictional boundaries

- Identification of temporary and permanent impact areas within waterways or wetlands. Indicate whether activity would be located in tidal waters or freshwater or both.

- Locations of all structures/fills/utilities/staging/disposal areas, etc.

- All proposed culvert locations

- Location of construction access

- Location of cross section(s), as applicable

**Cross section drawing(s)** including:

- Existing and proposed elevations
- Ordinary high water and/or wetland boundary or other jurisdictional boundaries

- Cross section of proposed culverts showing culvert dimensions with ordinary high water mark

8. ANADROMOUS STREAM INFORMATION:

If the proposed activity would affect or occur within a stream, please indicate whether the stream supports anadromous fish. http://www.sf.adfg.state.ak.us/SARR/AWC/

Y_______ N*__________

*N: If a determination is made that the stream would NOT support anadromous fish, please provide an explanation:


10. INFORMATION ON ANY KNOWN HISTORIC PROPERTIES THAT MAY BE AFFECTED BY THE PROPOSED ACTIVITY.

http://dnr.alaska.gov/parks/oha/shpo/shpo.htm
11. INFORMATION ON ANY KNOWN FEDERALLY ENDANGERED OR THREATENED SPECIES THAT MAY BE AFFECTED BY THE PROPOSED ACTIVITY.

http://ecos.fws.gov/tess_public/StateListingAndOccurrence.do?state=AK

12. COPY OF ANY ENVIRONMENTAL IMPACT STATEMENT, OR ANY OTHER ENVIRONMENTAL REPORT WHICH WAS PREPARED FOR YOUR PROJECT.

13. APPLICANT PROPOSED MITIGATION STATEMENT (ATTACHMENT 4).

14. COPY OF COASTAL PROJECT QUESTIONNAIRE.

   Alaska Coastal Management Program, available at

   http://dnr.alaska.gov/coastal/acmp/Projects/pcpq.html
ATTACHMENT 1

INFORMATION TO SUBMIT FOR USACE PERMIT APPLICATION

ALASKA DISTRICT

REGULATORY DIVISION

USACE CONTACTS:

For projects within Southeast Alaska (from Cape Suckling south):

US Army Corps of Engineers
Juneau Field Office
8800 Glacier Highway, Suite 106
Juneau, AK 99801

Phone: 907-790-4490

(To be completed for rest of Alaska... stay tuned.)