DRAFT STUDY PLAN

BEAVER FALLS HYDROELECTRIC PROJECT

FERC No. 1922

Prepared for:

The City of Ketchikan d/b/a Ketchikan Public Utilities

Ketchikan, Alaska

Prepared by:

Kleinschmidt

Pittsfield, Maine
www.KleinschmidtGroup.com

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FERC PROJECT NO. 1922

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1.0 INTRODUCTION AND BACKGROUND

The City of Ketchikan d/b/a Ketchikan Public utilities (KPU) is the licensee, owner, and operator of the existing Beaver Falls Hydroelectric Project (Beaver Falls Project) Federal Energy Regulatory Commission (FERC) No. 1922. The Beaver Falls Project is located on Beaver Falls Creek near the City of Ketchikan, Ketchikan Gateway Borough, Alaska (Figure 1-1). A detailed description of the Beaver Falls Project is provided in KPU's Pre-Application Document (PAD)[1].

FERC issued a 30-year license to KPU to operate Beaver Falls Project on November 7, 1994. The license went into effect on November 1, 1994 and will expire on October 31, 2024. KPU intends to file an application for a new license prior to October 31, 2024, 2 years prior to the license expiration date.

KPU is using FERC's Traditional Licensing Process (TLP) as found in Title 18 of the U.S. Code of Federal Regulation (CFR), §16.8. KPU filed a Notice of Intent (NOI), PAD, and request to utilize the TLP with FERC, resource agencies, and stakeholders on July 16, 2019 to initiate Project relicensing. On August 19, 2019, FERC authorized KPU's request to utilize the TLP and also issued the NOI to file the license application and the notice of the PAD.

In accordance with the TLP (18 CFR §16.8), KPU hosted an initial joint agency/public meeting and site visit on October 3, 2019. Stakeholder commentary on the PAD content and relicensing study requests were due to KPU within 60 days after the joint agency/public meeting (December 2, 2019). This document contains KPU's Draft Study Plan intended to address study requests and provide additional information in response to stakeholder comments on the PAD. The general

[1] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15309317

purpose of the studies proposed for the Beaver Falls Project relicensing are to gather pertinent resource information pertaining to potential Project-related resource effects. The studies proposed by KPU are intended to gather additional information to that provided in the PAD for the development of the draft and final license applications. Additional information would provide pertinent resource information for consideration in FERC's environmental analysis of the relicensing of the Beaver Falls Project.

As discussed in Section 4.0, KPU will finalize this Study Plan in consultation with resource agencies and stakeholders and will file a Final Study Plan with resource agencies, stakeholders, and FERC prior to initiating studies.

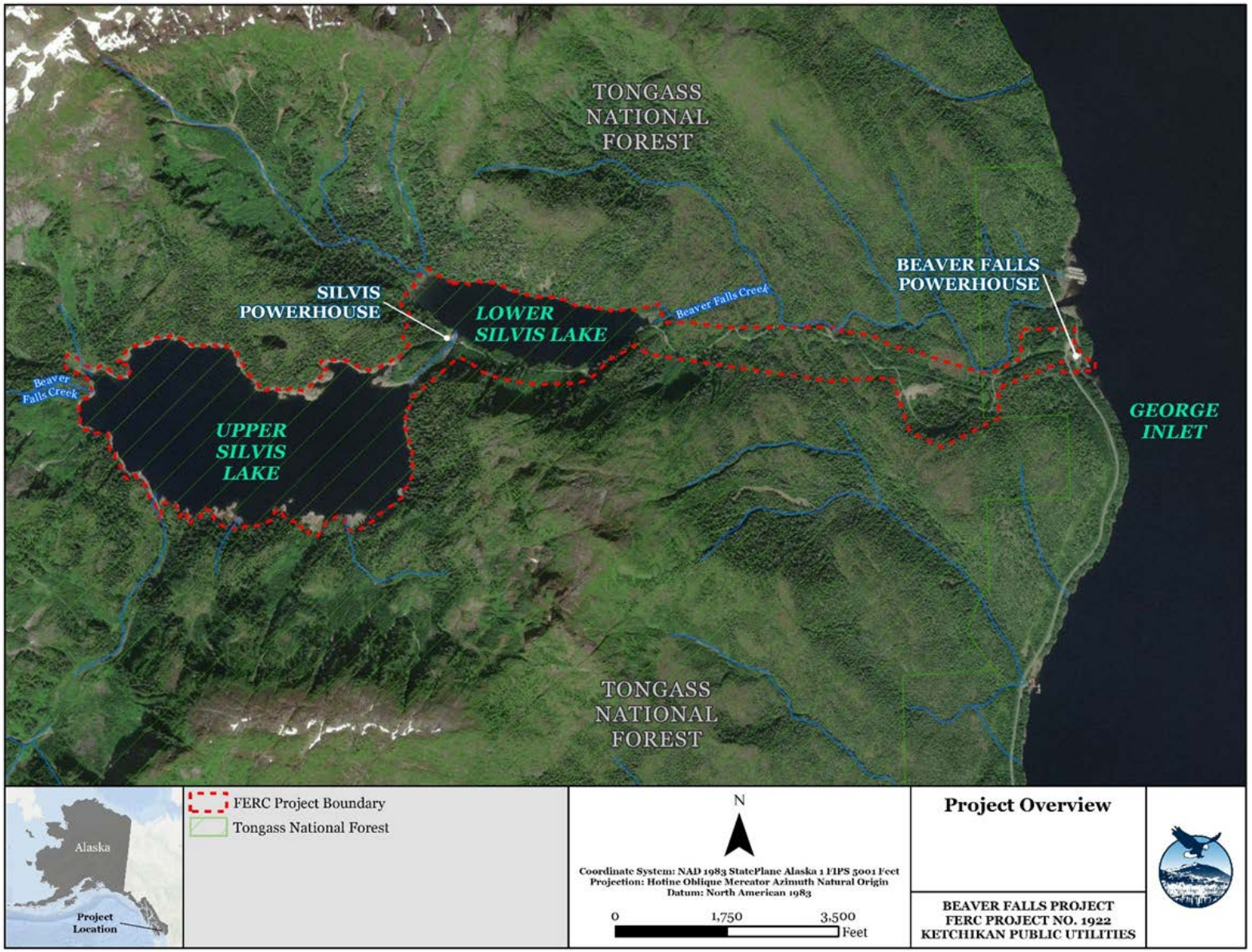

FIGURE 1-1 BEAVER FALLS PROJECT LOCATION

2.0 COMMENTARY AND STUDY REQUESTS

KPU asked that study requests follow FERC's TLP Study Request Criteria as required under 18 CFR §16.8:

i. Identify FERC's determination of necessary studies to be performed or the information to be provided by the potential applicant;

ii. Identify the basis for FERC's determination;

iii. Discuss FERC's understanding of the resource issues and FERC's goals and objectives for these resources;

iv. Explain why each study methodology recommended by FERC is more appropriate than any other available methodology alternatives, including those identified by the potential applicant pursuant to paragraph (b)(2)(vi) of this section;

v. Document that the use of each study methodology recommended by FERC is a generally accepted practice; and

vi. Explain how the studies and information requested would be useful to the agency, Indian tribe, or member of the public in furthering its resource goals and objectives.

KPU received comment letters on the PAD from the U.S. Department of Agriculture, Forest Service, (Forest Service) and the Alaska State Historic Preservation Office (Alaska SHPO) on November 29, 2019 and December 2, 2019, respectively (Appendix A). KPU additionally received an email from FERC containing comments on the PAD on September 9, 2019 (Appendix A). Table 2-1 summarizes PAD comments and study requests received and KPU's responses to individual comments and requests and informs KPU's studies proposed in Section 3.0.

TABLE 2-1 STAKEHOLDER COMMENTS/STUDY REQUESTS AND KPU RESPONSE

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	General Comment	Any on-the-ground site investigations/studies that take place on National Forest System lands or roads may require authorization by a Special Use Permit from the Forest Service prior to beginning work.	KPU will work with the Forest Service, U.S. Department of Agriculture (Forest Service) to determine if a Special Use Permit is needed prior to beginning any study work.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	General Comment	Agency policy directs us to write "Forest Service, U.S. Department of Agriculture" the first time and thereafter, "Forest Service". Please change USFS to Forest Service in the acronym chart and throughout the document.	KPU will incorporate the name change into the Draft License Application (DLA) and other pertinent licensing documents.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	General Comment	Please change the acronym TNF to Tongass National Forest or Tongass and KMRD to Ketchikan Misty Fjords Ranger District or District.	KPU will incorporate the name change into the DLA and other pertinent licensing documents.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	5.1 Overview; Pg 5-2	The majority of the project area is located outside of the Revilla Roadless Area (No. 524). However, in 2018, the State of Alaska petitioned the Secretary of Agriculture to exempt the Tongass National Forest from the 2001 Roadless Rule. The Department of Agriculture responded, directing the Forest Service to initiate steps to examine a state-specific roadless area management direction for the Tongass. The October 2019 draft environmental impact statement, prepared under the National Environmental Policy Act, provides an analysis of six alternatives, which are options, choices, or courses of action related to roadless management in Alaska. The alternatives range from no action to the removal of the Tongass from the 2001 Roadless Rule. The Department has identified Alternative 6, which is a full exemption, as the preferred alternative at this time. A final decision is expected in 2020.	KPU will incorporate the updated classification determined in 2020 in the DLA and any other relevant licensing documents.
Formal Letter	12/2/2019	Forest Service, U.S.	6.1.3.4 Access Road	This section discloses the access road and the maintenance issues that have occurred due to landslides and snow avalanches. Road operations	KPU will incorporate the access road and trail maintenance language into the Project

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
		Department of Agriculture	and Trail; pg 6-12	are part of the facility operations and should probably be discussed in section 4.0 Project Location, Facilities, and Operations.	Location, Facilities and Operations section of the DLA.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.1.3.4 Access Road and Trail; pg 6-12	Major improvements have been made to the road drainage in the last several years, however, the inside road ditch along Lower Silvis Lake still requires periodic cleaning of sediments from the avalanche area. Is there a plan to install larger culverts or crossing structures to reduce the need for ditch cleaning and allow the sediment to pass under the road? Disclose any plans to make changes to the road to reduce road maintenance costs and improve natural sediment routing in the area.	KPU proposes to conduct a Road Condition Assessment in 2020 to document existing road conditions and determine if any further infrastructure improvements are needed.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.1.3.4 Access Road and Trail; pg 6-12	Provide additional information regarding road condition, adequacy of drainage capabilities, and any preventative measures being taken to reduce road maintenance needs associated with erosion, mass wasting and drainage across the road.	KPU proposes to conduct a Road Condition Assessment in 2020 to document existing road conditions and determine if any further infrastructure improvements are needed.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.2.2 Streamflow, Gage Data, and Flow Statistics; pg 6-14	The PAD references hydrologic data developed for the 1994 licensing and the Plant Upgrade Analysis of Upgrade Options, that ranges from 20 to 50 years in age. Given climate variability and current drought conditions for the Southern Southeast Alaska region, we recommended updated stream flow data for the Beaver Falls Hydroelectric Project be generated. The Curran et al. 2016 USGS publication and its associated model can be used to model the stream flow data for the ungauged site, and the on-site precipitation data the PAD states has been collected by Ketchikan Public Utilities since 2009 can be used in the calculations. The publication can be found at the following URL https://pubs.er.usgs.gov/publication/sir20165024 and the modeling tool, Application of Methods Tool version 1.2, found under the companion file bullet on this page.	KPU will utilize the 2016 USGS publication (Curran et al.) and its associated model to model stream flow data at the Project. KPU will include model results in the Initial Study Report.

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.8.2 Rare, Threatened, and Endangered Botanical Species and Habitats; pg 6-64	The Edible Thistle (*Cirsium edule var. macounii*) is a Forest Service listed sensitive plant species that occurs on Revillagigedo Island, with one population in the Shoal Cove area.	The DLA and relevant study plan text will note that the Edible Thistle has one identified population in the Shoal Cove area.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.8.2 Rare, Threatened, and Endangered Botanical Species and Habitats; pg 6-64	Several plant species on the 2009 Alaska Region Sensitive Species List are suspected to occur on the Ketchikan Misty Fjords Ranger District. Identify and discuss whether or not potential habitat for these species occur within the project area.	KPU's proposed Rare and Invasive Plant Species Survey will assist with identifying potential habitat within the Project area. Habitat potential for plant species listed on the 2009 Alaska Regional Sensitive Species List will be discussed in the Initial Study Report and DLA.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.9 Recreation and Land Use; pg 6-66	The Tongass National Forest is the largest National Forest, as stated on page 6-77, it is 16.7 million acres just under 17 million acres. Please correct this statement.	The DLA or other relevant text will correct the existing statement to "just under 17 million acres".
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	6.9.6.2 Land Management; pg 6-88	The 2016 Forest Plan contains content in Chapter 5 applicable to the Project, including Renewable Energy direction. Recommend including all relevant and applicable Forest Plan direction.	The DLA or other relevant licensing text will include reference to relevant and applicable Forest Plan direction from Chapter 5 of the 2016 Forest Plan.
February 202(	February 20	February 2020-	February 2020-	February 2020-	February 2020-
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Subsistence	Section 810 (a) of the Alaska National Interest Lands Conservation Act of 1980, (ANILCA), reads in part: In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands under any provision of law authorizing such actions, the head of the Federal agency having primary jurisdiction over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would	A subsistence section will be included in the DLA. Evaluation of resource impacts will be based on existing, relevant, and reasonably available information.

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
				reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. Include the subsistence resource in the existing environment and project effects section. Resource impacts based on existing, relevant, and reasonably available information must be evaluated.	
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Subsistence Access	ANILCA, section 811(a) reads in part, The Secretary [of Agriculture] shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands. Include access to subsistence resources in the existing environment and project effects section. Resource impacts based on existing, relevant, and reasonably available information must be evaluated.	A subsistence section and discussion of access to subsistence resources will be included in the DLA. Evaluation of resource impacts will be based on existing, relevant, and reasonably available information.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Preliminary Issues, Project Effects, and Potential Studies	As word choice can influence perception, we recommend the term “adverse” in place of “negative” in this section.	KPU will utilize the word "adverse" to describe effects in the DLA or other relevant licensing documents rather than "negative".
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Upland Botanical Resources; pg 7-3	The Alaska Exotic Plant Information Clearinghouse (AKEPIC) is a statewide database of invasive plant locations. Please identify who conducted the actual field surveys in the project area in 2004 and 2006.	This information is currently unknown. KPU will work with AKEPIC to identify who conducted field surveys in 2004 and 2006 and will incorporate this information into the DLA and other relevant licensing documents.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Rare, Threatened, Endangered, and Special Status Species; pg 7-4	Thank you for identifying the need for plant surveys. We suggest also focusing the surveys on habitats for sensitive plant species that are suspected to occur on the Ketchikan Misty Fjords District, if the habitats are present in the project area.	KPU's Rare and Invasive Plant Survey will include identification of sensitive plant species habitats.

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Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Cultural Resources; pg 7-4	We support the Alaska SHPO's response that the Beaver Falls Project infrastructure may be an historic property and potentially eligible to the National Register of Historic Places. The historic properties would include all structures, road, and trails greater than 50 years old and associated with the project. Development and implementation of a Historic Properties Management Plan (HPMP), with stakeholder consultation, is an excellent approach for resource conservation and cultural resource management. We suggest including the pump house that was reconstructed in 1975 in the HPMP. We ask for consideration of some type of mitigation in the HPMP for protecting the canoe run and trash scatter (cultural resources) within the area of potential affect.	KPU will work with the Forest Service and Alaska SHPO to develop a Built Resources Assessment, Cultural Resources Study, and an HPMP. The Silvis Powerhouse (referred to as the pump house in the 12/2/2019 USFS letter), canoe run, and trash scatter will additionally be incorporated into the studies and HPMP as determined through consultation.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Rare Plant and Invasive Species Survey; pg 7-5	We have included three guidance documents with this transmittal, to support development of the study plan(s) for invasive plant and rare plant species surveys. We ask that field surveys for rare and invasive plants follow the enclosed Forest Service data collection protocols. We have an interest in reviewing the field data and entering in Forest Service databases.	KPU will utilize the provided three guidance documents to develop the Rare and Invasive Plant Species Survey. KPU will consult with the Forest Service and the Ketchikan Indian Community (KIC) in development of this survey. The KIC's interest in this topic was raised during the Joint Agency and Public Meeting held on October 10, 2019. KPU will additionally consult with the Forest Service and KIC regarding collected field data.
Formal Letter	12/2/2019	Forest Service, U.S. Department of Agriculture	Historic Structures Survey; pg 7-6	A Historic Structures Survey and National Register of Historic Places (NRHP) evaluations for historic properties will coincide with the HPMP. These are very good approaches to cultural resource management for the project. We recommend documenting and evaluating the pump house (built in 1975) during the Historic Structures Survey and NRHP process. The pump house will be 50 years old within two years of the license renewal.	KPU will include the Silvis Powerhouse (referred to as the pump house in the 12/2/2019 USFS letter) in the Built Resources Assessment and the NRHP process as determined through consultation with the Forest Service and Alaska SHPO.

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Formal Letter	12/2/2019	Alaska State Historic Preservation Office	Historic Structures Survey; pg 7-6	Our office continues to encourage completing a cultural resources inventory on the Beaver Falls Hydroelectric Project's infrastructure, which should include a landscape perspective. An Historic Structures Survey may be too limiting to comprehensively address the complex of properties associated with the Project.	KPU proposes to conduct a Cultural Resources Phase I Study which will include a desktop Archaeological Resources Assessment to determine the archaeological sensitivity for potentially significant Native American and/or historic period archaeological sites within the Area of Potential Effect (APE). KPU will consult with the Alaska SHPO and the Forest Service on the results of that assessment.
Formal Letter	12/2/2019	Alaska State Historic Preservation Office	Historic Structures Survey; pg 7-6	The cultural resources study completed in the early 1990s should be examined by a cultural resource professional to determine if there are any methodological gaps or types of resources that were not taken into consideration. Resource issues could include properties of religious and cultural significance to tribes, testing for paleo-terraces, and not screening test deposits.	KPU proposes to conduct a Cultural Resources Phase I Study which will include examining the past cultural resources study completed during the 1990s licensing process and include a desktop Archaeological Resources Assessment. This Phase I study will determine if there are any potentially significant archaeological sites and determine if there are any methodological gaps or types of resources not taken into consideration during the 1990s study work. KPU will consult with Alaska SHPO and the Forest Service regarding the need for a Cultural Resources Phase II Study.
Formal Letter	12/2/2019	Alaska State Historic Preservation Office	Historic Structures Survey; pg 7-6	To complete identification for Section 106 of the National Historic Preservation Act, we recommend completing determinations of eligibility for identified properties rather than completing one or more National Register of Historic Places Nomination Forms.	KPU will incorporate this methodology into the Built Resources Assessment.
Formal Letter	12/2/2019	Alaska State Historic Preservation Office	PME	The protection, mitigation, and enhancement measures proposed for cultural resources includes incorporating new information into an Historic Properties Management Plan (HPMP). A HPMP can be a valuable tool, but for the purposes of complying with Section 106, such a document needs to be implemented through an agreement	KPU will consult with FERC, Alaska SHPO, Forest Service, and any other pertinent consulting parties in development of a Programmatic Agreement or a Memorandum of Agreement.

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				document, such as a Programmatic Agreement or a Memorandum of Agreement. Any agreement document and management plan used to implement an agreement for the purposes of Section 106 should be created in consultation with consulting parties.	
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	Please identify where penstock and transmission line segments are buried and above ground and the corresponding lengths for both developments.	This information will be included in the DLA.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	The single-line diagram is public information and should not be filed as CEII.	The single line diagram will be filed as public information in the DLA.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	We are missing details for the following project features: the dimensions and construction materials of the tailrace or flow conveyance out of the powerhouses.	This information will be included in the DLA.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	We are missing details for the following project features: the Beaver Falls penstock (specifically, where does the diameter of the penstock change and what are the corresponding lengths at each diameter?).	This information will be included in the DLA.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	We are missing details for the following project features: the transition from penstock to manifolds conveying flow to the Beaver Falls powerhouse (the configuration of this transition does not appear fully in the provided project drawings).	This information will be included in the DLA.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	We are missing details for the following project features: clarify the operational status and configuration of the generating units at the Beaver Falls development.	The Beaver Falls Powerhouse consists of four generating units: Unit No. 1, Unit No. 2, Unit No. 3, and Unit No. 4. Unit No. 2 is decommissioned and has not been in operation since 1962. Unit No 2 has since been used for parts for Unit No. 1. Units No. 1, 3, and 4 are currently in operation. This clarified language will also be included in the DLA and other pertinent licensing documents.

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	We are missing details for the following project features: confirm whether or not there is a trash rack on the Silvis development and if there, provide the dimensions and composition	The Upper Silvis intake tunnel invert is located 96-feet below the normal maximum lake surface elevation of 1,154 feet mean sea level. KPU has no record of a trash rack over the tunnel entrance. A sluice gate, located at El. 1045 and approximately 200 feet from the tunnel entrance, controls the outflow from the lake. There are two observed vertical shafts between the intake and the gate. Debris is kept out of the lower (El. 1086, rarely exposed) shaft by steel bars with irregular 1 in to 6 in spacing, and out of the upper shaft by bars covered with an extruded aluminum mesh screen.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	Clarify project operations involving the adit. How is the adit used for peaking operations? What conditions trigger use of the adit?	The adit provides additional flexibility to Project operations. When excess water is available in Lower Silvis Lake, or when there is increased natural flow in Beaver Falls Creek, but not sufficient to operate Unit 1 efficiently, the adit's butterfly valve is opened (either remotely or locally) to release additional water upstream of Beaver Falls Creek Diversion Dam and intake. The combined water from the adit and natural inflow to Beaver Falls Creek allows operation of Beaver Falls Unit No. 1. KPU does not have quantitative rules for operation of Unit 1 or the adit, but rather allows for flexibility based on system needs and the operator's judgment. Adit flow is not measured. KPU estimates that Beaver Falls Unit No. 1 is operated between 7 cfs and 33 cfs, maximizing efficiency.
Email	9/9/2019	Federal Energy Regulatory Commission	Project Facilities /Operation	Please clarify why no mitigation is proposed for the locations of slope instability that were identified and described in the PAD.	KPU proposes a Road Conditions Assessment to assess current road conditions and determine if infrastructure improvements are needed.

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
Email	9/9/2019	Federal Energy Regulatory Commission	Aquatic Resources	There appears to be a discrepancy in the description of lake level fluctuations for both Upper Silvis Lake and Lower Silvis Lake under existing operations. At one point in the PAD you state that Upper Silvis Lake maximum surface water elevation is 1,154 ft msl and minimum surface water elevation is 1,055 ft msl (a difference of 99 feet) with a maximum drawdown of 62 feet which generally occurs in April before the spring runoff is able to refill the lake. Later in the PAD, you state that Upper Silvis Lake is managed between 1154 ft msl and 1120 ft msl (a difference of 34 feet). For Lower Silvis Lake, you state that the maximum surface water elevation is 827 ft msl and the minimum surface water elevation is 802 ft msl (difference of 25 ft) but later in the PAD, you state that Lower Silvis lake is managed between 827 ft msl and 808 ft msl (difference of 19 ft). In your license application, please clarify the minimum, maximum, and average surface water elevations for both Upper and Lower Silvis lake under existing and proposed operations and include descriptions of any seasonal fluctuations that occur (i.e., magnitude and duration of drawdowns to meet energy demands, etc.).	The normal maximum water surface elevation of Upper Silvis Lake is 1,154 feet mean sea level (msl) and the minimum water surface elevation is 1,055 feet msl. The normal maximum water surface elevation of Lower Silvis Lake is 827 feet msl and the minimum water surface elevation is 802 feet msl. This information will be clarified in the DLA or other pertinent licensing documents and further description of seasonal drawdowns will be provided.
Email	9/9/2019	Federal Energy Regulatory Commission	Terrestrial/ Riparian Resources	In section 6.4.2.2 you erroneously describe as endemic to southeast Alaska several mammal species that have far wider distributions. In your license application, we recommend focusing on taxa that may be truly endemic to the project area (e.g., whose complete range is limited to Revillagigedo Island or less).	The DLA and other pertinent licensing documents will focus on taxa that are truly pervasive to the Project area (e.g., compete range is limited to Revillagigedo Island or less).
Email	9/9/2019	Federal Energy Regulatory Commission	Terrestrial/ Riparian Resources	In section 6.4.2.1 you cite Sitka black-tailed deer and mountain goats as species hunted in the project vicinity. Black bears should probably be included as well, as the project's vicinity of southwestern Revillagigedo Island (e.g., Wildlife	The DLA or other pertinent licensing documents will include the black bear in any text regarding hunting in the local area. Pertinent references will additionally be updated.

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
				Analysis Area 407, George Inlet-Ward Cove) has in recent years produced one of the highest black bear harvest levels in GMU 1A, Alaska's southeastern-most game management unit (see ADF&G's 2014 Black Bear Management Report). Also, your description of seasonal habitat use by black bears needs revision or clarification, as the source cited (ADFG 2019a) describes winter use of alpine and subalpine areas only by brown bears, not black bears. Please address these items in your license application.	
Email	9/9/2019	Federal Energy Regulatory Commission	Terrestrial/ Riparian Resources	There are several inconsistencies and omissions in your representation of vegetation communities in section 6.6. In the vegetation cover map (Figure 6-3), the cover type hemlock woodland is shown to occur within the project boundary but is not described in section 6.6. Within the project boundary, hemlock woodlands appear roughly comparable in area to the low-tall shrub cover type, and thus are among the three most extensive vegetation communities at the project. The deciduous forest vegetation type is included in Table 6-10, but is also not described. There is also disagreement between the acres and percentages presented in Table 6-10 (e.g., for the acreages provided, Hemlock-Sitka Spruce should be 31.8% of the project area (not 2.5%), and Water should be 62% (not 91.3%)). When you update the table to include all vegetation communities, please make sure their percentages are consistent with their acreages. Please provide these corrections to your vegetation community information in your license application. Last, you have not provided descriptions of animal species using these upland habitats; please do so in your license application.	The DLA or other pertinent licensing documents will update PAD vegetation maps and tables and include descriptions for all vegetation communities. The DLA will additionally include further description of animal species using upland habitats.
Email	9/9/2019	Federal Energy Regulatory Commission	Terrestrial/ Riparian Resources	While you describe and show riparian (Fig. 6-5) and littoral (Fig. 6-7) habitats in the project area, you have not provided the acreages for either of	Acreages for riparian and littoral habitats and information on how these habitat types

COMMENT FORMAT	DATE	AGENCY	TOPIC/ SECTION	COMMENT	KPU RESPONSE
				these habitat types or how they may be influenced by project operations (e.g., seasonal fluctuations of Upper Silvis Lake water level). Please provide this information in your license application.	are influenced by Project operations will be included in the DLA.
Email	9/9/2019	Federal Energy Regulatory Commission	Terrestrial/ Riparian Resources	Additionally, section 6.7.4 identifies a number of invasive plants and show locations where they have been recorded. However, from the map scale and descriptions we cannot determine the relationship of these plants to existing habitats within the project boundary (e.g., upland, riparian, or wetland) or how project operations may influence their occurrence or spread. Please provide this information in your license application.	Additional information on invasive plants and their location in relation to the Project boundary will be addressed in KPU's Rare and Invasive Plant Species Survey. KPU will further describe how Project operations may influence their occurrence or spread.
Email	9/9/2019	Federal Energy Regulatory Commission	Terrestrial/ Riparian Resources	The consultation record with Alaska Natural Heritage/Center for Conservation Science you provided does not indicate the spatial extent within which you requested records of state listed species (i.e., within the project boundary only, within a defined proximity to the boundary, or some wider area). In your license application, please clarify the area evaluated for records of state-listed species. Also, Table 6-14 is titled "Alaska Natural Heritage Program Revillagigedo Island Rare Species List", though the information it contains is only for the project study area. In your license application, please make sure that this table's title and the associated discussion only reflect the area that was queried for known records of state-listed species. Similarly, Table 6-9 should simply be described as Invasive Species (per ADF&G 2019b source), as it contains non-animal as well as animal species. Please provide these clarifications in your license application.	The DLA and associated tables will clarify the area evaluated for records of state-listed species. Table 6-9 will be updated to simply be described as Invasive Species.

3.0 DRAFT STUDY PLANS

KPU is proposing five studies for the Beaver Falls Project relicensing to address resources for which insufficient information was previously not available for the PAD, or for which specific issues have been identified through scoping and stakeholder comments. Proposed studies include:

1. Rare and Invasive Plant Species Survey
2. Built Resources Assessment
3. Cultural Resources Survey
4. Road Condition Assessment Study
5. Hydrologic Resources Desktop Assessment

Kleinschmidt Associates (Kleinschmidt), consultant for KPU, contacted the Alaska Department of Natural Resources (DNR) and the Alaska Department of Environmental Conservation (DEC) regarding KPU's list of proposed studies. In discussions with Alaska DNR and Alaska DEC on January 6, 2020, did not have any further study requests pertaining to water quantity for water rights needs or for water quality certification needs, respectively. Telephone discussion memorandums summarizing Kleinschmidt's conversation with Alaska DNR and Alaska DEC are included in Appendix B.

3.1 RARE AND INVASIVE PLANT SPECIES SURVEY

3.1.1 STUDY REQUESTS

KPU proposes to conduct a Rare and Invasive Plant Species Survey for the Beaver Falls Study Plan (KPU 2019). The Forest Service (2019) supports KPU's study proposal and provided guidance documents for development of the Beaver Falls Project Rare and Invasive Plant Species Survey (Appendix A).

3.1.2 GENERAL DESCRIPTION OF THE PROPOSED STUDY

The goal of the field survey is to identify any special status botanical species or invasive botanical species that may be present in the Beaver Falls Project Area[2]. This information would be used to document existing conditions and habitats, assess impacts of continued Project operations on existing resources, and inform the development of any necessary conservation plans and/or management plans as part of the FERC relicensing process and in conformance with Forest Service Standards.

3.1.3 GOALS AND OBJECTIVES

The Forest Service requested this study to identify rare plant and invasive species that may occur in the Project area (Presidential Executive Order 13112)[3]. This study would be conducted in compliance with Forest Service regulations as identified in Forest Service Manual (FSM) 2670 and the goals and objectives of the Tongass National Forest Land and Resource Management Plan (Forest Service 2016).

3.1.4 STUDY AREA

The study area for the rare and invasive plant species survey would focus on areas of potential disturbance associated with maintenance and access by both the public and KPU operation and maintenance employees during the term of the prospective license. Proposed study areas include the dual use access road/hiking trail, the transmission line corridor, Upper Silvis Lake foot trail,

[2] The Beaver Falls Project Area is defined as the area included within the FERC Project boundary.
[3] https://www.invasivespeciesinfo.gov/executive-order-13112

the open herbaceous area at the top of the Upper Silvis Dam, open herbaceous and recreation area around Lower Silvis Dam, the aboveground penstocks running from Lower Silvis intake to Beaver Falls Diversion Dam, the open herbaceous access area around the Beaver Falls Diversion Dam and intake, and the open access areas around the Beaver Falls Powerhouse and associated parking area. A 10-meter buffer would be included, where practical, within the constraints of safety and topography for each study area to limit the spread of invasive species from areas of disturbance in forested areas (Hansen and Clevenger 2005). Determination of the ability to adhere to the 10-foot buffer would be made in the field based on the following constraints: slope (no greater than 50 percent slope), ground surface (areas of cobble, loose soils, slick vegetation in general would be avoided on slopes greater than 15 to 30 percent), and natural obstacles such as downed trees or large boulders that prevent safe access. Figure 3-1 includes a map of the proposed study area inclusive of a 10-meter buffer for each study area.

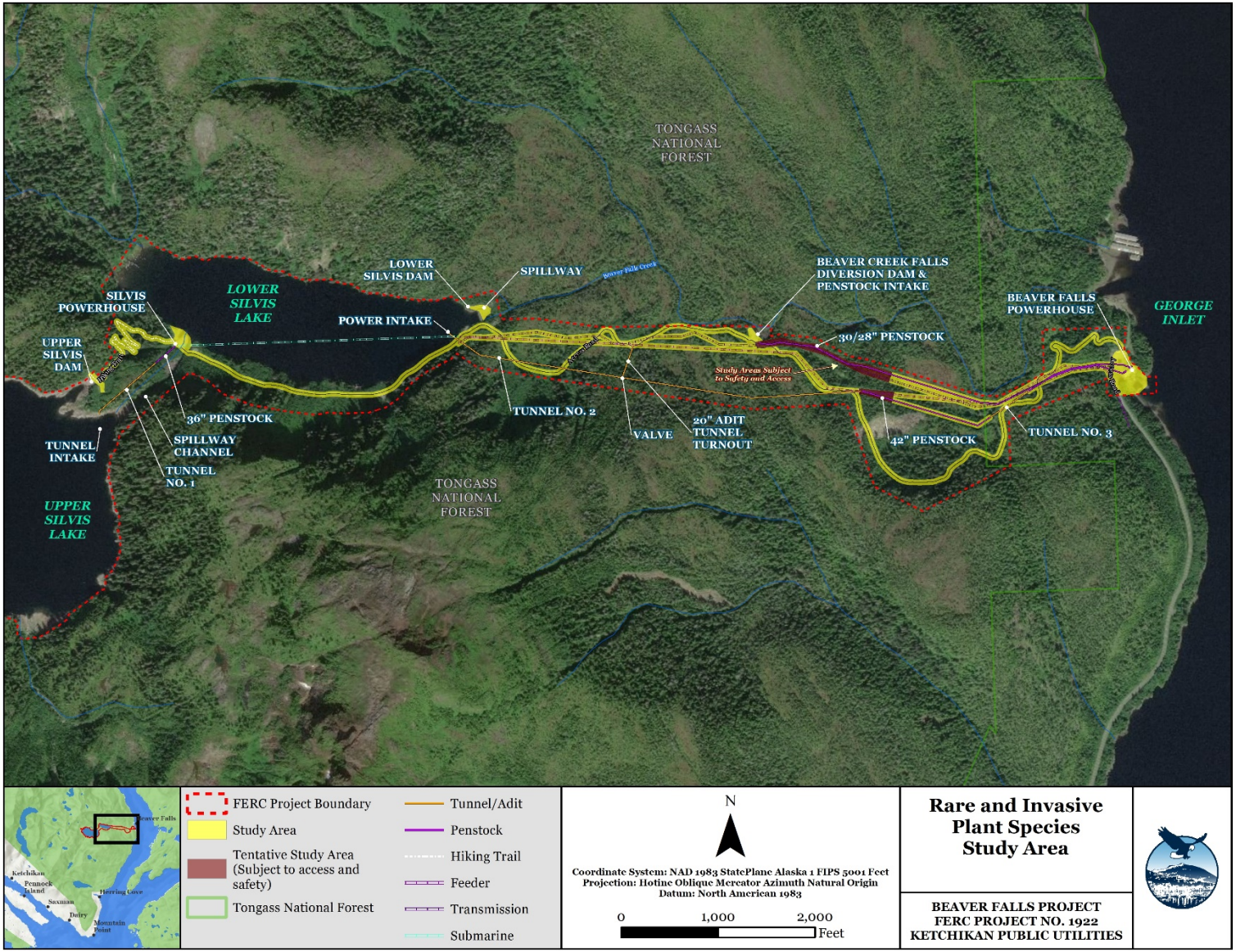


FIGURE 3-1 RARE AND INVASIVE PLANT SPECIES SURVEY STUDY AREA

3.1.5 BACKGROUND AND EXISTING INFORMATION

3.1.5.1 RARE PLANTS

The 2009 Forest Service Alaska Region Sensitive Species List designates 15 plant species as Forest Service Sensitive Species (Goldstein et al. 2009) (Table 3-1). All 15 sensitive plant species are known or suspected to occur in the Tongass National Forest. Several species are suspected to occur in the Ketchikan Misty Fjords Ranger District and two listed sensitive plant species, the lesser round-leaved orchid (*Platanthera orbiculata*) and edible thistle (*Cirsium edule* var. *macounii*) have been documented on Revillagigedo Island. Lesser round-leaved orchid is found in the southern Tongass National Forest in a variety of habitats including wet coniferous forests, low elevation forested wetlands, medium to high volume old growth hemlock forests, on slopes between 15 percent and 75 percent, and in areas of high bryophyte cover, with red cedar, low forb[4] cover, along forest edges or near gaps in otherwise shady forests, and near open water or boggy areas (Goldstein et al. 2009). Typically, the species flowers from July to August. The edible thistle is found in dry meadows and talus slopes, and open forests in the upper montane to subalpine/alpine zones (Turner 2015). The edible thistle flowers from June to October. Habitat for the lesser round-leaved orchid and the edible thistle has the potential to occur in the Project area.

[4] Forb is an herb other than grass. https://www.merriam-webster.com/dictionary/forb. Accessed February 13, 2020.

TABLE 3-1 2009 FOREST SERVICE ALASKA REGION SENSITIVE SPECIES PLANT LIST

COMMON NAME	SCIENTIFIC NAME	STATUS
Eschscholtz's little nightmare	*Aphragmus eschscholtzianus*	Sensitive
Moosewort fern	*Botrychium tunux*	Sensitive
Moonwort fern, no common name	*Botrychium yaaxudakeit*	Sensitive
Edible thistle	*Cirsium edule* var. *macounii*	Sensitive
Calder's loveage	*Ligusticum calderi*	Sensitive
Pale poppy	*Papaver alboroseum*	Sensitive
Unalaska mist-maid	*Romanzoffia unalaschcensis*	Sensitive
Spatulate moonwort	*Botrychium spathulatum*	Sensitive
Mountain lady's slipper	*Cypripedium montanum*	Sensitive
Large yellow lady's slipper	*Cypripedium parviflorum* var. *pubescens*	Sensitive
Alaska rein orchid	*Piperia unalascensis*	Sensitive
Lesser round-leaved orchid	*Platanthera orbiculata*	Sensitive
Kruckeberg's swordfern	*Polystichum kruckebergii*	Sensitive
Henderson's checkermallow	*Sidalcea hendersonii*	Sensitive
Dune tansy	*Tanacetum bipinnatum* subsp. *huronense*	Sensitive

Source: Forest Service 2009

3.1.5.2 INVASIVE PLANTS AND NOXIOUS WEEDS

The state of Alaska defines noxious weeds as any species of plants, either annual, biennial, or perennial, reproduced by seed, root, underground stem, or bulblet, which when established is or may become destructive and difficult to control by ordinary means of cultivation or other farm practices; or seed of such weeds that is considered commercially inseparable from agricultural or vegetable seed (11 AAC 34.400[5]). Table 3-2 provides a list of designated noxious weed species as identified by the state of Alaska and which species have been observed on the Revillagigedo Island based on locations documented by the Alaska Exotic Plant Information Clearinghouse (AKEPIC 2019).

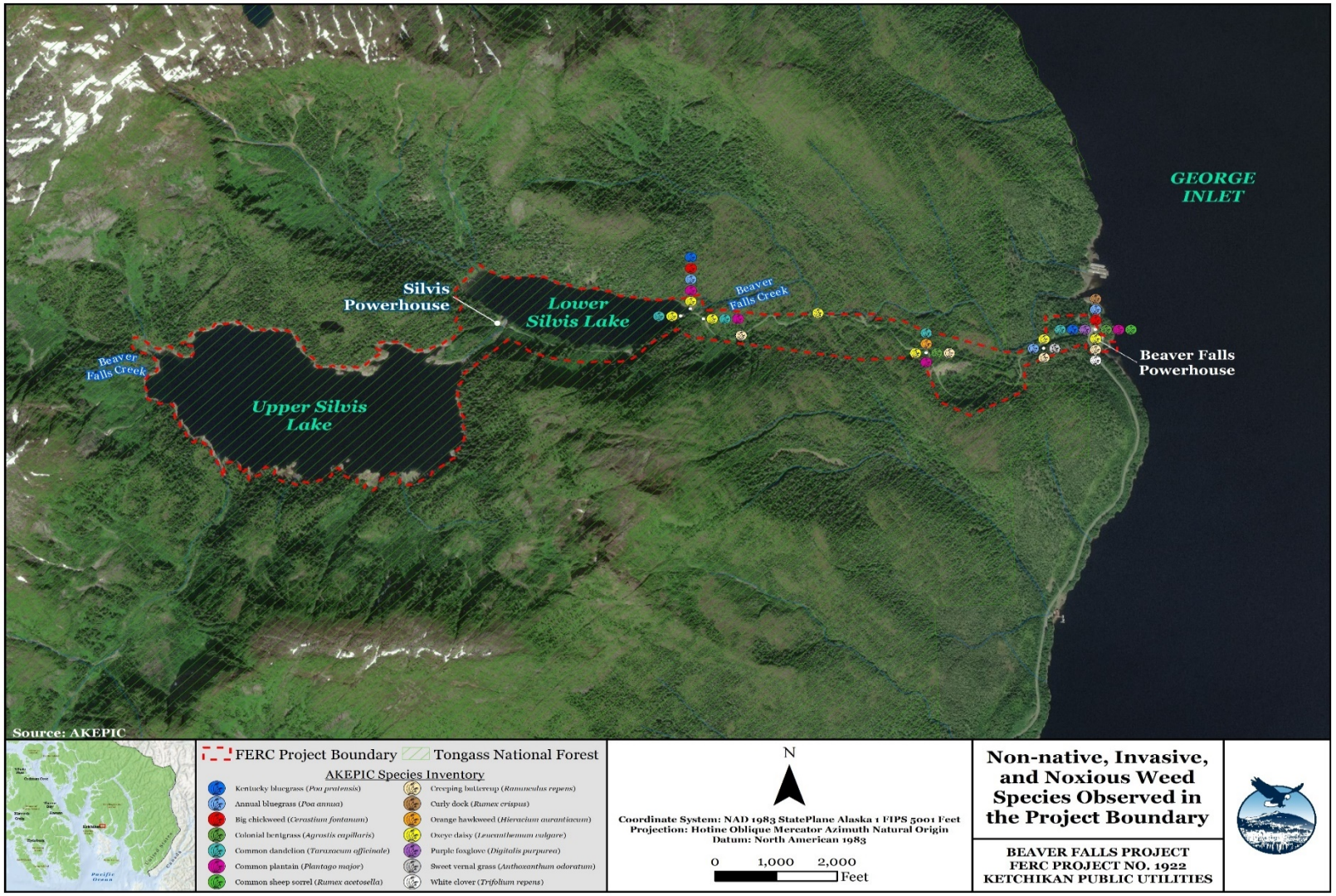
[5] https://casetext.com/regulation/alaska-administrative-code/title-11-natural-resources/part-4-agriculture/chapter-34-plant-health-and-quarantine/article-4-general-provisions/section-11-aac-34400-definitions

TABLE 3-2 ALASKAN PROHIBITED NOXIOUS WEED SPECIES[A]

COMMON NAME	SCIENTIFIC NAME	SPECIES DOCUMENTED ON REVILLAGIGEDO ISLAND[B]
Russian Knapweed	*Acroptilon repens*	
Whitetops and its varieties	*Cardaria draba, C. pubescens, Lapidium latifolium*	
Canada Thistle	*Cirsium arvense*	X
Field Bindweed	*Convolvulus arvensis*	X
Quackgrass	*Elymus repens*	
Leafy Spurge	*Euphorbia esula*	
Galensoga	*Galensoga parviflora*	
Hempnettle	*Galeopsis tetrahit*	X
Orange Hawkweed	*Hieracium aurantiacum*	X (observed along the Foot Trail)
Blue-flowering Lettuce	*Lactuca pulchella*	
Purple Loosestrife	*Lythrum salicaria*	
Austrian Fieldcress	*Rorippa austriaca*	
Horsenettle	*Solanum carolinense*	
Perennial Sowthistle	*Sonchus arvensis*	X

[a] Alaska Administrative Code 11 AAC 34.020 defines the list of Prohibited Noxious Weed. Orange hawkweed and purple loosestrife are not listed in 11 AAC 34.020 however these two species are listed as prohibited noxious weeds on the State of Alaska Department of Natural Resources list of Prohibited Noxious Weeds (DNR Division of Agriculture 2019).
[b] Locations as documented by the Alaska Exotic Plants Information Clearinghouse (AKEPIC) (AKEPIC 2019).
Source: AKEPIC 2019

In addition, in 2004 and 2006 non-native and invasive plants were documented along the dual use access road/hiking trail including colonial bentgrass (*Agrostis capillaris*), sweet vernal grass (*Anthoxanthum odoratum*), big chickweed (*Cerastium fontanum*), purple foxglove (*Digitalis purpurea*), oxeye daisy (*Leucanthemum vulgare*), common plantain (*Plantago majo*), annual bluegrass (*Poa annua*), Kentucky bluegrass (*Poa pratensis*), creeping buttercup (*Ranunculus repens*), common sheep sorrel (*Rumex acetosella*), curly dock (*Rumex crispus*), common dandelion (*Taraxacum officinale*), white clover (*Trifolium repen*) (AKEPIC 2019)(Figure 3-2).



Source: AKEPIC 2019

FIGURE 3-2 NON-NATIVE, INVASIVE, AND NOXIOUS WEED SPECIES DOCUMENTED WITHIN THE BEAVER FALLS PROJECT AREA

3.1.6 PROJECT NEXUS

The continued operation of the Beaver Falls Project could result in impacts to rare plants in the study area. As well, it could result in the spread and establishment of invasive species, especially in areas of disturbance. The data collected in this study will be used to document existing conditions and habitats, assess impacts of continued Project operations on existing resources, and inform the development of any necessary conservation plans and/or management plans as part of the FERC relicensing process and in conformance with Forest Service standards.

3.1.7 METHODS

Prior to field surveys, TRC Companies (TRC), KPU consultant, would contact the Forest Service and KIC to verify rare plant species and habitats with the potential to occur in the study area and to finalize study areas. Also, TRC discussions would survey timing and final survey logistics with the Forest Service and KIC, inclusive of the need and/or parameters surrounding a Special Use Permit.

Field surveys would be conducted by a TRC botanist and global positioning system (GPS) technician. The field survey would conduct rare plant and invasive species surveys concurrently and would focus on the designated study areas (Section 3.1.4; Figure 3-1) as determined in consultation with the Forest Service and KIC to identify rare and invasive plant species and to verify habitat for sensitive plant species included on the Forest Service Alaska Region Sensitive Species List. A systematic pedestrian survey of potential habitat would be conducted to identify populations or occurrences of rare plant species and invasive species in the study area.

For areas that are inaccessible due to terrain, systematic and careful ocular surveys would be conducted where feasible, using binoculars from nearby vantage points. Pedestrian surveys would seek to limit disturbance on steep and unstable slopes by conducting systematic and careful ocular surveys from lower and upper vantage points where feasible. Surveys would verify invasive species presence at locations previously identified along the dual use access road/ hiking trail in the Alaska Exotic Plant Information Clearinghouse database.

Habitat for rare plant species and populations or occurrences of rare plant and occurrences of invasive species would be mapped, either as point, line, or polygon features, using portable GPS

units designed to gather location data to the sub-meter. Identified features would be photographed and data collected in an electronic platform (e.g., a tablet with TRC's Fulcrum electronic data collection software). Data would be available after the completion of the survey in an electronic format either Excel or pdf. Data collection would include the species name, aerial extent, approximate number, cover value, associated vegetation community, and whether the plant is alive or dead.

A report summarizing survey results would be prepared and provided to the Forest Service and KIC. Field data would be provided to the Forest Service for review and for use in Forest Service databases.

3.1.8 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This rare plant and invasive plant species survey would employ standard practices for conducting a botanical survey. Recorded field data would be formatted in accordance with Forest Service guidelines (Forest Service 2015).

A rare plant and invasive plant species report summarizing field survey results would be developed using the Forest Service Guidance for Preparing a Rare Plant Resource Report, Tongass National Forest (Krosse 2017a) and Forest Service Tongass National Forest-Guidance for Biological Evaluations: Sensitive Plants (Krosse 2017b). Any invasive species management recommendations would follow the Forest Service Guidance for Invasive Plant Management Program Tongass National Forest (Krosse 2019).

3.1.9 DELIVERABLES AND SCHEDULE

The proposed study would be completed during the 2020 field season. The current scope is for one field survey to be conducted during optimal flowering times for the species of interest. Consultation with the Forest Service in terms of survey timing and logistics may result in the need for a second field survey trip to coordinate with site-specific flowering periods for the two species of interest. The Forest Service may provide additional information on the recent precipitation and climatic conditions for the area which would affect species bloom timing. TRC would consult with the Forest Service and KIC regarding optimal survey timing. A Study Report

would be developed and distributed to FERC, resource agencies, and stakeholders for review approximately February 2021.

3.1.10 COST AND LEVEL OF EFFORT

The estimated cost for this study is $31,000 which includes consultation with the Forest Service and KIC, one field survey visit inclusive of several days of pedestrian field surveys, data entry, and production of a report. Costs assume no survey delays would occur due to weather. If a second field survey is required per Forest Service direction, TRC would separately cost a second survey trip at the time the request is made.

3.1.11 REFERENCES

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Forest Service, U.S. Department of Agriculture (Forest Service). 2019. Comments on Pre-Application Document Beaver Falls Hydroelectric Project No. 1922. November 2019. 103 pp. Accessed February 14, 2020. https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15416008

Goldstein, M.I, D. Martin, and M.C. Stensvold. 2009. 2009 Forest Service Alaska Region Sensitive Species List. Assessment and Proposed Revisions to the 2002 List. U.S. Forest Service.

Hansen, Malin and Anthony P. Clevenger. 2005. The influence of disturbance and habitat on the presence of non-native plant species along transport corridors. Biological Conservation. 125. 249-259. 10.1016/j.biocon.2005.03.024.

Ketchikan Public Utilities (KPU). 2019. Pre-Application Document Beaver Falls Hydroelectric Project (FERC No. 1922). July 2019. 337 pp. Accessed February 14, 2020. https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15309317

Krosse, Patricia. 2017a. Guidance for Preparing a Rare Plant Resource Report. USDA Forest Service Alaska Region. August 2017. 18 pp.

Krosse, Patricia. 2017b. Tongass National Forest-Guidance for Biological Evaluations: Sensitive Plants. USDA Forest Service Alaska Region. September 2017. 20 pp.

Krosse, Patricia. 2019. Guidance for Invasive Plant Management Program Tongass National Forest. USDA Forest Service Alaska Region. September 2019. 59 pp.

Turner, Rick. 2015. Wrangell Island Project. Wrangell Ranger District Tongass National Forest. December 2015. 18 pp. Accessed January 2020. https://www.fs.usda.gov/nfs/11558/www/nepa/75452_FSPLT3_3107700.pdf

3.2 BUILT RESOURCES ASSESSMENT

3.2.1 STUDY REQUESTS

KPU proposed to conduct a Historic Structures Survey to comply with the Forest Service's letter of November 29, 2019 and the Alaska SHPO's letter of December 2, 2019. Both letters express the desire, though, to alter the study plan to provide an inventory on the Project's infrastructure, including a landscape perspective, to accommodate for a more general Built Resources Assessment and development of National Register of Historic Places (NRHP) Eligibility Determinations rather than completing the originally proposed Historic Structures Survey, which may be too limiting.

3.2.2 GENERAL DESCRIPTION OF THE PROPOSED STUDY

This study would be an intensive cultural resource survey which would include a landscape perspective to comprehensively address the properties associated with the Project. By using a landscape approach, the study looks at resources as part of a complex whole and takes into account how resources are affected by landforms, soils, and vegetation, providing a framework for assessing cultural resources within the study area. The study is designed to identify precisely and completely all historic resources in the Project area and would involve a detailed background research, and a thorough field inspection with documentation of all historic properties. The study should produce all the information needed to evaluate historic properties and prepare an inventory.

Intensive-level survey data would be recorded on the Alaska Building Inventory Form and include photographs of the property and a site map. The form would include a detailed physical description of the property. A statement of significance would be included to determine the property's historic context, has property specific historic information (e.g., past owners, historic uses, and construction history), an assessment of the property's historic significance, and a discussion on whether it retains enough historic integrity to convey that significance.

3.2.3 GOALS AND OBJECTIVES

The Alaska SHPO and Forest Service are requesting this study to identify potential historic properties in compliance with Section 106 of the National Historic Preservation Act (NHPA).

3.2.4 STUDY AREA

The Beaver Falls Project was initially developed by the City of Ketchikan in 1946 (KPU 1991). The Project originally consisted of a timber crib dam at Upper Silvis Lake, the Beaver Falls Creek Diversion Dam, a 28-inch-diameter penstock, and Beaver Falls Powerhouse containing Unit Nos. 1 and 2. A second phase of development occurred in 1954 and included construction of the Lower Silvis Dam, water conduits, and installation of Beaver Falls Powerhouse Unit Nos. 3 and 4. A third phase of development occurred from 1967 to 1968, when the Upper Silvis Dam was replaced with a concrete-faced rock-fill structure, power conduits, and the Silvis Powerhouse were built. After 1 year of operation, the Silvis Powerhouse was destroyed in 1969 by a landslide. The powerhouse was later rebuilt in 1975 and 1976.

The Project's hydroelectric facilities date after World War II and have been modified extensively. During the previous relicensing effort, it was determined that there are no archaeological or historic sites eligible for inclusion in the NRHP within the Project boundary. As of 1991, neither relicensing the Beaver Falls Project nor upgrading the access road were determined to result in any direct or indirect impacts on cultural resources in the Project boundary (Campbell 1991).

In the intervening years since 1991, elements of the built environment associated with the Beaver Falls Project have aged. Now, in 2019, some of these buildings and structures are over 50 years old. The boundary of the Area of Potential Effect (APE)/Study Area will be confirmed in consultation with Alaska SHPO and Forest Service.

3.2.5 BACKGROUND AND EXISTING INFORMATION

A cultural resources survey of the Beaver Falls Project was conducted by archaeologist Chris Rabich Campbell under subcontract to R.W. Beck and Associates, Inc. in 1991 during the previous relicensing effort (Campbell 1991). An archaeological survey was conducted to determine the impact of continued Project operation on cultural resources. The archaeological survey was based on preliminary research which suggested that sites or features would be located in the uplands as well as along the modern coast, and that these sites or features might range in age from the early Holocene to the early 20th century. The surveyed area included the shoreline

and beach fringe of the Project area, the access road, trail to Upper Silvis Lake, and the vicinity near the dam and the original outlet of Upper Silvis Lake.

A potentially historic house (cottage no. 4) with classic Craftsman period lines was identified in front of the Beaver Falls Powerhouse. The Campbell Report (1991) determined that neither relicensing the Beaver Falls Project nor upgrading the access road would not result in any direct or indirect impact on cultural resources in the Project area.

On September 1, 1993, the Alaska SHPO (Judith E. Bittner) wrote to KPU concurring with Campbell's Report (1991) that no archaeological properties are present in the Project boundary. However, SHPO stated:

> "A number of buildings are mentioned in the "Historical Use" section, but it is never made clear where they are in relation to project facilities or if in fact, they are part of the project facilities. We do know that the powerhouse was reconstructed in 1975-76 and therefore is not eligible for inclusion in the NRHPs at this time. Four cottages are mentioned on pg. 13 but only one, cottage no. 4, is described at all. Cottage no. 4 is said to have been built in 1915-25 at a cannery at Hidden Inlet about 60 miles to the southeast of Ketchikan and moved to its present site in 1953. This cottage was not considered for NRHP eligibility, presumably because it "had been moved some distance from its original location." Moved buildings may be eligible and it appears that it should be evaluated." (Letter from J. Bittner, State Historic Preservation Officer, Department of Natural Resources, State of Alaska to R. Cornelius, Ketchikan Public Utilities, September 1, 1993).

KPU responded to the Alaska SHPO's determination in a letter dated March 21, 1994 stating that "cottage no. 4 was sold and moved some time ago and KPU does not now own this cottage" (KPU 1994).

On November 29, 2019 and December 2, 2019, the Forest Service and the Alaska SHPO respectively, wrote to FERC in response to the July 16, 2019, PAD providing comments including recommendations to develop a HPMP, in consultation with consulting parties, to provide protection, mitigation, and enhancement measures for cultural resources.

3.2.6 PROJECT NEXUS

Compliance with Section 106 of the NHPA to identify the effects of continued Project operations to historic properties eligible for listing on the NRHP.

3.2.7 METHODOLOGY

TRC would consult with the Alaska SHPO and the Forest Service to confirm an APE and to confirm the survey methodology. TRC would discuss survey timing and final survey logistics with the Forest Service, inclusive of the need and/or parameters surrounding a Special Use Permit. The Built Resources Assessment would be conducted by a qualified consultant.

An intensive survey would be conducted to further evaluate the defined APE. The intensive survey would identify precisely and completely all existing historic resources in the APE, including the Silvis Powerhouse. The survey would involve detailed background research, thorough field inspection, and documentation of all historic properties to produce all the information needed to evaluate historic properties and prepare an Alaska Building Inventory Form.

Due to the relatively small number of known resources within the APE, data would be collected by hand. The survey would use a paper survey form carried in the field, with one form produced for each property documented. Information regarding appearance, history, integrity, and boundaries of each property sufficient to permit an evaluation of its significance would be recorded. Photos would be taken of each property in conjunction with the paper form and photo and documentation of all property numbers. Geographic Information System (GIS) data would be collected, and maps produced identifying resources within the proposed Project APE. A Section 106 Historic Resources Report would be produced to detail background research, field methodology, findings, and recommendations.

3.2.8 CONSISTENCE WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study would employ standard practices for conducting a built resource assessment in compliance with Alaska SHPO (OHA 2016) guidelines.

3.2.9 DELIVERABLES AND SCHEDULE

The proposed study would be completed during the 2020 field season, once snow is melted enough to provide good visibility and access for inspection of above ground resources within the Project APE. Subsequently, a Survey Report would be prepared reporting findings and making recommendations for eligibility. The Survey Report would be included within KPU's Study Report document to be distributed to FERC, resource agencies, and stakeholders for review approximately February 2021.

3.2.10 COST AND LEVEL OF EFFORT

The estimated cost for this study is $40,000 which includes consultation with Alaska SHPO and the Forest Service, several days of field inspection, photo documentation, eligibility evaluations, development of recommendations, and production of a report.

3.2.11 REFERENCES

Campbell, C.R. 1991. Cultural Resources Survey of Beaver Falls Project, FERC No. 1922, Ketchikan, Alaska, Final Report. Unpublished Report. Ketchikan Public Utilities, Ketchikan, Alaska.

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http://dnr.alaska.gov/parks/oha/pdf/BuildingManualFinal.pdf

3.3 CULTURAL RESOURCES SURVEY

3.3.1 STUDY REQUESTS

The Alaska SHPO's letter of December 2, 2019 requested that a cultural resources professional determine if any methodological gaps or types of resources were not taken into consideration in the 1991 cultural resources study (Campbell 1991). The Forest Service's letter of November 29, 2019 requested clarification of whether the canoe landing (KET-301) and the undocumented historic trash scatter located at or near the outlet of Beaver Falls are within the APE. A Phase I Cultural Resources Survey would provide additional information and clarification.

3.3.2 GENERAL DESCRIPTION OF THE PROPOSED STUDY

A Phase I Cultural Resources Survey (Desktop Analysis) would be conducted to identify historic properties within the Project's APE that may be eligible for the NRHP. A literature review of archival and background research would be conducted to identify previously recorded and potential historic properties; provide a review of the previous 1991 cultural survey (Campbell 1991); identify any data gaps including resources that may have not been taken into consideration, including the Silvis Powerhouse, the canoe landing (KET-301), the undocumented trash scatter located at or near the outlet of Beaver Falls, or any properties of religious and cultural significance to Indian tribes; or methodological gaps such as potential testing for paleo-terraces or the screening of test deposits. This Phase I Desktop Analysis effort would conduct background research, identify information gaps, and determine the sensitivity for potentially significant Native American and/or historic period archaeological sites present within the APE.

3.3.3 GOALS AND OBJECTIVES

The Alaska SHPO and Forest Service are requesting this study to identify potential historic properties in compliance with Section 106 of the NHPA.

3.3.4 STUDY AREA

The Beaver Falls Project was initially developed by the City of Ketchikan in 1946 (KPU 1992) and originally consisted of a timber crib dam at Upper Silvis Lake, the Beaver Falls Creek Diversion Dam, a 28-inch-diameter penstock, and Beaver Falls Powerhouse containing Unit Nos. 1 and 2. A second phase of development occurred in 1954 and included construction of the

Lower Silvis Dam, water conduits, and installation of Beaver Falls Powerhouse Unit Nos. 3 and 4. A third phase of development occurred from 1967 to 1968, when the Upper Silvis Dam was replaced with a concrete-faced rock-filled structure, power conduits, and the Silvis Powerhouse were built. After 1 year of operation, the Silvis Powerhouse was destroyed in 1969 by a landslide. The powerhouse was later rebuilt in 1975-1976.

The Project's hydroelectric facilities date after World War II and have been modified extensively. During the previous relicensing effort, it was determined that there are no archaeological or historic sites eligible for inclusion in the NRHP within the Project boundary. As of 1991, neither relicensing the Beaver Falls Project nor upgrading the access road were determined to result in any direct or indirect impacts on cultural resources in the Project boundary (Campbell 1991). The boundary of the APE/Study Area would be confirmed in consultation with SHPO and Forest Service.

3.3.5 BACKGROUND AND EXISTING INFORMATION

A cultural resources survey of the Beaver Falls Project was conducted by archaeologist Chris Rabich Campbell under subcontract to R.W. Beck and Associates, Inc. in 1991 during the previous relicensing effort (Campbell 1991). An archaeological survey was conducted to determine the impact of continued Project operation on cultural resources. Archaeological surveys were conducted based on preliminary research which suggested that sites or features would be located in the uplands and along the modern coast, and that these sites or features could range in age from the early Holocene to the early 20th century. The surveyed area included the shoreline and beach fringe of the Project area as well as the access road, trail to Upper Silvis Lake, and the vicinity near the dam and the original outlet of Upper Silvis Lake.

A canoe landing at the outlet of Beaver Falls Creek (outside of the FERC Project boundary) was identified as a result of the archaeological survey effort. This landing was assigned an Alaska Heritage Resource Survey designation of KET-301. A field review on July 29, 1991 verified the presence of a waste dump associated with the 1946 construction; it has not been recorded as an archaeological site (Campbell 1991).

On September 1, 1993, the Alaska SHPO (Judith E. Bittner) wrote to KPU concurring with Campbell's (1991) report that no archaeological properties are present in the FERC Project boundary.

On November 29, 2019, the Forest Service wrote to FERC in response to KPU's July 16, 2019, PAD providing comments including a request for clarification on the canoe landing (KET-301) and the undocumented trash scatter, and to develop a HPMP, in consultation with consulting parties, to provide protection, mitigation, and enhancement measures for cultural resources.

On December 2, 2019, the Alaska SHPO wrote to FERC in response to KPU's July 16, 2019, PAD providing comments including a request to review the 1991 cultural resource report (Campbell 1991) for methodological gaps or types of resources that were not taken into consideration, and to develop a HPMP, in consultation with consulting parties, to provide protection, mitigation, and enhancement measures for cultural resources.

3.3.6 PROJECT NEXUS

Compliance with Section 106 of the NHPA to identify effects to historic properties eligible for listing on the NRHP.

3.3.7 METHODOLOGY

TRC will consult with the Alaska SHPO and the Forest Service to confirm the APE and the Phase I methodology.

A Phase I Cultural Resources Survey (Desktop Analysis) would be conducted to identify historic properties within the Project's APE that might be eligible for the NRHP. A literature review of archival and background research would be conducted to identify previously recorded and potential historic properties, and to provide a review of the previous 1991 cultural survey (Campbell 1991) to identify any data gaps including resources that were not taken into consideration, methodological gaps such as potential testing for paleo-terraces, or the screening of test deposits. A report would be provided reflecting the level of effort and results of the Phase I Survey, including maps of previously identified resources and potentially sensitive areas within the APE, and any additional work that may be determined by the consulting parties.

3.3.8 CONSISTENCE WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study will employ standard practices for conducting Phase I Investigations in compliance with Alaska SHPO (OHA 2019) guidelines.

3.3.9 DELIVERABLES AND SCHEDULE

The proposed desktop study would be prepared concurrently with background research required for the Built Resources Assessment. A Phase I Report summarizing the results of the study and recommendations would be provided to the Alaska SHPO and the Forest Service promptly to determine whether or not a Phase II level of effort should be pursued.

3.3.10 COST AND LEVEL OF EFFORT

The estimated cost for this proposed desktop study is $5,000 which includes consultation with Alaska SHPO and the Forest Service, archival research, and development of a report and associated recommendations.

3.3.11 REFERENCES

Campbell, C.R. 1991. Cultural Resources Survey of Beaver Falls Project, FERC No. 1922, Ketchikan, Alaska, Final Report. Unpublished Report. Ketchikan Public Utilities, Ketchikan, Alaska.

Ketchikan Public Utilities (KPU). 1992. Application for New License for the Beaver Falls Hydroelectric Project: FERC Project No. 1922. Supplementary Technical Information. Volume 3. October 1992. 159 pages.

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http://dnr.alaska.gov/parks/oha/pdf/BuildingManualFinal.pdf

3.4 ROAD CONDITION ASSESSMENT STUDY

3.4.1 STUDY REQUESTS

The Forest Service's letter of November 29, 2019 and FERC's September 9, 2019 email requested further information pertaining to the conditions of the Beaver Falls Project access road and additional information pertaining to potential mitigation measures for erosion and sediment control. To accurately answer these issues, KPU proposes a Road Condition Assessment Study.

3.4.2 GENERAL DESCRIPTION OF PROPOSED STUDY

A Road Condition Assessment Study would be prepared to document existing conditions along the road including the condition of the roadway itself, drainage patterns, avalanche and sediment flow regimes, vegetation cover, eroded areas and slopes, existing structures, gradients, safety features, and areas requiring maintenance.

3.4.3 GOALS AND OBJECTIVES

The Forest Service and FERC are requesting further information pertaining to current road conditions. This study would help inform potential roadway improvements and mitigation measures that would reduce future maintenance requirements and costs, including mitigation of avalanche and debris flows, improved slope stability, reduced erosion, and provision of more reliable roadway access to the Silvis Powerhouse and Lakes.

3.4.4 STUDY AREA

The study area would encompass the dual use access road/hiking trail that runs from the Silvis Powerhouse down to the Beaver Falls Powerhouse. This access road is approximately 2-miles-long and is a single lane, dirt road.

3.4.5 BACKGROUND AND EXISTING INFORMATION

A dual use access road/hiking trail runs from the Silvis Powerhouse down to the Beaver Falls Powerhouse. This access road is approximately 2-miles-long and is a single lane, dirt road. The access road crosses many talus slopes, snow avalanche paths, and side hill drainage areas along Lower Silvis Lake. This section of the road has been closed off at times due to snow and rock avalanches, requires constant maintenance, and presents a danger to public vehicular access.

More routinely, in some areas, downslope erosion has narrowed the road to the extent where vehicle passage is difficult.

During the May 2019 site visit, indicators of slope instability were identified east of Lower Silvis Lake, that included visible slide debris, recently downed trees above the access road, trees with curved trunks at the base indicating soil creep, and loose saturated soils.

During the site visit a recent large slide event (over 5 years old) was identified approximately three-quarters of a mile east of the Lower Silvis Dam. The landslide debris and landslide scarp were visible above and below the access road. The identified slide originated above the access road and terminated approximately 600 feet downslope of the access road. The slide debris terminated less than 200 feet from the penstock carrying water to the Beaver Falls Powerhouse.

A TRC geologist visited the site in the Spring of 2019 and took photographs of locations of slope instability, erosion, debris flow, and general conditions of the roadway. Existing information includes maps and reference manuals authored by the Alaska DOT and Public Facilities.

3.4.6 PROJECT NEXUS

Ongoing Project operations is subject to changing conditions of the access road; erosion, avalanches, drainage patterns, and debris flows have the potential to occasionally render the road impassable, to necessitate expensive repairs and continual maintenance, and to result in negative environmental impacts. A survey of existing access road conditions would inform future evaluation of potential mitigation measures that could impact Project access and maintenance.

3.4.7 METHODOLOGY

A number of techniques and methodologies are typically employed in assessing road conditions. These techniques can range from sophisticated tools for developing a terrain model, to a more qualitative assessment using existing information and observational data. Given the remote nature of the Project area, vehicle restrictions to the Forest Service and KPU personnel, and its long-term use as a recreation trail, a basic assessment is warranted.

For this study, a simple assessment is proposed consisting of visual observation, GPS tagging, selected measurements and sampling, and photo logging of locations warranting further study for

potential mitigation. Provision of LIDAR data would greatly increase the effectiveness of the survey. A datasheet would be used for recording information during the proposed field walk (Appendix C). The datasheet could be customized to add pertinent information desired by the owner, resource agencies, and other interested parties.

The focus of the site walk would be to observe and collect baseline information on existing roadway conditions, including:

- Drainage patterns
- Slope instability
- Ongoing erosion
- Areas that currently lack vegetation
- Areas where debris has collected
- Areas of apparent previous avalanche flows
- Cross-slope areas
- Areas of smooth roadway
- Existing culverts and other erosion control structures

Personnel conducting the site walk should be knowledgeable in geology, as well as civil, structural, hydraulic, and geotechnical engineering and geology. TRC staff members as well as KPU operations personnel and Forest Service staff familiar with the access road would conduct this baseline conditions survey. KPU and Forest Service personnel would be an essential element to this study; their ability to compare existing conditions to previously observed conditions, documentation of previously successful maintenance practices, and identification of existing erosion and sediment control features/problem areas. A pre-walk meeting with KPU, TRC, the Forest Service, and other field walk attendees would be beneficial. Meeting topics would include a safety briefing, equipment requirements, logistics, team and documentation responsibilities, reporting methodologies, etc.

After completion of the site walk, an existing conditions report would be developed that would include GIS maps and LIDAR data (as available) to describe current access road conditions. These results would be used by KPU to explore access road mitigation measures, as appropriate.

3.4.8 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study would employ standard practices for evaluating the condition of roadways, including:

- AASHTO A Policy on Geometric Design of Highways and Streets (Green Book)[6]
- Alaska Highway Preconstruction Manual (the Alaska Department of Transportation & Public Facilities' guidance document for developing and designing highway and road projects in Alaska)[7]
- Alaska Highway Maintenance and Operations Handbook[8]
- Alaska Highway Drainage Manual[9]

Additional relevant state manuals can be found at:

http://www.dot.state.ak.us/stwddes/dcspubs/index.shtml

3.4.9 DELIVERABLES AND SCHEDULE

The proposed study would be completed during the 2020 field season, once snow is melted enough to provide good visibility and access for inspection of road conditions. An initial report would be prepared summarizing findings. The report would be included in KPU's Study Report document to be distributed to FERC, resource agencies, and stakeholders for review approximately February 2021.

3.4.10 COST AND LEVEL OF EFFORT

The estimated cost for the proposed study is $30,000. The scope of the proposed study includes several days of field inspection inclusive of a TRC staff member, photo documentation, consultation with resource agencies, coordination with KPU, and field inspection report finalization.

[6] https://codebookdownload.com/aashto-green-book-gdhs-7-aashto-green-book-a-policy-on-geometric-design-of-highways-and-streets-7th-edition/?msclkid=3d9ce689692a1d83ae60b8aff28a5790
[7] http://www.dot.state.ak.us/stwddes/dcsprecon/preconmanual.shtml
[8] http://dot.alaska.gov/stwddes/research/assets/pdf/ak_maint-ops_hb.pdf
[9] http://www.dot.state.ak.us/stwddes/desbridge/pop_hwydrnman.shtml

3.5 HYDROLOGIC RESOURCES DESKTOP ASSESSMENT

3.5.1 STUDY REQUESTS

KPU provided hydrologic data (KPU 2019) that was developed using a combination of gaged flows from the 1992 FERC relicensing process and back calculated flows developed for a 2007 plant upgrade analysis (Hatch Acres 2007). Given climate variability and current drought conditions for southern, southeast Alaska, the Forest Service's letter of November 29, 2019 recommended that an updated stream flow analysis be generated for the Beaver Falls Project. The Forest Service recommended utilizing a regional model developed by Curran et al. 2016 U.S. Geological Survey (USGS) and combining that with on-site precipitation data collected by KPU.

3.5.2 GENERAL DESCRIPTION OF PROPOSED STUDY

This study would provide updated stream flow information for the Beaver Falls Project using current hydrological methods applicable to ungaged streams in Alaska.

3.5.3 GOALS AND OBJECTIVES

There is no available up-to-date stream flow information for the Beaver Falls Project or for Beaver Falls Creek. Given climate variability for southern, southeast Alaska, it is important to understand the hydrograph for the Beaver Falls Project. The objective of the study is the use currently available information to update hydrograph stream flow for Beaver Falls Creek.

3.5.4 STUDY AREA

The study area includes the Beaver Falls Creek watershed.

3.5.5 BACKGROUND AND EXISTING INFORMATION

The Beaver Falls Project PAD (KPU 2019) provided a summary of available hydrologic data from the 1992 Beaver Falls Project license application (KPU 1992) and from an upgrade analysis completed in 2007 (Hatch Acres 2007). The data sources included monthly and annual average data for inflow to Upper Silvis Lake, Lower Silvis Lake, and the Beaver Falls powerhouse from 1917 to 1932 and 1956 to 1965 collected at USGS Gage #15066000 Beaver Falls Creek near Ketchikan, Alaska; a 1992 planning study by R. W. Beck covering 1916 to1987; and modeling

results for 1989 to 2004 (KPU 1992; Hatch Acres 2007). Monthly mean inflow ranged from 42 cubic feet per second (cfs) to 96 cfs for Upper Silvis Lake, 16 cfs to 26 cfs for Lower Silvis Lake, and 13 cfs to 19 cfs for the Beaver Falls powerhouse (KPU 2019). Annual average flow was 65 cfs, 22 cfs, and 16 cfs for Upper Silvis Lake, Lower Silvis Lake, and the Beaver Falls powerhouse, respectively.

In addition, KPU included monthly and annual average seepage data for the Upper Silvis and Lower Silvis weirs. The weirs are located directly downstream of the dams. The seepage data provides a reference for the amount of available water flowing through the Project area. Monthly average seepage for the Upper Silvis weir ranged from 13 gallons per minute (GPM) to 71 GPM (0.03 cfs to 0.16 cfs) with an annual mean seepage of 27 GPM (0.06 cfs) (KPU 2019). Monthly average seepage for the Lower Silvis weir ranged from 372 GPM to 563 GPM (0.83 cfs to 1.25 cfs) with an annual mean seepage of 425 GPM (0.95 cfs).

3.5.6 PROJECT NEXUS

The operation of the Beaver Falls Project may affect the flow of water through Beaver Falls Creek and the distribution of runoff throughout the watershed. Current information on available stream flows is necessary to provide a comprehensive understanding of Project area flows for Beaver Falls Project relicensing.

3.5.7 METHODOLOGY

KPU would use the recommended Curran et al. 2016 USGS publication and modeling tool (Application of Methods Tool version 1.2) to update site hydrologic information. Curran et al. (2016) presents methods for estimating regional regression-based flood magnitude and frequency at gaged and ungaged streams in Alaska. Precipitation at the Project, collected by KPU, would also be used in the calculations. The results of the model include flood frequency estimates (i.e., percent chance exceedance flows) and prediction intervals (i.e., lower and upper limit of 90 percent prediction interval) (Curran et al. 2016).

3.5.8 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

The study methods are in accordance with recommendations provided by the Forest Service. The use of regional regression equations for estimating flows for ungaged streams is an accepted scientific practice.

3.5.9 DELIVERABLES AND SCHEDULE

The proposed study would be completed in 2020. KPU would provide the study results in the Study Report to be distributed to FERC, resource agencies, and stakeholders for review around February 2021.

3.5.10 COST AND LEVEL OF EFFORT

The estimated cost for this proposed desktop study is $8,000. This includes consultation with the Forest Service, compilation of input data, and preparation of a study report

3.5.11 REFERENCES

Curran, J.H., Barth, N.A., Veilleux, A.G., and Ourso, R. T. 2016. Estimating flood magnitude and frequency at gaged and ungaged sties on streams in Alaska and conterminous basins in Canada, based on data through water year 2012. U.S. Geological Scientific Investigations Report 2016-5024, 47 p. Available online: https://pubs.er.usgs.gov/publication/sir20165024. Accessed February 7, 2010.

Hatch Acres. 2007. Beaver Falls Hydroelectric Project Life Extension/Upgrade Program Report. Prepared for Ketchikan Public Utilities. February 2007. 280p.

Ketchikan Public Utilities (KPU). 1992. Application for New License for the Beaver Falls Hydroelectric Project: FERC Project No. 1922. Supplementary Technical Information. Volume 3. October 1992. 159 pages.

Ketchikan Public Utilities (KPU). 2019. Pre-Application Document Beaver Falls Hydroelectric Project (FERC No. 1922). Prepared for City of Ketchikan d/b/a Ketchikan Public Utilities. Prepared by Kleinschmidt Associates. July 2019.

4.0 CONCLUSION AND PROCESS STEPS

4.1 COMMENTS ON THE DRAFT STUDY PLAN

This Draft Study Plan document provides resource agencies and interested stakeholders with the opportunity to comment on the proposed study plans. Any additional study requests or proposed modifications to KPU's proposed studies must follow FERC's TLP Study Request Criteria (18 CFR §16.8).

KPU requests that comments and/or edits on this Draft Study Plan be submitted to KPU within 30 days of receiving this document, on or before April 5, 2020. Based upon comments and/or questions received, KPU may schedule a conference call with interested stakeholders to clarify information contained within the Draft Study Plan and/or clarify stakeholder questions or comments. KPU would finalize the Study Plan and issue a Final Study Plan with resource agencies, FERC, and interested stakeholders prior to the start of the 2020 field season. In accordance with TLP regulations (18 CFR § 4.38), KPU is not obligated to conduct consultation with stakeholders regarding study plan development but is pursuing this extra consultation step to collaborate with stakeholders over the course of this relicensing process.

4.2 STUDY REPORT

Upon completion of 2020 field season work, KPU would develop a Study Report to be distributed to FERC, resources agencies, and interested stakeholders. The study report would be distributed approximately February 2021 and would summarize studies completed, review study results, and report on the status of the studies not completed during the 2020 field season. Upon resource agency and stakeholder review of this study report, KPU plans to schedule a meeting in February/March 2021 to review results and discuss the need for any additional 2021 study work that may be required to complete the relicensing process.

APPENDIX A

STUDY REQUESTS AND COMMENT LETTERS

USDA United States Department of Agriculture Forest Service Alaska Region

P.O. Box 21628
Juneau, AK 99802-1628

File Code: 2770
Date: November 29, 2019

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Comments on Pre-Application Document

Beaver Falls Hydroelectric Project No. 1922

Dear Ms. Bose:

Thank you for the opportunity to review the July 2019 Pre-Application Document (PAD) and to comment on the Beaver Falls Hydroelectric Project.

This project is located within the Tongass National Forest boundary in southeast Alaska. Our comments are related to National Forest System lands and interests within the project boundary. Our comments and relevant guidance documents are enclosed.

We look forward to working with FERC and Ketchikan Public Utilities (KPU) to ensure the needs of the public are addressed. If you have any questions regarding this submittal, please contact Jennifer Berger, Alaska Region Public Services Leader at (907) 586-8843 or jennifer.berger@usda.gov.

Sincerely,

DAVID E. SCHMID
Regional Forester

Enclosures (4)

cc: Jennifer Holstrom; Ketchikan Public Utilities, Melissa Dinsmore; Tongass National Forest

Forest Service Comments on the Pre-Application Document for the Beaver Falls Hydroelectric Project, FERC No. 1922

We have completed our review of the July 2019 Pre-Application Document (PAD) for the Beaver Falls Hydroelectric Project (FERC No. 1922). Overall, we are pleased with how the document was written and the effort to capture preliminary issues and propose mitigation and enhancement measures.

General Comments

Any on-the-ground site investigations/studies that take place on National Forest System lands or roads may require authorization by a special use permit from the Forest Service prior to beginning work.

Agency policy directs us to write "Forest Service, U.S. Department of Agriculture" the first time and thereafter, "Forest Service". Please change USFS to Forest Service in the acronym chart and throughout the document.

To be more clear on page 5-2 and throughout the document, please change the acronym TNF to Tongass National Forest or Tongass and KMRD to Ketchikan Misty Fjords Ranger District or District.

The following comments are organized by section and page as presented in the PAD.

5.0 General Description of the Existing Environment

5.1 Overview. Page 5-2.

The majority of the project area is located outside of the Revilla Roadless Area (No. 524). However, in 2018, the State of Alaska petitioned the Secretary of Agriculture to exempt the Tongass National Forest from the 2001 Roadless Rule. The Department of Agriculture responded, directing the Forest Service to initiate steps to examine a state-specific roadless area management direction for the Tongass. The October 2019 draft environmental impact statement, prepared under the National Environmental Policy Act, provides an analysis of six alternatives, which are options, choices, or courses of action related to roadless management in Alaska. The alternatives range from no action to the removal of the Tongass from the 2001 Roadless Rule. The Department has identified Alternative 6, which is a full exemption, as the preferred alternative at this time. A final decision is expected in 2020.

6.0 Description of the Existing Environment

6.1.3.4 Access road and trail. Page 6-12.

This section discloses the access road and the maintenance issues that have occurred due to landslides and snow avalanches. Road operations are part of the facility operations and should probably be discussed in section 4.0 Project Location, Facilities, and Operations.

Major improvements have been made to the road drainage in the last several years, however, the inside road ditch along Lower Silvis Lake still requires periodic cleaning of sediments from the avalanche area. Is there a plan to install larger culverts or crossing structures to reduce the need for ditch cleaning and allow the sediment to pass under the road? Disclose any plans to make changes to the road to reduce road maintenance costs and improve natural sediment routing in the area.

Provide additional information regarding road condition, adequacy of drainage capabilities, and any preventative measures being taken to reduce road maintenance needs associated with erosion, mass wasting and drainage across the road.

6.2 Water Resources
6.2.2 Streamflow, Gage Data, and Flow Statistics. Page 6-14.

The PAD references hydrologic data developed for the 1994 licensing and the Plant Upgrade Analysis of Upgrade Options, that ranges from 20 to 50 years in age. Given climate variability and current drought conditions for the Southern Southeast Alaska region, we recommended updated stream flow data for the Beaver Falls Hydroelectric Project be generated. The Curran et al. 2016 USGS publication and its associated model can be used to model the stream flow data for the ungauged site, and the on-site precipitation data the PAD states has been collected by Ketchikan Public Utilities since 2009 can be used in the calculations.

The publication can be found at the following URL https://pubs.er.usgs.gov/publication/sir20165024 and the modeling tool, Application of Methods Tool version 1.2, found under the companion file bullet on this page. The publication's citation is:

> Curran, J.H., Barth, N.A., Veilleux, A.G., and Ourso, R.T., 2016, Estimating flood magnitude and frequency at gaged and ungaged sites on streams in Alaska and conterminous basins in Canada, based on data through water year 2012: U.S. Geological Survey Scientific Investigations Report 2016–5024.

6.8 Rare, Threatened, Endangered, and Special Status Species
6.8.2 Rare, Threatened, and Endangered Botanical Species and Habitats. Page 6-64.
The Edible Thistle (*Cirsium edule var. macounii*) is a Forest Service listed sensitive plant species that occurs on Revillagigedo Island, with one population in the Shoal Cove area.

Several plant species on the 2009 Alaska Region Sensitive Species List are suspected to occur on the Ketchikan Misty Fjords Ranger District. Idenitfy and discuss whether or not potential habitat for these species occur within the project area.

6.9 Recreation and Land Use. Page 6-66.
The Tongass National Forest is the largest National Forest, as stated on page 6-77, it is 16.7 million acres just under 17 million acres. Please correct this statement.

6.9.6.2 Land Management. Page 6-88.
The 2016 Forest Plan contains content in Chapter 5 applicable to the Project, including Renewable Energy direction. Recommend including all relevant and applicable Forest Plan direction.

6.11 Cultural Resources
6.11.3 Prior Cultural Resource Investigations Within The Project Area. Page 6-112.
Although in 1993 it was determined that no cultural resources were located within the project area, it appears that a canoe landing (KET-301) and an undocumented historic trash scatter located at or near the outlet of Beaver Falls may be within the area of potential effect (APE).

Subsistence
Section 810 (a) of the Alaska National Interest Lands Conservation Act of 1980, (ANILCA), reads in part

> *In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands under any provision of law authorizing such actions, the head of the Federal agency having primary jurisdiction over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other*

lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes.

Include the subsistence resource in the existing environment and project effects section. Resource impacts based on existing, relevant, and reasonably available information must be evaluated.

Subsistence Access
ANILCA, section 811(a) reads in part, *The Secretary* [of Agriculture] *shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands.*

Include access to subsistence resources in the existing environment and project effects section. Resource impacts based on existing, relevant, and reasonably available information must be evaluated.

7.0 Preliminary Issues, Project Effects, and Potential Studies
As word choice can influence perception, we recommend the term "adverse" in place of "negative" in this section.

7.1.5 Upland Botanical Resources. Page 7-3.
The Alaska Exotic Plant Information Clearinghouse (AKEPIC) is a statewide database of invasive plant locations. Please identify who conducted the actual field surveys in the project area in 2004 and 2006.

7.1.7 Rare, Threatened, Endangered, and Special Status Species. Page 7-4.
Thank you for identifying the need for plant surveys. We suggest also focusing the surveys on habitats for sensitive plant species that are suspected to occur on the Ketchikan Misty Fjords District, if the habitats are present in the project area.

7.1.10 Cultural Resources. Page 7-4.
We support the Alaska SHPO's response that the Beaver Falls Project infrastructure may be an historic property and potentially eligible to the National Register of Historic Places. The historic properties would include all structures, road, and trails greater than 50 years old and associated with the project. Development and implementation of a Historic Properties Management Plan (HPMP), with stakeholder consultation, is an excellent approach for resource conservation and cultural resource management. We suggest including the pump house that was reconstructed in 1975 in the HPMP. We ask for consideration of some type of mitigation in the HPMP for protecting the canoe run and trash scatter (cultural resources) within the area of potential affect.

7.2 Potential Studies and Information Gathering
7.2.1 Proposed Studies

Rare Plant and Invasive Species Survey. Page 7-5.
We have included three guidance documents with this transmittal, to support development of the study plan(s) for invasive plant and rare plant species surveys. We ask that field surveys for rare and invasive plants follow the enclosed Forest Service data collection protocols. We have an interest in reviewing the field data and entering in Forest Service databases.

Historic Structures Survey. Page 7-6.
A Historic Structures Survey and National Register of Historic Places (NRHP) evaluations for historic properties will coincide with the HPMP. These are very good approaches to cultural resource management for the project. We recommend documenting and evaluating the pump house (built in 1975) during the Historic Structures Survey and NRHP process. The pump house will be 50 years old within two years of the license renewal.

Guidance for Preparing a Rare Plant Resource Report Tongass National Forest

Patricia C. Krosse, Ecology, Botany, and Invasive species Program Manager

Mimulus lewisii, Petersburg, Alaska
Photo Courtesy of Karen Dillman

August 2017

Table of Contents

This document was reviewed and edited by the following individuals in 2014:
Mary M. Stensvold, Alaska Regional Botanist (retired)
Karen L. Dillman, Ecologist, Tongass National Forest
Rick L. Turner, Ecologist, Tongass National Forest

1.0 Background

1.1 Purpose of a Rare Plant Resource Report

A rare plant resource report is part of the planning record for the National Environmental Policy Act (NEPA) process. The purposes of this report are to:

1. Document the results of the pre-field review and botanical surveys.
2. Describe rare plants in a manner that is compatible with Chapters 3 (Affected Environment) and Chapter 4 (Environmental Effects) of an Environmental Analysis or Impact Statement (NEPA document).
3. Describe the effects of the proposed action and alternatives on rare plants **or**[1] their habitats identified as issues for the project.
4. Provide mitigation measures needed for input into project road and/or unit cards or other tracking system.
5. Document any measures that were used in project design to protect known rare plant populations.
6. Provide recommendations for monitoring.

A rare plant resource report should be completed for projects that have direct and/or indirect impacts to rare plants[2]. If the project proposes little or no ground disturbance, or if survey information indicates a lack of presence of rare plants, then a rare plant resource report may not be necessary. The level of analysis and documentation depends upon the risk of possible impacts to rare plants that are considered a significant issue during the NEPA process.

1.2 Rare Plants on the Tongass National Forest

A rare plant on the Tongass National Forest is defined as a plant that:

1. Is on the Alaska Natural Heritage Program (ANHP) Rare Vascular Plant Tracking List that are known or suspected to occur on the Tongass (ANHP, 2016), is considered S1 and S2 in State ranking (some S3 are considered, but rarely), and is not designated as a Sensitive Species[3].
2. Is considered rare upon consultation and agreement among Tongass ecologists, District botanists, and the Region 10 botanist because of conservation concerns on the Tongass National Forest (e.g. plants with range edges or disjunct populations on the Tongass but not yet given a state ranking on the ANHP list).

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[1] According to most current FSM 2670.32 (Amendment 2600-2005-1) policy states: "*Analyze, if impacts cannot be avoided, the significance of potential adverse effects on the population **or its habitat** within the area of concern and on the species as a whole.*"

[2] A rare plant resource report is not required for projects that do not have identified rare plant issues or concerns (internal or external).

[3] Sensitive plants are by definition, rare, however they are considered separately from other rare plants that are not formally listed on the Regional Forester's Sensitive Species List and are analyzed separately in the Plant BE.

3. Has been or is being raised as an issue (internal or external) because of rarity or conservation concerns (through the NEPA process).

The list of rare plants is dynamic; plants may be dropped when they are found to be more abundant than previously thought, or plants may be added if they are newly discovered in the state or Forest. Plants may also be added or dropped as their taxonomic status changes. The Regional Office maintains a list of plants considered rare in Region 10. Generally, the Regional rare plant list is based on the ANHP rare plant tracking list. Appendix A provides the most current rare plant tracking list and provides detailed information on numbers of known occurrences within the Tongass along with other information on its status. This list was compiled by the Regional Office and is currently incomplete.

The USFS and other agencies contribute rare plant occurrence information to the ANHP for database inclusion. The plants considered sensitive on the Tongass are also on the ANHP plant tracking list. Each district botanist has the responsibility to review the Regional rare plant list and develop district rare plant lists designed to "target" rare plants that may occur in projects areas. These district lists may be further refined during project analysis to address only those species that have the potential to occur in a particular location. The ANHP database should be reviewed on an annual basis to ensure the most current status is applied to the rare plant list. In general, the list should only include S1 and S2 species, with only a few exceptions of S3 rankings. All species with S3 (or greater) ranking considered appropriate for the district list shall be discussed with the Regional Botanist prior to adding it to the list.

The Alaska Natural Heritage Program is Alaska's clearinghouse for information about plant and animal species of conservation concern, natural communities of conservation concern, and invasive non-native plant species. They collect, validate, and distribute this information and assist natural resource managers and others in applying it effectively. Each rare plant in the ANHP tracking list has a state ranking (S1 to S5) as well as a global ranking (G1 to G5) of conservation status. An S1 (G1) rank is defined as critically imperiled, S2 (G2) is imperiled, S3 (G3) is vulnerable, S4 (G4) is apparently secure, and S5 (G5) is secure. The ANHP plant tracking list changes periodically as previously unknown populations of rare plants are discovered and known populations are extirpated, or when taxa new to Alaska are discovered.

The ANHP has a rare lichen list for Alaska based on data from federal land management agencies and herbarium records. Some of these lichens occur on the Tongass National Forest (Dillman 2012). At this time the Forest is not analyzing affects to rare lichens due to management actions except for the sensitive lichen *Ricasolia amplissima* subsp *sheiyi*. However, there may be other species that are rare and may be suspected or known to occur on the district. These too may be added to the district rare plant list after consulting with the Regional botanist. The district botanist may consider the presence of rare lichens in a project area as an issue to be addressed in NEPA analysis. As with vascular plants, correct identification of rare lichens is dependent on the expertise of the botanist or ecologist.

Other rare botanical life forms, such as bryophytes, are less known on the Tongass; however as with rare lichens, district botanists have the prerogative to address any botanical life form that may be of concern due to rarity as part of the NEPA process after consultation with internal and external subject matter experts (e.g. Regional Botanist, ANHP botanists, university botanists, etc.).

1.3 Direction for Rare Plant Management

The law and policy direction for the Forest Service concerning rare plant management is the following:

1. The **National Forest Management Act of 1976 (NFMA)** states that forest planning must "provide for the diversity of plant and animal communities based on the suitability and capability of the specific land area."(USDA 1976).

2. **36 CFR 219.19 (2017)** viable population is defined as *"a population of a species that continues to persist over the long term with sufficient distribution to be resilient and adaptable to stressors and likely future environments*."

3. **36 CFR 219.6 (2012) and FSM 1909.12 (Chapters 10 and 20)** regarding "Species of Conservation Concern (SCC)": while the current Forest Plan Amendment (2016) does not include SCC designation for any species (fish, wildlife, plant or other), it may be important to consider this definition in light of future analysis of rare plants. "*A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area.*"

4. **FSM 2605**: For planning purposes, a planning area is one or more identified National Forest(s). Therefore, viability is addressed during Forest Planning. See the Tongass Land and Resource Management Plan Amendment plant biological evaluation (Appendix C).

5. **FSM 2602**: Maintaining at least viable populations of all native and desired non-native wildlife, fish and plants in habitats distributed throughout their geographic range on National Forest Systems lands.

6. **Tongass Land Management Plan** requires that the Forest Service implement regional and national policy and direction for the conservation, management, inventory and monitoring of rare plants (Chapter 4: Plants, page 4-39, USDA 2016).

1.4 Who Prepares a Rare Plant Resource Report?

Each District should have a qualified individual(s) designated by the District Ranger (or SO Staff Officer in cases where vacancies at the district exist) to prepare rare plant resource reports based on the Position Classification Standards (OPM) for botany (GS-430), General Natural Resources Management and Biological Sciences (GS-401) and/or Ecology (GS-408). These standards of professionalism applies to both Forest Service and non-FS personnel, such as contractors. Ensure professional standards are identified in all contracts and agreements involving rare plant survey and project planning.

2.0 Essential Elements for a Rare Plant Resource Report

The resource report should be organized in the standard professional journal format outlined below with the following suggested sections: Introduction, Methods, Results, Discussion, Literature Cited and Appendices. *The level of detail in the report should be commensurate with the complexity of the proposed action.*[4] In lieu of this format, the IDT leader for the project may provide a template for the rare plant resource report with the necessary sections.

2.1 Introduction

- Background:
    - Describe the purpose of the resource report and provide relevant and important background information, including a description of the project area and its general vegetation types. This may be done in part by citing references, in particular this document. See Forest Plan Amendment FEIS (2016) for the most current description of the general vegetation of the Tongass (pages 3-143).

    - Briefly define rare plants – cite this document (see Section 1.1)

- Overview of Issues:
    - Include pertinent Issue Statements generated by internal or external scoping.
    - Include the Units of Measure that will be used throughout the analysis to track the issue statement. Units of measure to be used for NEPA analysis are as follows:
        - Number of known occurrences[5] (include discussion of known locations impacted directly and indirectly by proposed management action).

[4] To aid in determining the appropriate level of analysis for a project, the project botanist/ecologist should consult with the IDT leader prior to beginning analysis.

[5] Usage of the term "occurrences" is intentional and deviates from usage of the term "population". Because the NRM-TESP database documents "occurrences" and not necessarily "populations" as defined by NaturServe, we may be miss-representing our Element Occurrence data as populations when they are not. To avoid this discrepancy, we will refer to the number of EOs in the database as "occurrences" until such

- Acres of known occurrences (derived by quantifying the polygon acreage of the mapped occurrence in NRIS-TESP).

- Proposed Action and Alternatives:
  - Describe the proposed action. The description should track through to the effects analysis. Keep this simple by not cutting and pasting the entire Chapter 1 section of the NEPA document.
  - Describe alternatives. The level of detail should parallel the description of proposed action. Keep this simple by not cutting and pasting the entire Chapter 2 section of the NEPA document.

2.2 Methods

Data and Literature Review of Source Documents:

- Provide a literature and data review of source documents used in the pre-field review and analysis; document what sources were reviewed to identify rare plants that are known or suspected to be in the project area. Review items may include any or all of the following:
  - Peer-reviewed and gray literature
  - Datasets (such as NRM-TESP, Arctos, Alaska Natural Heritage Program, USDA Plants)
  - Target species list for District or Project (reference list in an appendix)
  - GIS information (geology, soils, DEMs, streams, CoveType, etc.)
  - Aerial photographs (cite date and scale, for example, 1:15,840, 1991)
  - Floras and herbarium records
  - Include information identified during scoping. Be sure to cite references as appropriate (citations should match the Literature Cited section).

Surveys:

- Describe, if possible, how the survey routes were chosen or prioritized. If inventories are conducted, describe inventory methods, including:
  - Survey dates
  - Name of the botanist who conducted the survey, their job title and agency
  - General location of survey routes (e.g. inside/outside the direct and indirectly affects areas)
  - Survey intensity level (1-6)[6]
  - Describe data documentation methods, mapping methods and data entry methods.
  - State if the field data are entered into NRM or by what date they will be available.

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time as corrections to the database take place. Describing the number of individual plants within an EO may be reference in the "affected environment section" (Chapter 3); however analyzing both occurrences and number of individuals in the effects analysis (Chapter 4) is not necessary.

[6] Survey intensity is dependent upon the surveyor's professional judgment and is based on project size, knowledge about the site and species involved. There is no need to insert all survey intensities in an appendix. Simply discuss the intensity level and type (e.g. General survey using initiative meander methods) or cite this guidance (See Appendix B for complete listing of survey intensities).

- Notes on survey data:
  - ✓ Field data such as rare plant locations and surveys will be entered into the NRM database (NRIS-TESP) by the end of each fiscal year in which the surveys were completed.
  - ✓ Copies of survey records and plant location forms for both rare plants are to be filed into the appropriate project files and copies retained by the botanist.
  - ✓ Information on new rare plant locations will be documented in end of the year accomplishment reporting for botany and forwarded to the SO program manager by the end of October each year.

2.3 Results

Information from the Methods section are summarized here and include the following:

- Survey Quantity:
  - Acres of total survey within the project area (the sum of all survey polygons delineated in TESP in the project area);
    - Percent of survey within project area (sum of all survey acres divided by total project area acres);
  - Acres of survey within the directly affected areas (sum of all surveys polygons within timber harvest units, roads, recreation areas, etc. in project area);
    - Percent of survey within directly affected areas (sum of survey acres within directly affected area divided by total area of proposed affected area);
  - Acres of survey within the non-development LUDs (O/G Reserves, Beach and Estuary Buffer, Riparian Management Areas, etc.) within the project area;
    - Percent of survey within non-development LUDs (sum of survey acres within non-development LUDs divided by total acres of non-development LUDs).
  - Additional survey may be described quantitatively and are optional. These include:
    - Percentage of general habitats surveyed as a proportion of those habitats contained within the project area (based on Covertype or other vegetation data layer).
- Rare Plants Found:
  - List known locations of rare plants in the project area (derived from either field surveys, NRM or other database).
    - If no rare plants were found during surveys nor are known to occur in the project area, this report is not necessary.
  - Provide map of known locations.
  - For each taxon identified in the project area discuss the rare plants found in the project area including the following:
    - Known range on the Forest, in the US and worldwide

- State-wide and Global Ranking (ANHP ranking)
- Status of the known populations relative to other known occurrences on the Forest[7].

2.4 Discussion:

Environmental Consequences (Effects Analysis): Effects analysis include the direct, indirect and cumulative effects of proposed actions on rare plants. The difference between direct and indirect effects is based on when and where the impacts occurs. Cumulative effects is the combination of how much and when the effects occur. Temporal context for direct effects is immediately or shortly after an action is made that may influence rare plants. Indirect and cumulative effects may be measured in years since it may take a long time before deleterious effects are evident in relation to rare plant occurrences.

- Information should be organized and summarized in table format as well as narratively using the following subheadings: Direct, Indirect and Cumulative Effects by Alternative.
- Describe how each alternative might impact known rare plants occurrences in the project area. The purpose and need for the proposed project reflects a need for changing the existing condition, so if we do not take action, there should also be an effect (neutral, positive, or negative).
    - The effects of the No Action is often given less attention, but since it will often serve as the baseline against which other alternatives will be compared, it is especially important to analyze it in detail.
    - This section should include discussion of known occurrences within the Non-development LUDs as a basis from which to compare affects.
- The effects analysis by definition involves overlaying the rare plant occurrence data (EO polygons) on the project plan GIS layers (e.g. timber harvest units, roads, rec sites, etc.).
- DO NOT quantify total acres of potential rare plant habitat or general vegetation types[8]. Referencing the existence of potential habitat in the project area by referencing the rare plant matrix (Stensvold 2015) or target species list is sufficient.

Direct Effects:

- Provide a summary of the types of direct effects associated with the proposed action.
    - Direct effects occur immediately or soon after the implementation of the action (such as actual habitat loss, crushing or burying actual plants, sediment accumulation etc.).
- Describe the spatial boundary where direct effects are analyzed for any or all of the following:
    - Total acres of all proposed timber harvest units;

[7] Knowing the current status of all documented rare plant populations is not required. Only state what is known and admit to any uncertainties.

[8] There is no policy or law that requires quantification of potential habitat. Doing so provides a false sense of accuracy in our analysis methods.

  - Total acres of all proposed new and temporary road corridors;
    - Use a 13 meter (42.6 ft) buffer on either side of the road segment line to represent an average road corridor width of 26 m (85 ft) for forest logging roads (Powell 2014).
  - Total acres of recreation footprint (trails, cabins, other rec site);
  - Total acres of impacts due to minerals plan of operations or other mining activity;
  - Total acres of footprint for renewable energy development or other special uses;
  - Total area of watershed restoration activities;
  - Other actions not listed.
- If possible, quantify the direct effects. For example: Of the 2.3 miles of temporary road planned, 0.4 miles goes through a forest edge/wetland transition habitat where one occurrence of *Listera convallarioides* will be buried.

Indirect Effects:

- Provide a summary of the types of indirect effects associated with the proposed action.
  - Indirect effects are those effects that are "reasonably likely" to occur in a location spatially separated from the action or at a later point in time after a projects implementation (such as changes in hydrology or solar radiation intensities).
- Describe the spatial boundary where indirect effects are analyzed for all proposed actions (as above); however use the following areas for analysis:
  - A 50 m (164 ft.) buffer from the timber harvest unit boundary, road corridor or other activity footprint to the adjacent undisturbed areas to account windthrow or hydrologic changes that may occur over the long term.
    - Indirect effects of proposed timber harvest are analyzed by buffering timber harvest unit boundaries for each project alternative by 50 m and then overlaying this buffer on known rare plant occurrences in the project area.
    - Indirect effects of proposed road construction are analyzed by buffering the 26 m width of the road corridor by 50 m and overlaying the buffered area over known rare plant occurrences.

Cumulative Effects: The cumulative effects analysis includes the sum of the direct and indirect effects from current projects, past projects, or project that are expected to occur in the near future and include both National Forest Service (NFS) and non-NFS lands (if known).

- Past projects considered in the cumulative effects analysis are generally physically located within the cumulative effects analysis area (described below), such as roads and landings, rock quarries and harvest units (O/G and Y/G), communication sites, hydroelectric projects, watershed restoration, recreation development, road construction and maintenance, Log Transfer Facilities (LTF)

site construction, housing and building development and dispersed private lands, and Forest Highway improvements.

- Often, the IDT leader will provide a complete listing of past projects to consider in the cumulative effects analysis and the temporal scale for this analysis (e.g. 5, 10, 20 years into the future, etc.).
- The spatial extent of the cumulative effects analysis area should be ecologically driven. The Forest Plan Amendment (2016) used the entire National Forest boundary to represents the ecological boundary (range) for the direct, indirect and cumulative effects analysis to address the issue of viability[9]. Therefore, this level of analysis is not necessary for project-level cumulative effects analysis. References to the FPA (2016) Chapter 3.7 may be used as a reference for this section of the report.
    - A watershed, a Wildlife Analysis Area (WAA) or a VCU are not considered ecologically significant relative to a plant's distribution.
- Describe the spatial boundary where cumulative effects are analyzed and provide a clear rationale for selecting this area for rare plants.
    - Select a smaller geographic boundary than the national forest boundary which has some ecological relationship to the plant(s), for example:
        - **A major island** (oftentimes, an island is the best cumulative effects analysis area since it is a natural geographic boundary which has the potential to limit pollination and dispersal of rare plants, thus providing a barrier to genetic flow).
        - **A suite of islands** (for example, islands encompassed within a district)
        - **A Landtype Association** (Foss and Landwehr 2016)
        - **An Ecological Subsection** (Nowacki et. al. 2001)
- Provide 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 plant analyzed[10]**.
- Discuss changes in Alaska's climate (discussed in the Climate and Air section and Plants Section of the Forest Plan Amendment FEIS) which could affect the hydrology and other habitat conditions where rare plants occur.

Mitigation Measures and Monitoring Recommendations:

- Mitigation measures mentioned in this section are those that are additional to the Standards and Guidelines (USDA 2008, page 4-41).
    - Mitigation measures should be carried through on project tracking systems, such as timber harvest unit cards, road cards or other.

[9] The Tongass N.F. boundary represents the "planning area" and is therefore the appropriate analysis area for assessing viability of species (FSM 2605).

[10] Look for present effects of past actions that are, in the judgment of the botanist in consultation with the IDT leader, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for project actions and its alternatives on rare plants. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions.

- Monitoring recommendations should be evaluated in light of project issues and risk of impacts to rare plants. Prior to recommending monitoring, the district botanist/ecologist shall consult with the IDT leader.

3.0 Citing Literature

Format references using standard scientific reference format. Provide citations of all sources for the rare plants mentioned in the report. For database sources, include the date the database was searched.

4.0 Appendices

Several supporting documents may be referenced and added to the rare plant resource report including any of the following:

- District/Project rare plant target species list – this list is developed by the district botanist for all S1 and S2 plants from the AKNHP rare plant ranking list in combinations with any other rare species that are concern. This list may also be derived from the rare plant matrix created by Stensvold (2015).
- Survey Field Forms
- Element Occurrence Field Forms
- Maps of survey routes and rare plant locations
- Forest Plan Amendment (2008 and 2016) references as needed

5.0 Elements to Include in the NEPA document (EA, EIS) for Plants

Keep in mind that the amount of information needed for an EA vs. the EIS may be very different. That said, there may not be the need to have an elaborate Plants section in an EIS due to the absence of botanical resources as significant issues. Referencing the rare plant resource report is a good way to avoid unnecessary narratives in the NEPA document. At a minimum, the Plant Resources section in a NEPA document should include the following from the resource report for rare plants:

1. Affected Environment (Chapter 3):
    - Keep it simple. Analysis level should be commensurate with the scope of the project and the issues identified in the NEPA process. If rare plants have not been determined to be "significant" issues, the level of analysis and documentation should be brief.
    - Summarize general vegetation with a brief qualitative description of the overall vegetation communities/habitats within the project area.
    - Summarize rare plant species identified within project area.
    - Brief summary of the methods for field surveys and analysis.
2. Environmental Consequences section (Chapter 4):
    - Direct and Indirect Effects: Summarize activities relating to the project that may affect rare plants known in the project area (possibly a bullet list).

- Cumulative Effects: Summarize activities relating to the project that may affect rare plants known in the cumulative effects area (possibly a bullet list).
    - Include rationale for determining cumulative effects area.
- Affects by alternative summary table.

3. Reference Rare Plant Resource Report filed in administrative record.
4. Gather all electronic files referenced in the report, including all literature cited, for administrative record.

Literature Cited

Alaska Natural Heritage Program 2016. Rare Vascular Plant Tracking List. http://aknhp.uaa.alaska.edu/botany/Botany_tracking_page.htm

Code of Federal Regulations Title 36, Chapter 2, Part 219, Subpart A (36 CFR 219.6 & 219.19). 2012 & 2017.

Dillman, K.L. 2012. Rare Lichens Known or Suspected in the USFS Alaska Region 10. Internal report. 36 pp.

Foss, Jacqueline and Dennis Landwehr. 2016. Landtype Associations of the Tongass N.F. Internal document 1,000 p.

Nowacki, G., M. Shephard, P. Krosse, W. Pawuk, G. Fischer, J. Baichtal, D. Brew, E. Kissinger & T. Brock. 2001. Ecological subsections of Southeast Alaska and Neighboring Areas of Canada. USDA Forest Service, Alaska Region. Technical Publication No. R10-TP-75.

Powell, Jason. Recommendations on road right of way width measurements. Personal Communication 2014.

Stensvold, Mary. 2015. Stensvold, Mary. 2015. Rare Plant Matrix for the Alaska Region. Internal document. USDA Forest Service, Alaska Region.

University of Alaska Museum. 2009. ARCTOS Database http://www.uaf.edu/museum/collections/herb/ Fairbanks, Alaska.

USDA. 1978. National Forest Management Act. http://www.fs.fed.us/emc/nfma/includes/NFMA1976.pdf (06 Nov 2007)

USDA Forest Service. 1997. Tongass National Forest: Land and Resource Management Plan. U.S. Dept. of Agriculture, Alaska Region: U.S.D.A. Forest Service

USDA Forest Service. 2015. Forest Service Handbook 1909.12 Land Management Planning Handbook. Chapter 20 – Land Management Plan.

USDA Forest Service. 2005. Forest Service Manual 2600: Wildlife, Fish and Sensitive Plant Habitat Management. Chapter 2670 – Threatened, Endangered and Sensitive Plants and Animals. Amendment no. 2600-2005-1.

USDA Forest Service. 2008. Tongass National Forest: Land and Resource Management Plan. U.S. Dept. of Agriculture, Alaska Region: U.S.D.A. Forest Service

USDA Forest Service. 2016. Tongass National Forest: Land and Resource Management Plan. U.S. Dept. of Agriculture, Alaska Region: U.S.D.A. Forest Service

Appendix A – Alaska Region Rare Plant Matrix – see Alaska_Region_rare_plant_matrix_Nov2015.xlsx

Appendix B. Survey Types (NRIS-TESP).

Survey type	Description
Field Check	The survey area is given a quick "once over" but the surveyor does not walk completely through the project area. The entire area is not examined.
Cursory	A Cursory survey is appropriately used to confirm the presence of species of interest identified in previous surveys or in the pre-field analysis. By its nature, the cursory survey is rapid, and does not provide in-depth environmental information. The entire area is traversed at least once. For example, stand condition as seen in aerial photography can be verified by a cursory survey. Also, a cursory survey can be used to determine if a plant population that had been previously documented at a site remains present or intact.
General	The survey area is given a closer review by walking through the area and its perimeter or by walking more than once through the area. Most of the area is examined
Focused (Intuitive Controlled)	The Focused, or Intuitive Controlled, survey is the most commonly used and most efficient method of surveying for TES plants. During pre-field analysis, potential suitable habitat is identified for each species of interest and the survey effort is focused in those areas. This method requires adequate knowledge of suitable habitat in order to accurately select the areas of focused searching. When conducting intuitive controlled surveys, an area somewhat larger than the identified suitable habitat should be searched to validate current suitable habitat definitions.
Random	Random surveys employ an undirected, typically non-linear, traverse through a project area. They are employed either when there is inadequate natural history information about a species to discern its suitable habitat and the surveyor is simply searching for occurrences, or when a target species is very abundant within a search area and the surveyor is attempting to make estimates of population parameters such as intra-patch variations in density or the occurrence of predation or herbivory. However, a stratified random survey may be more effective in these latter cases.
Stratified Random	This survey is most often used within known population areas of target species, or when an area to be surveyed is of unknown habitat suitability and is relatively large. Stratified random surveys employ a series of randomly selected plots of equal size within a project area that are each thoroughly searched for target species. When conducting a stratified random survey, it is important to sample an adequate number of plots that are of sufficient size if statistical inference regarding the survey area is desired (discussion of sample

Survey type	Description
	designs, see Elzinga, C., *et al.* 1998)**.**
Systematic	Typically used in limited areas where the likelihood of occurrence of a target species may be evenly distributed throughout the survey area. Systematic surveys are often employed either within focused search areas (e.g., stratified random and intuitive controlled methods), or when a proposed project is likely to produce significant habitat alterations for species that are especially sensitive to the proposed activities.

Tongass National Forest-

Guidance for Biological Evaluations:

Sensitive Plants

Ligusticum calderi, Bald Mountain, Heceta Island

Courtesy of Meridian Environmental, Inc.

Patricia C. Krosse, Ecology, Botany, Air, and Invasives Program Manager

As revised from

Dillman, K.L., P.Krosse and M. Stensvold (March 2009)

Tongass National Forest

September 2017

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APPENDICIES

1.0 Background

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.

Conducting a Biological Evaluation (BE) is required for all projects (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.

1.1 Sensitive Species

The 2016 Standards and Guidelines for sensitive plants of the Tongass Land Management Plan (page 4-39) direct that project leaders consult with FS Manual (FSM) 2670 (2009) 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 2016). These standards were unchanged from the original 2008 Forest Plan Amendment. The BE process will help the interdisciplinary team determine if sensitive plants or their habitats will be affected by a proposed project.

1.2 Species of Conservation Concern

The Sensitive Species program and need for conducting Biological Evaluations is in transition due to the 2012 Planning Rule and newly published planning directives (1909.12 Chapters 10 and 20) which resulted in changes in terminology and definition of "at-risk" species referred to as "Species of Conservation Concern" (hereafter, SCC). As part of the at-risk species, SCC focuses attention on particular taxa that warrant conservation consideration and therefore will require forest plan components which address their conservation concern. The definition for SCC in the 2012 Rule provides important direction for identifying SCC:

> *A species of conservation concern is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area.* (36 CFR 219.9)

Criteria for identifying SCC differ from the criteria for Sensitive Species although there are important similarities. As with Sensitive Species, the intent is to identify those species whose conservation status suggests that long-term viability is in question. However, the spatial scale of interest, the level of scientific certainty, and the definition of viability all differ for SCC and Sensitive Species.

From October 2014 through March 2015, the Tongass fish, wildlife and botany programs went through a concerted effort to evaluate SCC from the three major taxa as pre-work for the 2016 Forest Plan Amendment. This included development of a process for SCC evaluations (based on

planning directives), comprehensive species evaluations for those species suspected to be at risk (at a minimum all listed Region 10 Sensitive Species), and a deliberative record documenting the process for evaluation, review and consultation with internal and external stakeholders. Final recommendations for SCC status were forwarded to the Tongass Forest Supervisor and then the Regional Forester. In spite of this work the Washington Office elected to have the Tongass maintain the sensitive species program and not move forward with SCC for the 2016 Forest Plan Amendment.

However, the result of this work is newly updated species evaluations for all sensitive plants and one lichen on the Alaska Region Sensitive Species list. Additionally, we evaluated several other species that we suspected to have conservations concerns. This work is compiled and represents the most recent documentation on known occurrences, status, trends and threats to our current sensitive plant species. This work is provided in Appendix A. Appendix A also provides the detailed SCC process used in the evaluations and Appendix B provides the deliberative record. Appendix B also represents the Alaska Region Sensitive/Rare Plant Matrix (Stensvold 2015) of all known or suspected rare plants on both the Tongass and Chugach National Forests.

1.3 Conclusions - Current BE Direction for Project Analysis

The Forest Plan Amendment (2016) conducted a Biological Evaluation for Plants (Appendix C) using the most recent species evaluations provided in the March 2015 SCC analysis. This evaluation and the analysis of effects for each species provides the basis in which to assess viability for sensitive species for each project. Under the current sensitive species program guidance, Forest Service policy requires that viability assessments focus on the Land and Resource Management Plan area. Because we have not yet transitioned to SCC, the role of the project BE is to continue to analyze the effects of the proposed actions on sensitive species. However, because of the sharing of both 1982 and 2012 Planning Rules, our current direction (under 2012) is to provide an evaluation of Plan consistency. In the absence of Forest-wide viability assessments, there may be considerable variation amongst specialists in the content and form of viability assessments; therefore, the Forest Plan Plant BE (2016) will serve as the appropriate reference to biological determinations set forth in the BE process for project activities that were covered in the Forest Plan Amendment (2016) (e.g. young growth management and renewable energy development). Findings from effects analysis are to be compared and contrasted with Forest Plan Plant analysis of effects as part of the Consistency Finding under our current Plan. For projects activities that were not specifically evaluated in the Forest Plan Amendment, additional effects analysis will be required.

1.4 Who Prepares a Plant BE?

Each District should have a qualified individual(s) designated by the District Ranger (or SO Staff Officer in cases where vacancies at the district exist) to prepare plant biological evaluations based on the Position Classification Standards (OPM) for botany (GS-430), General Natural Resources Management and Biological Sciences (GS-401) and/or Ecology (GS-408). These standards of professionalism applies to both Forest Service and non-FS personnel, such as

contractors. Ensure professional standards are identified in all contracts and agreements involving sensitive plant survey and project planning.

If the person preparing the document does not have the qualifications as stated above then the Plant BE must be reviewed and approved by a qualified Tongass botanist or ecologist. New resource specialists in this area will undergo a year of review prior to approval.

2.0 Project Initiation and Pre-field Review

The documents referenced in this section provide valuable methods and consistency in many aspects of sensitive plant surveys and Plant BE development.

The Project Initiation (PI) and Pre-field Review (PFR) are valuable to efficiently gather information to conduct a Biological Evaluation. They are available on the Tongass NF Ecology, Botany, Invasive Species & Air Quality SharePoint site as links to the Alaska Region Botany SharePoint site at https://ems-team.usda.gov/sites/fs-r10-botanyprgm/SitePages/Home.aspx

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. This form is helpful to the botanist to evaluate the needs of the project and should be required of all project proponents.

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 sensitive plant matrix (April 2015) located in Appendix B (sensitive/rare plant matrix for the Alaska Region). Habitat information is necessary in order to leave a trail of logic as to why surveys were or were not recommended. The signed, original PRE document is sent to the project leader and the botanist retains a copy.

The following information is developed through the Pre-field Review process:

- 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 Project Initiation 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.

- Known Occurrences[1] of Target Species – this is derived from NRM-TESP, other databases, and possibly undocumented field notes. Note the location of known sensitive plants by using the latitude and longitude (or general location) of the plant and distance from the project area. If the known location is associated with any harvest unit, road, trail or other citable location, add this to the Plant BE section under *Affected Environment* as well as the number of mapped occurrences in NRM-TESP for the project area, the cumulative effects analysis area, and the Forest as a whole.

- Review of Plant Habitats – this is derived by use of GIS data layers, such as CoverType, Soils, Shoreline, Streams, DEMs etc. Once the broad scale vegetation types are delineated in GIS, aerial photo reviews of the habitats of interest should take place (keeping in mind the target habitats for each species as identified in the sensitive plant matrix). Overlay proposed harvest units, road corridors, trails and other proposed actions on aerial photos to develop proposed survey sites based on the habitat types that most need to be surveyed.

- Proposed Survey Sites – survey sites should include not only the directly and indirectly affected areas, but should include the other habitats associated with the target species, even if they will not be impacted by management actions.

    - Survey Site Selection – A recommended target for survey should include about 10% survey in non-development LUDS within the project area (within target habitat types), such as Old Growth Reserves (OGRs), beach and estuary fringe, Riparian Management Areas (RMAs), and other non-management LUDs in the project area. The other 90% of the surveys should be selected based on the direct and indirectly affected areas and the aerial photo review of the target habitats identified in the beginning stages of the pre-field review.

2.1 Using the Pre-field Review as a BE

By completing the form and using professional 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 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 botanists 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

[1] Usage of the term “occurrences” is intentional and deviates from usage of the term “population”. Because the NRM-TESP database documents “occurrences” and not necessarily “populations” as defined by NaturServe, we may be miss-representing our Element Occurrence data as populations when they are not. To avoid this discrepancy, we will refer to the number of EOs in the database as “occurrences” until such time as corrections to the database take place. Describing the number of individual plants within an EO may be referenced in the “affected environment section” (Chapter 3); however analyzing both occurrences and number of individuals in the effects analysis (Chapter 4) is not necessary.

between the hard copy and the electronic copy. A header with the name of the project and the botanists 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 appropriate sensitive plant determination language in the document as follows:

FSM 2600, Chapter 2670, Amendment No. 2600-2009-1 (July 24, 2009)

2672.42 – Standards for Biological Evaluations

5. A determination of no effect, beneficial effect, or "may" effect on the species and the process and rationale for the determination in the environmental assessment or the environmental impact statement.

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 according the information provided in the rare plant matrix and the PRE 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 available in NRM-TESP.

3.0 Biological Evaluations

The Alaska Region Botany SharePoint site contains a template for a Biological Evaluation for Plants (https://ems-team.usda.gov/sites/fs-r10-botanyprgm/SitePages/Home.aspx). The BE Boilerplate and BE procedures were last updated in April of 2015. This template is updated periodically and provides basic guidance for the elements outlined below (sections 3.1-3.8). It is wise to periodically check the Regional SharePoint site for any revisions of forms, templates or sensitive species lists and matrices. 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

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. See Section 1.4 *Who Prepares a Plant BE* – and include the appropriate signature on the cover page.

3.2 Executive Summary

This functions as an abstract. Include a brief description of the proposed project, the methods, and findings if it is a project with a lot of information. Mention the plants analyzed along with the risk analysis and determinations.

3.3 Table of Contents

Use table of contents for larger documents.

3.4 Introduction

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.

3.5 Description of Alternatives

Use the information gathered from the Project Initiation Form. Describe the exact location of the project. This section may basically repeat what is in the proposed action with respect to describing the scope of the project. Provide a table showing the proposed action by alternative. For example, miles of road (new and temporary) proposed, units (acres), miles of trail, etc.

3.6 Affected Environment and Methods

Describe the general vegetation, or cite the 2016 Forest Plan Amendment (Section 3.7 – Plants) and link this discussion with a discussion of suspected and known sensitive species to habitat types known to exist in the project area which are derived from the pre-field review. Include citations as needed. Describe the results of field surveys.

3.6.1 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 formal determinations.

List any sources of existing information used in the pre-field review, including personal communication or meetings. Include the databases and the date they were used. Include the following elements:

- The list of sensitive plants that are known or suspected to occur on the unit (District or Forest).
- Documentation that all species were considered.
- Delineate which species that are known or suspected to occur within the project area may potentially be affected by the proposed action.
- Identify if any of the species evaluated were identified as "significant issues" in the scoping document.
- Include the Units of Measure that will be used throughout the analysis to track the issue statement. Units of measure to be used for NEPA analysis are as follows:
    - Number of known occurrences[2] (a discussion of known locations impacted directly and indirectly by proposed management action will be shown in Section 3.6.3).
    - Acres of known occurrences (derived by quantifying the polygon acreage of the mapped occurrence in NRM-TESP).

3.6.2 Field Survey for Sensitive Plants

This section includes the sensitive plants encountered, if any, the botanist who did the surveys, 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 entered into NRM-TESP at the end of the fiscal 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

[2] Usage of the term "occurrences" is intentional and deviates from usage of the term "population". Because the NRM-TESP database documents "occurrences" and not necessarily "populations" as defined by NaturServe, we may be miss-representing our Element Occurrence data as populations when they are not. To avoid this discrepancy, we will refer to the number of EOs in the database as "occurrences" until such time as corrections to the database take place. Describing the number of individual plants within an EO may be referenced in the "affected environment section" (Chapter 3); however analyzing both occurrences and number of individuals in the effects analysis (Chapter 4) is not necessary.

records should be filed in the project files and a copy retained by the botanist. Any sensitive plants found are documented on Element Occurrence field forms.[3] A brief summary of any new sensitive plant locations will be forwarded to the SO program manager by the end of October each year. Information to provide includes species name, location, size of population, and date the data was entered into NRM-TESP.

3.6.3 Sampling Methods

The Forest Service Manual (FSM 2670) 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)[4] is based on the botanists professional judgment to determine the survey intensity and total number of surveys needed for a project after completing the Pre-field Review analysis.

Information from the Methods section are summarized here and include the following:

- Survey Quantity:
    - Acres of total survey within the project area (the sum of all survey polygons delineated in TESP in the project area);
        - Percent of survey within project area (sum of all survey acres divided by total project area acres);
    - Acres of survey within the directly affected areas (sum of all surveys polygons within timber harvest units, roads, recreation areas, etc. in project area);
        - Percent of survey within directly affected areas (sum of survey acres within directly affected area divided by total area of proposed affected area);
    - Acres of survey within the non-development LUDs (O/G Reserves, Beach and Estuary Buffer, Riparian Management Areas, etc.) within the project area;

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[3] EO field forms and survey field forms found at https://ems-team.usda.gov/sites/fs-r10-botanyprgm/SitePages/Home.aspx

Survey intensity is dependent upon the surveyor's professional judgment and is based on project size, knowledge about the site and species involved. There is no need to insert all survey intensities in an appendix. Simply discuss the intensity level and type (e.g. General survey using initiative meander methods) or cite this guidance (See Appendix D for complete listing of survey intensities).

[4] See Appendix D for complete listing of all survey intensities. This appendix is not required to be included in every Plant BE. Simply citing this document will suffice.

        - Percent of survey within non-development LUDs (sum of survey acres within non-development LUDs divided by total acres of non-development LUDs).

    - Additional survey may be described quantitatively and is optional, such as:

        - Percentage of general habitats surveyed as a proportion of those habitats contained within the project area (based on Covertype or other vegetation data layer).

- Sensitive Plants Found:

    - List known locations of sensitive plants in the project area (derived from either field surveys, NRM or other database).

        - If no sensitive plants were found during surveys nor are known to occur in the project area, state this.

    - Provide map of known locations.

    - For each taxon identified in the project area discuss the sensitive plants found in the project area including the following:

        - Known range on the Forest, in the US and worldwide

        - State-wide and Global Ranking (ANHP ranking)

        - Status of the known populations relative to other known occurrences on the Forest[5].

3.7 Effects Analysis

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 plant occurrences or their actual habitat and how. 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.

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 the determination is “no effect”. If the surveys were not done at the 5 or 6 level, the BE should include an analysis of effects (see BE Boiler Plate at https://ems-team.usda.gov/sites/fs-r10-botanyprgm/SitePages/Home.aspx.

[5] Knowing the current status of all documented sensitive plant populations is not required. Only state what is known and admit to any uncertainties. A good reference for this discussion is the Forest Plan Amendment BE (2016).

To complete an analysis of effects, 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). Cumulative effects are also evaluated for the NEPA document.

Effects analysis include the direct, indirect and cumulative effects of proposed actions on sensitive plants. The difference between direct and indirect effects is based on when and where the impacts occur. Cumulative effects is the combination of how much and when the effects occur. Temporal context for direct effects is immediately or shortly after an action is made that may influence rare plants. Indirect and cumulative effects may be measured in years since it may take a long time before deleterious effects are evident in relation to rare plant occurrences.

- Information should be organized and summarized in table format as well as narratively using the following subheadings: Direct, Indirect and Cumulative Effects by Alternative.
- Describe how each alternative might impact known sensitive plant occurrences in the project area. The purpose and need for the proposed project reflects a need for changing the existing condition, so if we do not take action, there should also be an effect (neutral, positive, or negative).
    - The effects of the No Action is often given less attention, but since it will often serve as the baseline against which other alternatives will be compared, it is especially important to analyze it in detail.
    - This section should include discussion of known occurrences within the Non-development LUDs as a basis from which to compare affects.
- The effects analysis by definition involves overlaying the sensitive plant occurrence data (EO polygons) on the project plan GIS layers (e.g. timber harvest units, roads, rec sites, etc.).
- DO NOT quantify total acres of potential sensitive plant habitat or general vegetation types[6]. Referencing the existence of potential habitat in the project area by referencing the sensitive plant matrix (Stensvold 2015) or target species list is sufficient.

3.7.1 Direct Effects

Provide a summary of the types of direct effects associated with the proposed action. Direct effects occur immediately or soon after the implementation of the action (such as actual habitat loss, crushing or burying actual plants, sediment accumulation etc.).

Describe the spatial boundary where direct effects are analyzed for any or all of the following:

[6] There is no policy or law that requires quantification of potential habitat. Doing so provides a false sense of accuracy in our analysis methods.

- Total acres of all proposed timber harvest units;
- Total acres of all proposed new and temporary road corridors;
    - Use a 13 meter (42.6 ft.) buffer on either side of the road segment line to represent an average road corridor width of 26 m (85 ft.) for forest logging roads (Powell 2014).
- Total acres of recreation footprint (trails, cabins, other rec site);
- Total acres of impacts due to minerals plan of operations or other mining activity;
- Total acres of footprint for renewable energy development or other special uses;
- Total area of watershed restoration activities;
- Other actions not listed.

If possible, quantify the direct effects. For example: Of the 2.3 miles of temporary road planned, 0.4 miles goes through a forest edge/wetland transition habitat where one occurrence of *Cyperpidium parviflorum* will be buried.

3.7.2 Indirect Effects

Provide a summary of the types of indirect effects associated with the proposed action. Indirect effects are those effects that are "reasonably likely" to occur in a location spatially separated from the action or at a later point in time after a project's implementation (such as changes in hydrology or solar radiation intensities).

Describe the spatial boundary where indirect effects are analyzed for all proposed actions (as above); however use the following areas for analysis:

- A 50 m[7] (164 ft.) buffer from the timber harvest unit boundary, road corridor or other activity footprint to the adjacent undisturbed areas to account windthrow or hydrologic changes that may occur over the long term.

[7] This width is based on limited research on the edge effects of forest management practices on vegetation. Past studies of microclimate of forests adjacent to harvests indicate that edge-related microclimate effects may occur up to and beyond 200 meters from the harvest edge, with most change occurring within 20 m of the harvested edge; although the magnitude of an effect can differ among the climatic variables of interest (Chen et al. 1993, 1995; Concannon 1995; Russell et al. 2000). Research on edge effects on forest vegetation adjacent to harvests indicates that changes in temperature and light availability are greatest at the edge, but decline sharply inside adjacent unharvested forest. Declines among some groups of vascular and nonvascular plants is often greatest approximately 5-10 meters from the edge (Heithecker and Halpern 2007).

- Indirect effects of proposed timber harvest are analyzed by buffering timber harvest unit boundaries for each project alternative by 50 m and then overlaying this buffer on known sensitive plant occurrences in the project area.
- Indirect effects of proposed road construction are analyzed by buffering the 26 m width of the road corridor by 50 m and overlaying the buffered area over known sensitive plant occurrences.

3.7.3 Cumulative Effects

The cumulative effects analysis includes an analysis of impacts on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. They generally include the sum of the direct and indirect effects from current projects, past projects, or project that are expected to occur in the near future and include both National Forest Service (NFS) and non-NFS lands (if known). Baselines are the common starting point for all analysis. It is impossible to analyze cumulative effects and to make an effects determination if there is not a baseline from which to draw a comparison. The baseline for sensitive plants is the existing condition in the project area in relation to sensitive plant occurrences across the Tongass N.F.[8]

- Past projects considered in the cumulative effects analysis are generally physically located within the cumulative effects analysis area (described below), such as roads and landings, rock quarries and harvest units (O/G and Y/G), communication sites, hydroelectric projects, watershed restoration, recreation development, road construction and maintenance, Log Transfer Facilities (LTF) site construction, housing and building development and dispersed private lands, and Forest Highway improvements.
    - Often, the IDT leader will provide a complete listing of past projects to consider in the cumulative effects analysis and the temporal scale for this analysis (e.g. 5, 10, 20 years into the future.).
- Describe the spatial boundary where cumulative effects are analyzed and provide a clear rationale for selecting this area for sensitive plants. The spatial extent of the cumulative effects analysis area should be ecologically driven. The Forest Plan Amendment (2016) used the entire National Forest boundary to represent the ecological boundary (range) for the direct, indirect and cumulative effects analysis to

[8] To address the lack of formal viability assessments for all sensitive plants on the current sensitive species list, use current Conservations Assessments (CAs), if available, and the most recent species assessments conducted for the SCC analysis (Krosse et. al. 2015).

address the issue of viability[9]. Therefore, this level of analysis is not necessary for project-level cumulative effects analysis. References to the FPA (2016) Chapter 3.7 may be used as a reference for this section of the report.

  - A watershed, a Wildlife Analysis Area (WAA) or a VCU are not considered ecologically significant relative to a plant's distribution.

- Describe the spatial boundary where cumulative effects are analyzed and provide a clear rationale for selecting this area for sensitive plants. Select a smaller geographic boundary than the national forest boundary which has some ecological relationship to the plant(s), for example:
  - **A major island** (oftentimes, an island is the best cumulative effects analysis area since it is a natural geographic boundary which has the potential to limit pollination and dispersal of rare plants, thus providing a barrier to genetic flow).
  - **A suite of islands** (for example, islands encompassed within a district).
  - **A Landtype Association** (Foss and Landwehr 2016)
  - **An Ecological Subsection** (Nowacki et. al. 2001)
- Provide 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 plant analyzed[10]**.
- Discuss changes in Alaska's climate (discussed in the Climate and Air section and Plants Section of the Forest Plan Amendment FEIS) which could affect the hydrology and other habitat conditions where sensitive plants occur.

[9] The Tongass N.F. boundary represents the "planning area" and is therefore the appropriate analysis area for assessing viability of species (FSM 2605).

[10] Look for present effects of past actions that are, in the judgment of the botanist in consultation with the IDT leader, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for project actions and its alternatives on sensitive plants. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions.

Factor 1.Consequence of Adverse Effect From a Particular Activity

LOW: None, or questionable adverse effect on habitat or population. No cumulative effects expected.

MODERATE: Possible adverse effects in habitat or on population. Cumulative effects possible.

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 analysis 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. Criteria for conducting an analysis of effects for biological determinations[11]

3.7.4 Effects Analysis

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

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.

3.8 Biological Determinations

This section lists the determination for each plant, based on the analysis (refer to Section 2.1). Determinations should already take into account standards and guidelines (USDA 2016, page 4-

[11] 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.

39 or Appendix E). The project may negatively impact sensitive plants as proposed. However, with mitigation measures advised by the botanist, the project may avoid those anticipated impacts.

It is the responsibility of the District botanist/ecologist to ensure mitigation measures are accepted by the IDT and deciding official. There will be times when mitigation measures are not able to be implemented, for a variety of reasons. The process of IDT communication is essential and must be rectified prior to the signing of the ROD, DM or FONSI.

Any mitigation measures that have been agreed upon by the IDT and deciding official will be incorporated into the BE and NEPA document, as well as identified on project tracking tools, such as harvest unit cards, road card, or other.

Use appropriate determination language as stated in FSM 2600, Chapter 2670, Amendment No. 2600-2009-1 (July 24, 2009): 2672.42 – Standards for Biological Evaluations.[12]

The 2016 Forest Plan Amendment Biological Evaluation (Appendix C) provides the viability call for the sensitive species that are currently listed. It would be rare that a more restrictive determination of effects from that identified in the Forest Plan would be applied to any project.

3.9 Monitoring Recommendations

Monitoring recommendations should be evaluated in light of project issues and risk of impacts to rare plants. Prior to recommending monitoring, the district botanist/ecologist shall introduce through and gain acceptance of all monitoring from IDT and the deciding official.

4.0 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 alternatives-how many acres will be affected
- Alternatives.
- Names of surveyors, dates of surveys, levels (intensity) of surveys, and numbers of surveys by habitat type.
- Determine how much of the project area was surveyed (see page 9). This section may be strengthen by adding elements of the survey design. For example, 10% of the calcareous

[12] A determination of no effect, beneficial effect, or "may" effect on the species and the process and rationale for the determination in the environmental assessment or the environmental impact statement. The determinations should be part of the decision memo for the project.

fens in the project area were surveyed at randomly selected points across the area; or 50% of the proposed 20 miles of road were surveyed using 100-foot transects spaced every 1000 feet.

- The kinds of sensitive plant habitats expected or known in and around the project area; if there are none, then state this. This information is derived from the sensitive plant matrix (Stensvold 2015) and the pre-field review.
- Names of sensitive plants that are documented within the project area and cumulative effects analysis 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 2670, 2009).
- 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 the determination should read: *This project, as described, has no effect on 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.

5.0 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 the rare plant 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.

6.0 Literature Cited

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Guidance for Invasive Plant Management Program Tongass National Forest

Patricia C. Krosse, Program Manager Ecology, Botany, and Invasive Species,
Tongass National Forest

Revised
September 2019

Tansy ragwort (Senecio jacobaea)
Photo courtesy of Shawna Bautista, R6 Invasive species Coordinator

Reviewed and Approved by:
Shawna Bautista, R10/R06 Invasive Spp. Program Coordinator
Trish Wurtz, R10/R06 Pesticide Use Coordinator

Table of Contents

1.0 INTRODUCTION

The purpose of this document is to provide direction in the prevention and control of aquatic and terrestrial invasive plant infestations (including noxious weeds) on the Tongass National Forest. It utilizes an integrated pest management approach for managing invasive plant species on National Forest System (NFS) lands. This direction also pertains to invasive plant management on non-NFS lands in which the Forest Service and adjacent land ownerships work together to provide benefits to watershed resources (see Wyden Amendment P.L. 109-54 Section 434).

This guidance is specific to plants in accordance with current policy for Invasive Plant Management described in Forest Service Manual (FSM) 2900 (approved November 2011). FSM 2900 is a national directive that supports invasive species management programs relative to prevention, early detection and rapid response (EDRR), control and management, restoration and organizational collaboration. The guidance herein follows national-level policy and outlines specific practices for the Tongass National Forest in the form of Weed Best Management Practices (WBMPs). It provides WBMPs to achieve this goal for all management activities on or off NFS lands. Exhibits 1-6 provide information on process and methodology pertaining to the above management direction. Users of this document include botanists, ecologists, invasive species coordinators, hydrologists, project planners, engineers, minerals and recreation specialists and wilderness managers.

The direction provided in the FSM 2900 replaces the *Tongass Noxious Weed Management Manual Supplement (2080 Supplement no. R10 TNF-2000-2007-1 - October 19, 2007*).

For additional written policy pertaining to Invasive Plant Management on National Forest System Lands see FSM 2900 (Invasive Species Management Policy), 2070 (Native Plant Material Policy) and FSM 2150 (Pesticide Use Management and Coordination Policy).

2.0 DEFINITIONS

See FSM 2905 for definitions of terms related to invasive species management. Other terms applicable but not specified in FSM 2905 are the following:

Ecosystem: the complex of a community of organisms and its environment.
Introduction: the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity.
Native Species: with respect to a particular ecosystem, are species that, (other than as a result of anthropogenic introduction), historically occurred or currently occur in a particular ecosystem.
Weed: a plant that is not valued where it is growing and is often of vigorous growth; especially one that tends to overgrow or choke out more desirable plants (Merriam-Webster.com). The term “weed” is often used as a general category to encompass the sum of all non-natives or “alien” plants, as well as invasive and/or noxious plants.

3.0 BACKGROUND

This document follows direction from FSM 2900 Invasive Species Management (2011) and Executive Order (EO) 13112 (1999) as amended December 5, 2016. FSM 2900 provides National Forest System policy, responsibilities and direction for the prevention, detection, control and restoration of effects from aquatic and terrestrial invasive species that includes vertebrates, invertebrates, plants and pathogens. FSM 2900 is also referenced as guidance in the Tongass National Forest Land Management Plan for Invasive Plants (Chapter 4 - USDA 2016). The amended EO 13112 maintains the National Invasive Species Council (Council) and the Invasive Species Advisory Committee but expands the membership of the Council; clarifies the operations of the Council; incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into Federal efforts to address invasive species; and strengthens coordinated, cost-efficient Federal action.

The Alaska Center for Conservation Science's Weed Ranking Project has a ranking system to help the user determine a non-native plant's invasiveness in Alaska (http://aknhp.uaa.alaska.edu/botany/akepic/non-native-plants-alaska/). The ranking process (0 to 100, low to high invasiveness score) takes into account certain criteria for each invasive plant species such as: 1) documentation of presence in the state and known distribution, 2) climatic comparison of Alaska's climates to other climates outside Alaska where a plant is known to thrive, 3) biological characteristics, 4) dispersal ability, and 5) feasibility of control. There are about 300 non-native plant species documented in Alaska, and the roughly 120 of the most invasive are included in the weed ranking project.

We use the weed ranking system to aid in identifying the highest priority invasive plant treatment areas on each district throughout the Forest. Each district determines their own specific list of invasive plants targeted for treatment. A ranking 60 or higher is often considered a high priority plant for treatment; however, there are other criteria used in determining management options. For example, we use integrated pest management techniques and an early detection and rapid response strategy to actively treat invasive plants that may have a moderate to low invasiveness score but due to location and/or threat to resource values, are elevated to a high priority for treatment. These lists are dynamic and may be accessed by contacting the District botanist or ecologist.

In addition to each District Invasive Plant Treatment List, we emphasize the treatment of any plant species currently listed on the State of Alaska's "Prohibited and Restricted Noxious Weeds List" (2011) prepared by the Department of Natural Resources Division of Agriculture (see Exhibit 1). The State of Alaska's list was developed with agricultural producers in mind, not forest managers. The Committee for Noxious and Invasive Pests Management in Alaska (CNIPM) is working the get the state's list expanded. This is a multi-year project, but when it is successful it will include species like Japanese knotweed. That is not a concern to agricultural producers but should be a big concern to forest managers.

4.0 WEED BEST MANAGEMENT PRACTICES (WBMPS)

The objective of the Tongass National Forest's Weed Best Management Practices is to prevent the spread of existing weeds (with an emphasis on invasive plants) and prevent new infestations. The basis for these Prevention and Control Measures are National Policy: FSM 2900 (specifically FSM 2903(5)), which directs all National Forest and Grasslands to *ensure that all Forest Service management activities are designed to minimize or eliminate the possibility of establishment or spread of invasive species on the National Forest Systems, or to adjacent areas.* Some practices are specifically cited from policy and some items are the result of determinations based upon policy or other direction.

The table below contains two parts: 1) the *Management Action* or objective of an action; and 2) the recommended or required *Management Practices* which help meet the actions' intent. The FSM 2900 citation number helps the user link the Management Practice to a specific requirement in the FSM for further clarification. All users should become familiar with the "*All Resources*" section which provides Management Practices that apply to programmed activities within all resource program areas. Additionally, a user should refer to the section under their specific resource area (e.g. Roads, Recreation, Lands etc.) for WBMP's more specific to a particular resource. In summary, Management Practices which should be considered for all programmed activities and actions include: 1) those that fall under the "All Resources"; **and** 2) those found under the specific resource area related with the project.

Management Action	Management Practices
All Resources	
1) Determine the risk of invasive plant introduction or spread as part of the project planning and analysis process for proposed actions, especially for ground disturbing and site altering activities, and public use activities.	**1.1)** Environmental analysis for all proposed actions will consider the risk of invasive plant introduction (both District priority invasive plants and Alaska Prohibited and Restricted Noxious plants (See **Exhibit 1**) or spread in development and evaluation of alternatives and design features to reduce or eliminate the risk prior to project approval. *(FSM 2903 (4,12) and 2904.08(8))* See **Exhibit 2** for procedure in conducting invasive plant risk assessments for project planning and analysis, including an abbreviated analysis for Categorical Exclusions (CE).

2) Use contract and permit clauses, provisions, and/or specifications to require that the activities of contractors and permittees are conducted to prevent the introduction and spread of invasive plant species.	**2.1)** Before contracts are awarded or special use permits approved, incorporate appropriate contract clauses and specifications requiring measures to prevent the introduction and spread of invasive plant species. *(FSM 2903 (6) & 2904.08(14)).* See **Exhibit 3** for example contract clauses and/or provisions related to invasive plant prevention measures.
3) Make every effort to prevent the accidental spread of invasive plants carried by contaminated vehicles, equipment, personnel, or materials (including plants, wood, plant/wood products, water, soil, rock, sand, gravel, mulch, seeds, grain, hay, straw or other materials)	**3.1)** To meet the intent of national (FS-990a) and regional (FSM 2509.22) BMP's, standards and requirements for vehicle and equipment cleaning (including trail and road maintenance equipment, outfitter and guides equipment etc.) to prevent the accidental spread of invasive plant materials on NFS lands or to adjacent areas will follow **Exhibit 4**. *(FSM 2903 (7)(a))* **3.2)** Mechanical equipment cleaning must occur off NFS lands (This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area). If cleaning can only occur on NFS lands, permits are required (see 3.3 below) **3.3)** When mechanical equipment cleaning must occur on NFS lands, reference 2509.22 (R10 BMP Handbook) No. 15.2 to prevent water contamination and risk to humans. *(FSM 2509.2, FSH 2109.14, Chapter 40 & National Technical Guide FS-990a)* **3.4)** Make every effort to ensure that all materials used on the NFS lands are free of invasive plant materials (including reproductive/propagative material such as seeds, roots, flowers). *(FSM 2903 (7)(b))* **3.5)** Follow State of Alaska and Tongass N.F. weed-free gravel and straw certification programs or equivalent inspection and approval process to ensure these materials are certified prior to their use and spread on National Forest lands *(FSM 2903 (8); 36 CFR 261 and Departmental Regulation 1512-1)* **See Exhibit 5** for standards and procedures of straw and gravel certification. **3.6**. Before construction equipment moves into a project area, treat Alaska prohibited and restricted noxious weed plants (see **Exhibit 1**) and any priority District invasive plants along existing Forest Service access roads or trails leading to the project area. (*FSM 2070 and FSM 2903 (5)*

	3.7. All trail crews and other field going personnel should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment off NFS lands, particularly if going from one location to another that contains weeds or highly disturbed habitats. *(FSM 2904.08(9))*
4) Provide opportunities in invasive plant training for management, identification and reporting to Forest Service staff.	**4.1)** Training on invasive plant identification and management (including how to report an infestation) will occur as needed at each unit (district and SO) with a focus on field-going personnel, including seasonal employees and volunteers. *(FSM 2904.07(7) and 2904.08 (4))* **4.2)** Each unit will have an invasive species specialist or coordinator. *(FSM 2904.07(1) & FSM 2904.08(1))* **4.3)** Ensure at least one permanent staff member, per unit, other than the unit invasive species specialist, is trained and proficient in weed management. **4.4)** Each Line Officer or person responsible for developing plans for ground disturbing activities and vegetation manipulation will be trained in invasive species management principles and practices.*(FSM 2904.07(7))*
5) Revegetate bare soil resulting from project activities (roads, timber harvest, mining etc.) to minimize spread of invasive plants and if prompt natural regeneration is not expected.	**5.1)** For guidance on revegetating disturbed sites, including transportation projects, using both native and approved non-native plant materials for erosion control and/or other restoration activities **see Exhibit 6** *(FSM 2070 and FSM 2903(5))*
6) Monitor management activities, including maintenance and revegetation projects, for potential spread or establishment of invasive species in aquatic and terrestrial areas of the Forest.	**6.1)** Monitor treatment sites for efficacy and to evaluate impacts of affected resources. *(FSM 2903 (9), 2904.07 (6), and 2904.08 (6).* **6.2)** Conduct inventories and report information related to invasive plant infestations, impacts and all management activities occurring on the Forest to Forest or District Invasive Species Coordinator (*FSM 2904.08 (5))*
Roads	
All Transportation Projects (including those for timber harvest, mining and restoration)	
7) Remove seed source that could be transported by passing vehicles by minimizing roadside sources of weed seeds.	**7.1)** During road condition surveys and all transportation improvement projects. *See All Resources BMPs 1.1, 2.1, 3.1-3.5, 5.1.* **7.2)** When feasible treat high priority infestations prior to activities on existing roads. *(FSM 2904.08(4))*

	7.3) Avoid blading roads or pulling ditches when weeds are in seed set stage. *(FSM 2904.08(4))* **7.4)** If treatment of high priority plants is not feasible prior to maintenance or other activities strive to work from relatively invasive plant-free areas into the infested area, rather than vice-versa. **7.5)** Maintain desirable roadside vegetation. If desirable vegetation is removed during blading, ditch clean-out or other ground disturbing activities, area must be revegetated according to *All Resources BMP 5.1* and **Exhibit 6**.
8) Retain shade to suppress weeds.	**8.1)** Minimize the removal of trees and other roadside vegetation during transportation improvement projects.
9) Re-establish and monitor vegetation on bare ground due to construction activities that minimize weed spread.	**9.1)** For all transportation improvement projects (including grading and blading) seed all disturbed soil (except the travel way on surfaced roads) in a manner that optimizes plant establishment for that specific site. Monitor re-vegetation activities *(FSM 2070 and FSM 2903(5 and 9)) See All Resources BMP 5.1***.** **9.2) See Exhibits 6** for seeding specifications, which includes guidance on use of native plant materials for reseeding and/or restoration activities. *(FSM 2070 and FSM 2903(5*))
10) Minimize the movement of existing and new weed species caused by moving infested gravel and fill material.	**10.1)** Inspect all active gravel and borrow sources before use and transport. If weeds are present avoid infested areas. Treat infested areas until weeds are controlled. Avoid establishing new material sources in areas where weeds are present. *(FSM 2903(7)) See All Resources BMP 3.3, 3.4* **10.2)** If new infestations occur at a borrow pit that was previously approved, that pit may not be used as a material source for that project unless *the top 8" of contaminated material is removed and stockpiled. (FSM 2903(7)) See All Resources BMPs 3.1 to 3.5 and* **Exhibit 5** **10.3)** Monitor for emerging weeds on stockpiled material at new and existing pits. Monitor the area where pit material is used to ensure that no weed seeds are transported to the use site. *(FSM 2903(9))*
11) Ensure that weed prevention and related resource protection are considered in travel management.	**11.1)** Consider risk of weed introduction and spread factors in travel plan (road closure) decisions during or after a project is complete. Consider road closures in areas that are weed-free and/or at unusually high risk to weed invasion. *(FSM 2903.(3))*
12) Ensure road blading and	**12.1)** Do not blade within two weeks before herbicide

roadside herbicide application are coordinated chronologically to minimize herbicide use and increase effectiveness.	applications or after weeds have gone to seed. **12.2)** Do not spray after blading until you have vegetative regrowth.
13) Reduce weed establishment in obliteration/ reclamation projects.	**13.1)** Treat weeds in obliteration and reclamation projects before roads are decommissioned.
Recreation, Wilderness, Roadless Areas	
14) Minimize transport and establishment of weeds on NFS lands.	**14.1)** Treat weeds as needed at trailheads, boat launches, outfitter and public camps, cabins, airstrips, and roads leading to and from trailheads. *(FSM 2904.08(4))* **14.3)** Motorized trail users should inspect and clean their vehicles prior to using on NFS lands. Provide educational materials to outfitters & guides, ATV and snowmobile groups alerting them of this need. *(FSM 2904.07(8) & FMS 2904.07(10))*
15) Increase weed awareness and prevention efforts among forest users.	**15.1)** Use education programs and materials (e.g. Leave No Weeds) to increase weed awareness and prevent weed spread by recreationists. *FSM 2904.07(8))* **15.2)** Post prevention practices at all NFS trailheads, roads, boat launches and forest portals.*(FSM 2904.07(8))*
Cultural Resources	
16) Reduce weed establishment and spread at archeological excavations. Visit site after excavation is complete to look for weeds.	**16.1)** Archeological site excavations will be re-seeded to the standards given in *BMP 5.1 for All Resources*. **16.2)** Passports In Time programs and other Cultural Resource workers should be given weed briefings and should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. *(FSM 2903(5))*
Forest Management	
17) Ensure that weed prevention is considered in all timber projects.	**17.1)** Silvicultural prescriptions and logging plans will include weed prevention measures (e.g. shade retention and minimal soil disturbance). *(FSM 2903(4))* **17.2)** Treat pre-existing and proposed marine access facilities, landings, skid trails and helispots that are weed infested before logging activity to ensure they are weed-free, including monitoring after harvest activities end *(FSM 2903(3and 9))*
18) Monitor for weeds after sale	**19.1)** Collect KV or other funds to treat soil disturbance or

activity and treat as needed.	weeds as needed after timber harvest and regeneration activities.
Minerals	
19) Minimize weed establishment in mining operations and reclamation.	**19.1)** Retain bonds until vegetation on the site is re-established.
20) Remove seed source and limit seed transport into new or existing mining operations.	**20.1)** Before equipment moves into new or existing mining operations, treat weeds along existing access roads within the area of operation. Treated sites should be re-seeded with desirable species and/or mulched promptly after treatment. *See All Resources BMP 5.1 and All Transportation Projects under Roads Management Practices 7-13.*
21) Minimize weed spread caused by moving infested gravel and fill material.	**21.1)** For new pits and stockpiled material at existing pits, follow *BMPs 3.1 to 3.5*, and **Exhibit 5** for guidance *(FSM 2903.(9))*
Soil and Watershed	
22) Integrate weed prevention and management in all soil, watershed and stream restoration projects.	**22.1) See Exhibits 6** for seeding specifications, which includes guidance on use of native plant materials for reseeding and/or restoration activities. *(FSM 2070 and FSM 2903(5)*)
Lands and Special Uses	
23) Incorporate weed prevention in all special use permits, road use permits and easements.	**23.1.)** Include weed control requirements in all FRTA (Forest Roads and Trails Act) and other private road easements.
24) Minimize weed spread caused by moving infested gravel and fill material.	**24.1)** All active gravel and borrow sources must be inspected before use and transport. If weeds are present, strip at least the top 8" and stockpile contaminated material to reduce transport of buried weed seed. Treat weeds at new pits where widespread weeds are present before transport and use. *See All Resources BMP 3.4*
Fire	
Pre-fire, Pre-incident training	
25) Increase weed awareness among all fire personnel.	**25.1)** Increase weed awareness and weed prevention information in all fire training (especially resource coordinator and fire management teams) by providing local information to in-coming incident management teams, such as weed identification and notification process. *(FSM 2904.07(7))*

Aviation Operations	
26) Mitigate and reduce weed spread in Air Operations.	**26.1)** Provide Forest aviation staff basic training in weed awareness as it pertains to aircraft use as a possible vector for some species of weeds. *See All Resources BMP 4.1, 4.4* **27.2)** Provide weed awareness briefings for local fixed wing and helicopter contractors as needed; provide a notification process for vendors to inform the USFS regarding certain weeds that are known to be spread via aircraft, such as aquatic invasive plants. *(FSM 2904.08(3))*
Administration/General	
27) Ensure all Forest Service administrative sites are weed-free.	**27.1)** Apply weed treatment and prevention on all Forest Service administrative sites including Ranger Stations, trailheads, cabins, campgrounds, interpretive and historic sites. *(FSM 2903(1))*

EXHIBIT 1. STATE OF ALASKA'S PROHIBITED AND RESTRCITED NOXIOUS WEED LIST

http://dnr.alaska.gov/ag/akpmc/invasives/noxious-weeds.htm

State of Alaska list of prohibited and restricted noxious weeds:

Common Name	Scientific Name
(1) Bindweed, field	*Convolvulus arvensis*
(2) Fieldcress, Austrian	*Rorippa austriaca*)
(3) Galensoga	*Galensoga parviflora*
(4) Hempnettle	*Galeopsis tetrahit*
(5) Horsenettle	*Solanum carolinense*
(6) Knapweed, Russian	*Centaurea repens*
(7) Lettuce, blue-flowering	*Lactuca puichella*
(8) Orange Hawkweed	*Hieracium aurantiacum*
(9) Purple Loosestrife	*Lythrum salicaria*
(10) Quackgrass	*Agropyron repens*
(11) Sowthistle, perennial	*Sonchus arvensis*
(12) Spurge, leafy	*Euphorbia esula*
(13) Thistle, Canada	*Cirsium arvense*
(14) Whitetops and its varieties	*Cardaria drabe, C. pubescens, Lepidium latifolium*

The following are prohibited and restricted weed seed and amounts (for example, only allowed in seed mixture for revegetation at the amounts disclosed):

Common Name	Scientific Name	Amount allowable seed
(15) Annual bluegrass	(*Poa annua*	90 seeds per pound
(16) Blue burr	*Lappula echinatat*	18 seeds per pound
(17) Mustard	*Brassica kaber, juncea*)	36 seeds per pound
(18) Oats wild	*Avena fatua*	7 seeds per pound
(19) Plantain, buckhorn	*Plantago s*p.	90 seeds per pound
(20) Radish	*Raphanus raphanistrum*	27 seeds per pound
(22) Vetch, tufted	*Vicia cracca*	2 seeds per pound
(23) Wild Buckwheat	*Polygonum convovulus*	2 seeds per pound

EXHIBIT 2.TONGASS N.F. INVASIVE PLANT RISK ASSESSMENT PROCEDURES

INVASIVE PLANT RISK ASSESSMENT and ANALYSIS OF EFFECTS STANDARD FORMAT

For EIS's and EA's, a comprehensive risk assessment of the project alternatives will be completed, according to the process delineated below. This analysis can be incorporated into specialist's reports or directly into NEPA documents, as appropriate. In addition, this format provides information needed for the overall effects analysis for invasive plants (Affected Environment and Environmental Effects sections of NEPA documents). For CEs, an abbreviated risk assessment process may be adequate. For these types of projects, an Invasive Plant Risk Assessment Short Form is provided at the end of this Exhibit.

Sections that should be in an Invasive Plant Risk Assessment

1. Cover Page

- Document Title ["Invasive Plant Risk Assessment and Analysis of Effects"]
- Project Name and NEPA Analysis (EIS, EA)
- District(s) Name
- Signature element for preparer, preparer's name typed or printed, preparer's title and date prepared.
- Signature element for reviewer, if appropriate, reviewer's title and date reviewed.

2. Introduction

This section focuses on the intent of the risk assessment and noting the appendices (if any) in the document. It should reference the Forest Plan Amendment (2016) Chapter 3, page 149-150 with the following statements:

> *See the Tongass Land and Resource Management Plan Final Environmental Impact Statement (Volume 1, pages 3-149 through 150) for definition of noxious weeds and invasive plants and pertinent policy and references for information provided in this risk assessment and analysis of effects (USDA 2016).*

Example of standard paragraph:

> *The purpose of this Invasive Plant Risk Assessment is to provide a process to determine the risk factors associated with project activities in order to comply with Forest Service policy that directs all management activities be designed to minimize or eliminate the possibility of establishment or spread of invasive species. The risk assessment is designed to develop and utilize site-based and species-based information to prioritize the management of invasive species infestations in aquatic and terrestrial habitats. The analysis of effects incorporates the risk assessment and is part of the planning process required for proposed actions, especially for ground disturbing and site altering activities and public use activities.*

3. Overview of Issues Addressed

Describe in a few sentences if issues were raised in the scoping period, including internal issues by the IDT[1], concerning invasive plants and the proposed project. Briefly describe how the project may be promoting, impacting or negating the introduction or spread of invasive plants. If no issues were raised in scoping or in any past NEPA document associated with the project, then this section may not be necessary.

4. Affected Environment

Describe all of the **activities planned** in the project, including all ground disturbing activities and their aerial extent (acres or miles of road or trail) for each alternative. Include site-specific prescriptions, where possible. This information should be readily available in a summary format from the project planners.

Describe the **existing condition** of the project area in relation to invasive plants including the number of invasive populations, species in the project area, and the general vegetation. If known, provide brief historical or background information that supports how invasive plant presence has developed into the current condition. This narrative may also include rare or sensitive plants that are within the areas where invasive plants reside or are in the project area. Consider making a table with the following information if many invasive plants are present: the known invasive plant with invasiveness score, year inventoried, number of occurrences or acres, the location in or near the project area, current or new vectors associated with the project to consider, at-risk habitats and their vulnerability to invasive plant spread (using professional judgement of the vulnerability low, medium or high and should correspond to the brief description of habitat vulnerability for this section), and if known and occurring, the treatment method and year against a known infestation(s).

Example of Table

Species and invasiveness score	**Inventory Year**	**# of occurrences or infestation acres**	**Location in or near project area**	**Current and/ or new vectors to consider**	**At-risk habitats and vulnerability (Low, Med, High)**	**Treatments method and Year**
PHAR/89	2013	.1 acre scattered pops within	Along roads FS 2044, also other connecting rds. N end of island but outside project area	Current: Vehicle traffic, water in ditches, wind. New: temp road construction from FS 2044	Sandy, riparian areas near bridges,(High)	Hand pull 2014

[1] While invasive plant issues may not be raised by the public through scoping, they should always be recognized as potential internal issues by the project IDT botanist/ecologist. The "significance" of invasive plants as issues for the project should be addressed in this section.

In this section, include **habitat vulnerability** (some may have been documented in a table related to known infestations) with a short discussion of the current site-specific factors present in the project area, and what makes the project area vulnerable or resistant to invasive plant infestation(s). Use the following *general level of risk* for the following habitat or site types:

- Disturbed areas (riparian areas, stream crossings, road sides, recreation sites, highly used remote recreation sites, trails, Admin sites, Marine Access Facilities MAF, rock pits) – High vulnerability
- Wetlands – low to moderate (unless disturbed by road construction or other mucking activity, or aquatic invasive plant vector)
- Alpine areas – low to moderate vulnerability
- Forested Areas – moderate to low vulnerability (unless disturbed as a result of timber harvest
- Estuaries – moderate to high vulnerability

Vulnerability takes in plant invasiveness and ecological preferences, habitat presence and disturbance regime. A given project may have low risk areas as well as high-risk areas.

And finally, describe **data documentation methods**, such as mapping methods and data entry methods. Provide a literature and data review of source documents used in analysis; document what sources were reviewed to identify invasive plants that are known to be in the project area, including any site specific surveys that were conducted in the project area. Review items may include any or all of the following:

- Peer-reviewed and gray literature
- Datasets (such as NRM-INVP, AKEPIC, USDA Plants)
- Target species list for District or Project (reference list in an appendix)
- GIS information
- Aerial photographs (cite date and scale, for example, 1:15,840, 1991)
- Floras and herbarium records
- Surveys: Describe, if possible, how the survey routes were chosen or prioritized. If inventories are conducted, describe inventory methods, including:
    - Survey dates
    - Name of the botanist who conducted the survey, their job title and agency
    - General location of survey routes (e.g. inside/outside the direct and indirectly affects areas)
    - State if the field data are entered into NRM or by what date they will be available.

Notes on survey data:

- *Field data (invasive plant surveys) will be entered into the NRM database (NRIS-INVP) by the end of each fiscal year in which the surveys were completed.*

5. Environmental Consequences

Insert the following type of paragraph for the introductory statements of Environmental Consequences. Some of the statements may not be applicable to every project:

> *Ground disturbance associated with* **[xxx activities associated with the project]** *provides an opportunity for invasive plant introduction or expansion. Introduction and spread of invasive plants are potentially the direct effect of* **[xxx activities]** *because these activities disturb soil and/or remove existing vegetation, providing opportunities for invasive plants to establish or spread. Additionally, movement of equipment and personnel can also provide opportunities for transport of invasive plant seeds or propagules into new areas. Indirect effects can include the establishment or spread of invasive plants through the use of roads after* **[xxx activities]** *for recreation or during road maintenance. Similarly, road maintenance and use increases the risk of invasive species spread and colonization. The impacts of invasive plant spread and colonization can often spread beyond the area of disturbance.*

Units of Measure for Analysis:
Introduce the method of analysis or basis for the effects analysis and the risk assessment and what metrics will be used to analyze invasive plant impacts in the project area. Use the following paragraph or something similar as applicable:

> *Because of the difficulty in estimating the amount of disturbance that will be caused by each alternative, a relative estimate of total acres of* **[insert here the type of activity, for example timber harvest and miles of road construction]** *is used to compare each alternative's potential for establishment and spread of invasive plants. However, it should be noted that the acres of* **[insert here the type of activity such as timber harvest in either old-growth or young-growth harvest units]** *is many times greater than the soil disturbance that would a result from these activities. Contrary to* **[insert activity here, such as timber harvest],** *road construction is a direct source of soil disturbance; therefore, total miles of road construction may be interpreted as a relatively accurate account of the level of soil disturbance created as a result of this activity.*

Incomplete and Unavailable Information:
Describe incomplete and unavailable information. If none, then delete the heading. For example, survey information or recent surveys are lacking.

Spatial and Temporal Context for Effects Analysis of Risk:
Discuss effects timeframes (short term vs. long term) for direct, indirect and cumulative effects that are important to mention in a risk assessment. Short term is generally the time period during and right after the project is implemented. Long term is generally after the project is completed and into the future 1 to 5 years or the length of the Forest Plan. Describe sources of information used to support the assessment. Discuss the spatial context for the effects analysis and provide rationale for analysis area relevant to the discussion.

Describe the **spatial boundary where direct effects** are analyzed for any or all of the following:

- Total acres of all proposed timber harvest units;
- Total acres of all proposed new and temporary road corridors;
    - Use a 13 meter (42.6 ft.) buffer on either side of the road segment line to represent an average road corridor width of 26 m (85 ft.) for forest logging roads (Powell 2014).

- Total acres of recreation footprint (trails, cabins, other rec site);
- Total acres of impacts due to minerals plan of operations or other mining activity;
- Total acres of footprint for renewable energy development or other special uses;
- Total area of watershed restoration activities;
- Other actions not listed.

Describe the **spatial boundary where indirect effects are analyzed** for all proposed actions (as above); however use the following areas for analysis:

- Indirect effects of proposed road construction are analyzed by buffering the 26 m width of the road corridor by 50 m and overlaying the buffered area over known invasive plant occurrences.
- Map out other spatial extents specific to each project where you suspect invasive plants to spread through time. Each project will be unique. This could be existing rock pits, old landslides, roads, etc.

Describe the **spatial boundary where cumulative effects are analyzed** for past, present and reasonable foreseeable activities that are relevant to invasive plant spread or introduction. Include both National Forest Service (NFS) and non-NFS lands (if known).

- Past projects considered in the cumulative effects analysis are generally physically located within the cumulative effects analysis area (described below), such as roads and landings, rock quarries and harvest units (O/G and Y/G), communication sites, hydroelectric projects, watershed restoration, recreation development, road construction and maintenance, MAF site construction, housing and building development and dispersed private lands, and Forest Highway improvements.
- Often, the IDT leader will provide a complete listing of past projects to consider in the cumulative effects analysis and the temporal scale for this analysis (e.g. 5, 10, 20 years into the future, etc.).
- The spatial extent of the cumulative effects analysis area should be as ecologically driven as possible such as an island, a watershed(s), or a suite of islands. Oftentimes, an island is the best cumulative effects analysis area since it is a natural geographic boundary which has the potential to limit pollination and dispersal of invasive plants.
- A watershed or suite of watersheds may also be a logical cumulative effects boundary for invasive plant spread.
- A Wildlife Analysis Area (WAA) or a VCU are not considered ecologically significant relative to a plant's dispersion.

Effects Common to All Alternatives:

Insert the following or similar:

> *Ground disturbance associated with* **[insert proposed activities such as timber harvest, road construction, renewable energy development, and other management activities]** *within the project area provides an opportunity for invasive plant introduction or expansion. Introduction and spread of invasive plants create potential direct effects on proposed activities because these activities disturb soil and/or remove existing vegetation, providing openings for invasive plants to establish or spread. Additionally,*

movement of equipment and personnel can also provide opportunities for transport of invasive plant seeds or propagules into new areas. Indirect effects can include the establishment or spread of invasive plants through the use of roads after harvest for recreation or during road maintenance. The impacts of invasive plant spread and colonization can often spread beyond the area of disturbance.

Changes in Southeast Alaska's climate could also create the conditions that encourage the spread of invasive plants by altering opportunities for invasive plants to colonize new areas, and could be compounded by climate change. Changing climate may also result in range extensions for some species that are native at more southerly latitudes, and they may become established or become more widespread on the Tongass as a result. Changes in growing conditions would likely favor some plant species and stress others. There is uncertainty in the effect of changes in the climate to the invasive plants in the project area.

Effects Specific to Each Alternative:

Insert the following or similar:

All of the alternatives include ***[insert specific project activities, such as timber harvest and road construction]*** *activities, which could directly and indirectly increase the number and spread of invasive plants. Increased disturbance increases the risk of establishment or spread of invasive plants. The effects would vary between alternatives depending on the level of disturbance due to* **[insert project activities such as timber harvest, new roads construction and development of renewable energy projects].**

Alternative 1-No Action

Provide a brief paragraph of an overview of the no action alternative. There may or may not be any *direct effects* in the No Actions alternative.

Alternative 2, 3 etc. - Proposed Actions

If necessary, provide a brief paragraph of an overview of the proposed actions, but only provide the details that may later be necessary to support the assessment of risk to spread or introduction of invasive plants.

Design Features and Mitigation Measures:

List the recommended actions to help prevent the introduction or spread of invasive plants (See Weed BMPs and cite applicable measures by number). Include recommendations for preventing the spread of known invasive plants within or adjacent to the project area and for preventing the transport or spread of known invasive plants from within to outside the project area.

Include recommendations for control measures of the known invasive plants or new infestations of invasive plants within or adjacent to the project area. Recommended control measures may not necessarily be implemented in association with the proposed project activities. Indicate how the control measures are currently being implemented or how they will be implemented (i.e. as part of the NEPA decision or as part of a district invasive plant annual program of work).

- NOTE: if control measures include the use of herbicides or ground disturbance such as digging, a NEPA-compliant environmental analysis would be needed before such measures can be implemented.

Direct and Indirect Effects
The direct and indirect effects discussion can be combined into one section or remain separate, as long as the two effects are distinguished. Be sure to characterize the extent and/or duration of the effects.

Direct effects:
Describe the direct effects for each alternative, such as alterations in habitats expected in the project area as a result of the proposed action(s). Discuss in terms of short-term disturbances and long-term alterations and how known invasive plants may respond. Discuss any long-term or chronic disturbances and changes in invasive plant habitat expected as the result of activities. Consider road building, recreation use, and other disturbances. **Identify the levels of risks (Low, Medium or High)** incurred according to the amount of disturbance through the short-term and long-term, and any long-term habitat alterations.

If it's a large project, consider summarizing this information with a direct effects table containing actions (road building, trail maintenance, timber harvest, brush cutting etc., increased road traffic), the habitat alteration associated with the action (rock road creation and rock pit disturbance, soil disturbance, vegetation removal etc.), and the level of risks (L, M or H, and long or short term) to invasive plant spread or introduction.

Indirect effects:
Describe the indirect effects such as increasing vectors or changes in hydrology or solar radiation which might result from implementation of the project. For the no action alternative, describe whether there may be indirect effects from not carrying out the proposed action. Include the project-related activities and equipment which might help to spread current infestations or introduce more. If utilization by current vectors might increase, include a discussion of this. **Identify the levels of risks (Low, Medium, or High)** incurred according to the increased or newly introduced vectors or other indirect effects as a result of the project.

Cumulative effects:
Describe any cumulative effects that could occur as a result of the direct and indirect effects combining with existing or future potential effects from the past, present and foreseeable future activities. If no direct or indirect effects, then no cumulative effects.

Cumulative effects are the anticipated response of invasive plants to the proposed actions. Discuss how or whether direct and indirect effects predicted above could combine with effects of past, present and reasonably foreseeable actions and produce a higher risk of spread or introduction.

Considering all of the information in this risk assessment *including the management considerations*, discuss the expected outcome of the project with respect to the level of risk of invasive plant introduction and spread by species and Alternative.

Considering all of the information in the risk assessment, but ***excluding*** *the management considerations* (the decision maker can decide to eliminate all or some of them), discuss the outcome of the project with respect to the level of risk of invasive plant introduction and spread.

Summary of Effects:
Provide an *estimate of the effects* (individually, collectively) using the metrics defined above of the past, present, and reasonably foreseeable actions within the project's spatial and temporal boundaries on each plant analyzed[2].

Summarize the bottom-line conclusions of the analysis in the risk assessment. This information will be useful for the comparison summary of alternatives and other parts of the NEPA document.

Identify the levels of risks incurred according to the level *of confidence in the efficacy of the actions*, with the assumption that the actions would be implemented, as written

6. References:
List all cited and reviewed references. Personal Communications must be cited separately from literature citations. The contact information for the personal communications source must be given.

7. Appendices:
Attach maps of infestations relative to the project.

[2] Look for present effects of past actions that are, in the judgment of the botanist in consultation with the IDT leader, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for project actions and its alternatives on invasive plants. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions.

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PROJECT NAME, LOCATION AND TYPE OF NEPA PROJECT (CE, or EA in very limited cases):

PROJECT DESCRIPTION (include proposed action, acres and general habitat of proposed disturbance or alteration of habitat due to project proposal if any).

INVASIVE PLANTS KNOWN: Check references such as NRIS-INVP, ALA or other herbarium databases, AKEPIC records, FACTS, floras etc., and contact Forest/District Botanists/Ecologists. Document sources of information. Provide the invasive plant's habitat, location within the project areas, date documented if known, and location of record. A table format is recommended for this information if many species are present. See example below.

Table 1.Invasive plant species documented from the project area

Invasive Species/Invasive Score	General habitat	Acres or populations	Year documented	Source of Information

VULNERABLE HABITAT AND RISK OF SPREAD IN THE PROJECT AREA:
Obtain information about vulnerable habitat from sources such as professional ecological knowledge of site, GIS (eg. Soil, CoverType, ChannelType geodatabases), aerial photo interpretation, and/or site visits by other resource specialists.

Using your knowledge of vulnerable habitats in the project area, list them here and provide a short explanation as why they are vulnerable. If there are no vulnerable habitats then state this here. List cover or site types if known.

Using your knowledge of invasive plant habitat preference, indicate in a table or a paragraph form, the known plants suspected to be a threat to the vulnerable habitats present and determine the risk of spread or introduction due to project activities and taking into consideration the known vectors to help the spread. Could be a descriptive paragraph or a table format

Table 2. Example to summarize information of risk to vulnerable habitat by invasive plants

Plant species/Invasive score	Vulnerable habitat for invasion	Known Vectors	Risk of Spread or Introduction (None, Low, Med or High) due to Project Activities

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1) Does the evidence indicate that no invasive plants, vulnerable habitats or the threat of invasive plant spread exist within the project area?

 YES. Explain exactly why (insert here), delete the rest of the information below, and sign and date this document. Invasive Plant Risk Assessment complete.
 NO. Go on to question 2.

2) Based on knowledge of the proposed project and the species present, can a "low or no risk" statement be made that involves the spread or introduction of invasive plants by vectors associated with the project into vulnerable habitats?

 YES. Explain exactly why (insert here), delete the rest of the information below, and sign and date this document. Invasive Plant Risk Assessment is complete.
 NO. Go on to question 3.

3) Based on knowledge of the project, the vulnerability of the habitats and the invasive species and vectors involved, can a statement be made that "implementation of the proposed project, including design features, may increase the risk of spread or introduction of invasive plants into the project area"?

 YES. Explain exactly why and the risk level involved and explain the design features that are part of the proposed project. Sign and date this document. Invasive Plant Risk Assessment complete.

 CANNOT BE DETERMINED WITH AVAILABLE INFORMATION.
 Make additional survey recommendations (insert here), check one of the boxes below, sign and date this document.

 Field surveys are recommended if they were not already completed for this project to be performed during the following months (state the months here) in order to identify all of the invasive species that could potentially occur within the project area. More information is required before the project's Invasive Plant Risk Assessment is complete.

 Field surveys are not recommended for the following reasons: (insert here)

Prepared By: _____ Date: _____
Reviewed By:_____Date:_____
Journey Level Biologist or Botanist as appropriate for taxon group.

EXHIBIT 3: CONTRACT CLAUSE AND PROVISION EXAMPLES FOR WEED PREVENTION MEASURES RELATED TO NFS ACTIVITIES.

Following are several example clauses or contract specifications for weed prevention measures applicable to NFS activities, including timber sale contracts, road maintenance contracts, and special use activities. They include language applicable to equipment and vehicle cleaning standards, erosion control measures (seeding specifications) and general weed prevention measures (i.e. straw and gravel certification). These may be applied to any Forest Service activity as applicable.

Weed Prevention and Control for Special Uses: (FSH 2709.11 – SPECIAL USES HANDBOOK - CHAPTER 50 – STANDARD FORMS AND SUPPLEMENTAL CLAUSES: Amendment No.: 2709.11-2016-1. Effective Date: January 29, 2016)

D-10. Noxious Weed and Exotic Plant Prevention and Control.

NOXIOUS WEED AND EXOTIC PLANT PREVENTION AND CONTROL. The holder shall be responsible for the prevention and control of noxious weeds and exotic plants arising from the authorized use. For purposes of this clause, noxious weeds and exotic plants include those species recognized as such by [Federal, State, or local agency]. The holder shall follow prevention and control measures required by [Federal, State, or local agency]. When determined to be necessary by the Authorized Officer, the holder shall develop a plan for noxious weed and exotic plant prevention and control. These plans must have prior written approval from the Authorized Officer and, upon approval, shall be attached to this permit as an appendix.

D-18. Herbicide and Pesticide Use.

HERBICIDE AND PESTICIDE USE. Herbicides and pesticides may not be used outside of buildings to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, or fish without the prior written approval of the Authorized Officer. A request for approval of planned uses of pesticides shall be submitted annually by the holder on the due date established by the Authorized Officer. The report shall cover a

12-month period of planned use beginning 3 months after the reporting date. Information essential for review shall be provided in the form specified. Exceptions to this schedule may be allowed, subject to emergency request and approval, only when unexpected outbreaks of pests require control measures which were not anticipated at the time an annual report was submitted. Only those materials registered by the U.S. Environmental Protection Agency for the specific purpose planned shall be authorized for use on National Forest System lands. Label instructions and all applicable laws and regulations shall be strictly followed in the application of pesticides and disposal of excess materials and containers.

Equipment Cleaning Provisions for Timber Sales, Special Uses, Public Works, Service and Stewardship Contracts:

TIMBER SALE CONTRACT DIVISION BT
STANDARD PROVISIONS FOR TIMBER SALES TO BE MEASURED BEFORE FELLING
(June 2006)

BT6.35 Equipment Cleaning.

(a) Areas, known by Forest Service prior to timber sale advertisement, that are infested with invasive species of concern are shown on Sale Area Map. A current list of invasive species of concern and a map showing the extent of known infestations is available at the Forest Supervisor's Office. For purposes of this provision, "Off-Road Equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles.

(b) Purchaser shall adhere to the following requirements with regard to cleaning "Off-Road Equipment":

(i) Prior to moving Off-Road Equipment onto the Sale Area, Purchaser shall identify the location of the equipment's most recent operation. Purchaser shall not move any Off-Road Equipment that last operated in an area infested with one or more invasive species of concern onto Sale Area without having cleaned such equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds, and having notified Forest Service, as provided in (iii). If the location of prior operation cannot be identified, then Purchaser shall assume that the location is infested with invasive species of concern.

(ii) Prior to moving Off-Road Equipment from a cutting unit that is shown on Sale Area Map to be infested with invasive species of concern to, or through any other area that is shown as being free of invasive species of concern, or infested with a different invasive species, Purchaser shall clean such equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds, and shall notify the Forest Service, as provided in (iii).

(iii) Prior to moving any Off-Road Equipment subject to the cleaning requirements set forth above, Purchaser shall advise Forest Service of its cleaning measures and make the equipment available for inspection. Forest Service shall have 2 days, excluding weekends and Federal holidays, to inspect equipment after it has been made available. After satisfactory inspection or after such 2 day period, Purchaser may move the equipment as planned. Equipment shall be considered clean when a visual inspection does not disclose seeds, soil, vegetative matter, and other debris that could contain or hold seeds. Purchaser shall not be required to disassemble equipment unless so directed by the Forest Service after inspection.

(iv) If Purchaser desires to clean Off-Road Equipment on National Forest land, such as at the end of a project or prior to moving to, or through an area that is free of invasive species of concern, Purchaser shall obtain prior approval from Contracting Officer as to the location for such cleaning and measures, if any, for controlling impacts.

(v) Contracting Officer may order delay, interruption, or modification of this Contract pursuant to BT8.33.

(c) Nothing contained in this Subsection shall be interpreted as creating any warranty on the part of the Forest Service that all locations of invasive species of concern have been described herein, elsewhere in this Contract, or designated on the ground. Following sale advertisement, additional locations may be described or designated, and other species may be added to the list of invasive species of concern. In such event, Contracting Officer may order delay, interruption, or modification of this Contract pursuant to BT8.33.

(d) The parties shall promptly communicate with one another with respect to description or designation of additional locations; discovery of locations of new species or new infestation; and, addition of species to the list of invasive species of concern.

FOREST SERVICE CONTRACT SPECIFICATIONS FOR EQUIPMENT CLEANING

D.2 EQUIPMENT REQUIREMENTS

Equipment shall meet all standards established by specification or incorporated by reference and shall be maintained in good repair by the Contractor.

D.2.1 Contractor Provided Equipment - Weed Wash Containment Station Equipment

Wash systems shall be high pressure with low volume and may be supplemented with low pressure with high volume. High pressure systems have water pressures designated above 1000 pounds per square inch (psi), while high volume systems deliver 10 gallons of water per minute or more.

Type 1 – Self-Contained with Recycling Water System
Type 2 – Self-Contained with Non-Recycling Water System

Standard method of hire: Daily rate which includes fully operated equipment, delivery, pickup, servicing, and mileage to/from site.

1. The Host Agency will:
    a. Determine weed wash needs and type of unit(s) used and area(s) of placement.
2. The Government will:
    a. Provide wash water to the wash site.
    b. Remove waste water.
    c. Remove solid waste or designate an appropriate disposal site.
    d. Inspect washed equipment to ensure that the wash station meets agreement requirements. If the wash station does not meet the expectations of the government, it may be removed and replaced with a different system.
3. The Contractor shall:
    a. Thoroughly wash all vehicles and equipment to remove all soil, plant parts and seeds. Vehicles and equipment include, but are not limited to fire engines, heavy equipment, logging equipment, transports, pickups, SUVs and sedans;

b. Ensure that contractor services include, but are not limited to, the removal of all mud, caked dirt, and vegetative parts off of the undercarriage, cross members, frame, skid plates, belly pans, wheels, treads, tracks, suspension, bumpers, wheel wells, radiator grills, and the ledges on the inside of rear and front bumpers;
c. Visually and manually inspect hard to reach areas to ensure that they are clean;
d. Inspect and wash all soil and plant parts off of drafting hoses and drafting gear on engines and water tenders;
e. Ensure that the system used does not cause damage to the paint or electrical connections of vehicles and equipment being washed;
f. Keep the wash station in repair and fully operational during the designated assignment;
g. Capture, package and label solid waste in secure, easily transportable containment packages/devices, approved by the government representative at the incident, and place them at a location specified by the government. Containers/packages of solid waste shall weigh no more than 50 lbs each;
h. Maintain a daily record of all washed vehicles. The contractor shall use government forms, if required by the government.

4. The Contractor shall not:

a. Dispose of solid waste unless an acceptable disposal site is designated by the government for the waste to be disposed of; otherwise this is the responsibility of the government (The intention is to ensure proper disposal).

D.2.1.1 Minimum Requirements

Type 1 Self-Contained with Recycling Water System

1. Portable commercial power washers with two hand-held, high pressure wands/nozzles. These nozzles must be suitable to wash 100% of the underbody surfaces.
2. Underbody washer. The underbody washing system must have nozzles that can be directed to within 45 degrees of vertical. The spray from these nozzles must be able to cover 100% of the underbody surfaces.
3. A wash water storage tank. The wash water storage tank shall have adequate capacity to operate the wash system continuously for a minimum of two hours.
4. Waste water shall be contained by the wash system. All wash residues shall be removed from the tracking surfaces of the vehicle being washed before vehicle exits system to prevent contamination to the exiting vehicle.
5. Wash water shall be filtered to a minimum of 100 microns, or use a clean water final rinse. Contractor is responsible for maintaining the quality of the recycled water to ensure clean and safe washed equipment. Contractor shall maintain the containment system in a functional condition at all times. Prior to disposal, all waste water shall be filtered to 100 microns or smaller particle size. Waste water shall be disposed of in accordance with wastewater requirements of the authority having jurisdiction.
6. Contractor shall place solid waste in a secure, easily transportable (not to exceed 50 lbs) containment device in consultation with the ground support or resource advisor on the incident. Solid waste shall be disposed of by the host agency unless an appropriate disposal site has been identified by the government. In that case, the contractor shall dispose of the solid waste at this designated site.
7. Process time to wash a single wildland fire engine shall not exceed 5 minutes average for any 10 fire engines (i.e., 12 engines per hour).
8. The contractor shall provide at least two (2) skilled operators to perform operations. The operators shall be knowledgeable in the safe operation, maintenance, and repair of the wash

system. Operators shall be able to demonstrate knowledge, skills, and abilities to manage all waste products from the washer system. These personnel shall be present at all times during the incident operational periods, and are responsible for the safe operation of the wash station.
9. The wash system must be able to accommodate equipment up to 10’ wide.
10. Two, 1000 watt halogen work lights on stands and GFI module.
11. The wash system must comply with all applicable OSHA regulations related to operator safety and all segments of the washer must be in operating condition with no missing parts. All alternating current electric motors shall be listed with Underwriters Laboratory.

D.2.1.2 Minimum Requirements
Type 2: Self-Contained with Non-Recycling Water System (this may be a direct-draining or remote discharge system)

1. Portable commercial power washer with two hand-held, high pressure wand/nozzles. These nozzles must be suitable to wash 100% of the underbody surfaces.
2. A wash water storage tank. The wash water storage tank shall have adequate capacity to operate the wash system continuously for a minimum of two hours.
3. Waste water shall be disposed of in accordance with waste water requirements of the authority having jurisdiction.
4. Remote discharge systems shall have an adequate means to pump all waste water at least 200’ from the wash station. Prior to disposal, all waste water shall be filtered to a minimum of 100 microns or smaller particle size, or through dewatering bags fabricated from Amoco 4553 or equivalent geotextile cloth, having a maximum apparent opening size of 150 microns.
5. Direct draining systems shall utilize Amoco 4553 or equivalent geotextile cloth, having a maximum apparent opening size of 150 microns. This cloth shall withstand heavy truck traffic. A 15’ wide by 40’ piece shall be supplied by the contractor and shall be installed on a pad of gravel or a well-drained surface that is provided by the host agency. Contractor shall maintain the mat in a functional condition at all times. All solid waste greater than 150 micron size, including all geotextile cloth pieces, shall be placed in a secure, easily transportable containment (not to exceed 50 lbs) device in consultation with the ground support or resource advisor on the incident. Solid waste shall be disposed of by the host agency unless an appropriate disposal site has been identified by the government. In that case, the contractor shall dispose of the solid waste at this designated site.
6. Process time to wash a single wildland fire engine under normal conditions shall not exceed 8 minutes average for any 10 engines (i.e., 7.5 engines per hour).
7. The contractor shall provide at least two (2) skilled operators to perform operations. The operators shall be knowledgeable in the safe operation, maintenance, and repair of the wash system. Operators shall be able to demonstrate knowledge, skills, and abilities to manage all waste products from the washer system. These personnel shall be present at all times during the incident operational periods, and are responsible for the safe operation of the wash station.
8. The wash system must comply with all applicable OSHA regulations related to operator safety and all segments of the washer must be in operating condition with no missing parts. All alternating current electric motors shall be listed with Underwriters Laboratory.
9. The wash system must be able to accommodate equipment up to 10’ wide.
10. Two (2), 1000 watt halogen work lights on stands and GFI module.
11. The system may have:
    a. A mechanical underbody washer. The underbody washing system must have nozzles that can be directed to within 45 degrees of vertical. The spray from these nozzles must be able to cover 100% of the underbody surfaces.

b. An additional operator, skilled and knowledgeable in the safe operation, maintenance and repair of the wash system. Operators shall be able to demonstrate knowledge, skills and abilities to manage all waste products from the washer system. These personnel shall be present at all times during the incident operational periods, and are responsible for the safe operation of the wash station.

Roadway Vegetation Maintenance

842.01
Service Required

Remove vegetation, including trees, on roadway surfaces and roadsides.

842.02
Performance Standard

Roadway vegetation maintenance is complete when the vegetation has been removed from the designated treatment area which interferes with traffic, obscures signs, impedes the flow of water or diverts water from drainage structures.

Maintenance Level 4 and 5 roads

Vegetation shall be removed to a maximum height of X inches above ground surfaces. Trees larger than X inches diameter breast height (dbh) are designated to remain.

Maintenance Level 3 roads

Vegetation shall be removed to a maximum height of X inches above ground surfaces. Trees larger than X inches dbh are designated to remain.

Maintenance Level 2 roads

Vegetation shall be removed to a maximum height of X inches above ground surfaces. Trees larger than X inches dbh are designated to remain.

Where MARKED ON THE GROUND, listed in the ROAD LISTING, SHOWN ON THE PLANS or as ordered by the Contracting Officer the following invasive plant prevention practices will be followed:

(Fill in with specific prevention practices provided by the local FS weed specialist)

842.03
Location of Work

As specified on roads listed on the ROAD LISTING, SHOWN ON THE PLANS, or as ordered by the Contracting Officer.

Maintenance Level 4 and 5 roads

The treatment area will be SHOWN ON THE PLANS. If plans or supplemental specifications are not included, the treated area includes the road bed measured from center line to bottom of ditch / or defined road edge, plus an additional X feet on each side. If there is no defined road edge, or a ditch does not exist, the treated area is X feet from both sides of center line of the road. Provide a vertical clearance of X feet measured from the road surface elevation.

Maintenance Level 3 roads

The treatment area will be SHOWN ON THE PLANS. If plans or supplemental specifications are not included, the treated area includes the road bed measured from center line to bottom of ditch, or defined road edge, plus an additional X feet on each side. If there is no

defined road edge, or a ditch does not exist, the treated area is X feet from both sides of center line of the road. Provide a vertical clearance of X feet measured from the road surface elevation.

Maintenance Level 2 roads

The treatment area will be SHOWN ON THE PLANS. If plans or supplemental specifications are not included, the treated area includes the road bed measured from center line to bottom of ditch, or defined road edge, plus an additional X feet on each side. If there is no defined road edge, or a ditch does not exist, the treated area is X feet from both sides of center line of the road. Provide a vertical clearance of X feet measured from the road surface elevation.

842.04

Measurement

Measurement under this Section will be made by the total number of units for each item listed in the SCHEDULE OF ITEMS completed and accepted.

A. Mile: Work activity will be measured along the centerline of the road regardless of the number of lanes.

842.05

Payment

A. The accepted quantities will be paid at the contract price per unit of measurement for the Section 842 pay items listed in the schedule of items. Payment will be full compensation for the work prescribed in this Section.

Pay Item	Pay Unit
842(1) Vegetation Maintenance Level 4&5 roads	Mile
842(2) Vegetation Maintenance Level 3 roads	Mile
842(3) Vegetation Maintenance Level 2 roads	Mile

42.06

Acceptable Quality Levels

Description	Major Defect	Minor Defect	Allowable Defects		
			Major	Minor	
Tree damage	**Damage to more than 30% of the tree bole**	**Damage to 30% or less of the tree bole**	**X per unit**	**X per unit**	**Remo**
Horizontal Clearance	**More than 20% not cleared to limits**	**20% or less not cleared to limits**	**0**	**X per unit**	**F**
Vertical Clearance	**More than 20% not cleared to limits**	**20% or less not cleared to limits**	**0**	**X per unit**	**F**
Height above ground surface	**More than 20% not cleared to limits**	**20% or less not cleared to limits**	**0**	**X per unit**	**F**
Drainage	**Impeded flow or water diverted out of drainage structures.**	**20% or less impeded, but water will stay in the channel.**	**0**	**X per unit**	**F**

Description	Major Defect	Minor Defect	Allowable Defects		
			Major	Minor	
Oversized Material (Level 4&5)	Material greater than 3" diameter remaining on the road surface	Material 1” – 3” in diameter remaining on the road surface	0	0	F
	Material greater than 3" diameter and 36" in length remaining on the roadway drainages or has the potential to move into drainages.	Material 1” - 3" in diameter and greater 36" in length remaining on the roadway slopes and drainages or has the potential to move into drainages.	X per unit	X per unit	Rewo than X
Oversized Material (Level 3)	Material greater than 3" diameter and 12" in length remaining on the road surface	Material 1” - 3" in diameter and 36" in length remaining on the road surface	0	X per unit	F
	Material greater than 3" diameter and 36" in length remaining on the roadway drainages or has the potential to move into drainages.	Material 1” - 3" in diameter and greater 36" in length remaining on the roadway slopes and drainages or has the potential to move into drainages.	X per unit	X per unit	Rewo than X
Oversized Material (Level 2)	Concentrations of material greater than 6" diameter and 3 feet in length remaining on the road surface	Material less than 6" diameter and 3 feet in length remaining on the road surface	0	X per unit	F
	Unstable concentrations of material less than 6" diameter and 3 feet in length remaining on the roadway slopes.	N/A	0	X per unit	F
	Material greater than 3" diameter and 36" in length remaining on the roadway drainages or has the potential to move into drainages.	Material 1” - 3" in diameter and greater 36" in length remaining on the roadway slopes and drainages or has the potential to move into drainages. .	0	X per unit	F
Concentrations (Level 3-5)	Any concentrations that affect sight distance	N/A	0	0	F

Description	Major Defect	Minor Defect	Allowable Defects		
			Major	Minor	
Work Area Management	Not following approved safety plan which may include signs, flaggers, and other temporary traffic control measures	Not following approved safety plan which may include signs, flaggers, and other temporary traffic control measures	0	0	Suspend co
Invasive plant prevention	Invasive plant prevention practices not followed	N/A	0	N/A	Treat af direc Contra

* Forests have the option to choose a pay reduction in lieu of rework. However, each Forest must establish a thresho pay reductions for each defect.

Intent and use: User to establish threshold for the acceptable level of quality.

Mobilization/ Equipment Moving

881.01
Service Required

A. Mobilization of personnel, equipment, and material to the project site.
B. Moving of equipment outside the established work schedule as ordered.

881.02
Performance Standards

A. Make equipment available for inspection before it is used on National Forest System lands.
B. Moving is complete, when the contractor has moved from the present work site to the ordered work site and returned to the previous location.
C. Equipment will be clean and weed-free before it arrives on National Forest System lands.

881.03
Location of Work:

As specified on roads listed on the ROAD LISTING, SHOWN ON THE PLANS, or as ordered by the Contracting Officer.

881.04
Measurement:

Measurement under this Section will be made by the total number of units for each item listed in the SCHEDULE OF ITEMS completed and accepted.

A. Mile: Work activity will be measured along the shortest feasible route to the nearest one (1) mile, from the starting location of the move, to the ordered work site.

881.05
Payment

A. The accepted quantities will be paid at the contract price per unit of measurement for the Section 881 pay items listed in the schedule of items. Mobilization is complete when all equipment, personnel, and materials are moved to the project site and work has been started. Payment will be full compensation for the work prescribed in this Section.

Pay Item		Pay Unit
881(1)	Mobilization	Lump Sum
881(2)	Mobilization	Each
881(3)	Equipment Moving	Miles

881.06
Acceptable Quality Levels

Description	Major Defect	Minor Defect	Allowable Defects		
			Major	Minor	
Weed-free equipment	Equipment not weed-free.	N/A	0	N/A	Equipr until it w
Ordered Movement of Equipment	Equipment not moved within designated time	N/A	X	N/A	Reduce for X ar over de
Equipment meets all state and federal regulations	Does not meet state and federal regulations	N/A	0	N/A	Bring eq state regulati eq
Equipment leaks	Equipment leaks in sensitive areas or leaks that are large and not typically inherent in the specific equipment	Small leaks inherent in the specific type equipment	0	N/A	Replace restore dire Contra

*** Forests have the option to choose a pay reduction in lieu of rework. However, each Forest must establish a thresho pay reductions for each defect.**

Intent and use: User to establish threshold for the acceptable level of quality.

Invasive and Noxious Plant Treatment Provisions:

INVASIVE/NOXIOUS PLANT TREATMENT (02/13).
The existing locations shown on the table and attached map below being used by the Purchaser/Contractor shall be treated by XXXXX [date] to remove weeds of concern.

Location (unit no., road milepost, GPS coordinate)	Weed Species	Acreage	Treatment Method

Attach maps here.

Revegetation Provisions (seeding, fertilizing, planting):

PROTECTION OF DISTURBED AREAS FROM ESTABLISHMENT OF INVASIVE AND NOXIOUS WEEDS (02/12).

Description

This work consists of applying required seed mixtures, fertilizer, mulch, and planting containerized or bare root plant stock singularly or in specified combinations to roadways, disposal areas or other disturbed sites. Work area may be limited to designated portions of the roadway and roadside (cut and fill slopes, waste and spoil areas) or include treatment of the entire area bounded by the outer limits of the disturbed sites constructed by the Purchaser/Operator/Contractor.

In addition to the requirements of XXX.XX, Purchaser/Operator/Contractor shall seed and fertilize areas where mineral soil is exposed as designated by the Forest Service.

Seed Mixture

The application rate for the any seed mixture is 45 lbs. /acre (39 kg/ha) in the following amounts and mixtures to be sown in terms of pure live seed (PLS):

% composition of Mixture/Species of Seed	PLS Pounds per Acre ((Kilograms/Hectare)
40% Annual ryegrass (*Lolium perenne ssp. Multiflorum*)	18 lbs. (16.1 kg)
40% Boreal red fescue (*Festuca rubra*, Boreal variety)	18 lbs. (16.1 kg)
20% Arctared fescue (*Festuca rubra*, Arctared variety)	9 lbs. (8.0 kg)

If either Boreal red fescue or Arctared fescue is unavailable, Fawn Tall fescue may be substituted. If Fawn Tall Fescue is unavailable, then the amounts of the available two may be adjusted to total 100%.

When native grass seed is required, use the following seed mixture:

% composition of Mixture/Species of Seed	PLS Pounds per Acre (Kilograms/Hectare)
30% Nortran tufted hairgrass (*Deschampsia caespitosa)*	13.5 lbs. (12.1 kg)
60% Arctared Fescue (*Festuca rubra*, Arctared variety)	27 lbs. (24.1 kg)
10% Annual ryegrass (*Lolium perenne* ssp. *Multiflorum*)	4.5 lbs. (4.0 kg)

If Nortran tufted hairgrass is unavailable, Norcoast Bering hairgrass (*Deschampsia beringensis*) may be substituted. For SE Alaska, the use of Nortran over Norcoast is preferred, if available.

All seed purchased will be certified to be either free of weed seeds listed on the current "State of Alaska list of prohibited and restricted noxious weeds", or contain no more than 0.05% of "other seed", whether identified or not.

Furnish seed separately or in mixture in standard containers. Furnish the Government duplicate signed copies of a certificate signed by a Registered Seed Technologist or Seed Analyst (certified through either the Association of Official Seed Analysts or the Society of Commercial Seed Technologists) certifying that each lot of seed has been tested in accordance with the Association of Official Seed Analysts standards within 12 months prior to the date of application. This certification shall include:

(1) Name and address of laboratory
(2) Date of test

(3) Lot number for each kind of seed
(4) Name of seed(s)
(5) Percentage of germination
(6) Percentage of purity
(7) Percentage of weed content
(8) Certification that the seed lot meets applicable State and Federal laws with regard to prohibited and restricted noxious weeds
(9) In the case of a mixture, the proportions of each kind of seed.

Legume seed shall be inoculated with approved cultures in accordance with the instructions of the manufacturer. No seed may be applied without prior written approval.

Fertilizer

The following kinds and amounts of standard commercial grade fertilizer shall be used with guaranteed analysis of contents clearly marked on container. Furnish fertilizer in sealed containers. Fertilizer shall be applied at the rate of 300 lbs. /acre (340 kg/ha) with the following chemical analysis:

Type of Fertilizer	Chemical Analysis (% NPK)	Pounds Per Acre
Complete	% Nitrogen – 10 % Phosphorus - 20 % Potassium - 10	200 lbs. /acre (225 kg/ha)
Urea (*Nitrogen Urea)	% Nitrogen – 46 % Phosphorus – 0 % Potassium – 0	100 lbs. /acre (110 kg/ha)

Mulch

Mulch materials (including hydro-seed flurries) will be certified to be free from weeds listed on the current "State of Alaska list of prohibited and restricted noxious weeds", or contain no more than 0.05% of "other seed", whether identified or not.

Mulch Type	Application Rate

Plant Stock

Live plant stock (including container stock, bare root, plugs or cuttings) will be certified to be free of any plant materials from species listed on the current "State of Alaska list of prohibited and restricted noxious weeds. Furnish the following listed plant materials:

Stock	Size	Bare Root	Containerized	Plugs

Schedules and Applications

Schedule

Unless otherwise agreed to in writing, apply seed and fertilizer to disturbed areas between April 15 and September 15 during weather and moisture conditions favorable for quick germination and growth of the plants. Native seed mixtures (tufted hairgrass) should be applied before July 30 to ensure proper germination and establishment before the fall season. Seeding shall be completed in a timely manner following the last disturbance activity by the Purchaser/Operator/Contractor in the disturbed area.

To control erosion, apply seed to disturbed soil and slopes within 30 days of disturbance. If the road has not been completed and accepted by that time, apply seed by the dry method as an interim erosion control measure. Complete seeding as soon as other ground-disturbing work is accepted, unless a specific seeding season is listed below.

Do not apply the treatment when the ground is frozen or excessively wet (i.e. standing for flowing water). Terminate application during periods when there is too much wind or rain to allow consistent treatment rates and control of the treatment area to the designated limits.

The Certified seed analysis reports from each container shall be provided by Purchaser/Operator/Contractor to the Forest Service prior to application of the seed.

When fertilizer and seed are applied in separate operations, the second operation shall be carried out within 72 hours of the first operation.

When an adequate seedbed does not exist, Purchaser/Operator/Contractor shall scarify to get a 2 inch loose soil seedbed, prior to seeding.

Roadside and Slope Treatment

Roadsides will not require advance preparation unless required in the SPECIAL PROJECT SPECIFICATIONS or as SHOWN ON THE DRAWINGS.

Apply the designated treatment by hand operated machine. When both roadbed (under XXX.xx) and slopes are shown in the SPECIAL PROJECT SPECIFICATIONS for treatment, application may be done at the same time.

The Contractor will not be required to operate self-propelled equipment beyond the defined roadbed. Do not apply treatment materials to the foreslope of ditches unless roadbed treatment (XXX.xx) is also required.

Roadbed Treatment

Scarify portions of the roadbed not previously disturbed and left loose under Section XXX.xx to a minimum depth of 100 mm unless bedrock is encountered at a lesser depth. The maximum distance between furrows formed by scarification is 300 mm.

Treat barrier mounds placed under Section X-XXX while in a roughened condition.

Planting

Plant designated woody plant materials at the staked locations or designated spacing.

Place containerized plant stock in an appropriately sized hole formed by a dibble or other device to place the roots at the proper depth.

Place bare root plant stock in a slotted cut formed by a mattocks, pulaski, or other edged tool. Place the crown at ground level. Do not bend or break the roots.

Compress the area adjacent to the hole by foot or special tool to form a depression up and down slope from the stem and force the soil against the container or roots with no air voids.

Hold the plantings firmly in place by the soil. When checked by pulling upward on the top 12 mm of the plant stem, the planting shall either break at the hold point or the area compressed against the roots show evidence of movement. Remove and replace with fresh stock plantings that are not held firmly by the soil.

Government Provided Materials

The Government will provide the following listed materials. At least ten (10) calendar days' notice must be given to the government prior to actual date material will be picked up.

Materials will be provided at: _____

INSTRUCTIONS: For optional use in contracts when identified in the NEPA document that the establishment of vegetative cover is necessary to minimize the establishment and growth of weeds. For appraisal purposes, treat cost estimates with the erosion control estimate.
For government provided materials, this section applicable to the case where the government provides seed or other plant materials to the contractors, such as in the case of using native plant species.

Table of Contents

PREFACE

Preface_wo_09_24_2019

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-14 for construction of National Forest System Roads.

625 - TURF ESTABLISHMENT

625.00_Forest_8_18_2019

Delete Section 625 in its entirety and replace with the following:

Section 625. — TURF ESTABLISHMENT

Description

625.01 This work consists of soil preparation, watering, fertilizing, seeding, and mulching. Seeding and mulching methods are designated as dry or hydraulic.

Material

625.02 Conform to the following Subsections:

Agricultural limestone	713.02
Fertilizer	713.03
Mulch	713.05
Seed	713.04
Tackifiers	713.11

Construction Requirements

625.03 General. Apply turf establishment to prepared ground or any disturbed area between **April 15th** and **September 15th.** Apply turf establishment to the areas shown on the plans or worklists within **14** days after completion of ground disturbing activities.

Seeded areas damaged by construction activities shall be reseeded within 10 days of the damage. Do not seed during windy weather or when the ground is excessively wet, frozen, or snow covered.

Assure that all seed and mulch used in the work conforms to the weed free requirements of Section 713.

625.04 Preparing Seedbed. Ensure that the surface soil is in a roughened condition favorable for germination and growth.

625.05 Watering. Maintain moisture as follows:

Watering is not required.

625.06 Fertilizing. Apply fertilizer by the following methods:

(a) Dry Method. Apply the fertilizer with approved mechanical equipment. Hand operated methods are satisfactory on areas inaccessible to mechanical equipment.

(b) Hydraulic Method. Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add fertilizer to the slurry and mix before adding seed. Add the tracer material when designated by the CO.

Fertilizer shall be applied at a rate of 200 pounds of 10-20-10 (Nitrogen-Phosphorus-Potassium) fertilizer plus 100 pounds of 46-0-0 Urea Nitrogen per acre in all seed applications.

625.07 Seeding. Apply seed by the following methods:

(a) Dry Method. Apply the seed with approved power- driven seeders, drills, or other mechanical equipment. Hand-operated seeding methods are satisfactory on areas inaccessible to mechanical equipment; or

(b) Hydraulic Method. Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add a tracer material consisting of either

wood or grass cellulose fiber mulch to the water. Apply the tracer material at a rate of 400 pounds per acre to provide visible evidence of uniform application. Add the seed to the water slurry no more than 30 minutes before application. Seed by hand areas inaccessible to seeding equipment.

Furnish and apply the following kinds and amounts of pure live seed:

	Type of Seed	Quantity of Pure Live Seed (Lbs/Acre)
1.	*Boreal Red Fescue (Festuca rubra, Boreal Variety)	18
2.	Annual Ryegrass (Lolium multiflorum)	9
3.	*Arctared Fescue (Festuca rubra, Arctared Variety)	18
	Total	45

*If Boreal Red Fescue or Arctared Fescue is unavailable, Fawn Tall Fescue may be substituted in the same proportion.

For watershed restoration activities or erosion control measures where native plant materials are desired, use the following turf mixture.

Furnish and apply the following kinds and amounts of pure live seed (Native mix):

	Type of Seed	Quantity of Pure Live Seed (Lbs/Acre)
1.	Nortran tufted hairgrass (Deschampsia caespitosa)	13.5
2.	Annual Ryegrass (Lolium multiflorum)	4.5
3.	*Arctared Fescue (Festuca rubra, Arctared Variety)	27
	Total	45

625.08 Mulching. Apply Mulch within **48** hours after seeding by the following methods.

(a) Dry Method. Mulch is not required when using the Dry Method.

(b) Hydraulic Method. Apply mulch in a separate application from the seed using hydraulic-type equipment according to Subsection 625.07(b).

Apply bonded fiber matrix hydraulic mulch at a minimum rate of **1,205** pounds per acre. Apply so no hole in the matrix is greater than 0.04 inches. Apply so that no gaps exist between the matrix and the soil.

Apply mulch uniformly over the entire disturbed area. Mulch by hand areas inaccessible to mulching equipment.

625.09 Protecting and Caring for Seeded Areas. Repair or apply supplemental applications of seed, mulch, fertilizer, and water as many times as needed until turf is established or final acceptance.

625.10 Acceptance. Material for turf establishment will be evaluated under Subsections 106.02 and 106.03.

Placing of turf establishment will be evaluated under Subsections 106.02 and 106.04.

Measurement

625.11 Measure the Section 625 pay items listed in the bid schedule according to Subsection 109.02 and the following as applicable:

When measuring turf establishment and supplemental applications by the acre, measure on the ground surface.

When measuring water by volume or mass, measure in the hauling vehicle or by metering.

Payment

625.12 The accepted quantities will be paid at the contract price per unit of measurement for the Section 625 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

EXHIBIT 4. TONGASS N.F. MECHANIZED EQUIPMENT AND VEHICLE CLEANING GUIDANCE AS A MEANS FOR PREVENTING THE SPREAD OF INVASIVE AND NOXIOUS WEEDS.

This guidance is intended to assist resource specialists, forest managers, contract administrators, road engineers, or others that work with **mechanized equipment and vehicles** in the prevention of spreading invasive plants. For activities on National Forest System lands, an Invasive Plant Risk Assessment (IPRA) should be prepared according to Forest Service policy (FSM 2903 (4,12) and 2904.08(8)). Examples include (but are not limited to) road construction, reconstruction, decommissioning, storage, road maintenance, trail construction, other recreation projects requiring use of mechanized equipment and vehicles for timber harvest, commercial and pre-commercial thinning, watershed and wildlife restoration, mineral development, hydroelectric and other renewable energy development projects and all special uses, including outfitting and guiding. This includes projects covered under both documented and undocumented Categorical Exclusions (CEs). Through the risk assessment process (see Exhibit 2 of WBMP Guidance), implementation of equipment and vehicle cleaning provisions may be necessary to meet Forest Service policy regarding invasive plant prevention (FSM 2903 (7) (a)). Provisions for weed prevention associated with boot and gear cleaning is provided for in the Weed BMP 3.7

The IPRA will include analysis of the provisions set forth below.

- If appropriate (see #3 below), reference C(T) 6.35 contract provision for preventing spread of high priority invasive plants; or
- If project is other than Timber Sale, Public Works, Service, or Stewardship project (including agreements), use C(T) 6.35 contract provision as a template for development of a project specific contract provision and modify as necessary to meet the needs of the project
- An atlas of invasive species of concern, their locations and extents, will be made available for the project record prepared for the intended management action.

Timber Sale, Public Works, Service, and Stewardship Contracts and other authorizations, contracts and applicable agreements ***will*** include equipment cleaning provisions under the following conditions:

1. In roadless areas and other areas that have isolated road systems, all mechanized equipment and service vehicles will be cleaned before entering the area and before equipment gets transported to another road system.

    - Isolated road systems are road systems which are not connected to a community.
    - Mechanized equipment includes all harvest, road building and road maintenance equipment, including roadside brushers, and other construction equipment.
    - Service Vehicles include USFS and contractor/partner transport vehicles.

2. At the Forest Supervisor's discretion, Timber Sale, Public Works, Service, and Stewardship Contracts and other applicable contracts and/or agreements ***may*** include equipment and service vehicle cleaning provisions under the following additional conditions:

   - In areas that have road systems which are directly connected to a community.
   - Equipment and vehicles may be cleaned before entering the area and before it is transported to another road system.
   - Mechanized equipment includes all harvest, road building and road maintenance equipment, including roadside brushers, and other construction equipment;
     - Cleaning brushers on road systems connected to communities may be warranted in certain locations and will be contract-specific for these locations.
   - Vehicle cleaning is optional on Forest Service, contractor and/or partner transport and service vehicles used by sale administrators, engineering representatives, show-me trips and field crews of any kind on road systems connected to a community.

3. If equipment and vehicle cleaning is required for the project, all cleaning is the responsibility of the contractor and will be done on non-NFS lands before arriving at the isolated road system unless otherwise noted in the contract.

4. If cleaning must be done on NFS lands, one or more cleaning location(s) must be designated and identified on the Sale Area Map or other project map.

   a. Locations should be convenient to Marine Access Facilities to enable equipment and vehicles to be cleaned prior to any work or transport being done.

   b. Locations will not be near any fish bearing streams or municipal watershed streams.

5. In partnership with the district invasive species coordinator, the Contracting Officer or designee approves the location for cleaning if location is not already identified on Sale Area Map or other project map.

6. Portable equipment and vehicle cleaning systems are available for use by any resource group working in remote locations for use on Forest Service vehicles, such as brushers and service vehicles. These are unfiltered systems. Contact the Forest Invasive Species Coordinator for procuring their use.

7. Mitigation measures (BMPs) must be in place to control impacts of pollution and seed materials (seed, roots, flowers) contained within the runoff from the cleaning, including sediment traps, petroleum absorption cloth, etc. The contractor, partner or USFS shall comply with all regulations concerning preventing pollutants contained within timber sale or other permit provisions. (See FSM 2509.22 15.2).

8. The definition of "clean" will be the following:

   - The equipment/vehicle will be free of soil and/or mud contaminated with plant parts (including roots, seeds, flowers, stems) on the tractor, wheels, shovel, and undercarriage of the vehicle or equipment. Identification of plant species contained within the soil or mud is not required.
   - If you see bare metal or paint, it is clean!
   - Use good judgment!

9. Contractor/Purchaser shall give Forest Service two working days to inspect cleaning; otherwise the cleaning is self-certified. Inspecting equipment for cleanliness will be the responsibility of the Contracting Officer's Representative (COR) or designee.

10. We will have an appraisal allowance until cost collections capture the cost of cleaning equipment, if necessary.

11. Language in the timber sale prospectus or other bid package will state that equipment cleaning will be required, if necessary.

12. Feedback on the effectiveness of equipment cleaning will take place during annual meetings of the Sale Administrators, Transportation Engineers and other resource groups as they implement these guidelines.

EXHIBIT 5: STRAW AND GRAVEL GUIDANCE

Weed-free Certification Program

Land managers are increasingly concerned with the spread of selected highly invasive weeds to new areas such as natural areas, streams, rivers and wetlands. Nationally and within the State of Alaska, work is being done to address the introduction and spread of invasive weeds to these high-value areas through construction practices, seeding specifications and weed-free products.

The North American Weed Management Association (NAWMA) has lead the way in developing nationwide weed-free straw and gravel certification standards. The State of Alaska's Division of Agriculture, in partnership with Alaskan stakeholders and agencies, has adapted these standards **as a voluntary program** to meet the unique needs of our state. The Tongass N.F. has, in turn, adopted the same standards to address the intent of National Policy (FSM 2903(8), which states:

> *Where States have legislative authority to certify materials as (or invasive-free) and have an active State program to make those State-certified materials available to the public, forest officers shall develop rules restricting the possession, use, and transport of those materials unless proof exists that they have been State-certified as (or invasive-free), as provided in 36 CFR 261 and Departmental Regulation 1512-1.*

The Alaska Weed-free certification programs offer a way for producers to ensure that their products meet NAWMA standards and have reduced potential for transport and dispersal of listed weed species. By using these standards, Tongass N.F. consumers/users of these materials can ensure that we are doing our part in meeting the weed prevention measures identified in National policy.

The State of Alaska's Division of Agriculture has certification programs in place for both straw and gravel materials, offering straw producers and gravel pit managers the opportunity to have their sites certified during the growing season. Each program is based on NAWMA standards and is adapted to Alaska. The Tongass N.F. has adopted similar standards for the certification of both gravel and straw materials that will be used on National Forest System lands.

Weed-free Straw Program

Alaska's Weed-free Straw program offers certification for straw and straw products. Straw and hay can be certified by an inspector who has attended training in the past five (5) years. The certified field where the hay is grown must be inspected within 10 days of harvest, be free of the listed weed species and meet other minimum program standards. Weed-free straw and straw provide consumers the opportunity to help prevent the spread of weed species to places they visit or manage.

Forest Service programs, as consumers of hay and straw materials, have many uses for Weed-free Straw and Straw. The primary use of straw is for erosion control, as a sediment trap. In addition, straw and hay may also be used as mulch. Ground or shredded mulches are contained within hydro-seed slurries and can contain unknown weed seeds which can establish in sensitive or pristine areas.

The objective of this program is to help prevent and slow the potential for transport and dispersal of listed weed species following the North America Weed Management Association (NAWMA) and Alaska Certification Standards. A list of noxious or undesirable weeds is provided by the State of Alaska, DNR. Forest Service invasive species specialist have added other priority species to this list which specifically address highly invasive weeds known to exist on the Tongass N.F. not previously listed nation-wide or within the State, as well as several other species currently on our "Watch List" (see species list at the end of this document).

To purchase straw, contact your local Soil and Water Conservation District for a list of participating producers, or the Alaska Plant Materials Center. Remember this is a specialty product and large orders of material should be coordinated with producers well in advance. To ensure the hay or straw is , it should contain an inspection certificate in the form of a certification tag (see photo below). This tag ensures that the State of Alaska's minimum standards for straw has been met.

The Invasive Plant Risk Assessment (see Exhibit 2 of WBMP Guidance) will be used to identify where and when straw materials are required for project implementation.

A bale of hay is identified by a certification tag

For more information on the certification program, please consult these resources: Division of Agriculture: http://plants.alaska.gov/invasives/.php North American Weed Management Association: http://www.nawma.org/

Weed-free Gravel Program

Since 2009, the State of Alaska's Division of Agriculture has been coordinating efforts to research and prevent the spread of invasive plants via gravel in Alaska through the development of a weed-free gravel certification program. This voluntary program aims at providing a weed-free gravel product to land managers working in sensitive areas while also offering producers a way to certify materials for a value-added product. The Tongass N.F. has adopted similar standards developed by DNR for rock sources on NFS lands in order to ensure National policy for weed prevention is being met (FSM 2903 (7) and (8)).

White sweetclover infestation in a gravel pit.

The Weed-free Gravel Certification Program, structured much like the existing Weed-free Straw Certification Program, involves a coordinated inspection by trained personnel to document that the material site does not contain any propagative parts of noxious or undesirable (listed) plants (see below). A material site must be inspected twice per growing season for commercial rock sources [3] to fully meet the standards and once per growing season for remote material sites that meet certain criteria.

The Weed-free Gravel Program for the Tongass N.F. requires inspector training. Inspectors may be from various backgrounds, for example, invasive plant specialists, botanists, ecologist, soil scientists, engineers, and foresters. The training is developed by the State of Alaska, Division of Agriculture and the Cooperative Extension Service in Palmer, Alaska and provided by the Tongass Invasive Species Program Manager once a year. Inspector trainings are held each spring and will be offered to new and recertifying inspectors. Though an inspector certification is valid for 5 years, we encourage attendance each year to keep up with program changes and to refresh your plant identification skills. The program is offered via webinar broadcast to include everyone who needs the certification. This training will be one of several requirements in the gravel certificating program.

Gravel pit minimum standards - Gravel/borrow area shall be free of those noxious weeds or undesirable plant species identified in the following list (see below) and those weeds declared noxious within the state of origin.

[3] A commercial rock source is one that is managed and owned by a private enterprise. Materials from commercial sources are purchased from the vendor either directly by the Forest Service or by means of a contractor or second party through an agreement or other entity. Rock and soil sources taken from NFS lands require one inspection per year.

1. Imported gravel/borrow material shall be inspected in the State/Province of origin by proper officials or authority.
2. Local gravel/borrow material shall also be inspected in the area of origin (area shall include, but not limited to, surrounding ditches, top soil piles, gravel/sand piles, fence rows, roads, easement, rights-of-way, working areas, storage areas, and a buffer zone surrounding the area.)
3. Gravel/borrow material shall be inspected prior to movement by the proper officials or authority (certified inspectors).
4. Gravel/borrow area which contains any noxious weeds, or undesirable plant species, as identified in the following list, may be certified if the following requirements are met:
    a. Area upon which the gravel/borrow material was mined was treated to prevent seed formation or seed ripening to the degree that there is no danger of dissemination of the seed, or any injurious portion thereof from such noxious weeds, or undesirable plant species, or the propagating parts of the plant are not capable of producing a new plant.
    b. Noxious weed(s) or undesirable plant species was treated not later than rosette to bud stage, or boot stage for grass species.
    c. Treatment method can include but is not limited to: 1) burning, 2) mowing, cutting or rouging, 3) mechanical methods, or 4) chemicals.
5. An inspection certificate shall document that the above requirements have been met based upon a reasonable and prudent visual inspection.
6. Documentation of soil and rock source materials and status of infestation will be provided in the USFS Geospatial Roads layer and the USFS NRM-INVP database. Certification status will be identified in both databases.
7. The Invasive Plant Risk Assessment (see Exhibit 2 of WBMP Guidance) will be used to identify where and when rock sources are required for project implementation.

Minimum Guidelines for gravel/borrow material inspections:

The inspector will follow the following inspection procedures:

1. The entire border shall be walked or driven.
2. All storage areas, gravel/sand piles shall also be inspected and meet the standards.
3. Around all equipment, crushers, and working areas must be inspected to meet the standards.
4. Areas shall be inspected regularly at least twice a year in the growing season at commercial quarries.
    a. **Exemption:** Remote material sites only require one inspection in a season if that pit received an “exceeds” certification at the end of the previous season.
5. An inspector may not inspect gravel/borrow material of which said inspector has ownership or financial interest.
6. Inspector will follow all safety protocol set forth by gravel/borrow material owner/operator while on-site.

Tongass N.F. WEED-FREE CERTIFICATION PROGRAM - Gravel Inspection Form

This form is to be used by Forest Sale Administrators, Contracting Officers and/or their representatives or other Forest users to document the inspection results of all gravel materials planned for use on NFS lands within the Tongass National Forest. Borrow materials may be obtained from commercial sources, which require participation of the producer/operator in the weed-free certification program, or from local sources on NFS lands, all which require inspection and certification by qualified inspectors.

Statewide Program Contact:
Division of Agriculture
Plant Materials Center
5310 S. Bodenburg Spur Rd.
Palmer, AK 99645
(907) 745-8785 | Fax 746-1568

Forest Program Contact:
Tongass N.F. Ecology Program Manager
648 Mission Street
Ketchikan, AK 99901
(907) 228-6272 | Fax 228-6215

Producer/Operator[4]_____Phone_____
Address_____
City_____
State_____
Zip_____
Pit Location_____
Acres for inspection_____
Material description: (Sand/ Gravel/Rock/Top soil) _____
Date Inspection: _____ Inspection Results_____

Material Site Name/Number[5] _____
Acres _____
Material description: (Sand/ Gravel/Rock/Top soil) _____
Legal Description/GPS waypoints_____
Date Inspection_____ Inspection Results_____

Please attach a detailed sketch and/or map showing sites to be inspected.

Operator Signature_____

Inspector Signature_____

Distribute copies: to

1. **The State of Alaska, Division of Agriculture**
2. **TNF Ecology Program Manager**
3. **Producer, Sale Administrator or Engineering Representative**

[4] Applies to Commercial borrow sources only.
[5] Applies to all other borrow sources, for example rock pits on NFS lands.

North American Weed-free Straw and Gravel Certification Standards List

(Species that CANNOT be present in straw material or gravel pit to qualify for certification)

Common Name	Scientific Name
Absinth wormwood	*Artemisia absinthium*
Bermudagrass	*Cynodon dactylon*
Buffalobur	*Solanum rostratum*
Canada thistle	***Cirsium arvense***
Common burdock	*Arctium minu*
Common crupina	*Crupina vulgaris*
Common tansy	***Tanacetum vulgare***
Dalmatian toadflax	***Linaria dalmatica***
Diffuse knapweed	*Centaurea diffusa*
Dyers woad	*Isatis tinctoria*
Field bindweed	*Convolvulus arvensis*
Hemp (marijuana)	*Cannabis sativa*
Henbane, Black	*Hyoscyamus niger*
Hoary cress, (Whitetop)	*Cardaria spp*
Horsenettle	*Solanum carolinense*
Houndstongue	*Cynoglossum officinale*
Johnsongrass	*Sorghum halepens*
Jointed goatgrass	*Aegilops cylindrical*
Leafy spurge	*Euphorbia esul*a
Matgrass	*Nardus stricta*
Meadow knapweed	*Centaurea pratensis*
Medusahead	*Taeniatherum caput-medusa*
Milium	*Milium vernal*
Musk thistle	*Carduus nutans*
Orange hawkweed	***Hieracium aurantiacum***
Oxeye daisy	***Chrysanthemum leucanthemu***
Perennial pepperweed	*Lepidium latifolium*
Perennial sorghum	*Sorghum almum*
Perennial sowthistle	***Sonchus arvensis***
Plumeless thistle	*Carduus acanthoides*
Poison hemlock	*Conium maculatum*
Puncturevine	*Tribulus terrestris*
Purple loosestrife	*Lythrum salicaria*
Quackgrass	*Agropyron repens*
Rush skeletonweed	*Chondrilla juncea*
Russian knapweed	*Centaurea repens*
Scentless chamomile	*Matricaria perforata* or *M. milaceum*
Scotch broom	***Cytisus scoparius***
Scotch thistle	*Onopordum acanthium*
SericeaLespedeza	*Lespedeza cuneata*
Silverleaf nightshade	*Solanum elaeagnifolium*

Common Name	Scientific Name
Skeletonleaf bursage	*Ambrosia tomentosa*
Spotted knapweed	***Centaurea maculosa***
Squarrose knapweed	*Centaurea virgate*
St. Johnswort	***Hypericum perforatum***
Sulfur cinquefoil	*Potentilia recta*
Syrian beancape	*Zygophyllum fabago*
Tansy ragwort	***Senecio jacobae***
Toothed spurge	*Euphorbia dentate*
Wild oats	*Avena fatua*
Wild proso millet	*Panicum miliaceum*
Yellow hawkweed	***Hieracium pretense***
Yellow starthistle	*Centaurea solstitialis*
Yellow toadflax	***Linaria vulgaris***

Alaska Weeds of Concern List for Certification Standards (2012)

During the certification process, the plants on the Alaska Weeds of Concern list are surveyed for **in addition to** the nationally recognized North American Weed Management Association's (NAWMA) Noxious Weed List. In order to have products certified as , no propagative parts of any of these listed species may be present. **Highlighted text** references weeds known to exist on the Tongass N.F.

Straw

Common Name	Scientific Name
Hempnettle	***Galeopsis* spp.**
Bird vetch	*Vicia cracca*
Black bindweed/wild buckwheat	***Polygonum convolvulus***
Narrowleaf hawksbeard	***Crepis tectorum***
Hawkbit/fall dandelion	*Leontodon autumnalis*
Narrowleaf hawkweed	***Hieracium umbellatum***
Corn spurry	*Spergula arvensis*

Gravel

Common Name	Scientific Name
White sweetclover	***Melilotus alba***
Narrowleaf hawkweed	***Hieracium umbellatum***
Narrowleaf hawksbeard	***Crepis tectorum***
Reed canarygrass	***Phalaris arundinacea***
Japanese knotweed	***Polygonum cuspidatum*)**
Bird vetch	*Vicia cracca*
Hawkbit/fall dandelion	*Leontodon autumnalis*
Hempnettle	***Galeopsis* spp.**
Black bindweed/wild buckwheat	***Polygonum convolvulus***
Bohemian Knotweed	***Polygonum sachalinense***
Giant Knotweed	***Polygonum x bohemicum***

Tongass N.F. Additional Weeds of Concern List for Certification Standards (2017)

During the certification process, the plants on the TNF Additional Weeds of Concern list are surveyed for in addition to the nationally recognized North American Weed Management Association's (NAWMA) Noxious Weed List and the State of Alaska's Weeds of Concern List. In order to have products certified as , no propagative parts of any of these listed species may be present.

Scientific Name	Common Name
Alliara petiolata (Bieb.) Cavara & Grande	garlic mustard
Cirsium vulgare (Savi) Ten.	bull thistle, common thistle
Hieracium lachenalii K.C. Gmel.	Common hawkweed
Brassica rapa	field mustard
Brassica rapa var. rapa	purple-topped turnip
Cotula coronopifolia L.	common brassbuttons
Galeopsis bifida Boenn. and G. *tetrahit* L.	split-lip hemp-nettle
Melilotus officinalis (L.) Lam	yellow sweetclover, king's crown
Brachypodium sylvaticum (Huds.) Beauv.	false-brome
Carduus nutans L., *C. acanthoides* L., *C. pycnocephalus* L., *C. tenuiflorus* W. Curtis	musk thistle, plumeless thistle, Italian thistle, slender-flowered thistle
Heracleum mantegazzianum Sommier & Levier	giant hogweed
Hydrilla verticillata (L. fil.) Roy	Hydrilla
Rubus discolor Weihe & Nees	Himalayan blackberry
Spartina alterniflora Loisel, *S. angelica* C.E. Hubbard, *S. densiflora* Brongn., *S. patens* (Ait.) Muhls	Atlantic cordgrass, saltmarsh grass, smooth cordgrass
Zostera japonica Aschers. & Graebn.	dwarf eelgrass

EXHIBIT 6. GUIDANCE FOR REVEGETATING DISTURBED SITES FOR EROSION AND WEED CONTROL, TONGASS NATIONAL FOREST

August 2018

Erosion Control on the Tongass National Forest

Erosion control is not optional on the Tongass National Forest. Most areas of exposed mineral soil will erode under typical rainfall events. The objective of erosion control is to strategically treat areas where erosion will either impact water quality or degrade soil functions while avoiding the spread of invasive plants

Erosion control on the Tongass NF consists of natural vegetation seeding, transplants, and tree planting, a select set of introduced vegetation (grass seeding), other non-structural measures such as covering areas of exposed mineral soil with slash or erosion control blankets, and structural measures like rock walls and check dams.

Whatever form of erosion control is used the objective is to establish groundcover to minimize surface erosion from disturbed soil.

Grass seeding is a very common form of erosion control practiced on the Tongass especially for cutslopes and fill slopes on roadsides. Grass seeding is the focus of this document, but we want the user to know that other erosion control options are available and suitable in many circumstances.

Due to concerns for weed introductions through the use of seeding mixtures, we focus our seeding specifications and other forms of erosion control on either non-invasive, non-native grass seed mixtures, or the use of native plant materials for certain types of projects (such as watershed restoration and recreation projects). As a result, our concern for spreading invasive plants is lessened.

Slash cover is commonly used in timber harvest units where large (greater than 100 square feet) of exposed mineral soil can be covered with readily available slash in the harvest unit. Dense slash accumulations are not allowed according to the forest plan standard. Dense slash accumulation typically occur on equipment trails where slash is placed in multiple layers to support the weight of the equipment and avoid equipment rutting. (See the forest plan definition of dense slash and woody debris accumulations.)

Rock walls are often used to support undercut till slopes on roads that are to be left open to traffic.

Erosion control blankets and wattles are also an option on roadside cutbanks that are laid back to a natural angle of repose. If used, erosion control blankets and geotextiles must be weed free.

Seeding and transplanting of red alder seedlings has been used to stabilize exposed soils on stream restoration projects.

Grass seeding continues to be used to stabilize loose sediments on landslides. Tree planting in combination with erosion control blankets or other geotextiles and grass seeding has been used to stabilize landslide sediments. Landslide seeding should be evaluated for appropriateness of seeding on a case-by-case basis by a soil scientist and watershed specialist.

In some cases grass seeding has invaded wet organic soil sites and now dominates those sites. The forest spends thousands of dollars a year treating invasive plant populations, most of which have been started through our grass seeding program.

Evaluation

All areas of exposed mineral soil greater than 100 square feet are evaluated for erosion control. The specific type of erosion control method will be evaluated by a soil scientist, botanist, ecologist and/or sale administrator. The evaluation should take into account risk of erosion and the risk of introduced seed or species spread beyond the target application area. It is often appropriate to apply erosion control on areas of exposed mineral soil smaller than 100 square feet in size given downslope resources at risk.

Grass Seeding For Erosion Control.

- Seeding has long been standard procedure for road construction and all other ground-disturbing projects. It is the most cost-effective erosion control practice available. (See FSH 2509.22 R10 BMPs 12.17, 14.5, 14.8, 14.20, 14.24, 14.25 for specific references to seeding).

- The 2008 Tongass Forest Plan Invasive Species Standards and Guidelines and FSM 2900 provide policy for minimizing spread of invasive species. Guidance for the Invasive Plant Management Program, (Krosse 2017) provides a suite of management actions and practices specific to the Tongass N.F. which address how to implement FSM 2900. We call these management practices Weed BMPS. All resource programs have the responsibility to avoid spreading invasive plants through their management actions, including erosion control practices.

- Seeding is most successful if completed by June 30, to ensure that ground cover is established before heavy fall rains and frost. If seeding cannot be completed prior to September 15, or appears unsuccessful by that time, other erosion control measures must be applied to disturbed areas near surface waters before heavy fall rains and frost.

- The Tongass National Forest has a standard seed mix and fertilizer application rate that is compatible with invasive plant policy. It includes non-native, non-invasive seed varieties that are known to grow well in SE AK:

Apply seed and fertilizer to disturbed areas between April 15 and September 15.

Quantity of Pure

Kind of Seed	Live Seed (Lbs/Acre)
1. Boreal Red Fescue*	10
2. Annual Ryegrass	10
3. Arctared Fescue*	5
Total	25

* If either Boreal red fescue or Arctared fescue are unavailable, Fawn Tall fescue may be substituted. If Fawn Tall Fescue is unavailable, then the amounts of the available two may be adjusted to total 100%. **Seed mixture contains no more than 0.01% other seed, whether identified or not.**

Fertilizer shall be applied at a rate of 200 pounds of 10-20-10 fertilizer plus 100 pounds of urea (46-0-0) per acre in all applications. The final analysis of this mix is 22-13-6.

- Several studies conducted in the Tongass NF support the fact that seeding, when correctly applied, is effective in reducing surface erosion. (See Wilson 1965, Landwehr and Krosse 2001, and Landwehr et al 1997 on our fsweb.)

- There are some situations that may require structural erosion control measures in addition to or in lieu of seeding. These include:
  - Excavation of fluid road subgrade materials during culvert removal
  - Over-steepened slopes
  - Riparian and streambank disturbance during structure removal or watershed restoration work. We may want to use native materials or structural methods to avoid the chance of introduced species spread downstream.
  - Wetland disturbance. We may want to avoid grass seed for concern of grass dominance of the site.

- Other erosion control measures, often more expensive than seeding, include:
  - Mulch (alder leaves, branches, slash, wood chips)

- Natural fiber (coconut, jute, etc) mats or logs
- Silt fencing, ditch dams, sediment retention devices (these usually require hand maintenance to remove collected sediment)
  - Note: straw bales used as sediment traps must be "weed-free". See Exhibit 5 in Guidance for Invasive Plant Management Program, Tongass National Forest (Krosse 2017).
- Rock walls

- If fertilizer is applied correctly, there is generally no concern for water quality impacts. Case-by-case, if eutrophication is a nearby concern, deviation in standard fertilizer applications may be warranted, or alternative erosion control measures can be applied.

- Alder and willow fascines have successfully accelerated recovery of permanent vegetation along streambanks, but are generally not acceptable as an immediate source of groundcover or substitute for erosion control seeding. Wetlands plant 'plugs' have also been successful in restoring natural vegetation to disturbed wetland areas.

- Currently, the cost of native seed is prohibitively high, but could be collected by hand on-site for special projects, on a case-by-case basis. Identification of the need for native plant materials must be accomplished in project erosion control plans one to three years prior to project implementation, depending on the types and sources of native materials needed.

- For a list of vendors and price list of seed materials (native and non-native), contact district botanists/ecologist, or Supervisor's Office Ecology Program Manager.

Patti Krosse, Ecologist
Julianne Thompson, Hydrologist
Dennis Landwehr, Soil Scientist

Document Content(s)

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Natural Resources
DIVISION OF PARKS & OUTDOOR RECREATION
Office of History & Archaeology

550 West 7th Avenue, Suite 1310
Anchorage, AK 99501-3561
907.269-8700
http://dnr.alaska.gov/parks/oha

December 2, 2019

File No.: 3130-1R FERC / 2018-00377

David Turner
Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street, N.E.
Washington, D.C. 20426

Subject: Beaver Falls Hydroelectric Project, FERC No. 1922 – Pre-Application Document

Dear Mr. Turner:

The Alaska State Historic Preservation Office (AK SHPO) received links to Ketchikan Public Utilities Notice of Intent and Pre-Application Document (PAD) to relicense the Beaver Falls Hydroelectric Project on July 16, 2019. Following the Joint Agency/Public Meeting in October 2019, our office reviewed the PAD and offer the following comments for your consideration.

- Our office continues to encourage completing a cultural resources inventory on the Beaver Falls Hydroelectric Project's infrastructure, which should include a landscape perspective. An Historic Structures Survey may be too limiting to comprehensively address the complex of properties associated with the project.
- The cultural resources study completed in the early 1990s should be examined by a cultural resources professional to determine if there are any methodological gaps or types of resources that were not taken into consideration. Resource issues could include properties of religious and cultural significance to Tribes, testing for paleo-terraces, and not screening test deposits.
- To complete identification for Section 106 of the National Historic Preservation Act, we recommend completing determinations of eligibility for identified properties rather than completing one or more National Register of Historic Places Nomination Forms.
- The protection, mitigation, and enhancement measures proposed for cultural resources includes incorporating new information into an Historic Properties Management Plan (HPMP). A HPMP can be a valuable tool, but for the purposes of complying with Section 106, such a document needs to be implemented through an agreement document, such as a Programmatic Agreement or a Memorandum of Agreement. Any agreement document and management plan used to implement an agreement for the purposes of Section 106 should be created in consultation with consulting parties.

Thank you for the opportunity to comment. Please contact Sarah Meitl at 269-8720 or sarah.meitl@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer

JEB:sjm

Document Content(s)

From:	Julia Kolberg
To:	Katie Sellers; Jennifer Holstrom
Cc:	David Turner
Subject:	P-1922 PAD Comments
Date:	Monday, September 09, 2019 1:24:34 PM

Good afternoon,

In reviewing the pre-application document, we noticed a few potential issues and information needs that should be addressed in the license application. While none of them rise to the level of a deficiency, we wanted to highlight these issues and make sure you were aware of the need to address them as you develop your application.

Project Facilities/Operation

- Please identify where penstock and transmission line segments are buried and above ground and the corresponding lengths for both developments.
- The single-line diagram is public information and should not be filed as CEII.
- We are missing details for the following project features:
  - the dimensions and construction materials of the tailrace or flow conveyance out of the powerhouses
  - the Beaver Falls penstock (specifically, where does the diameter of the penstock change and what are the corresponding lengths at each diameter?)
  - the transition from penstock to manifolds conveying flow to the Beaver Falls powerhouse (the configuration of this transition does not appear fully in the provided project drawings)
  - clarify the operational status and configuration of the generating units at the Beaver Falls development
  - confirm whether or not there is a trashrack on the Silvis development and if there, provide the dimensions and composition
- Clarify project operations involving the adit. How is the adit used for peaking operations? What conditions trigger use of the adit?
- Please clarify why no mitigation is proposed for the locations of slope instability that were identified and described in the PAD.

Aquatic Resources

- There appears to be a discrepancy in the description of lake level fluctuations for both Upper Silvis Lake and Lower Silvis Lake under existing operations. At one point in the PAD you state that Upper Silvis Lake maximum surface water elevation is 1,154 ft msl and minimum surface water elevation is 1,055 ft msl (a difference of 99 feet) with a maximum drawdown of 62 feet which generally occurs in April before the spring runoff is able to refill the lake. Later in the PAD, you state that Upper Silvis Lake is managed between 1154 ft msl and 1120 ft msl (a difference of 34 feet). For Lower Silvis Lake, you state that the maximum surface water elevation is 827 ft msl and the minimum surface water elevation is 802 ft msl (difference of 25 ft) but later in the PAD, you state that Lower Silvis lake is managed between 827 ft msl and 808 ft msl (difference of 19 ft). In your license application, please clarify the minimum,

maximum, and average surface water elevations for both Upper and Lower Silvis lake under existing and proposed operations and include descriptions of any seasonal fluctuations that occur (i.e., magnitude and duration of drawdowns to meet energy demands, etc).

Terrestrial/Riparian Resources

- In section 6.4.2.2 you erroneously describe as endemic to southeast Alaska several mammal species that have far wider distributions. In your license application, we recommend focusing on taxa that may be truly endemic to the project area (e.g., whose complete range is limited to Revillagigedo Island or less).
- In section 6.4.2.1 you cite Sitka black-tailed deer and mountain goats as species hunted in the project vicinity. Black bears should probably be included as well, as the project's vicinity of southwestern Revillagigedo Island (e.g., Wildlife Analysis Area 407, George Inlet-Ward Cove) has in recent years produced one of the highest black bear harvest levels in GMU 1A, Alaska's southeastern-most game management unit (see ADF&G's 2014 Black Bear Management Report). Also, your description of seasonal habitat use by black bears needs revision or clarification, as the source cited (ADFG 2019a) describes winter use of alpine and subalpine areas only by brown bears, not black bears. Please address these items in your license application.
- There are several inconsistencies and omissions in your representation of vegetation communities in section 6.6. In the vegetation cover map (Figure 6-3), the cover type hemlock woodland is shown to occur within the project boundary but is not described in section 6.6. Within the project boundary, hemlock woodlands appear roughly comparable in area to the low-tall shrub cover type, and thus are among the three most extensive vegetation communities at the project. The deciduous forest vegetation type is included in Table 6-10, but is also not described. There is also disagreement between the acres and percentages presented in Table 6-10 (e.g., for the acreages provided, Hemlock-Sitka Spruce should be 31.8% of the project area (not 2.5%), and Water should be 62% (not 91.3%)). When you update the table to include all vegetation communities, please make sure their percentages are consistent with their acreages. Please provide these corrections to your vegetation community information in your license application. Last, you have not provided descriptions of animal species using these upland habitats; please do so in your license application.
- While you describe and show riparian (Fig. 6-5) and littoral (Fig. 6-7) habitats in the project area, you have not provided the acreages for either of these habitat types or how they may be influenced by project operations (e.g., seasonal fluctuations of Upper Silvis Lake water level).Please provide this information in your license application.
- Additionally, section 6.7.4 identifies a number of invasive plants and show locations where they have been recorded. However, from the map scale and descriptions we cannot determine the relationship of these plants to existing habitats within the project boundary (e.g., upland, riparian, or wetland) or how project operations may influence their occurrence or spread. Please provide this information in your license application.
- The consultation record with Alaska Natural Heritage/Center for Conservation Science you provided does not indicate the spatial extent within which you requested records of state-listed species (i.e., within the project boundary only, within a defined proximity to the

boundary, or some wider area). In your license application, please clarify the area evaluated for records of state-listed species. Also, Table 6-14 is titled "Alaska Natural Heritage Program Revillagigedo Island Rare Species List", though the information it contains is only for the project study area. In your license application, please make sure that this table's title and the associated discussion only reflect the area that was queried for known records of state-listed species. Similarly, Table 6-9 should simply be described as Invasive Species (per ADF&G 2019b source), as it contains non-animal as well as animal species. Please provide these clarifications in your license application.

Please let me know if you have any questions related to these topics.
Thanks!
Julia

Julia Kolberg
Office of Energy Projects
Federal Energy Regulatory Commission (FERC)
julia.kolberg@ferc.gov
(202) 502-8261

APPENDIX B

TELEPHONE MEMORANDUMS

TELEPHONE DISCUSSION NOTE

DATE:	January 6, 2020	**PROJECT:**	Beaver Falls Hydroelectric Project Relicensing (FERC No. 1922)
TIME:	2:00 p.m. EST	**TALKED WITH:**	Carl Reese, Alaska Department of Natural Resources (DNR)
PLACED:	Katie Sellers, Kleinschmidt Associates (Kleinschmidt)	**BY:**	Katie Sellers

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Katie Sellers (Kleinschmidt) spoke with Carl Reese (DNR) regarding development of the Beaver Falls Study Plan. Katie told Carl that KPU is pulling together a Study Plan in accordance with comments received from the Forest Service, U.S. Department of Agriculture (Forest Service), Alaska State Historic Preservation Office (AK SHPO), and the Federal Energy Regulatory Commission (FERC). Since KPU hadn't heard from DNR regarding water quantity or quality studies, Kleinschmidt was calling to check in before finalizing the Study Plan. Carl responded that the DNR only looks at water quantity and that DEC only looks at water quality. Carl noted that since there are no proposed changes to project operations, that DNR does not require a study or the need to update the water right information that is currently on file. Carl responded that in Alaska they will not likely require a Water Quality Certificate since no changes are proposed to the project.

Katie told Carl that he would continue to be included in the Study Plan distribution and overall relicensing distribution and to let her know if he sees any red flags as Ketchikan Public Utilities (KPU) and Kleinschmidt progress through the relicensing process.

TELEPHONE DISCUSSION NOTE

DATE:	January 6, 2020	**PROJECT:** Beaver Falls Hydroelectric Project Relicensing (FERC No. 1922)	
TIME:	2:30pm EST	**TALKED WITH:** James Rypkema, Alaska Department of Environmental Conservation (DEC)	
PLACED:	Katie Sellers, Kleinschmidt Associates (Kleinschmidt)	**BY:**	Katie Sellers

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Katie Sellers (Kleinschmidt) spoke with James (Jim) Rypkema (DEC) regarding development of the Beaver Falls Study Plan. Katie told Jim that KPU is pulling together a Study Plan in accordance with comments received from the Forest Service, U.S. Department of Agriculture (Forest Service), Alaska State Historic Preservation Office (AK SHPO), and the Federal Energy Regulatory Commission (FERC). Since KPU hadn't heard from DEC regarding water quality studies, Kleinschmidt was calling to check in before finalizing the Study Plan. Jim responded that unless there are changes proposed to the project, the DEC does not plan to issue/require a Water Quality Certificate for the Project. Jim instructed that KPU should file a request with him (letter sent via email requesting 401 certification) with the Draft License Application (or possibly ahead of time with project description, drawings, and the Exhibit E environmental section). Jim noted that DEC would likely respond with providing a waiver form and that KPU would then need to pay a small fee for the waiver.

Katie told Jim that he would continue to be included in the Study Plan distribution and overall relicensing distribution and to let her know is he sees any red flags as Ketchikan Public Utilities and Kleinschmidt progress through the relicensing process.

APPENDIX C

ROAD CONDITION ASSESSMENT STUDY SAMPLE DATASHEET

CITY OF KETCHIKAN/PUBLIC UTILITIES BEAVER FALLS HYDROELECTRIC PROJECT SITE VISIT DATA SHEET (UNPAVED ROAD)	DATE

PART I – DATA COLLECTION

NAME OF DATA COLLECTOR(s)	TITLE(s)	PHONE NO.(s)

PART II – SITE INFORMATION

KEY FOR DAMAGE CATEGORY *(USE APPROPRIATE LETTERS IN THE "CATEGORY" BLOCK BELOW)*

a. DEBRIS REMOVAL	d. DRAINAGE FEATURES	g. FACILITIES UNDER CONSTRUCTION
b. PROTECTIVE MEASURES	e. BRIDGES/RET. WALL	h. EROSION REPAIR
c. ROAD REPAIR	f. CULVERTS	i. SLOPE STABILITY

SITE NO.	CATEGORY(IES)	LOCATION (USE MAP LOCATION ADDRESS, GPS COORDINATES, ETC.) LAT: LONG:

DESCRIPTION OF CONDITION (QUANTIFY)	PIC NO.	PIC NO.
DESCRIPTION OF CONDITION (QUANTIFY)	**PIC NO.**	**PIC NO.**
DESCRIPTION OF CONDITION (QUANTIFY)	**PIC NO.**	**PIC NO.**
DESCRIPTION OF CONDITION (QUANTIFY)	**PIC NO.**	**PIC NO.**

PART III – POSSIBLE SOLUTIONS

KEY FOR POSSIBLE SOLUTIONS *(USE APPROPRIATE LETTERS IN THE "CATEGORY" BLOCK BELOW)*

A. REMOVE DEBRIS/VEGETATION	F. CONSTRUCT CULVERT	K. RESTORE SUPERELEVATION
B. PLACE ROCKFALL BARRIER	G. INSTALL SNOW FENCE	L. REMOVE WINDROW
C. GRADE/FILL ROADWAY/SHOULDER	H. FILL AND REVEGETATE	M. REPAIR POTHOLE/RUT
D. CLEAR DITCH/CULVERT	I. STABLIZE SLOPE	N. INSTALL EDGE DRAIN
E. CONSTRUCT STRUCTURE	J. RESTORE CROWN	O. PLACE RIP RAP

POSSIBLE SOLUTIONS	CATEGORY(IES)

SKETCHES