ANGOON AIRPORT

Draft Environmental Impact Statement and Section 4(f) Evaluation

Appendices I–S

JANUARY 2015

Federal Aviation Administration

APPENDIX I
AQUATIC RESOURCES TECHNICAL REPORT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

FRESHWATER, ESTUARINE, AND MARINE RESOURCES EXISTING CONDITIONS TECHNICAL REPORT FOR ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ANGOON, ALASKA

Prepared for

Federal Aviation Administration
and
Alaska Department of Transportation and Public Facilities

Prepared by

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska (Figure 1). At present, there is no land-based airport runway in or near Angoon. The DOT&PF prepared the Angoon Airport Master Plan (DOT&PF 2007) for their proposed airport location. The EIS is evaluating two alternative airport locations in addition to the DOT&PF's proposed location and multiple access road alternatives associated with those airport locations (Figure 2). (*Note*: Access Alternative 5 was studied and is shown on maps throughout this report, but it was subsequently dropped from consideration in the EIS.) Two of the airport alternatives and portions of their associated access roads are located on lands administered by the U.S. Forest Service (USFS) within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area).

The proposed land-based airport would be a small, commercial airport typical of other rural airports in the region. The initial construction would include a 3,300-foot-long paved runway, with the ability to extend the runway length to 4,000 feet in the future if air traffic warrants it. The airport would have a short, perpendicular taxiway leading from the runway to a small apron area, which may eventually contain a passenger shelter building. The proposed airport is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The proposed access road would have a gravel surface and would be two lanes wide (one lane in each direction) with 9-foot-wide lanes and minimal shoulders.

This report describes the freshwater, estuarine, and marine habitats and resources (including fish, invertebrates, algae, and seagrasses) potentially affected by the proposed project and its alternatives. It includes information on federally designated essential fish habitat (EFH) in the vicinity of the Airport and access road alternatives. Field data presented in this report are available for agency review upon request. Separate technical reports regarding other habitats and aquatic natural resources, such as marine mammals, seabirds, and wetlands (SWCA 2010b), as well as hydrology (Vigil-Agrimis, Inc. [VAI] 2010) are also available.

1.1 Project Setting

The community of Angoon is located on the southwestern shore of Admiralty Island in Southeast Alaska, approximately 60 miles southwest of Juneau. Angoon is the only permanent settlement on the island, which consists mostly of Admiralty Island National Monument and Kootznoowoo Wilderness Area. The community is situated on a peninsula at the entrance to Kootznahoo Inlet, with the Mitchell Bay basin to the east and Chatham Strait to the west. The proposed construction and operation of the new airport (Airport project) would occur in the vicinity of Favorite Bay, a sub-basin of Mitchell Bay. According to the Western Regional Climate Center (WRCC), the area has a relatively mild maritime climate with an average annual maximum temperature of 47.7˚F and minimum temperature of 37.0˚F (WRCC 2010) and is within the temperate coastal rain forest ecosystem. Annual precipitation in Angoon averages 42 inches (WRCC 2010), which is considerably lower than other areas of Southeast Alaska.

1.2 Analysis Areas

The analysis areas for this technical report consist of a study area and a landscape area. The study area consists of the water bodies in the vicinity of the airport and access alternatives. Information about existing conditions in the study area provides a context within which to consider potential impacts to those resources within and surrounding the alternatives. The landscape area is a larger area that establishes the context of potential project impacts on a landscape scale.

1.2.1 STUDY AREA

The study area for freshwater, estuarine, and marine resources consists of the aquatic habitats in the vicinity of the airport and access alternatives (Figure 1). The freshwater and estuarine parts of the study area consists of portions of the streams and lakes that drain into Favorite Bay, several lakes and streams near the northern ends of Airport Alternatives 3a and 4 that drain to Kanalku Bay, and the estuarine areas where freshwater streams mix with marine waters. The marine parts of the study area consists of the Favorite Bay basin including the area known as Pea Hen, the area around Killisnoo Harbor extending from the shoreline south of Airport Alternative 12a to Killisnoo Island, and the Salt Lagoon near the Angoon Ferry Terminal. These areas were chosen because they include the aquatic habitats that could be indirectly or directly affected by the proposed project or its alternatives, and they allow for the assessment of potential impacts from the project alternatives at an appropriate scale to determine local effects. The actual areas of direct or indirect effects are anticipated to be small and localized.

The freshwater part of the study area was divided into seven drainage basins (Figure 3) to assess potential direct and indirect local impacts to aquatic resources from the proposed airport and access alternatives. Only one of these basins contains a named stream (Favorite Creek), and this basin was defined by that stream's watershed boundary (similar to seventh-level hydrologic unit codes [HUCs]). The remaining basins consist of first- and second-order coastal streams that drain directly to salt water. These basins were divided by geographical area for comparison purposes, and named for their geographic location (see Table 1 and Figure 3 for names of basins).

1.2.2 LANDSCAPE AREA

The landscape area for fish and aquatic invertebrates (Figure 1) covers a broad geographic area that includes the study area. Though the study area is useful in assessing potential local impacts (e.g., impacts to a sub-basin) from the proposed project, the landscape area provides information for assessing impacts on a broader scale (e.g., impacts to the entire basin including different sub-basins) and understanding the severity and context of impacts at the local level. The Mitchell Bay basin, which includes the Favorite Bay sub-basin, was chosen as the landscape area. It is the next higher order hydrologic unit that is generally similar to the local area, and contains more variable terrain, habitats, and species, such as the Hasselborg Creek/Salt Lake sub-basin (described below).

1.3 Regulatory Setting

Federal and state laws applicable to resources in the area are summarized below, as are FAA orders related to aquatic resources.

- **Magnuson-Stevens Fishery Conservation and Management Act:** The Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S. Code [U.S.C.] 1801–1803) provides for the conservation and management of the coastal fishery resources, as well as the anadromous species and continental shelf fishery resources of the United States. Federal agencies must consult with the

National Marine Fisheries Service (NMFS) on all actions that may adversely affect designated EFH. All of the marine waters in the study area, including intertidal habitats, have been designated as EFH by NMFS for one or more fish species. Section 4.0 of this report provides information regarding EFH in the study area.

- **Endangered Species Act:** The Endangered Species Act (ESA) (7 U.S.C. 136, 16 U.S.C. 1531 et seq.) Section 7(a)(2) ensures that actions authorized, funded, or carried out by federal agencies will not jeopardize the continued existence of any endangered or threatened species or adversely modify their critical habitat. Several stocks of Pacific salmon listed under the ESA range throughout the North Pacific but are unlikely to occur in the study area.
- **Alaska Anadromous Fish Act:** Anadromous fish (such as salmon) spend part of their life cycle in fresh water and part of their life cycle in salt water. The Anadromous Fish Act (Alaska Statute [AS] 16.05.871) requires that an individual or governmental agency provide prior notification and obtain approval from the Alaska Department of Fish and Game (ADF&G) "to construct a hydraulic project or use, divert, obstruct, pollute, or change the natural flow or bed" of a water body used by anadromous fish.
- **Alaska Fishway Act:** The Fishway Act (AS 16.05.841) requires that an individual or government agency notify and obtain authorization from ADF&G for activities within or across a stream used by fish if the department determines that such uses or activities could represent an impediment to the efficient passage of fish.
- **Alaska Coastal Management Act:** The Alaska Coastal Management Act (AS 46.40) requires local governments to develop coastal management plans. Although Angoon does not have a local coastal management program, the area is covered by Alaska Coastal Management Program statewide standards (11 Alaska Administrative Code [AAC] 112) regarding land and water uses in Alaska's coastal zone. These standards require avoidance or minimization of impacts to coastal habitats or subsistence uses of coastal resources.
- **The National Forest Management Act of 1976:** This act is a reorganized, expanded, and amended Forest and Rangeland Renewable Resources Planning Act of 1974, and is the primary statute governing the administration of national forests. In general, it requires the Secretary of Agriculture to assess forest lands; develop a management program based on multiple-use, sustained-yield principles; and implement a resource management plan for each unit of the National Forest System. It specifically directs the USFS to provide maintain fish and wildlife habitats.
- **Tongass Land Management Plan:** The Tongass Land Management Plan (TLMP) is a USFS zoning document that designates land use and details the goals and objectives for specific zones (USFS 2008). There are two designated land uses for the landscape area: wilderness national monument, and wilderness national monument wild, scenic, or recreational river. The TLMP also incorporates the Forest Service Handbook (FSH) on Soil and Water Conservation (FSH 2509.22), which is consistent with the Alaska Forest Resources and Practices Act (AS 41.17) regarding water quality.
- **Executive Order 12962 – Recreational Fisheries:** Executive Order 12962 directs federal agencies to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities**.**
- **Clean Water Act:** The Clean Water Act of 1972 (Public Law [P.L.] 92-500) as amended in 1977 (P.L. 95-217) and 1987 (P.L. 100-4) aims to restore and maintain the chemical, physical, and biological integrity of the nation's waters by preventing point and nonpoint pollution sources. The Act gives

authority to state and federal agencies to develop water quality standards by which to manage and regulate water quality.

- **Executive Order 11988 – Floodplain Protection:** Executive Order 11988 directs agencies to avoid long- and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. The order also requires agencies to restore and preserve the natural and beneficial values served by floodplains.
- **FAA Order 1050.1E, Environmental Impacts: Policies and Procedures:** Appendix A, Section 8, *Fish, Wildlife, and Plants*, of FAA Order 1050.1E addresses the FAA's policy relative to the consideration of aquatic resources in the National Environmental Policy Act (NEPA) process. Section 8 incorporates by reference each of the previously listed laws and executive orders and establishes the FAA's significant impact threshold relative to aquatic resources.
- **FAA Order 5050.4B NEPA Implementing Instructions for Airport Actions:** While FAA Order 5050.4B does not specifically address aquatic resources, it reiterates the FAA's policies contained in Order 1050.1E, Appendix A. Chapter 2, *Biotic Resources,* and Chapter 8, *Federally-listed Endangered or Threatened Species*, of FAA's Environmental Desk Reference supplement to FAA Order 5050.4B provide guidance regarding FAA's consideration of aquatic resources during the NEPA process. The Desk Reference outlines FAA's policy for determining impacts, determining significance of impacts, and considering mitigation measures, and incorporates by reference the various laws and policies outlined above.

1.4 Agency Coordination

Several state and federal regulatory agencies have been contacted regarding aquatic resources in the Angoon area. This consultation included discussions regarding field methods as well as general and federally listed aquatic species in the Angoon area. The agencies were also contacted during the formal EIS scoping period and asked to provide comment on the proposed project relative to the resources under their regulatory purview. Additionally, the FAA's consultant team contacted ADF&G biologists to request information about aquatic species for the Angoon area; ADF&G permit coordinators to coordinate fish resource permits for freshwater and marine fish sampling and discuss sampling methodology; USFS biologists to request species information for the Angoon area and discuss methodology; and NMFS biologists to request information about general and listed species in the study area and general Angoon area.

2.0 Freshwater and Estuarine Resources

Freshwater and estuarine habitats were surveyed and mapped to provide a description of baseline conditions for the Angoon Airport EIS. Freshwater and estuarine fish, invertebrates, algae, and seagrasses that occur in the area and have the potential to be affected by construction and long-term use of airport facilities are described below.

2.1 Methods

Species and habitats were documented using a variety of methods including literature reviews of existing information, field surveys, interviews with local experts in biological resources, and best professional judgment.

2.1.1 EXISTING DATA SOURCES

Several reports were examined, such as the Mitchell Bay Landscape Assessment (USFS 2002) and the Angoon Hydropower EIS (USFS 2009a). The *ADF&G Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes* (Johnson and Klein 2009) was consulted regarding streams in the area.

2.1.2 FIELD DATA COLLECTION

Freshwater and estuarine habitats were surveyed in three 2-week sessions from May through August 2009 (Figure 2). Favorite Creek and small unnamed tributaries to Favorite Bay, Kanalku Bay, and Killisnoo Harbor were surveyed to document existing habitats, fish presence/absence, and potential fish passage barriers. Additionally, the Favorite Bay tidal flats and the mouths of small unnamed tributaries to Favorite Bay (Figure 2) were surveyed to document existing estuarine areas. In all, 26 stream basins, four lakes, and their associated estuarine areas (where applicable) were surveyed. Satellite imagery (DigitalGlobe 2004) was used to create preliminary habitat maps that were ground-truthed and refined through field data collection. Ground-truth points and field locations were recorded using a Trimble Geo XT handheld GPS unit with submeter accuracy.

Habitat

Streams were surveyed by walking the length of stream likely to be directly or indirectly affected by the proposed project: typically from just upstream of the point of potential impact downstream to the confluence with marine waters or to a freshwater lake where anadromous salmonid presence confirmed no passage barrier downstream. Channel morphology, substrates, bank and riparian conditions, USFS channel types, fish presence, and fish passage barriers were noted. Channel morphology and types were determined using USFS stream assessment methods (Paustian 1992; USFS 2001a). Stream surveys verified a 1980s USFS stream survey (personal communication, Schneider 2008) and a limited USFS stream GIS layer that was created by hydrologic modeling rather than by field surveys (USFS 2009b). Stream gradient was determined using a clinometer or eye level with stadia rod.

Estuarine habitats were surveyed by walking the shoreline and the intertidal reaches of stream mouths that have the potential to be indirectly affected by the proposed project. Channel morphology, substrates, bank and riparian conditions, USFS channel types (if applicable), aquatic vegetation, fish and invertebrate presence, and fish passage barriers were noted. Salinity was determined in selected locations, by using a refractometer (Sper Scientific, Scottsdale, Arizona) or a YSI water quality probe (YSI 556 MPS).

Species

Several sampling methods were used to document fish presence/absence in freshwater and estuarine habitats. For all methods of fish sampling, fish were counted (with a subsample measured), identified to species when possible, and released to the same environment.

Gee minnow traps were used to document fish presence in streams. Minnow traps with 0.25-inch mesh size were baited with sterilized salmon eggs. Eggs were treated with a 1:10 solution of Betadine for 10 minutes; borax was added to the egg mixture as a preservative and thickening agent, which also prolonged the release of scent. Baited traps were set for 0.75 to 10.5 hours, in at least 0.5 foot of water. Trap spacing varied by habitat (size of stream, number of trappable pools) and length of stream surveyed. Approximately 0.5 mile of lower Favorite Creek was sampled with 20 minnow traps; in smaller unnamed tributaries, an average of 0.21 mile per tributary was sampled using up to 10 traps (Figure 2).

Two lakes north of Favorite Bay (Figure 2) were sampled using minnow traps. Traps baited with sterilized salmon eggs were set in open water and along the shoreline at depths ranging from 4.5 to more than 6.0 feet.

Deep water traps were suspended in the middle of the lake at various depths using a buoy. Additional species presence information was obtained from interviews with local sport anglers and subsistence users.

Tidal traps and beach seines were used to document fish presence in estuarine areas. Fyke traps with a 0.08-inch mesh funnel and 0.25-inch cod end were set in tidal areas to fish both incoming and outgoing tides. Traps were set for 1.25 to 9.5 hours, in at least 2 feet of water.

Two types of beach seines were used, depending on habitat types: a 50-foot seine (with 0.25-inch mesh) was used in smaller, shallower channels, and a 150-foot seine (with 0.25-inch mesh wings and 0.13-inch mesh bunt) in wider, deeper areas. The 50-foot seine was 6 feet deep and the 150-foot seine was tapered with 7-foot deep wings and a 10.8-foot deep bunt. The larger seine was anchored on one end to the shore and deployed using a non-motorized skiff in a semi-circular arc around the sampling area. Seining occurred during low and high tides across various habitat types.

At several estuarine locations where habitat and tide levels were appropriate, gee minnow traps with 0.25-inch mesh size were used to document fish presence. Traps were baited with sterilized salmon eggs and set for 2.5 to 10.5 hours in up to 8 feet of water.

An Ocean Systems Deep Blue underwater camera was used to record fish presence/absence and distribution during adult salmonid migration in the Favorite Creek estuarine channel on an incoming tide (July 23, 2009) for one hour. The camera was placed 1 foot above the bottom adjacent to the thalweg and oriented perpendicular to the streamflow. Footage was recorded to DVD and later reviewed to quantify fish and identify species and life stage where possible.

2.1.3 DATA ANALYSIS

Freshwater streams were mapped using a combination of GPS field data points, a modeled streams layer created for the Angoon Airport EIS based on hydrology and topography (VAI 2010), USFS GIS data for Admiralty Island streams (USFS 2009b), and a modeled intertidal line based on 5-foot topographic contour data (R&M Engineering 2001). Further description of the intertidal line is provided in section 3.1.2. Mapping was limited to larger streams with both potential fish use and the potential to be directly or indirectly impacted by the proposed project. Several other small freshwater streams and seeps within the study area were not mapped, because they are not likely to be affected by the proposed project.

Streams were surveyed downstream from the upstream extent of potential project impacts to document existing habitats, stream class, channel type, fish presence, and potential fish passage barriers. Data were collected using modified USFS Tier 1 protocols (USFS 2001). Channel morphology and types were determined using Paustian (1992) and USFS (2001), and were updated after the field surveys with Paustian et al. (2009) to reflect the new channel types established by the USFS.

Stream classes are defined in detail in USFS (2008) and are summarized here.

- Class I: Contains anadromous fish populations.
- Class II: Contains only resident fish populations.
- Class III: Does not contain fish populations, but directly influences fish-bearing stream reaches by moving sediment and food sources downstream.
- Class IV: Does not contain fish populations and does not directly influence fish-bearing stream reaches. Generally small headwater streams.
- Class V (Non-stream): Does not contain fish populations. Generally intermittent with little incision and bankfull width.

Streams with suitable or potential fish habitat were also surveyed upstream of the extent of potential project impacts to assess connectivity to other habitats and populations. Fish use may extend beyond the survey boundary and likely varies by species and by season based on streamflow. Fish presence was assumed upstream of the last observed fish, unless a barrier was noted or habitat became unsuitable (e.g., continuously steep gradient or lack of pools).

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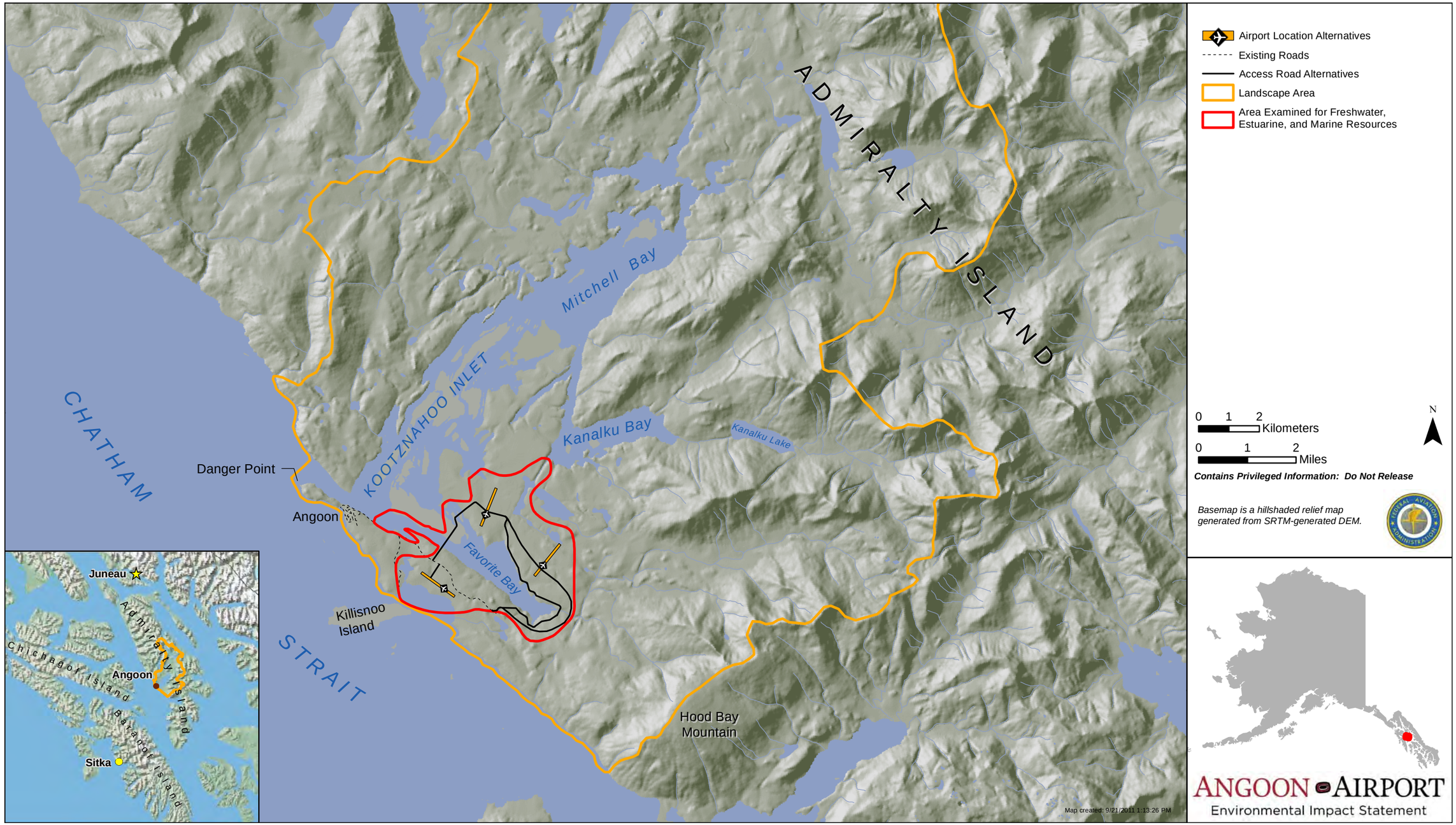

Figure 1. General location of areas studied for freshwater, estuarine, and marine resources relative to the larger landscape area. *Note*: Airport alternatives illustrated on all figures represent locations only and do not depict final areas of disturbance.

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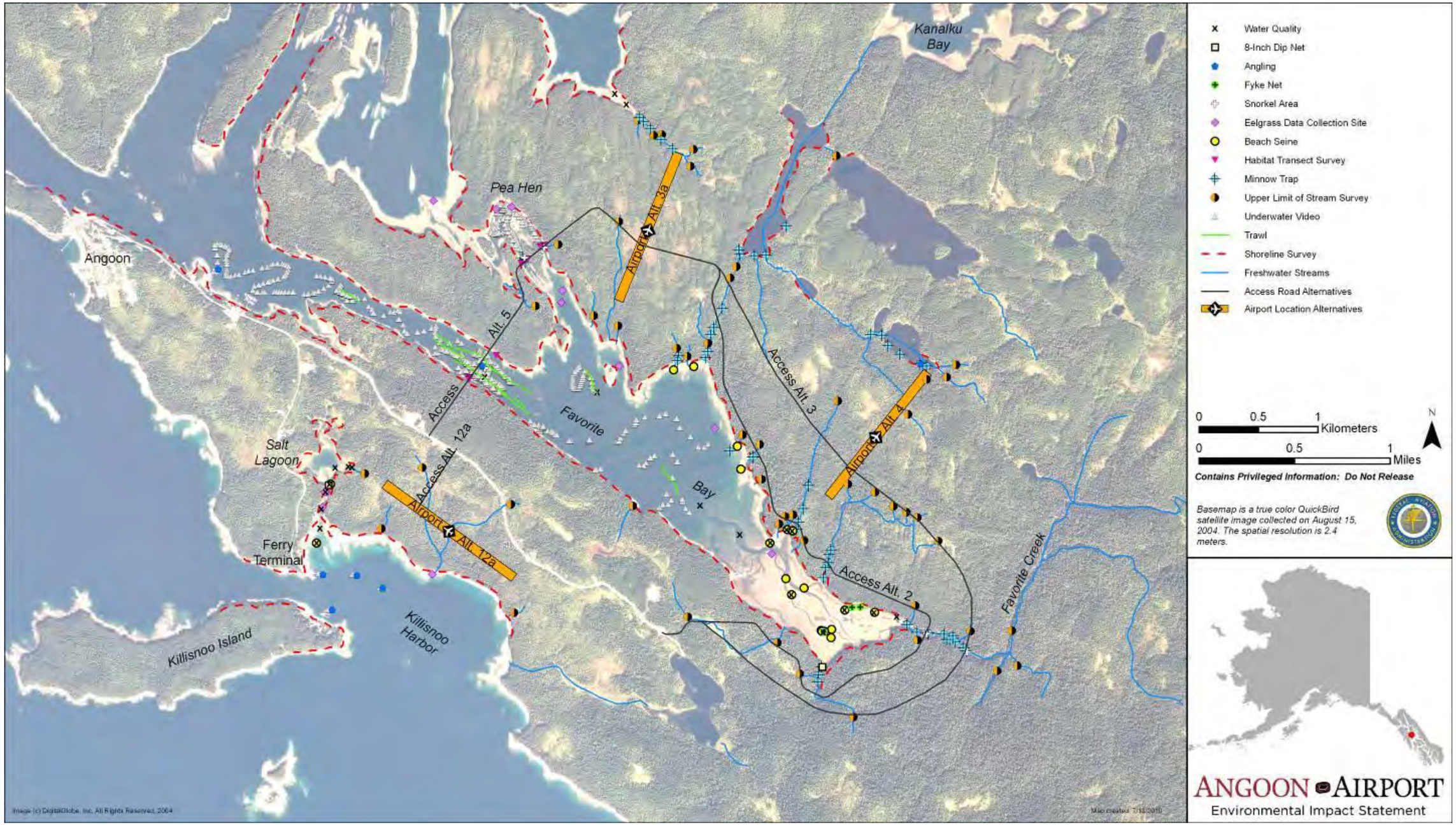

Figure 2. 2009 field survey sampling locations.

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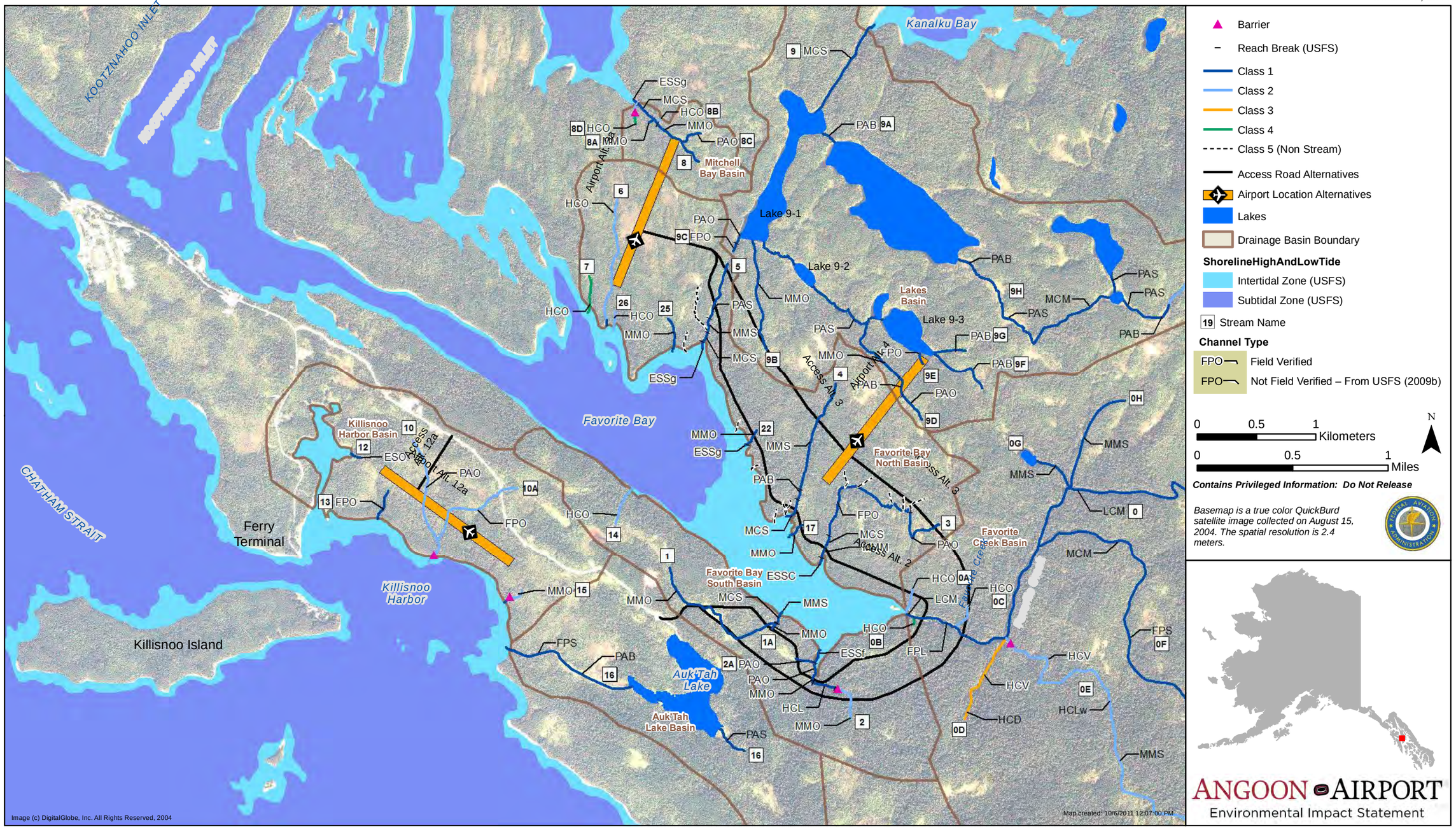

Figure 3. Freshwater parts of the study area. NOTE: See Table 2 for definitions of channel type codes.

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Table 1. Miles of Stream Class and Stream Density Summarized by Drainage Basins in the Study Area

Drainage Basin	Class I	Class II	Class III	Class IV	Total Stream Miles	Drainage Area (square miles)	Stream Density (miles/square mile)
Auk'Tah Lake Basin	1.9	0.0	0.0	0.0	1.9	1.1	1.6
Favorite Bay North Basin	2.7	0.7	0.0	0.2	3.6	1.7	2.1
Favorite Bay South Basin	1.2	0.4	0.0	0.0	1.6	1.1	1.5
Favorite Creek Basin	13.8	10.3	6.6	0.0	30.7	20.6	1.5
Killisnoo Harbor Basin	0.3	1.3	0.0	0.0	1.6	1.1	1.4
Lakes Basin	8.2	0.3	0.4	0.0	8.9	3.2	2.7
Mitchell Bay Basin	0.6	0.1	0.0	0.1	0.8	0.2	3.3
Total	28.7	13.1	7.0	0.3	49.1	29.1	NA

Note: Numbers reflect mapped streams in SWCA field data and USFS stream vector data for the Angoon, Alaska vicinity (2009b).

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2.2 Habitats and Species in the Study Area

National Forest Management Act (1976) regulations require that fish habitats be managed to maintain viable populations of species well distributed across a national forest. Population viability is defined as a fish or wildlife population that has the estimated number and distribution of reproductive individuals to ensure the population's continued existence in a given area (USFS 2008a). Analysis of impacts to USFS management indicator species (MIS) is one way to address this management direction. MIS are wildlife species whose responses to land management activities are thought to reflect the likely responses of other species with similar habitat requirements (USFS 2008a). The study area contains four salmonid fish MIS, which are discussed here and in section 5.3 Management Indicator Species.

2.2.1 STREAMS

Numerous perennial and seasonal streams are found in the area; streams surveyed for the Airport project are displayed in Figure 3 and summarized in Table 1. Measurements and specifications of stream channels intersecting airport and access alternatives are provided in Appendix A.

Favorite Creek

Favorite Creek is the largest stream in the Favorite Bay sub-basin, the only stream with observed anadromous salmonid spawning and year-round rearing, and the only stream in the study area listed in the ADF&G Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes (Johnson and Klein 2009). The U.S. Geological Survey (USGS) maintained a flow gage in the Favorite Creek sub-basin from 2001 to 2003, but data are from a tributary to Favorite Creek with a limited drainage basin, and flow volumes are not comparable to those in the mainstem of Favorite Creek. The closest and most similar sub-basin with year-round flow data is Hasselborg Creek (northeast section of the landscape area). The USGS maintained a gage on Hasselborg Creek from 1951 to 1968. Average mean monthly flows in Hasselborg Creek during that time varied from approximately 140 to 540 cubic feet per second (cfs), with the range of monthly flows spanning from 30 to 768 cfs (USGS 2009a). The mean monthly flow in Favorite Creek is estimated to be less than that of Hasselborg Creek, which has a larger drainage basin (56 square miles) than Favorite Creek (21 square miles). Although the drainage basin of Hasselborg Creek is larger than that of Favorite Creek, 11% of the basin consists of lakes (versus 0.1% of the Favorite Creek basin); therefore, the Hasselborg Creek basin would likely respond more slowly to storm events than the Favorite Creek basin (VAI 2010). The predicted flow during a two-year flood recurrence interval for Favorite Creek is 1,790 cfs (VAI 2010). The annual hydrograph, which is typical for Southeast Alaska streams (Milner et al. 1997), generally peaks twice a year: in fall or early winter and again in May and June (as demonstrated by the USGS gage on an unnamed tributary to Favorite Creek described above) (USGS 2009b).

The Favorite Creek sub-basin originates between Hood Bay Mountain and Middle Mountain and drains 21 square miles. The lower 0.7 mile of the creek, within the area that may be directly or indirectly affected by the proposed project, was surveyed; the upper reaches of Favorite Creek are upstream of any potential project impacts and were not surveyed.

The USFS channel type in lower Favorite Creek (as field-verified by the FAA consultant team fisheries biologists) was FPL, with tributaries having HC0 and HCV channel types (Table 2, see Figure 3). Although bedrock sideslopes were observed on the downstream left bank, and the overriding geomorphology of the stream is LC, the channel exhibited FPL characteristics (e.g., alluvium streambanks, isolated sand substrates, and some meandering) that provide highly valuable anadromous fish spawning and rearing habitat. In May 2009, Favorite Creek had a wetted width of approximately 72 to 92 feet (22 to 28 meters [m]) in the lower half mile, and a bankfull width of 105 to 230 feet (32 to 70 m). Substrates were predominantly gravels and cobbles,

with some sandy depositional areas. Streambanks and side walls were composed of alluvium, bedrock, and organic material. There was a considerable amount of overhanging vegetation, large woody debris, and undercut banks (a complete large wood survey of Favorite Creek is provided in VAI 2010). Side channels and low-flow areas were abundant in the contained valley floor. A large logjam was documented on mainstem Favorite Creek between Access Alternatives 2 and 3, where the head of a small island splits the main channel. During a period of high flow in the spring, water was impounded behind the logjam, creating a lake-like reach that stretched approximately 328 feet (100 m) upstream. In July and August, the lake was gone and the stream flowed directly under the logjam. The area upstream of the logjam contained a large amount of sand and fine sediment, likely a result of decreased water velocities due to the logjam. The areas immediately up and downstream of the logjam were the only areas where sand was documented in the lower 0.75 miles of Favorite Creek. The logjam appeared to be temporarily (in geomorphic time) creating the FPL channel type characteristics observed in the lower 0.75 miles of Favorite Creek. Channel characteristics transition at the Access Alternative 3 crossing, and immediately upstream of the crossing, the channel type becomes LCL. Three small tributaries with seasonal surface flow enter lower Favorite Creek within the study area (streams 0A, 0B, 0C in Figure 3); these tributaries were completely dry by August.

Table 2. Stream Miles and Process Groups by Drainage Basins in the Study Area

		Stream Miles by Process Group (miles in fish habitat, or Class I and II streams)									
Drainage Basin[1]	**Drainage Area Acres**	**AF**	**ES**	**FP**	**HC**	**LC**	**MC**	**MM**	**PA**	**L**	**Total Stream Miles**
Auk'Tah Lake Basin	727.9	0.0 (0.0)	0.0 (0.0)	0.3 (0.3)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.7 (0.7)	0.9 (0.9)	1.9 (1.9)
Favorite Bay North Basin	1092.8	0.0 (0.0)	0.0 (0.0)	0.7 (0.7)	1.1 (0.9)	0.0 (0.0)	0.2 (0.2)	1.0 (1.0)	0.6 (0.6)	0.0 (0.0)	3.6 (3.4)
Favorite Bay South Basin	690.7	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.3 (0.3)	0.0 (0.0)	0.0 (0.0)	1.2 (1.2)	0.1 (0.1)	0.0 (0.0)	1.6 (1.6)
Favorite Creek Basin	13,153.4	0.5 (0.5)	0.0 (0.0)	4.2 (4.2)	15.4 (9.0)	3.3 (3.3)	2.2 (2.2)	3.4 (3.4)	1.5 (1.4)	0.2 (0.1)	30.7 (24.1)
Killisnoo Harbor Basin	721.0	0.0 (0.0)	0.1 (0.1)	0.8 (0.8)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.1)	0.6 (0.6)	0.0 (0.0)	1.6 (1.6)
Lakes Basin	2076.5	0.0 (0.0)	0.0 (0.0)	0.2 (0.2)	0.7 (0.3)	0.0 (0.0)	1.0 (1.0)	1.0 (1.0)	4.1 (4.1)	1.9 (1.9)	8.9 (8.5)
Mitchell Bay Basin	147.1	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.1 (0.0)	0.0 (0.0)	0.2 (0.2)	0.4 (0.4)	0.1 (0.1)	0.0 (0.0)	0.8 (0.7)
Total	18,609.5	0.5 (0.5)	0.1 (0.1)	6.2 (6.2)	17.6 (10.5)	3.3 (3.3)	3.6 (3.6)	7.1 (7.1)	7.7 (7.6)	3.0 (2.9)	49.1 (41.8)

Note: Numbers reflect mapped streams in SWCA field data and USFS stream vector data for the Angoon, Alaska vicinity (USFS 2009b). Data reflect current conditions; in some cases, channel types vary from those previously modeled by USFS (2009b).

Note: HC= high gradient, MM= moderate gradient mixed-control, MC= moderate gradient contained, LC= large contained, FP= floodplain, PA= palustrine, AF= alluvial fan, ES= estuarine, L= lake. Process groups defined in Paustian et al. (2009).

Note: Stream miles calculated inland of the mean higher high water line , 13 feet as determined by NOAA (see Section 3.1.3 for mean higher high water line methods).

Note: Drainage basins shown in Figure 3. Specifications and channel measurements of streams intersecting airport and access alternatives are provided in Appendix A.

Fish sampling verified the presence of six species of salmonids and at least one species of sculpin in Favorite Creek (Table 3). Age 1+ juvenile coho (*Oncorhynchus kisutch*) were the most common fish documented and were almost entirely associated with the presence of undercut banks (although these areas were the most commonly sampled in the field). These areas likely provide velocity refuge for young coho, as no fish were observed (via snorkeling) in areas of higher velocity in the main channel. The majority of young-of-the-year coho had not emerged from the gravel by late May 2009; those that had emerged were observed in the channels of the estuarine tidal flats (see Figure 2). Young-of-the-year coho were abundant in Favorite Creek by mid-July 2009. Juvenile pink and chum salmon were less abundant in freshwater in late May, as they had already migrated to estuarine and nearshore marine areas, where they were relatively more abundant. Presence of age 1+ coho in Favorite Creek indicates the area is used for year-round rearing.

Spawning by adult pink and chum salmon (*O. gorbuscha* and *O. keta*) was observed in August 2009 in lower Favorite Creek. Though the Favorite Creek sub-basin is not known to have spawning or rearing populations of sockeye salmon (*O. nerka*), one adult was observed in lower Favorite Creek in August 2009. Occasional adult presence has been noted in the creek since 1960 (personal communication, Monagle 2008a). Though there is not a weir to estimate escapement in Favorite Creek, ADF&G has tracked index counts of spawning salmon in Favorite Creek since 1960. Index counts are estimated based on aerial surveys and occasionally foot surveys, and provide a relative snapshot of abundance. ADF&G index counts are the only data available regarding salmonid abundance in Favorite Creek. Index counts indicate that the range of estimated peak counts from 1960 to 2008 (in years with data) spanned from 0 to 8,500 pink salmon and from 0 to 2,000 chum salmon (personal communication, Monagle 2008a). At least 200 chum salmon were observed in the tidewater area of Favorite Creek on July 23, 2009. Approximately 2,000 to 3,000 adult pink salmon and at least 10 chum salmon were observed in the lower 0.75 mile of Favorite Creek by the FAA consultant team fisheries biologists on August 20, 2009.

Pink salmon in Favorite Creek exhibit a late-stock run type and spawn in both odd and even years. Available peak index numbers from ADF&G show no indication of odd-year or even-year run-type dominance in Favorite Creek. Salmon runs in Southeast Alaska vary in run timing and run type. For example, pink salmon runs in nearby Thayer Creek (outside the landscape area) are dominated by late-stock fish with higher runs occurring in even years (i.e., 2008, 2010), whereas Kanalku Creek is dominated by late-stock odd year runs (Halupka et al. 2000).

In mid-July 2009, hundreds of adult pink and chum salmon, Dolly Varden (*Salvelinus malma*), and cutthroat trout (*O. clarkii*) were observed staging within the estuarine channels of the Favorite Bay tidal flats (Figure 4), but they could not ascend Favorite Creek due to low streamflows. By mid-August, streamflows had increased slightly and pink and chum salmon had ascended Favorite Creek to spawn. A few redds (spawning beds) were observed in the tidally influenced freshwater area of Favorite Creek, just downstream of the Access Alternative 2 crossing on August 20, 2009 (see Figure 3). Spawning was observed up to 100 m above the Access Alternative 3 crossing (the upstream-most survey point in August 2009).

Neither Chinook salmon (*O. tshawytscha*) nor steelhead (*O. mykiss*) were observed in Favorite Creek, and there is no known documentation of these species using the creek (Alaska Department of Environmental Conservation [DEC] et al. 2006; Johnson and Klein 2009; personal communication, Schneider 2008; USFS 2002).

Table 3. Freshwater and Estuarine Fishes Observed in the Study Area in 2009

		Location			
Scientific Name	**Common Name**	**Lakes**	**Favorite Creek**	**Favorite Bay Tributary**	**Estuary**
Family Salmonidae					
**Oncorhynchus clarkii*	cutthroat trout	●J	●J,A		●A
**Oncorhynchus gorbuscha*	pink salmon		●A		●J,A
Oncorhynchus keta	chum salmon		●A		●J,A
**Oncorhynchus kisutch*	coho salmon	●J	●J	●J	●J
Oncorhynchus nerka	sockeye salmon		●A		
**Salvelinus malma*	Dolly Varden	●J		●J	●J,A
Family Gasterosteidae					
Gasterosteus aculeatus	threespine stickleback	●A			●A
Family Cottidae					
Cottus aleuticus	coastrange sculpin			●J	●J
Cottus asper	prickly sculpin	●A			●J
Leptocottus armatus	Pacific staghorn sculpin				●J
Unidentified sp.	unidentified sculpin species	●U	●U		●U
Family Pleuronectidae					
Platichthys stellatus	starry flounder				●J

Note: A= Adult, J=Juvenile, U=Age unknown based on size.

*Fish MIS

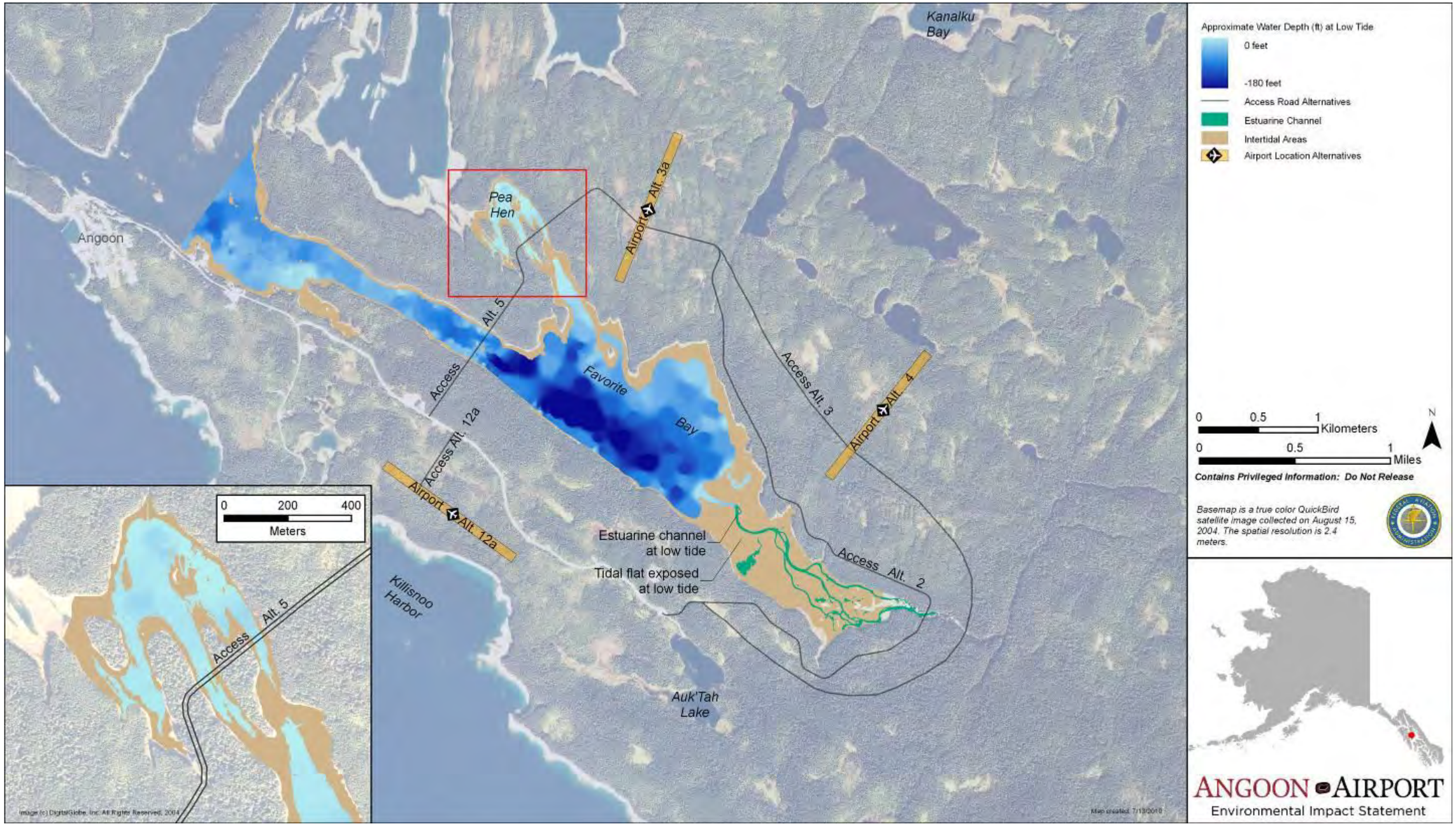

Figure 4. Favorite Bay bathymetry.

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Expected life history timing and of use of aquatic habitats by important aquatic species is presented in Table 4. Habitat requirements and life history attributes of these species are listed in Appendix B. Important species are defined for this technical report as those species that are 1) protected by the MSA or fishery management plans (FMPs); 2) commercially, culturally, or recreationally significant, with cultural significance determined from the FAA consultant team (SWCA 2010a); and/or 3) prey for sensitive marine mammals or bird species (SWCA 2010b).

Other Unnamed Freshwater Streams

Other streams documented in the study area were small (see Figure 3, Tables 1 and 2), with wetted widths ranging from 1.3 to 12.1 feet (<0.4 to 3.7 m) in June 2009. Bankfull widths ranged from 2.0 to 49.2 feet (0.6 to 15.0 m) (excluding Favorite Creek). (Specifications and measurements for stream channels intersecting airport and access alternatives are provided in Appendix A.) Habitat appeared suitable for seasonal juvenile coho rearing in most streams (see Table 1). Some of these tributaries were dry by August. Fish sampling documented a variety of species in streams and estuarine areas of the Favorite Bay basin (see Table 3). Generally, both anadromous and resident salmonids were observed in freshwater habitats throughout the study area. Juvenile salmonids were observed in 100% of streams sampled for fish presence and in 66% of all streams surveyed including streams that were not directly sampled for fish presence (though fish may have been visually observed) (see Figure 3, Table 1).

Streams on the north side of Favorite Bay typically had dark tannin-stained water, and streams on the south side were generally clear. On both sides of the bay, these small streams were surrounded by mature forests with a closed canopy that limits thermal energy accumulation in the summer and allows for year-round fish use where flows permit. Streams had a considerable amount of large wood from adjacent riparian areas (both downed logs and live tree roots), which appeared to be their main pool-forming element. Given these functions, impacts to the forest canopy adjacent to these streams could decrease their habitat value for salmonid rearing.

Several natural barriers to fish passage were documented (see Figure 3, Table 1): two waterfalls (on streams 2 and 8D) and a sink hole where surface flow converts to subterranean flow at the mouth of stream 10. The sink hole was located in beach gravels and did not appear to be a karst feature. Though karst systems occur on Admiralty Island (Prussian and Baichtal 2007), none were observed during 2009 field surveys. One human-made passage barrier was observed at the mouth of stream 15, where an improvised dam lined with tarps collects water that is likely used by residents of nearby dwellings.

Lakes

One small lake occurs in the upper Favorite Creek basin (see Figure 3) and is located approximately 1.3 stream miles upstream of the Access Alternative 3 crossing; therefore, this lake is not expected to be affected by the project. Several other lakes connected by small tributaries occur near Airport Alternative 4 (see Figure 3) and form a complex of lakes, small streams, wetlands, beaver ponds, and muskegs. This lake complex drains to Kanalku Bay. Because Kanalku Bay supports a sockeye salmon fishery (with runs primarily using Kanalku Lake), the lakes near Airport Alternative 4 were examined for juvenile sockeye presence in June 2009. Sockeye were not observed in the lake complex, though sampling was limited. However, cutthroat trout, coho salmon, Dolly Varden, threespine stickleback (*Gasterosteus aculeatus*), and prickly sculpin (*Cottus asper*) were collected in the lake complex (see Table 3). The presence of coho salmon indicates that these lakes are accessible to anadromous fish species, including sockeye. It is unknown if the coho collected at the lakes originated within the lakes' basin or migrated upstream to these lakes from other basins. No suitable spawning habitat was observed in any of the lake tributaries surveyed (upper reaches of stream 9 through 9G). The lower reach of stream 9 between Kanalku Bay and lake 9-1) was not surveyed as it is not expected to be affected by the project, but may contain spawning habitat. (Waters in the lake complex were tannin-stained and shorelines tended to drop off sharply into deep water (>20 feet).

Table 4. Life-Stage Timing for Fishes in Freshwater and Estuarine Habitats of the Study Area

Salmonid	Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dolly Varden[1]	return to fresh water												
	spawning												
	adult overwintering (primarily lakes)												
	juvenile rearing (lakes and streams)												
	adult annual outmigration												
	juvenile outmigration												
pink salmon[2]	return to fresh water												
	spawning							late		mid			
	outmigration												
	estuary rearing												
sockeye salmon[3]	return to fresh water												
	spawning												
	juvenile rearing (lakes only)												
	outmigration												
	estuary rearing												
chum salmon[4]	return to fresh water												
	spawning							mid	mid				
	outmigration												
	estuary rearing												
coho salmon[5]	return to fresh water												
	spawning												
	juvenile rearing (lakes and streams)												
	outmigration												
	estuary rearing												
cutthroat trout[6]	return to fresh water												
	adult overwintering (lakes and streams)												
	spawning (headwater streams)												
	juvenile rearing (lakes and streams)												
	juvenile/adult annual outmigration												
	estuary foraging												

Notes: range of activity; greater activity; peak of activity

[1] (ADF&G 1994; Harding 2008; Yanusz 1997)

[2] (ADF&G 1994; Groot and Margolis 1991)

[3] (Conitz and Burril 2008; Conitz and Cartwright 2007; Groot and Margolis 1991; Halupka et al. 2000)

[4] (ADF&G 1994, 2009b; Groot and Margolis 1991; Halupka et al. 2000)

[5] (ADF&G 1994; Crone and Bond 1976; Groot and Margolis 1991; Halupka et al. 2000; Koski 2009)

[6] (ADF&G 1994; Yanusz 1997)

Signs of beaver (lodges, dams, gnawed wood) were ubiquitous throughout the lake complex. Numerous species of submerged aquatic vegetation were observed along the shoreline of the lakes, including yellow pond lily (*Nuphar polysepalum*) and pondweed (*Potamogeton* sp.). The shoreline supported vegetation typical of Southeast Alaska lacustrine habitats (though different from the freshwater stream habitats surveyed), such as shore pine (*Pinus contorta* var. *contorta*) and marsh five-finger (*Potentilla palustris*). Auk'Tah Lake (east of Killisnoo Harbor) would not be affected by the proposed project and therefore was not surveyed (see Figure 3).

Existing Road Stream Crossings

There is one existing road stream crossing in the vicinity of the airport and access alternatives (Figure 3), and fish passage status there is unknown. Existing roads are on the Angoon peninsula only and run from Angoon to Auk'Tah Lake. Table 5 provides a summary of existing roads and stream crossings by drainage basin.

Table 5. Existing Mapped Roads and Stream Crossings by Drainage Basin

Drainage Basin	Drainage Area (sq. miles)	Miles of Existing Roads	Road Density per Square Mile	Percentage of Basin as Roads[1]	All Existing Road Stream Crossings	Existing Road Fish Stream Crossings
Auk'Tah Lake Basin	1.1	0.6	0.5	0.4	0	0
Favorite Bay North Basin	1.7	0.0	0.0	0.0	0	0
Favorite Bay South Basin	1.1	0.0	0.0	0.0	0	0
Favorite Creek Basin	20.6	0.0	0.0	0.0	0	0
Killisnoo Harbor Basin	1.1	2.3	2.0	1.5	1	1
Lakes Basin	3.2	0.0	0.0	0.0	0	0
Mitchell Bay Basin	0.2	0.0	0.0	0.0	0	0
Total	29.1	2.9	NA	NA	0	0

[1]Assumes standard minimum clearing widths and road surface specifications for Tongass National Forest roads: 40 feet total road surface and cut slope width.

2.2.2 ESTUARINE AREAS

Estuarine areas are at the mouths of creeks and small tributaries and in the Favorite Bay tidal flats (see Figures 3 and 4). For this technical report, estuaries are considered to be semi-enclosed coastal areas where sea water is measurably diluted with fresh water from upland areas (Pritchard 1967). The Favorite Bay tidal flats were the most extensive estuarine area surveyed. This area is influenced by Favorite Creek (with the highest discharge of any stream in the survey area) and many tributaries that create a complex inflow of freshwater and extensive estuarine channels throughout the flats. The Favorite Bay tidal flats are approximately 1.2 miles long and 0.3 mile wide (see Figures 2 and 4); fresh water appears to flow to the mouth of the flats on an outgoing or slack tide (bottom and surface salinities of 0.04 parts per thousand [ppt] in 1 foot of water, Table 6). Salty water flows up to the mouth of Favorite Creek at high tide. At an extreme high tide on May 29, 2009, during a period of high freshwater discharge, bottom salinity near the mouth of Favorite Creek was 20.50 ppt at a water depth of 2.5 feet, and surface salinity in the same location was 0.95 ppt. On an outgoing tide, the bottom salinity fell to 0.04 ppt and was similar to surface salinity. Tidal influence (e.g., fluctuating water levels or backwatering) was observed in the lower reaches of Favorite Creek (up to approximately 164 feet (50 m) above the Access Alternative 2 crossing during extreme high tides when freshwater outflow is low) in August 2009, yet established vegetation and invertebrates indicate salinity intrusion does not commonly exceed this point. Marine and estuarine species were not observed above the mouth of Favorite Creek. During low freshwater discharge from Favorite Creek, salinity may be greater near the mouth of the creek than when measurements were collected in May 2009.

Substrate in the estuarine channels of the Favorite Bay tidal flats was generally a mixture of sand, gravel, and shell and became siltier near the mouth of the flats before depths and salinities transitioned to subtidal marine waters (Figure 5). Substrate in the tidal flats was mostly mud with a mixture of shell and sand. The tidal flats support a variety of aquatic life including softshell clam (*Mya arenaria*), Pacific littleneck clam (*Protothaca staminea*), butter clam (*Saxidomus gigantea*), Nuttall's cockle (*Clinocardium nuttallii*), limpets, isopods, euphasids, hermit crabs, barnacles, eelgrass (*Zostera marina*), black pine (*Neorhodomela larix*), sea hair (*Enteromorpha intestinalis*), and loose Ahnfelt's seaweed (*Ahnfeltiopsis gigartinoides*). Further description of intertidal areas is provided in section 3.2.1.

Other small unnamed tributaries (such as streams 2, 3, and 4) had varying sizes of brackish water interface at their mouths. Salinity in these areas was variable, depending on tidal stage and freshwater outflow, which were less than that of Favorite Creek. Bottom salinities ranged from 27.00 ppt on a high tide to 0.00 on a low tide; surface salinities ranged from 9.00 to 0.00 ppt respectively (see Table 6, Figure 2). Species composition reflected fluctuating salinity levels. Algae, such as rockweed (*Fucus* sp.), green string lettuce (*Enteromorpha lindza*), and mermaid's tresses (*Ulothrix flacca*) were common at the mouth of creeks, though were increasingly less common near the mouth of Favorite Creek, indicating higher outflows of fresh water in that area.

Several species of fish were collected from the nearshore shallow-water estuarine areas: juvenile salmonids, sculpins, threespine stickleback, and juvenile starry flounder (*Platichthys stellatus*) (see Table 3).

Table 6. Estuarine Salinity in the Vicinity of the Airport and Access Alternatives

Location	Fisheries Biologists Survey Date	Time	Tide	Depth (feet)	Bottom Salinity (ppt)	Surface Salinity (ppt)
Favorite Creek						
Tidal flats near mouth	29-May-09	6:40	High	2.5	20.50[1]	0.95[1]
Tidal flats near mouth	29-May-09	7:25	Ebb	4	0.06[2]	0.07[2]
Mouth of Favorite Creek	29-May-09	8:00	Ebb	1	0.04[3]	0.04[3]
Unnamed tributaries to Favorite Bay						
Mouth of stream 2	28-May-09	7:04	Ebb	2.7	7.00	7.00
Tidal flats near stream 2	28-May-09	8:16	Ebb	2	1.00	1.00
Tidal flats near stream 2	28-May-09	9:04	Ebb	0.8	0.00	0.00
Estuary near streams 3 & 4	30-May-09	7:37	Slack/high	4.5	27.00	3.00
Mouth of stream 4	30-May-09	7:43	Ebb	2.3	25.00	4.00
Big cove at stream 4	30-May-09	8:21	Ebb	5.9	9.00	9.00
600 feet upstream of mouth of main estuarine channel	30-May-09	14:00	Slack/ low	1	0	0.2
Mouth of tidal flats	30-May-09	14:02	Slack/ low	Out of reach	Not taken	0
Mouth of stream 8 (~148 feet downstream of freshwater channel start)	2-Jun-09	13:11	Ebb	1	24.00	2.00
Mouth of stream 8 (~263 feet downstream of freshwater channel start)	2-Jun-09	13:12	Ebb	0.5	22.00	2.00

Note: Locations are shown in Figures 2 and 3; ppt= parts per thousand.

[1] Temperature 9.3˚C at bottom, 5.9˚C at surface; pH 7.3 at both bottom and surface.

[2] Dissolved oxygen 13.5 ppt, temperature 4.8˚C, pH 7.2 at both bottom and surface.

[3] Temperature 4.8˚C, pH 7.2 at both bottom and surface.

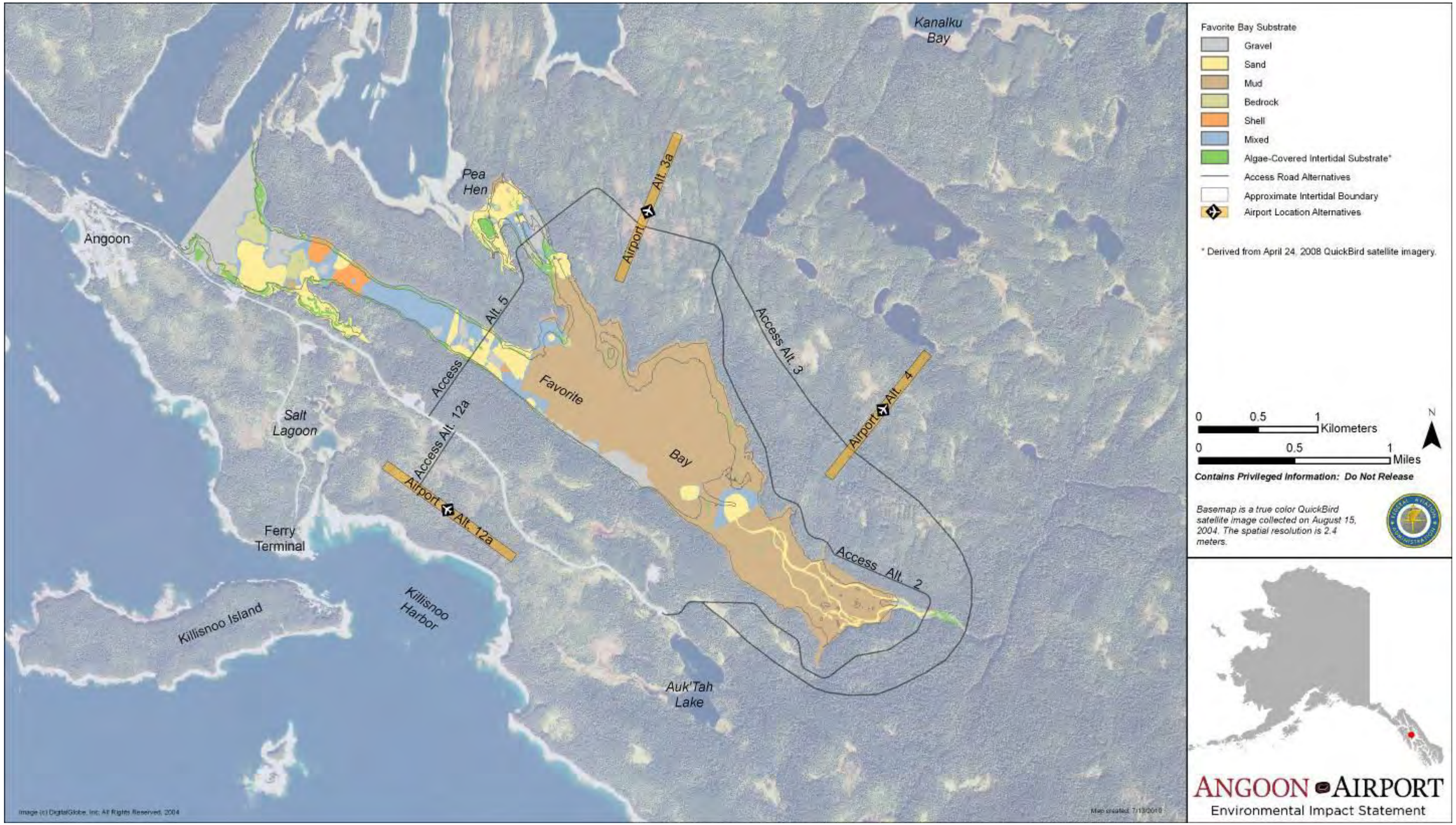

Figure 5. Favorite Bay dominant substrates.

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2.3 Habitats and Species in the Landscape Area

2.3.1 STREAMS AND LAKES

There is a high density of perennial streams within the Mitchell Bay area; however, runoff per unit area in Mitchell Bay is relatively low in comparison to the majority of Southeast Alaska (USFS 2002).Habitats and species in the landscape area are generally similar to those in the study area. Because the landscape area is broader than the study area, it contains a larger variety of habitats that support additional species.

For example, Mitchell Bay supports a small sockeye fishery, with two primary populations or runs of fish: one using Kanalku Lake, and the other run using Salt and Freshwater lakes near Hasselborg Creek to spawn and rear (USFS 2002). A unique population of stream-spawning sockeye is present in Hasselborg Creek: juveniles of this population are not associated with a lake environment and instead rear in salt water, the only river-sea stock of sockeye on Admiralty Island (Halupka et al. 2000). ADF&G maintains a weir on Hasselborg Creek to monitor this population. The USFS reports that the sport fisheries in Kanalku Bay are healthy except for the sockeye fishery, which has been depleted due to overfishing (USFS 2002). Kanalku Lake sockeye spawning escapements were extremely low in 2001 and 2003, with 240 and 271 fish respectively (Conitz and Burril 2008). In 2006, escapement was estimated at 1,300 fish, the third consecutive year with more than 1,000 fish since 2001 (Conitz and Burril 2008). Escapement increased substantially in 2009 to 2,664 sockeye, more than twice the average escapement estimated from 2001 to 2008 (Vinzant and Bednarski 2010).

Kanalku Creek also supports pink, chum, coho (in small numbers), and Dolly Varden (Conitz and Burril 2008 DEC et al. 2006). The peak adult salmon count for all species in Kanalku Creek is 6,078 fish (DEC et al. 2006). The mean annual escapement for pink salmon in Kanalku Creek is 2,322 adults (Halupka et al. 2000).

Numerous other salmonid species similar to those found in the study area also use the landscape area for spawning, rearing, and migration. Other streams that are known to support salmonid spawning populations include Hasselborg Creek, Jims Creek, and Gabriel Creek (DEC et al. 2006). Of these streams, Hasselborg Creek is the only sub-basin known to support steelhead (DEC et al. 2006). Other lakes (besides Kanalku Lake) occur in the landscape area but are relatively small and are not known to support substantial spawning populations of sockeye.

Chinook salmon also use the landscape area for foraging and migration, but do not spawn in the area (USFS 2002). The closest spawning population of Chinook occurs at Wheeler Creek (northwest Admiralty Island, (Halupka et al. 2000), which is outside the landscape area. Although Chinook salmon have recently been noted in Hasselborg Creek, they are thought to be hatchery strays from the Chatham Strait area (Geiger and ADF&G staff 2007).

2.3.2 ESTUARINE AREAS

Salt Lake (in the northeast portion of the landscape area) is one of the most extensive estuarine systems in the landscape area. This brackish water area is separated from Mitchell Bay by a tidal falls and can be accessed by boat only at high tide. Hasselborg Creek and Freshwater Lake flow into Salt Lake, creating a relatively sheltered estuary. The lake is also primary rearing habitat for Hasselborg Creek sockeye salmon, a unique population of stream-spawning fish that rear in the brackish waters of Salt Lake (Halupka et al. 2000) due to barriers that block passage to the upper Hasselborg Creek basin. The Salt Lake basin also is the largest coho-producing basin on Admiralty Island (Geiger and ADF&G staff 2007).

The intertidal estuarine areas associated with some creeks in the landscape area provide spawning habitat for pink and chum salmon. For example, large numbers of pink salmon spawn in the lower portion of Kanalku Creek and its associated intertidal estuarine area (Conitz and Burril 2008).

3.0 MARINE RESOURCES

Marine fish, invertebrates, algae, and seagrasses that occur in the study area and have potential to be affected by construction and long-term use of airport facilities are described below. Marine habitats in the study area were surveyed and mapped to provide a description of baseline conditions for the Airport EIS.

3.1 Methods

Species and habitats were documented using a variety of methods: literature reviews of existing information, field surveys, interviews with local experts in biological resources, and best professional judgment.

3.1.1 EXISTING DATA SOURCES

Several existing reports were examined, such as the Mitchell Bay Landscape Assessment (USFS 2002) and the Angoon Hydropower EIS (USFS 2009a).

3.1.2 FIELD DATA COLLECTION

Marine habitats in the study area were surveyed in three 2-week field sessions from May through August 2009 (see Figure 2 for survey locations). Intertidal and subtidal habitats were examined to document existing habitats and species presence/absence. Satellite imagery (DigitalGlobe 2004) was used to estimate habitat conditions that were ground-truthed by field surveys. Locations were documented with a Trimble Geo XT handheld GPS unit with submeter accuracy.

Habitat

Intertidal habitats that could be directly affected by the project were quantitatively surveyed with transects. Transects were placed in the area of potential direct impact at the Access Alternative 5 bridge crossings (see Figure 2) and were marked with a measuring line. (Note: Access Alternative 5 was dropped from consideration in the EIS after aquatic field studies were completed.) Quadrats of 3.2 square feet (1 m^2) were surveyed every 13 to 23 feet (4 to 7 m, depending on the total length of the transect) starting from mean lower low water (MLLW) to the high tide line (18.6 feet) or the start of persistent woody vegetation. Bank and riparian conditions, dominant substrates, percent cover by algae, seagrass, or invertebrates, as well as the presence of fish species were noted. Gradient data were collected using a clinometer or eye level and a stadia rod. Salinity was recorded at select locations (see Figure 2), by using a refractometer or a YSI water quality probe (specifications listed in section 2.1.1).

Intertidal areas that could be indirectly affected were assessed by walking the shoreline at low tide and noting habitat conditions and species. Additionally, the intertidal zone around the perimeter of Favorite Bay was also documented using a digital camera. Video of the shoreline was taken from a boat moving adjacent to the shoreline during an extreme low tide (−4.0 feet on July 24, 2009, as observed at the National Oceanic and Atmospheric Administration [NOAA] Juneau tide station). Video footage was used to ground-truth an ERDAS aerial imagery classification for intertidal habitat (described in section 3.1.2).

An underwater camera was used to document subtidal habitat and species use in Favorite Bay and estuary, Pea Hen, and Killisnoo Harbor (see Figure 2). The camera was deployed from a motorized boat or canoe and towed along a predetermined transect. The camera was lowered to the seafloor using either a downrigger or a

2-pound lead weight (depending on depth and current speed). Camera depths ranged from the surface (0 feet) to up to approximately −120 feet. Two submersible LED lights were used in deeper areas to increase visibility. Transects were performed both parallel to and perpendicular to the shoreline; a grid-like sampling pattern was used at the Access Alternative 5 Favorite Bay bridge crossing (see Figure 2). The camera was towed at approximately 0.87 knots (1 mile per hour) to acquire the best quality imagery. Video was recorded to DVD in the field while real-time video feed was monitored by crew to ensure proper camera position and data capture. GPS position, habitat type, and depth (as monitored by a Lowrance LCX fishfinder) were recorded every 1 to 2 minutes during the camera tow. Video footage was later reviewed and coded using the habitat classification system described in Data Analysis Methods (section 3.1.2) below.

Because marine habitats in Killisnoo Harbor (south of Airport Alternative 12a) would not be directly affected by the proposed project, they were not extensively mapped or classified. However, an underwater camera was used to verify fish presence and habitats in select locations. No marine bridges are proposed for this area and potential marine impacts would be limited to indirect effects related to run-off from streams. Therefore, this area is not included in the figures of marine habitats mapped for the project.

Fish and Invertebrates

An otter trawl was used to document fish presence in Favorite Bay. The trawl measured 4.1 by 3.9 feet (1.25 by 7.9 m) at the mouth and consisted of a 1.2-inch (3-centimeter [cm]) mesh funnel with a 0.4-inch (1-cm) mesh inner liner in the cod end. The inner liner is a soft nylon weave designed to reduce abrasion of fish scales and slime. Trawls were conducted during both incoming and outgoing tides, with tows lasting for 5 to 15 minutes in areas with water depths of 32 to 125 feet. Trawls occurred near the surface (15 feet), at various midwater depths, and on the bottom at depths of 35 to 55 feet. The maximum depth fished was 55 feet. Initial tows were short, with duration prolonged if catch was low. Tow length and location were measured with a Trimble Geo XT GPS unit. Depth of the net, length of the sampling line, tidal stage, and vessel speed were noted. Vessel speed was minimized during net retrieval to reduce mortality due to net impingement. Trawl catch was placed in coolers filled with site water for sorting and processing. Fish were counted (with a subsample measured), identified to species when possible, and released to the same environment.

The volume of water fished was determined as the product of the area of the net mouth and the linear distance towed. It is assumed that the area of the net mouth during tow is 80% of the maximum stretched mouth area, or 12.8 square feet (7.9 m^2).

Marine Vegetation

To address scoping comments from the U.S. Fish and Wildlife Service and NMFS regarding marine vegetation, algae and seagrasses in the study area were mapped (Figures 6 and 7). Subtidal eelgrass beds were located using an underwater video camera and mapped using a GPS unit. Intertidal eelgrass beds were located in the field and mapped using a combination of GPS data and QuickBird infrared satellite imagery (DigitalGlobe 2004). Elevation relative to tidal height was noted, and surface area was estimated using GIS.

Due to morphological variation in seagrass samples, and concerns regarding potential documentation of an invasive species, specimens were sent to Sandra Talbot, USGS Alaska Science Center, Anchorage, for positive species determination via genetic analysis. Samples were preserved in silica powder and DNA extracted and amplified via polymerase chain reaction (PCR) using methods outlined in Talbot et al. (2006). This genetic screening uses sequence differences at nuclear ribosomal internal transcribed spacers to differentiate *Zostera marina* (native species) from the non-native *Z. japonica* and other exotic species. Results were verified using microsatellite screening, with markers that amplify DNA only from *Z. marina*.

3.1.3 DATA ANALYSIS

Subtidal Bathymetry

Depths recorded from boat sonar in the field were corrected based on the predicted tidal heights at the NOAA Juneau tide station (NOAA 2009) to determine depth relative to MLLW. The correction value for Favorite Bay (relative to the Juneau tide station) is −2.8 feet at high tide and +0.3 feet at low tide. The time correction for Favorite Bay is +11 minutes for high tide and +15 minutes for low tide relative to the predicted times for Juneau. Depth data were augmented with the NOAA (2007) nautical chart for Hood Bay and Kootznahoo Inlet. Mapped bathymetric values are approximate and should not be used for navigation purposes.

Intertidal and Subtidal Boundaries

Little to no bathymetric or elevation data were available to estimate the lower boundary of the intertidal zone. Therefore, a combination of satellite imagery interpretation, sample point interpolation from shoreline field data, and five-foot topographical contours (R&M Engineering 2001) were used to determine boundaries for the intertidal and subtidal zones. The lower boundary of the intertidal zone (intertidal-subtidal boundary) was estimated from satellite imagery interpretation of low-tide conditions and corrected for predicted tidal heights at the NOAA Juneau Tide Station (NOAA 2009) based on the date and time the imagery was acquired. The 8.01-feet (2.44-m) resolution QuickBird satellite image (DigitalGlobe 2004) was taken on April 24, 2008 and georeferenced to a 2004 image from the same provider. The tidal height at the time of satellite imagery capture was +3 feet above MLLW. Therefore, the lower limit of the intertidal zone, which was clearly visible, was determined to be approximately +3 feet above MLLW (0 feet) for cartographical purposes.

The upper boundary of the intertidal zone was determined by interpolating and analyzing a 13-foot contour (representing mean higher high water as determined by NOAA (personal communication, Ehret 2009), based on five-foot topographical contours (R&M Engineering 2001). This level was then modified further based on ground observations and GPS field data that indicated that the contours were inaccurate in some locations. Therefore, the contour layer was amended in certain areas, primarily at the mouth of Favorite Creek and in the tidal flats, where landforms were particularly complex and diverse. Tidal sedge meadows and tidally influenced pools were identified using satellite imagery. Where direct field observations were lacking, the existing contour data were used. Other obvious errors from interpolation methods were omitted or smoothed based on landforms visible on the satellite imagery.

Intertidal Habitat Classification

Shoreline video and photographs of field sampling locations were used to create known sample points. Satellite imagery (DigitalGlobe 2004) was classified using a 25-class unsupervised (isodata) classification. In order to add information to the habitat classification, a normalized differenced vegetation index was calculated for the imagery. The individual classes were assigned to a habitat class based on field observations and video. The classification was then edited by hand to eliminate shadow areas and classification speckle.

Areas of algae-covered substrate were easily identified in the classifications and verified with the video. Substrate composition was also consistent between imagery classification and field observations. The intertidal classification was combined with the subtidal habitat mapping, and inconsistencies between the interpolation of the two were reconciled to make a seamless and useable data set.

Subtidal Habitat Classification

Underwater video footage from Favorite Bay was recorded and reviewed. GPS tracks and points collected in the field were spatially linked to the underwater video to create a habitat classification sample database and habitat classification maps for Favorite Bay. Several substrate classes (mud/silt, sand, gravel, cobble, boulder, bedrock or shell), depth and percent algal cover were recorded for each sample point. Substrate size was classified

using the Coastal and Marine Ecological Classification Standard developed by NOAA (Madden et al. 2009). Kelp and non-kelp algae were differentiated and their relative percent cover documented in 5% increments (Figures 6 and 7). Eelgrass, invertebrate communities, and vertebrate species presence were also noted and mapped. Shallow subtidal areas were surveyed from the shoreline, and data were integrated with underwater video observations to analyze subtidal habitat below the lowest observed water line in the satellite imagery, approximately +3 feet relative to MLLW.

Substrate and Vegetation

Subtidal sample points were selected from underwater video transect data collected in Favorite Bay to model substrate and aquatic vegetation. Where direct observations from the vessel were not available, data were supplemented with intertidal and shallow subtidal shore-based foot and snorkel surveys. The analysis extent of the substrate model was restricted to subtidal areas delineated by the lowest water line visible in the satellite imagery. Inverse distance weighting was used with varying numbers of nearest neighbors and maximum distances to estimate continuous surfaces of each substrate or algal component. Estimated surfaces in the northern part of Favorite Bay were assessed to determine which models produced the best data fit. Dominant algal and substrate components were calculated and combined into one model representing all substrate and biological components. Areas where no substrate type was dominant were classified as mixed. Minor modifications to the model were made as necessary; for example, if the model generated inadequate representations of substrate or algae as compared to field data and/or satellite imagery, then the model was adjusted. In areas where substrate was not visible due to abundance of algal cover, data were not entered into the model, and were inferred based on data from surrounding nearest neighbors. Field photos, satellite imagery, GPS-linked underwater video transect data, and shoreline-based observations confirmed the relative accuracy and extents of substrate and algal habitat characterizations represented on the map.

3.2 Habitats and Species in the Study Area

3.2.1 Intertidal Areas

The intertidal zone in Favorite Bay is generally narrow in the northwest part of the bay and wider near the head of the bay (see Figure 4). In the narrow northwest part of the bay, the shoreline is mostly rocky and drops off steeply to the subtidal zone. Algal cover reflects substrate type, with rocky, algae-covered substrates occurring more frequently in the narrowest (northwest) part of the bay (see Figures 5 and 6). Substrate size tends to increase with distance from the head of the bay and the tidal flats.

One area in Favorite Bay that appears to be unique in physical characteristics and in biological diversity is Pea Hen (see Figures 4, 5, 6, and 7). It contains nearly all classes of substrate and experiences a unique flushing tidal pattern. Both the northern and southern entrances to Pea Hen are slightly elevated from the interior Pea Hen area, and act as shelves blocking tidal flow from Favorite Bay and surrounding environments until water levels are above the elevated area. As a result, water remains ponded in the interior part of the site even at low tide because the elevated entrances to the area prevent full emptying at maximum ebb flow. Therefore, the area is relatively protected from high velocity flushing and water exchange and does not experience as drastic tidal exposure as other areas in Favorite Bay.

The Pea Hen area also appeared to support relatively high biological diversity (Tables 7 and 8) as well as a wide variety and complexity of habitats (various substrates, vegetative cover, tidal exposures, flushing, etc.). Algal and seagrass cover was extensive in Pea Hen (see Figures 6 and 7), and Angoon residents report the area is a primary location for subsistence gathering of chitons or gumboots (primarily *Katharina tunicata*), green urchins (*Strongylocentrotus droebachiensis*), and cockles. A total of 43 invertebrate species was documented during intertidal transects and subtidal snorkeling at the Access Alternative 5 bridge crossings in Pea Hen, whereas 24

species were documented at the Access Alternative 5 bridge crossing of Favorite Bay using similar survey methods (see Table 7). As noted above, Access Alternative 5 has since been dropped from consideration in the EIS. The latter location has a smaller intertidal zone that drops off steeply to subtidal habitats and therefore a smaller total area was surveyed, which may account for some of the difference in species diversity between the two locations. However, due to the habitat complexity and diversity in Pea Hen it is assumed that species diversity would remain higher in Pea Hen than in Favorite Bay, even if a larger area were sampled. Of the species documented in Pea Hen, 14 were not documented elsewhere in the study area. Similarly, five species were collected at the Access Alternative 5 Favorite Bay bridge crossing that were not found elsewhere.

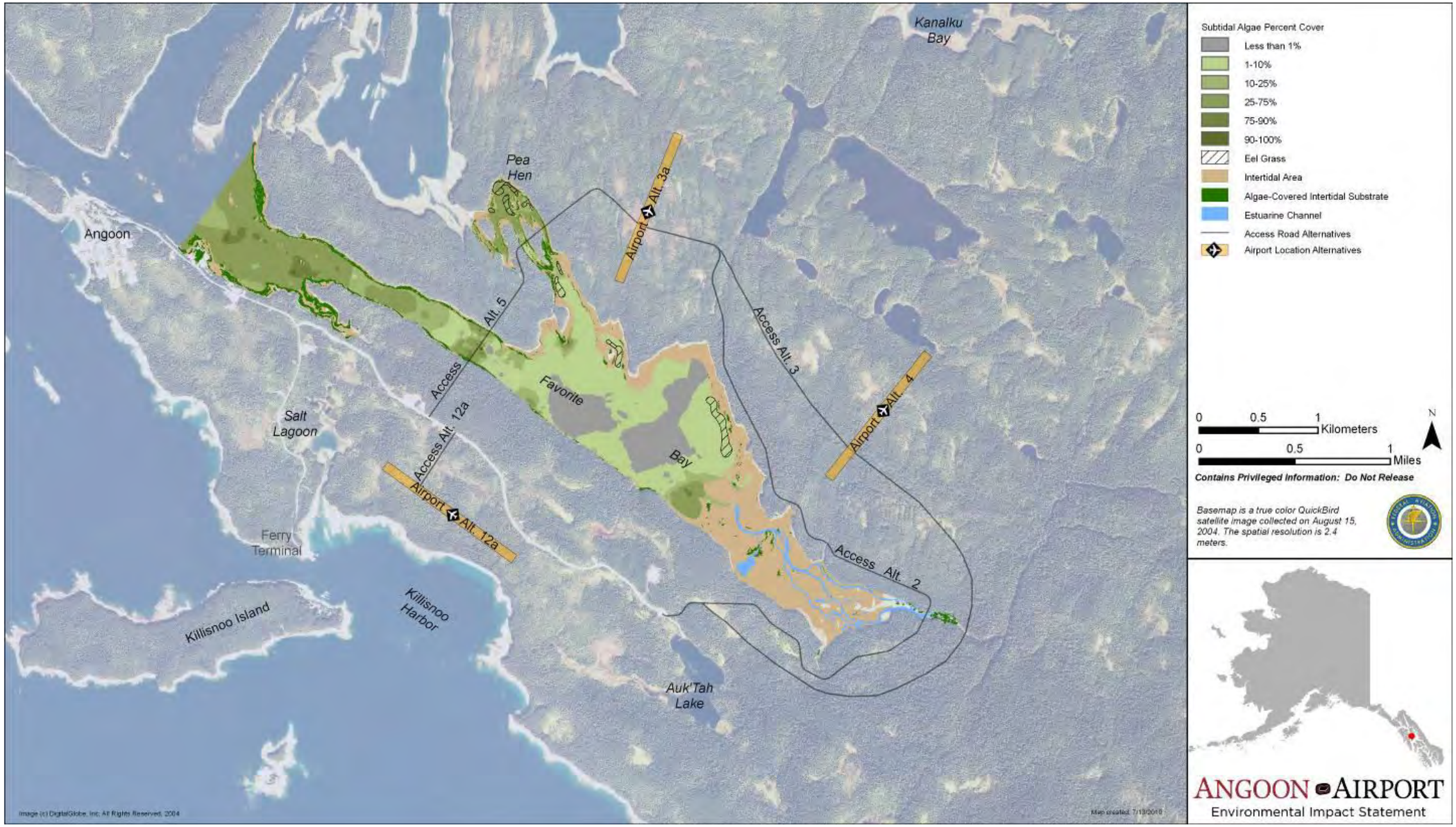

Figure 6. Favorite Bay aquatic vegetation: algae.

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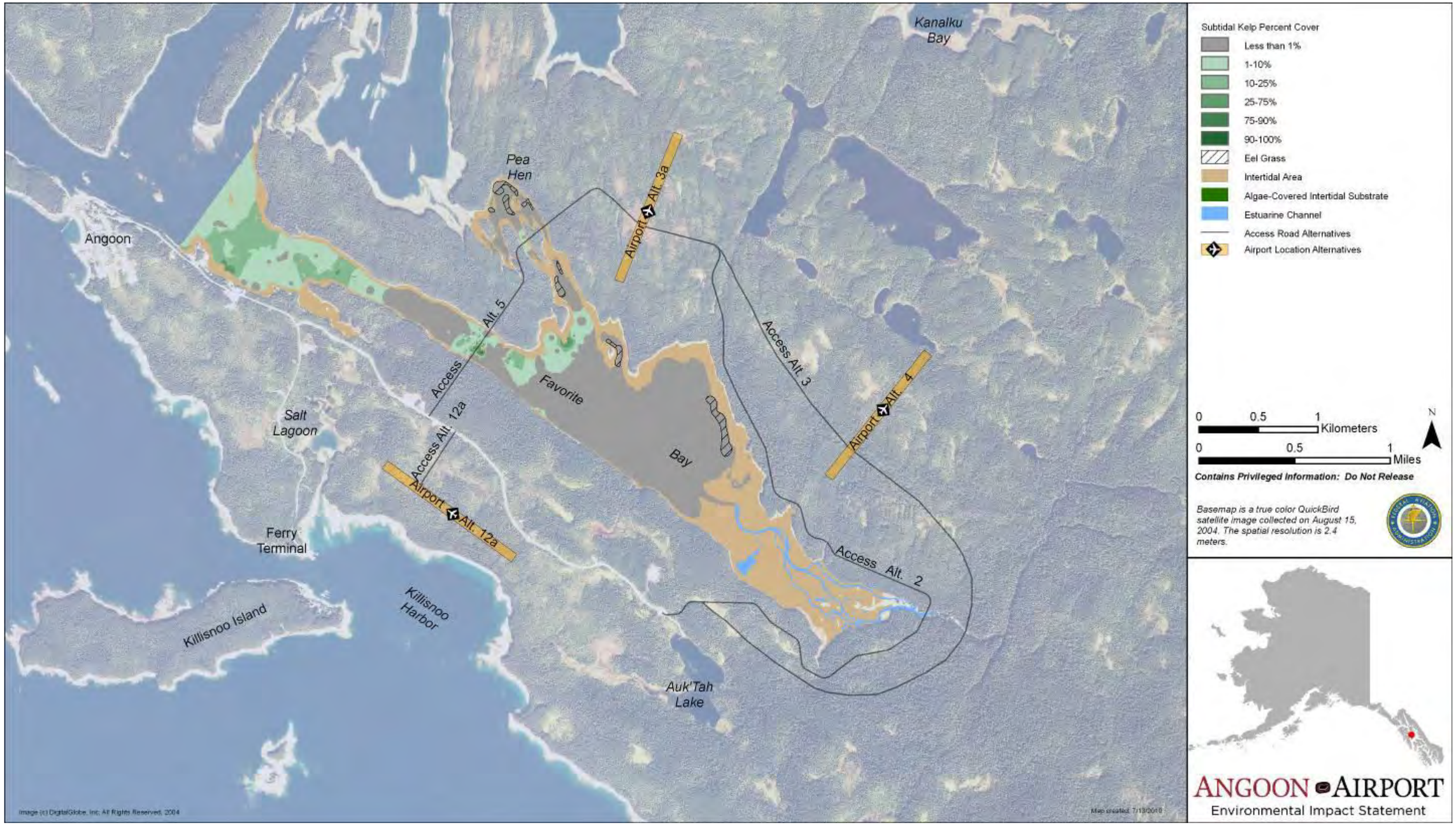

Figure 7. Favorite Bay aquatic vegetation: kelp.

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Table 7. Marine Invertebrates Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Phylum Porifera	**Sponges**					
Haliclona permollis	purple encrusting sponge	I				
Suberites domuncula	hermit crab sponge				I	
Unidentified sp.	red sponge	I				
Unidentified sp.	yellow sponge	S				
Unidentified sp.	pink encrusting sponge	I, S				
Phylum Cnidaria	**Anemones, jellies, etc.**					
Anthopleura artemesia	burrowing anemone	I			I	
Anthopleura xanthogrammica	green surf anemone				I	
Metridium farcimen	giant plumose anemone		S	S		S
Metridium senile	short plumose anemone	S	S	S		S
Unidentified spp.	unidentified jellyfish (at least 4 spp.)	S	S	S		
Unidentified sp.	unidentified anemone	S	S	S		
Urticina crassicornis (previously *Tealia* sp.)	painted anemone	S				
Phylum Annelida	**Segmented worms**					
Class Polychaeta	**Tube worms**					
Eudistylia vancouveri	Vancouver feather duster	I, S	S			
Schizobranchia sp.	feather duster worm	S		I		
Spirorbis sp.	tube worm	I	I			
Unidentified sp.	small polychaete worm	I	S	I, S	I, S	
Unidentified sp.	scale worm	I	S			
Phylum Ectoprocta	**Bryzoans**					
Unknown sp.	encrusting bryzoan	I		S		
Phylum Mollusca	**Bivalves, snails, chitons, nudibranchs, etc.**					
Class Polyplacophora	**Chitons**					
Cryprochiton stelleri	giant Pacific chiton					I
Katharina tunicata	black leather chiton	I, S	S			
Mopalia lignosa	woody chiton				S	
Mopalia sp.	mopalia chiton	I, S				
Tonicella insignis	white-line chiton			S		

Table 7. Marine Invertebrates Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Tonicella lineata	lined chiton	I				
Class Gastropoda	**Snails and slugs**					
Littorina sp.	periwinkle snail	I	I		I	
Margarites pupillus	puppet margarite	I	I			
Nucella canaliculata	channelled dogwinkle	I			I	
Nucella lamellosa	wrinkled dogwinkle				I	
Unidentified sp.	snail eggs	I	I			
Unidentified sp.	unidentified snail	S		S		
Subclass Prosobranchia	**Limpets**					
Lottia pelta	shield limpet	I	I	I	I	
Tectura persona	mask limpet	I	I	I	I	
Unidentified sp.	unidentified limpet	S		I, S		
Subclass Opisthobranchia	**Sea slugs, nudibranchs**					
Janolus fuscus	white and orange-tipped nudibranch		S			
Unidentified sp.	nudibranch egg ribbons				S	
Unidentified sp.	unidentified wavey-margined nudibranch	I				
Class Bivalvia	**Bivalves**					
Chlamys sp.	pink scallop			S		
Clinocardium nuttallii	Nuttall's cockle	I, S		I		
Mya arenaria	softshell clam	I, S	I	I	I, S	
Mytilus trossulus	Pacific blue mussel	I	I, S	I	I	
Protothaca staminea	Pacific littleneck clam	I, S	I, S	I	I, S	
Saxidomus gigantea	butter clam		S	I	I, S	
Tresus capax	fat gaper clam			I	I	
Unidentified sp.	unidentified clam	I	S			
Unidentified sp.	unidentified tiny clam entwined in filamentous algae	I				
Class Cephalopoda	**Octopuses and squids**					
Enteroctopus dofleini	giant Pacific octopus					S
Phylum Arthropoda	**Crabs, shrimps, amphipods, etc.**					

Table 7. Marine Invertebrates Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Subphylum Crustacea	**Crabs, shrimps, etc.**					
Subclass Cirripedia	**Barnacles**					
Balanus glandula	common acorn barnacle	I	I, S		I, S	
Balanus nubilus	giant acorn barnacle	S				
Semibalanus cariosus	thatched acorn barnacle				I	
Unidentified sp.	unidentified barnacle		I	I		
Subclass Eumalacostraca	**Crabs, shrimps, lobsters, amphipods**					
Order Euphausiacea	**Krill**					
Unidentified sp.	euphasid, krill			I		
Order Decapoda	**Crabs, shrimps, lobsters**					
Infraorder Caridea	**Shrimps**					
Lebbeus sp.	lebbeid shrimp	S		S		
Pandalus danae	coonstripe shrimp (dock shrimp)			S		
Pandalus hypsinotus	humpback shrimp (coonstripe shrimp)			S		
Pandalus platyceros	Pacific prawn (spot shrimp)			S		
Unidentified sp.	unid shrimp	S		S		
Infraorder Anomura	**Hermit and lithode crabs**					
Hapalogaster mertensii	hairy crab		S	S	S	
Unidentified sp.	unidentified king crab		S			
Unidentified sp.	unidentified hermit crab	I	I	I, S	I	
Infraorder Brachyura	**True crabs**					
Cancer magister	Dungeness crab			S	S	
Cancer oregonensis	Oregon rock crab	S		S		
Cancer sp.	rock crab	S				
Chionoecetes bairdi	tanner crab		S	S		
Hemigrapsus nudus	purple shore crab				I	
Hyas lyratus	Pacific lyre crab		S			
Oregonia gracilis	graceful decorator crab		S	S		
Pugettia gracilis	graceful kelp crab	S				

Table 7. Marine Invertebrates Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Order Isopoda	**Isopods (pill bugs)**					
Idotea wosnesenskii	rockweed isopod	I				
Unidentified sp.	unidentified isopod		I	I	I	
Order Amphipoda	**Amphipods (scuds)**					
Unidentified sp.	unidentified bright red amphipod			S		
Unidentified sp.	unidentified amphipod				I	
Phylum Echinodermata	**Spiny-skinned animals**					
Class Asteroidea	**Sea stars**					
Asterina miniata	bat star	S	S			
Crossaster papposus	rose star			S		
Dermasterias imbricata	leather star					
Evasterias troschelii	mottled star			S	S	
Henricia leviuscula leviuscula	blood star	S	S			
Leptasterias hexactis	drab six-armed star	S	S			
Pisaster sp.	unidentified sea star		S	S		
Pycnopodia helianthoides	sunflower star	I, S	I, S	I, S	I, S	I, S
Solaster sp.	sun star		S			
Class Ophiuroidea	**Brittlestars**					
Unidentified sp.	unidentified brittlestar		S	S		
Class Echinoidea	**Urchins**					
Strongylocentrotus droebachiensis	green urchin	S	S	S	S	
Unidentified sp.	unidentified small urchin			S		
Class Holothuroidea	**Sea cucumbers**					
Cucumaria miniata	red sea cucumber		S			
Cucumaria vegae	tiny black sea cucumber	I				
Parastichopus californicus	giant sea cucumber		S	S		

Note: Table includes intertidal and subtidal species.

I= observation in intertidal zone; S= observation in subtidal zone.

Table 8. Marine Vegetation Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Phylum Chlorophyta	**Green algae**					
Acrosiphonia sp	green filamentous	I	I		I	
Codium ritteri	coarse spongy cushion			S		
Rhizoclonium tortuosum (previously *Chaetomorpha*)	twisted sea hair	I				
Ulva fenestrata	sea lettuce		S			
Ulva intestinalis (previously genus *Enteromorpha*)	sea hair		I	I	I	
Ulva linza (previously genus *Enteromorpha*)	green string lettuce		I	I	I	
Ulva sp.	sea lettuce	I	I	I	I	
Ulvaria obscura	dark sea lettuce	I				
Ulothrix flacca	mermaid's tresses			I		
Unidentified sp.	slimy green filamentous	I				
Unidentified sp.	unidentified green filamentous	I	I			
Phylum Phaeophyta	**Brown algae**					
Agarum sp.	sieve kelp		S	S		
Alaria marginata	ribbon kelp	I, S	S		S	
Alaria sp.	kelp	I, S	S	S		
Coilodesme bulligera	sea chip	I				
Costaria costata	seersucker kelp			S		
Cymathere triplicata	three-ribbed kelp		S			
Desmarestia sp.	acid kelp	S				
Fucus gardneri	rockweed	I, S	S	I, S		I, S
Laminaria saccharina	sugar kelp	I	S			
Laminaria yezoensis	suction-cup kelp		S			
Leathesia difformis	sea cauliflower				I	
Melanosiphon intestinalis	twisted sea tubes	I	S		I	
Nereocystis luetkeana	bull kelp			S		
Ralfsia fungiformis	sea fungus	I	I			
Unidentified sp.	brown/red finely branched filamentous algae		I			
Unidentified sp.	densely-tufted filamentous brown algae		I			

Table 8. Marine Vegetation Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Unidentified sp.	encrusting brown slime (on bedrock)	I				
Unidentified sp.	slimey brown filamentous	I				
Unidentified sp.	unbranched brown algae		I			
Phylum Rhodophyta	**Red algae**					
Ahnfeltiopsis gigartinoides	loose Ahnfelt's seaweed			I		
Constantinea sp.	saucer algae	I		I		
Cryptosiphonia woodii	bleached brunette		I			
Gloiopeltis furcata	jelly moss	I	I			
Halosaccion glandiforme	sea sac		I, S		I, S	
Neorhodomela larix	black pine			I	I	
Neorhodomela oregona	Oregon pine	I				
Palmaria callophylloides	frilly red ribbon		I			
Phycodrys riggii	common sea oak		I			
Porphyra sp.	Porphyra algae		I, S			
Odonthalia floccosa	sea brush		I		I	
Sparlingia pertusa	red eyelet silk			S		
Unidentified sp.	crustose coraline red	I, S	I, S		I, S	
Unidentified sp.	encrusting red algae		I			
Unidentified sp.	foliose red coraline	I				
Unidentified sp.	unidentified red coarse filamentous		I			
Unidentified sp.	unidentified red fine filamentous		I			
Phylum Anthophyta	**Seagrass**					
Zostera marina	eelgrass	S	I, S	I, S	S	S

Note: I= observation in intertidal zone; S= observation in subtidal zone.

In the Killisnoo Harbor portion of the study area, the Salt Lagoon near the Angoon Ferry Terminal is the most extensive intertidal area (see Figures 2 and 3). The lagoon mouth and neck drain almost entirely at low tide, except for isolated tide pools and a small subtidal pond at the head of the lagoon. Local residents report that this area is used extensively for rearing by juvenile pink salmon; several juvenile pink and chum salmon were observed in the lagoon in June 2009 (Table 9). Adult pink, chum, coho, and Chinook salmon were observed at the ferry terminal, but none were observed entering the Salt Lagoon. There is minimal freshwater inflow into the lagoon, and therefore salinities remain high (21.00–30.00 ppt) even at low tide (Table 10). It is unlikely that salmonid spawning occurs in any tributaries of the Salt Lagoon (see Figure 3), as flow and substrates are not suitable for spawning. Fish, invertebrate, and vegetation species were mostly marine or estuarine, and included kelp and other algae, shiner perch, sticklebacks, anemones, sea stars, crabs, and clams (Tables 7 and 8). Eelgrass was documented in the lagoon in small patches. The mouth of the lagoon is accessible by road, and residents commonly drive in and across the intertidal zone in this area. Evidence of this access included tire tracks and trash. This is one of the few locations in the study area that is currently accessible by road, the other locations being the Angoon floatplane and community boat basin docks. However, the latter areas do not have extensive shallow water intertidal zones.

Table 9. Marine Fishes Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Family Clupeidae	**Herrings**					
Clupea pallasii	Pacific herring		A	A		A
Family Salmonidae	**Salmon and Trout**					
Oncorhynchus gorbuscha	pink salmon	A	J, A	J, A	J	J, A
Oncorhynchus keta	chum salmon		J	J, A	J	A
Oncorhynchus kisutch	coho salmon		J	J, A		A
Oncorhynchus nerka	sockeye salmon			A		
Oncorhynchus tshawytscha	Chinook salmon			A		A
Salvelinus malma	Dolly Varden			A		A
Family Gadidae	**Cods**					
Gadus macrocephalus	Pacific cod			J, A		
Theragra chalcogramma	walleye pollock	J		J		
Family Gasterosteidae	**Sticklebacks**					
Gasterosteus aculeatus	threespine stickleback	J, A		A	A	
Family Scorpaenidae	**Rockfish**					
Sebastes ciliatus	dusky rockfish		A			
Sebastes maliger	quillback rockfish					A
Sebastes sp.	unidentified rockfish		J			
Family Hexagrammidae	**Greenlings**					
Hexagrammos decagrammus	kelp greenling		A			
Hexagrammos stelleri	whitespotted greenling		U	U		
Family Cottidae	**Sculpins**					
Hemilepidotus hemilepidotus	red Irish lord			A		

Table 9. Marine Fishes Observed in the Study Area in 2009

		Location				
Scientific Name	**Common Name**	**Pea Hen**	**Access Alternative 5: Favorite Bay Bridge**	**Favorite Bay**	**Salt Lagoon**	**Killisnoo Harbor**
Leptocottus armatus	Pacific staghorn sculpin			J, A		
Myxocephalus polyacanthocephalus	great sculpin		J, A	J, A		A
Oligocottus maculosus	tidepool sculpin	U			U	
Oligocottus synderi	fluffy sculpin				U	
Triglops pingelii	ribbed sculpin		U			
Unidentified sp.	unidentified sculpin species		U			
Family Agonidae	**Poachers**					
Pallasina barbata	tubenose poacher		A			
Family Cyclopteridae	**Lumpsuckers**					
Eumicrotremus orbis	Pacific spiny lumpsucker		A			
Family Liparidae	**Snailfish**					
Liparis callyodon	spotted snailfish				U	
Family Embiotocidae	**Surfperches**					
Cymatogaster aggregata	shiner perch			J, A	A	A
Family Bathymasteridae	**Ronquils**					
Bathymaster signatus	searcher		U			
Family Stichaeidae	**Pricklebacks**					
Stichaeus punctatus	Arctic shanny		U			
Lumpenus sagitta	snake prickleback			A		
Family Pholidae	**Gunnels**					
Apodichthys flavidus	penpoint gunnel		A		A	
Pholis laeta	crescent gunnel	A	A		A	
Family Pleuronectidae	**Righteye flounders**					
Hippoglossus stenolepis	Pacific halibut		J	J, A		J
Lyopsetta exilis	slender sole		U			
Lepidopsetta bilineata	southern rock sole		U			
Platichthys stellatus	starry flounder			J		J, A

Note: A= Adult, J=Juvenile, U=Age unknown based on size.

Table 10. Salinity in Favorite Bay and Salt Lagoon

Location	Fisheries Biologists Survey Date	Time	Tide	Depth (feet)	Bottom Salinity (ppt)	Surface Salinity (ppt)
Favorite Bay						
Favorite Bay (trawl)	3-Jun-09	9:58	Flood	42	28.41[1]	24.30[1]
Favorite Bay (trawl)	3-Jun-09	14:40	Ebb	60	28.60[2]	19.84[2]
Salt Lagoon						
Salt Lagoon	1-Jun-09	15:30	Slack	2	n/a	30.00
Salt Lagoon	1-Jun-09	15:42	Slack/ flood	2	n/a	25.00
Salt Lagoon	1-Jun-09	15:56	Flood	0.4	n/a	25.00
Eelgrass bed in Salt Lagoon	1-Jun-09	15:59	Flood	0.5	n/a	25.00
Upstream-most narrow point in Salt Lagoon	1-Jun-09	16:36	Flood	0.5	n/a	24.00
Wide area in Salt Lagoon	1-Jun-09	16:54	Flood	0.3	n/a	24.00
Mouth of stream 12 at head of Salt Lagoon	1-Jun-09	17:24	Flood	0.5	n/a	21.00
Pond behind mouth of stream 12	1-Jun-09	17:28	Flood	1	n/a	17.00

Note: Locations are shown in Figures 2 and 3; ppt= parts per thousand

[1] Dissolved oxygen 11.0 ppt at bottom and 11.1 ppt at surface; temperature 7.6˚C at bottom and 9.6˚C at surface; pH 6.7 at both bottom and surface.

[2] Dissolved oxygen 10.6 ppt at bottom and 14.5 ppt at surface; temperature 7.3˚C at bottom and 13.2˚C at surface; pH 7.2 at bottom and 7.1 at surface.

3.2.2 SUBTIDAL AREAS

Marine Vegetation

A total of 18.63 acres of eelgrass beds was documented from several locations in the study area (see Figures 6 and 7). Beds ranged in size from 0.39 acre to 8.02 acres. In addition to the eelgrass beds depicted in Figures 6 and 7, other small patches of eelgrass were documented throughout the study area. However, due to their small size, these patches are not perceptible in the vegetation mapping; they are shown as sampling points in Figure 2. One of these patches was in the Favorite Bay tidal flats, and was composed entirely of very small plants (leaf length 5.5 inches, width 0.6 inches [1.5 millimeters]) that did not appear to have definitive morphological characteristics of either *Z. marina* (a native species) or *Z. japonica* (an invasive species considered by some to belong to the genus *Nanozostera*). Due to concerns regarding potential documentation of an invasive species, specimens were sent to the USGS Alaska Science Center for genetic analysis and species determination. Photographs and details of the specimens are provided in Appendix C. Genetic analyses indicated that seagrass samples from Angoon were *Z. marina* (personal communication, Talbot 2009a). Microsatellite markers used in the genetic analyses would have indicated evidence of hybridization, had any occurred. Furthermore, there is no evidence of hybridization between *Z. marina* and *Z. japonica* in other locales (Rhode 2007). It may be that growing conditions limit growth of *Z. marina* in certain locations. Similar small *Z. marina* plants have been observed in other Southeast Alaska locations, such as Blind Slough near the South Mitkof Island Ferry Terminal (personal communication, Talbot 2009b). These plants, initially thought to be *Z. japonica* by collectors, were also genetically analyzed and found to be *Z. marina*.

Of the areas where eelgrass was observed, shoot density and biomass were visibly highest in the northern Pea Hen area and in the sheltered inlet south of Airport Alternative 3a (see Figures 2, 6, and 7). These two areas are sheltered from strong currents and tidal energy and have deeper waters where shoots remain completely subtidal even at extreme low tides. Where eelgrass occurred in the lower intertidal/upper subtidal zones, such as the Favorite Bay tidal flats and near the southern entrance to Pea Hen, shoot density and biomass were lower. Eelgrass in these areas occurred in the −2 foot to −5 foot zone, relative to MLLW. Shoots in these areas were small during surveys in late May 2009, but grew larger by mid-August 2009.

In addition to eelgrass, numerous algal species were documented in the study area (see Table 8). The most extensive algal cover occurred in Pea Hen, around the large rock near the Access Alternative 5 bridge crossing of Favorite Bay (see Figures 3, 6, and 7), and in the northwest part of the bay, primarily associated with bedrock outcroppings. The algal species in the northwest part of Favorite Bay near Angoon were dominated by marine species, such as bull kelp. The greatest diversity of marine vegetation was observed at the Access Alternative 5 Favorite Bay bridge crossing (see Table 8), where 30 species were documented by intertidal transect surveys in June 2009. This diversity is likely due to the abundance of substrates with grain sizes large enough for algae to attach. The second greatest diversity of marine vegetation was observed at Pea Hen, where 22 species were documented. Pea Hen had a wide array of substrates, depths, and habitat complexity, which likely contribute to the observed vegetation diversity.

Marine Substrates

A variety of substrates were documented in Favorite Bay (see Figure 5). Rocky substrates occurred more frequently in the narrowest (northwest) part of the bay, likely reflecting the relatively high tidal currents and velocities in this area. Substrate size tended to increase with distance from the head of the Bay and the tidal flats.

Because marine areas in the Airport Alternative 12a (Killisnoo Harbor) portion of the study area would not be directly affected by the proposed project, they were not extensively mapped or classified. No bridges are proposed for this area and potential marine impacts would be limited to indirect effects related to run-off from streams. Therefore, this area is not included in the figures of marine habitats mapped for the project. Underwater video from subtidal Killisnoo Harbor shows substrates dominated by gravels.

Marine Fishes

Various species of marine fishes were observed (see Table 9) in the study area. Several species that were collected have designated EFH. One dusky rockfish (*Sebastes ciliatus*) was collected with an extensive parasitic infection of the internal copepod *Sarcotaces* sp. Habitat requirements of species with cultural, recreational, or commercial importance that are likely to occur in the study area are described in Appendix B; timing of habitat use by these species is detailed in Table 11.

In several locations (north shore of Favorite Bay, Killisnoo Harbor), schools of adult shiner perch (estimated 3,000+ individuals) were documented. The northernmost range of this species was recently expanded after documentation of the species near Hoonah, Alaska (Johnson et al. 2003). The previous northernmost range of the species was thought to be Wrangell Island (McConnaughey and McConnaughey 1998 as cited in Johnson et al. 2003) or Sitka (Mecklenburg et al. 2002). These field data support the northward range expansion for shiner perch.

Favorite Bay is an important rearing area for Pacific herring (*Clupea pallasii*). Herring spawning has not been formally documented in Favorite Bay since the early 1980s (SWCA 2010a), though Angoon residents report observations of spawning in spring 2009. Herring spawn primarily on kelp and other aquatic vegetation (ADF&G 1994). Previous spawning locations included the big rock bisecting the narrow channel southwest of Pea Hen

Table 11. Life-Stage Timing for Fishes in Marine Habitats of the Study Area

Species	Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dolly Varden[1]	nearshore presence												
	return to fresh water												
	adult annual outmigration												
	juvenile outmigration												
pink salmon[2]	return to fresh water												
	juvenile outmigration												
	estuary rearing												
sockeye salmon[3]	return to fresh water												
	outmigration												
	estuary rearing												
chum salmon[4]	return to fresh water												
	outmigration												
	estuary rearing												
coho salmon[5]	estuary rearing												
	return to fresh water												
	outmigration												
steelhead trout[6]	return to fresh water				late								
	juvenile/adult annual outmigration												
Chinook salmon[7]	adults present												
cutthroat trout[8]	adults present												
	juvenile/adult annual outmigration												
sharks (salmon shark, spiny dogfish, and others)[9]	shallow nearshore presence												
	birthing in shallow nearshore waters (spiny dogfish)												
	birthing (salmon shark)												
Pacific herring[10]	spawning in aquatic vegetation in shallow water												
	adults present												
capelin[11]	adult spawning on sand or gravel beaches												
	eggs present in gravel/sand beaches												
	larval presence/hatching												
cods[12]	walleye pollock and Pacific cod use of shallow nearshore waters												
rockfish[13]	juvenile rearing in nearshore shallows												

Table 11. Life-Stage Timing for Fishes in Marine Habitats of the Study Area

Species	Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	(some species)												
sablefish[14]	juvenile rearing in nearshore shallows												
greenlings[15]	lingcod spawning												
	nearshore activity (multiple species)												
sculpins (multiple species)[16]	spawning nearshore												
	adult presence												
sandfish[17]	larvae in nearshore shallow waters												
Pacific sand lance[18]	spawning, adult and juvenile nearshore activity												
righteye flounders[19]	spawning, adult and juvenile nearshore activity												
king crab (red, blue, golden/ brown)[20]	reproductive activity												
Dungeness crab[21]	reproductive activity												
Tanner crab[22]	reproductive activity												
clams and chitons[23]	spawning												
	planktonic larvae												

Key: range of activity; greater activity; peak of activity

Note: Timing information for skates, pricklebacks, and gunnels was not available at the time of writing.

[1] (Groot and Margolis 1991; Whalen 1991)
[2] (ADF&G 1994)
[3] (Conitz and Burril 2008; Conitz and Cartwright 2007; Groot and Margolis 1991; Halupka et al. 2000)
[4] (Groot and Margolis 1991)
[5] (ADF&G 1994; DEC et al. 2006; Johnson and Klein 2009; Pacific States Marines Fisheries Council [PSMFC] 1996)
[6] (Groot and Margolis 1991)
[7] (ADF&G 1994; DEC et al. 2006; Groot and Margolis 1991; Halupka et al. 2000)
[8] (ADF&G 1994; Yanusz 1997)
[9] (ADF&G 2009a; Carroll 2005; NOAA 2005)
[10] (ADF&G 1994)
[11] (NOAA 2005; North Pacific Fishery Management Council [NPFMC] 2009; Ormseth et al. 2008)
[12] (ADF&G 2009b; NPFMC 2005, 2009)
[13] (NPFMC 2005)
[14] (Alaska Fisheries Science Center [AFSC] 2009)
[15] (ADF&G 1994, 2006)
[16] (California Department of Fish and Game 2009; Sempier 2003; Goodson and Weisgerber 1988)
[17] (Thedinga et al. 2006)
[18] (DEC et al. 2006; NPFMC 2009; Robards et al. 1999)
[19] (AFSC 2009; DEC et al. 2006; Mecklenburg et al. 2002; NOAA 2005; Pacific Fishery Management Council 2005)
[20] (ADF&G 1985; Jewett and Onuf 1988; National Park Service [NPS] 2009)
[21] (ADF&G 1985; NPS 2009)
[22] (ADF&G 1985; NPS 2009)
[23] (DEC et al. 2006)

and the area between the big rock and Pea Hen (personal communication, Frederickson 2009), likely due to the algal cover in these areas (see Figures 6 and 7). Juvenile and adult herring use Favorite Bay and Kootznahoo Inlet year-round and are harvested for various subsistence purposes throughout the year.

No invasive fish, aquatic invertebrate, or aquatic plant species were observed in the study area during 2009 surveys by the FAA consultant team (according to lists of invasive species in Alaska Exotic Plant Information (Alaska Exotic Plant Information Clearinghouse 2010; Fay 2002; McClory and Gotthardt 2008). The softshell clam is considered a non-native species in Alaska (McClory and Gotthardt 2008), though it was present historically in the state, until glaciations in the Pleistocene era caused extinction in the Pacific Ocean (MacNeil 1965 as cited in Powers et al. 2006). Softshell clams were reintroduced to Alaska during the late 1800s via transplants of oyster (*Crassostrea virginica*) from the Atlantic Ocean and are now common throughout the state (Hanks 1963 as cited in Powers et al. 2006). They are not considered highly invasive (McClory and Gotthardt 2008) and were found in the study area (see Table 7).

3.3 Habitats and Species in the Landscape Area

3.3.1 Intertidal Areas

A large amount of intertidal area occurs throughout the landscape area due to an intricate formation of narrow channels, islands, and passages that make up Kootznahoo Inlet (see Figure 1). This network of islands and narrow passages creates a large amount of intertidal coastline. Habitats are similar to those in the study area. Kootznahoo Inlet is a popular algae harvesting area for Angoon residents. One of the most common species collected is black seaweed (*Porphyra abbottae*).

3.3.2 Subtidal Areas

No commercial clamming or scallop dredging is known to occur in the landscape area. Dungeness crab (*Cancer magister*) use mud and sand habitats at all depths of the Mitchell Bay area. Dungeness crab are harvested commercially in Favorite Bay, and shrimp are harvested commercially in Mitchell Bay (USFS 2002). The last commercial harvest of herring in Mitchell Bay occurred in 1976 (personal communication, Monagle 2008b). There are no commercial salmon fisheries in the Mitchell Bay basin (USFS 2002).

Subtidal areas in Mitchell Bay are used by numerous salmonid species for foraging and migration. Of these species, Chinook salmon are the only species that do not spawn in the landscape area (USFS 2002). The closest spawning population of Chinook occurs at Wheeler Creek (northwest Admiralty Island, (Halupka et al. 2000), which is outside the landscape area. The majority of Chinook present in Southeast Alaska originate in large trans-boundary mainland river systems (e.g., Taku, Stikine, and Alsek rivers) (Halupka et al. 2000). Chinook stocks that spawn on Admiralty Island are primarily of the spring-run type and are considered an inside-rearing stock, where rearing and growth to maturity occur almost exclusively within nearshore waters of Southeast Alaska (McPherson et al. 2003). Therefore, Chinook adults and sub-adults may be present in the landscape area throughout the year. The Admiralty Island stocks are primarily stream-type fish that spend one year in fresh water and four to six years within inshore marine waters (McPherson et al. 2003). The peak abundance of immature adult Chinook in Favorite Bay occurs in May and June (as observed by the FAA's consultant team in 2009).

Kanalku Bay supports the largest subsistence harvest of sockeye within the landscape area, primarily in July and August and is the preferred subsistence fishing area for Angoon residents (Conitz and Burril 2008). In 2001, sockeye spawning escapement in the Kanalku Creek sub-basin was extremely low (240 fish, Conitz and Burril 2008). Angoon residents voluntarily curtailed fishing during the first half of the season in 2002, and by 2006 ADF&G implemented a restricted fishing season (Conitz and Burril 2008). The average annual subsistence

harvest of sockeye reported by Kanalku permit holders from 1994 to 2001 was over 1,500 fish (Conitz and Burril 2008). The USFS reports that the sport fisheries in Kanalku Bay are healthy except for the sockeye fishery, which has been depleted due to overfishing (USFS 2002).

4.0 Essential Fish Habitat

Essential fish habitat (EFH) is broadly defined by the Magnuson-Stevens Fishery Conservation Act (MSA) and the Sustainable Fisheries Act to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (962 *Federal Register* 66551, Section 600.10 Definitions). *Waters* include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include areas historically used by fish, if appropriate. *Substrate* includes sediment, hard bottom, structures underlying the waters, and associated biological communities. *Necessary* has been defined as the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. *Spawning, breeding, feeding, or growth to maturity* covers a species' full life cycle.

EFH is identified only for species managed under a federal fisheries management plan (FMP). In the Angoon area, most groundfish are managed under the FMP for groundfish of the Gulf of Alaska. Salmon are managed under the FMP for the salmon fisheries in the exclusive economic zone off the coast of Alaska; however, federal management has been deferred to the State of Alaska. Salmon EFH is analyzed in three parts: freshwater, nearshore, and marine. Freshwater EFH is specified by the Alaska Department of Natural Resources under AS 41.14.870(a), and salmonid streams are identified in Johnson and Klein (2009). Marine salmonid EFH includes all estuarine and marine areas used by Pacific salmon of Alaska origin (NMFS 2005). A separate EFH assessment will be completed for this project following selection of the preferred alternatives.

Marine EFH has been identified by NMFS for the following salmon species: Chinook, coho, chum, pink, and sockeye. Marine EFH has been identified by NMFS for at least one life history stage of the following non-salmonid marine species: walleye Pollock (*Theragra chalcogramma*), Pacific cod (*Gadus macrocephalus*), yellowfin sole (*Limanda aspera*), southern rock sole (*Lepidopsetta bilineata*), Alaska plaice (*Pleuronectes quadrituberculatus*), flathead sole (*Hippoglossoides elassodon*), arrowtooth flounder (*Atheresthes stomias*), sablefish (*Anoplopoma fimbria*), rockfishes, sharks, squid, skates, sculpins, and forage fish (NPFMC 2008). Favorite Creek is the only stream in the study area currently listed as having chum, coho, and pink salmon present (Johnson and Klein 2009), and was the only stream with observed pink and chum spawning during 2009 field surveys. However, other streams in the study area were identified as containing rearing habitat (Table 1) for juvenile salmonid species listed in Table 3, and will be proposed for inclusion in ADF&G's *Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes* (Johnson and Klein 2009) as stipulated by the ADF&G fish resource permit for this project. Therefore, these streams should also be considered as EFH for coho salmon. Many other species with designated EFH were documented in the study area in 2009 (see Table 9; Appendix B: Table B1).

5.0 Special Status Species

5.1 Species Protected under the Endangered Species Act

The FAA's consultant team contacted NMFS about fish, aquatic invertebrates, and aquatic plants in the study area that are listed under the federal ESA. NMFS did not identify any such species. While not listed as threatened or endangered, forage fish and invertebrates in the area are likely to be prey of the threatened eastern U.S. stock of Steller sea lion (*Eumetopias jubatus*) and the endangered humpback whale (*Megaptera novaeangliae*). A detailed discussion on all federally protected marine mammals and seabirds is included in the *Vegetation, Wetlands, and Wildlife Resources Technical Report* (SWCA 2010b). Forage fish for ESA marine

mammals and seabirds that may use the study area include Pacific herring, gunnels, pricklebacks, sand lance (*Ammodytes hexapterus*), and smelts (see Table 9; Appendix B).

5.2 Tongass National Forest Sensitive Species

The USFS has identified sensitive species in the Tongass National Forest. These are defined as "plant or animal species that are susceptible or vulnerable to habitat alterations or management activities resulting in a viability concern for the species long-term persistence. Sensitive species may be those species under consideration for official listing as endangered or threatened species, are on an official state list, or are recognized by the Regional Forester as needing special consideration to ensure viable populations and to prevent their being placed on federal or state lists" (USFS 2008).

There are no fish, invertebrate, algae, or seagrass USFS sensitive species known to occur in the study or landscape areas.

5.3 Management Indicator Species

Management indicator species (MIS) are wildlife species whose responses to land management activities are thought to reflect the likely responses of other species with similar habitat requirements (USFS 2008a). The USFS identified the following species as fish MIS: pink salmon (*Oncorhynchus gorbuscha*) to represent anadromous fish that require freshwater gravel habitats, coho salmon (*O. kisutch*) to represent anadromous fish that require stream and lake freshwater habitats, Dolly Varden (*Salvelinus malma*) as a widely distributed freshwater species, and cutthroat trout (*O. clarkii*) due to their dependence on small freshwater stream habitats that are susceptible to management activities (USFS 1997). All four of these fish MIS occur in the study and/or landscape areas.

6.0 SUMMARY

A variety of aquatic habitats were observed in the study area. Freshwater habitats included Favorite Creek, 10 perennial stream basins, 14 seasonal stream basins, and three lakes (see Figure 3). Estuarine habitat was documented in the Favorite Bay tidal flats and at the mouths of streams 2, 3, and 4. Of the 49 streams surveyed, 15 of the streams contained suitable anadromous and resident fish habitat, two streams contained suitable resident habitat only, 12 additional streams contained potentially suitable anadromous and/or resident fish habitat, and 16 streams did not contain suitable fish habitat (see Table 1). Eleven species of fish were observed in freshwater and estuarine habitats. Marine habitats covered a wide array of depths (0 to −108 feet below MLLW), substrates (mud to bedrock), and algal cover (0 to 100% cover). Generally, water depths were greatest southeast of the Access Alternative 5 Favorite Bay Bridge (see Figure 4), substrates were coarser with distance from the tidal flats (see Figure 5), and vegetation was densest at the Access Alternative 5 Favorite Bay Bridge, Pea Hen, and the northwest part of the bay (see Figures 6 and 7). Thirty-two species of marine fish, 76 species of invertebrates, and 47 species of aquatic vegetation were noted. Additional fish and invertebrate species that are expected to use the study area but were not observed during summer 2009 field efforts are described in Appendices B and C. These species, which may be present at various times of the year, should be considered when assessing the effects of the proposed project on aquatic life due to their cultural, commercial, or recreational importance, or their protection under the MSA or an FMP. No invasive species were documented in the study area, which was relatively undisturbed by humans and appeared to be properly functioning habitat.

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Literature Cited

ADF&G. 1985. *Alaska Habitat Management Guide, Southcentral Region, Volume 1: Life Histories and Habitat Requirements of Fish and Wildlife*. Juneau, Alaska: Alaska Department of Fish and Game.

———. 1994. *Wildlife Notebook Series*. Alaska Department of Fish and Game. Available at: http://www.adfg.state.ak.us/pubs/notebook/notehome.php. Accessed November 10, 2008.

———. 1997. *Wildlife notebook series: Alaska king crabs*. Available at: http://www.adfg.state.ak.us/pubs/notebook/shellfsh/kingcrab.php. Accessed March 8, 2010.

———. 2006. *Atka mackerel fisheries in Alaska. Division of Commercial Fisheries.* Available at: http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/mackerel/mackerelhome.php. Accessed July 27, 2009.

———. 2008a. *Final Report: Southeast Alaska Chinook Salmon Age, Sex, Length Project. July 1, 2007-June 30, 2008*. ADF&G Project Code 11261144. Juneau, Alaska: Alaska Department of Fish and Game.

———. 2008b. *Sea cucumber fisheries in Alaska*. Alaska Department of Fish and Game. Available at: http://www.cf.adfg.state.ak.us/geninfo/shellfsh/seacucumber/seacuchome.php. Accessed February 2, 2009.

———. 2009a. *Halibut and groundfish fisheries*. Available at: http://www.sf.adfg.state.ak.us/region2/groundfish/gfhome.cfm. Accessed December 27, 2009.

———. 2009b. *Sport fish run timing*. Available at: http://www.sf.adfg.state.ak.us/StateWide/runtim/runtim.cfm?chart=runjno. Accessed August 11, 2009.

AFSC. 2009. *Species information*. Available at: http://www.afsc.noaa.gov/#. Accessed March 8, 2010.

Alaska Exotic Plant Information Clearinghouse. 2010. *Invasive plants of Alaska*. Alaska Exotic Plant Information Clearinghouse. Available at: http://akweeds.uaa.alaska.edu/. Accessed January 11, 2010.

Alaska Natural Heritage Program. 2005. *Dwarf eelgrass Zostera japonica Aschers. and Graebn*. Alaska Natural Heritage Program. Available at: http://akweeds.uaa.alaska.edu/pdfs/potential_species/bios/Species_bios_ZOJA.pdf. Accessed December 16, 2009.

Bargman, G. 1998. *Forage Fish Management Plan: A Plan for Managing the Forage Fish Resources and Fisheries of Washington*. Olympia, Washington: Washington Department of Fish and Wildlife.

Burke Museum of Natural and Cultural History. 2006. *Zostera japonica*. Burke Museum of Natural and Cultural History. Available at: http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Zostera&Species=japonica. Accessed January 12, 2010.

California Department of Fish and Game. 2009. *Marine sportfish identification: other fishes*. Available at: http://www.dfg.ca.gov/marine/mspcont7.asp. Accessed July 27, 2009.

Carroll, A. 2005. *Hot blooded predator: The salmon shark. Alaska's salmon sharks*. Alaska Department of Fish and Game, December 4, 2009. Available at: http://www.wildlifenews.alaska.gov/index.cfm?adfg=wildlife_news.view_article&articles_id=152&issue_id=27. Accessed 2010.

Conitz, J.M., and S.E. Burril. 2008. *Kanalku and Sitkoh Lakes Subsistence Sockeye Salmon Project: 2006 Annual Report*. Fishery Data Series No. 08-29. Juneau, Alaska: Alaska Department of Fish and Game.

Conitz, J.M., and M.A. Cartwright. 2007. *Kanalku and Sitkoh Lakes Subsistence Sockeye Salmon Project: 2004 Annual Report*. Fishery Data Series No. 07-01. Juneau, Alaska: Alaska Department of Fish and Game.

Conners, M.E., and M.A. Guttormsen. 2005. Forage fish species in the Gulf of Alaska. *North Pacific Fisheries Management Council 2005, Stock Assessment and Fishery Evaluation (SAFE) Report for Groundfish Resources in the Gulf of Alaska*, http://www.afsc.noaa.gov/refm/docs/2005/GOAforage.pdf.

Cowles, D. 2006. *Key to invertebrates found at or near the Rosario Beach Marine Laboratory (a campus of Walla Walla University) Fidalgo Island, Anacortes, WA*. Available at: http://www.wallawalla.edu/academics/departments/biology/rosario/inverts/index.html#Systematic%20Index. Accessed February 17, 2009.

Crone, R.A., and C.E. Bond. 1976. Life history of coho salmon, *Oncorhynchus kisutch*, in Sashin Creek, southeastern Alaska. *Fishery Bulletin* 74 (4):897–923.

DEC, U.S. Coast Guard, and U.S. Environmental Protection Agency. 2006. *Southeast Alaska Subarea Contingency Plan for Oil and Hazardous Substance Spills and Releases - Sensitive Areas Section*. Updated March 2006.

DigitalGlobe, Inc. 2004. Quickbird satellite multispectral aerial imagery of the Angoon, Alaska, vicinity. Longmont, Colorado: DigitalGlobe, Inc.

DOT&PF. 2007. *Angoon Airport Master Plan*. Available at: www.angoonairporteis.com.

Ehret, T. 2009. Tidal data and location of tide station in Favorite Bay, Alaska. E-mail communication on November 13, 2009, from T. Ehret, Physical Oceanographer, NOAA Center for Operational Oceanographic Products and Services, Silver Spring, Maryland, to Linda Mark, Geologist, Vigil Agrimis.

FAA. 2007. *Environmental Desk Reference for Airport Actions*. Federal Aviation Administration, Airports Planning and Environmental Division, APP-400, October 2007. Available at: http://www.faa.gov/airports/environmental/environmental_desk_ref/media/desk_ref.pdf. Accessed March 29, 2010.

Fay, V. 2002. *Alaska Aquatic Nuisance Species Management Plan*. October 2002. Juneau, Alaska: Alaska Department of Fish and Game.

Flora of North America Association. 2008. *Zostera*. Available at: http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=135358. Accessed January 12, 2010.

Frederickson, A. 2009. The location of historic herring spawning activity in Favorite Bay. Verbal communication on August 2009, from A. Frederickson, Angoon resident, to Ryan French, Aquatic Biologist, SWCA Environmental Consultants.

Froese, R., and D. Pauly (eds.). 2008. *FishBase Version September 2008*. Available at: www.fishbase.org. Accessed November 10, 2008.

Geiger, H., and ADF&G staff. 2007. *Northern Chatham Strait Sockeye Salmon: Stock Status, Fishery Management, and Subsistence Fisheries*. Special Publication No. 07-15. Anchorage, Alaska: Alaska Department of Fish and Game.

Goodson, G., and P.J. Weisgerber. 1988. *Fishes of the Pacific Coast*. Palo Alto, California: Stanford University Press.

Groot, C., and L. Margolis (eds.) 1991. *Pacific Salmon Life Histories*. Vancouver: University of British Columbia Press.

Halupka, K.C., M.D. Bryant, M.F. Willson, and F.H. Everest. 2000. *Biological Characteristics and Population Status of Anadromous Salmon in Southeast Alaska*. Technical Report PNW-GTR-468. Portland, Oregon: U.S. Forest Service.

Hanks, R.W. 1963. *The Soft-shell Clam*. Circular 162. U.S. Fish and Wildlife Service.

Harding, R.D. 2008. *Southeast Alaska Steelhead and Dolly Varden Management*. Special Publication 08-21. Anchorage, Alaska: Alaska Department of Fish and Game.

Jewett, S.C., and C.P. Onuf. 1988. *Habitat Suitability Index Models: Red King Crab*. Biological Report No. 82(10.153). March 1988. Washington, D.C.: U.S. Fish and Wildlife Service.

Johnson, J., and K. Klein. 2009. *Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes – Southeastern Region, Effective June 1, 2009*. Special Publication No. 09-04. Anchorage, Alaska: Alaska Department of Fish and Game.

Johnson, S.W., M.L. Murphy, D.J. Csepp, P.M. Harris, and J.F. Thedinga. 2003. *A Survey of Fish Assemblages in Eelgrass and Kelp Habitats of Southeastern Alaska*. NOAA Technical Memorandum NMFS-AFSC-139. Seattle, Washington: Alaska Fisheries Science Center.

Johnson, S.W., A.D. Neff, and J.F. Thedinga. 2005. *An Atlas on the Distribution and Habitat of Common Fishes in Shallow Nearshore Waters of Southeastern Alaska*. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-157. Seattle, Washington: Alaska Fisheries Science Center.

Koski, K.V. 2009. The fate of coho salmon nomads: the story of an estuarine-rearing strategy promoting resilience. *Ecology and Society* (1), http://www.ecologyandsociety.org/vol14/iss1/art4/.

MacNeil, F.S. 1965. *Evolution and Distribution of the Genus Mya, and Tertiary Migrations of Mollusca*. Professional Paper 483-G. U.S. Geological Survey.

Madden, C.J., K. Goodin, R.J. Allee, G. Cicchetti, C. Moses, M. Finkbeiner, and D. Bamford. 2009. *Draft Coastal and Marine Ecological Classification Standard*. Version III, August 2009. Charleston, South Carolina, and Arlington, Virginia: National Oceanic and Atmospheric Administration and NatureServe.

McCain, B.B., S.D. Miller, and W.W. Wakefield, II 2005. Appendix B, Part 2:Life History, Geographical Distribution, and Habitat Associations of 82 West Coast Groundfish Species: A Literature Review, Draft January 2005. In *Pacific Coast Groundfish Management Plan for the California, Oregon, and Washington Groundfish Fishery. November 2005*, http://www.pcouncil.org/groundfish/gffmp/gfa19/GF_FMP_App_B2.pdf.

McClory, J., and T. Gotthardt. 2008. *Non-native and Invasive Animals of Alaska: A Comprehensive List and Select Species Status Reports*. Alaska Natural Heritage Program, Environment and Natural Resources Institute, University of Alaska Anchorage. Available at: http://www.adfg.state.ak.us/special/invasive/documents/invasivespp_report.pdf. Accessed January 8, 2010.

McConnaughey, B.H., and E.McConnaughey. 1998. *Pacific Coast*. New York: Chanticleer Press, Inc.

McPherson, S., D. Bernard, J.H. Clark, K. Pahlke, E. Jones, J. Der Hovanisian, J. Weller, and R. Ericksen. 2003. *Stock Status and Escapement Goals for Chinook Salmon Stocks in Southeast Alaska*. Special Publication No. 03-01. Anchorage, Alaska: Alaska Department of Fish and Game.

Mecklenburg, C.W., T.A. Mecklenburg, and L.K. Thorsteinson. 2002. *Fishes of Alaska*. Bethesda, Maryland: American Fisheries Society.

Mecum, R.D. 2009. Angoon Airport Environmental Impact Statement scoping comments from National Marine Fisheries Service. Letter to Leslie Grey, Federal Aviation Administration, February 10, 2009, from R. Mecum, Acting Administrator, Alaska Region, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

Milner, A.M., J.G. Irons, III, and M.W. Oswood. 1997. The Alaskan landscape: an introduction for limnologists. In *Freshwaters of Alaska*, edited by A.M. Milner and M.W. Oswood. New York: Springer.

Monagle, K. 2008a. Favorite Creek index counts. E-mail communication on December 19, 2008, from Monagle, K., Fisheries Biologist, ADF&G, Douglas to Leyla Arsan, Aquatic Biologist, SWCA Environmental Consultants.

———. 2008b. Favorite Bay herring information. E-mail communication on December 30, 2008, from Monagle,, K., Fisheries Biologist, ADF&G, Douglas to Leyla Arsan, Aquatic Biologist, SWCA Environmental Consultants.

NMFS. 2005. Appendix F.5: EFH report for the salmon fisheries in the EEZ off the coast of Alaska. *Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska*, http://www.fakr.noaa.gov/habitat/seis/final/Volume_II/Appendix_F.5.pdf.

NOAA. 2005. *EFH Assessment Report for the Groundfish Resources of the Gulf of Alaska Region*. National Marine Fisheries Service. Available at: http://www.fakr.noaa.gov/habitat/seis/final/Volume_II/Appendix_F.1.pdf. Accessed November 7, 2008.

———. 2007. *Nautical Chart for Hood Bay and Kootznahoo Inlet. Chart no. 17339, edition 12, August 1, 2007*. Available at: http://www.charts.noaa.gov/OnLineViewer/17339.shtml. Accessed January 7, 2010.

———. 2009. *2009 NOAA tide predictions: Favorite Bay*. Available at: http://www.tidesandcurrents.noaa.gov/get_predictions.shtml?year=2009&stn=1393+Juneau&secstn=Favorite+Bay&thh=%2B0&thm=11&tlh=%2B0&tlm=15&hh=-2.8&hl=%2B0.3&footnote=. Accessed May 15, 2009.

NPFMC. 2005. *Environmental Assessment/Regulatory Impact Review/Regulatory Flexibility Analysis for Amendments 65/65/12/7/8 to the BSAI Groundfish FMP (#65), GOA Groundfish FMP (#65), BSAI Crab FMP (#12), Scallop FMP (#7) and the Salmon FMP (# 8) and Regulatory Amendments to Provide Habitat Areas of Particular Concern*. March 2005. Anchorage, Alaska: North Pacific Fishery Management Council.

———. 2008. *Fishery Management Plan for Groundfish of the Gulf of Alaska*. January 2008. Anchorage, Alaska: North Pacific Fishery Management Council.

———. 2009. *Fishery Management Plan for Groundfish of the Gulf of Alaska*. January 2009. Anchorage, Alaska: North Pacific Fishery Management Council.

NPS. 2009. *Guide to sport fishing opportunities in the northern Southeast Alaska area*. Available at: http://www.nps.gov/glba/planyourvisit/upload/Southeast%20AK%20Fishing%20Guide.pdf. Accessed December 18, 2009.

Ormseth, O.A., L. Connors, M. Guttormsen, and J. Vollenweider. 2008. Appendix 2: Forage fishes in the Gulf of Alaska. In *North Pacific Fisheries Management Council Gulf of Alaska SAFE*. Anchorage, Alaska: North Pacific Fisheries Management Council.

Orsi, J.A., E.A. Fergusson, W.R. Heard, M.V. Sturdevant, A.C. Wertheimer, D.G. Mortensen, and B.L. Wing. 2004. *Survey of Juvenile Salmon in the Marine Waters of Southeastern Alaska, May–August 2003*. Alaska Fisheries Science Center, National Marine Fisheries Service. Available at: http://www.afsc.noaa.gov/ABL/MSI/pdf/ORSI-AP2003-2004-SECM2003Sampling-NPAFCDoc.798.pdf. Accessed December 1, 2009.

Orsi, J.A., M.V. Sturdevant, J.M. Murphy, D.G. Mortensen, and B.L. Wing. 2000. Seasonal habitat use and early marine ecology of juvenile Pacific salmon in southeastern Alaska. *North Pacific Anadromous Fish Commission Bulletin* 2:111–122.

Pacific Fishery Management Council. 2005. *Pacific Coast Groundfish EFH FEIS. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery Appendix B Part 2 Groundfish Life History Descriptions*. Pacific Fishery Management Council. Available at: ftp://ftp.streamnet.org/pub/marinehabitat/FinalEFHEIS/Volume%205/FMP%20App%20B2.pdf.

Paustian, S.J. 1992. *A Channel Type Users Guide for the Tongass National Forest, Southeast Alaska*. Technical Paper 26. Juneau, Alaska: U.S. Forest Service.

Paustian, S.J, D. Kelliher, K. Anderson, D. Blanchet, S. Brady, M. Cropley, J. Edgington, J. Fryxell, G. Johnejack, M. Kuehn, S. Maki, R. Olson, J. Seesz, and M. Wolanek. 2009. *A Revision to the Channel Type Users Guide for the Tongass National Forest, Southeast Alaska*. R10-TP-26, Revision. Juneau, Alaska: U.S. Forest Service.

Powers, S.P., M.A. Bishop, J.H. Grabowski, and C.H. Peterson. 2006. Distribution of the invasive bivalve *Mya arenaria* L. on intertidal flats of southcentral Alaska. *Journal of Sea Research* 55:207– 216.

Pritchard, D.W. 1967. What is an estuary: physical viewpoint. In *Estuaries*, edited by G.F. Lauff. Washington, D.C.: American Association for the Advancement of Science.

Prussian, K.M., and J.F. Baichtal. 2007. Delineation of a karst watershed on Prince of Wales Island, southeast Alaska. In *Advancing the Fundamental Sciences: Proceedings of the Forest Service National Earth Sciences Conference, San Diego, CA, 18-22 October 2004*, edited by M. Furniss, C. Clifton and K. Ronnenberg. Portland, Oregon: U.S. Forest Service.

PSMFC. 1996. *Pacific herring fact sheet*. Available at: http://www.psmfc.org/habitat/edu_herring_fact.html. Accessed November 10, 2008.

R&M Engineering, Inc. 2001. Topographic data generated at five-foot contour intervals from stereo-pair aerial photographs taken April 2001. Prepared for the Federal Aviation Administration, Anchorage, Alaska, for the Angoon Airport Master Plan. Juneau, Alaska: R&M Engineering, Inc.

RaLonde, R. 1996. Paralytic shellfish poisoning: the Alaska problem. *Alaska's Marine Resources* (2), http://seagrant.uaf.edu/features/PSP/PSP.pdf.

Rhode, J. 2007. *Potential for Hybridization Between an Invasive Seagrass Species and its Native Congener*. University of North Carolina. Available at: http://www.weedcenter.org/funding/docs/FinalReports_8_08/2006%20Research%20Grant%20Reports/Rhode_J_Final_Report.pdf. Accessed March 8, 2010.

Robards, M.D., M.F. Willson, R.H. Armstrong, and J.F. Piatt (eds.) 1999. *Sand Lance: A Review of Biology and Predator Relations and Annotated Bibliography. Research Paper PNW-RP 521*. Portland, Oregon: U.S. Forest Service.

Rudy, P., Jr., and L.H. Rudy. 1983. *Oregon Estuarine Invertebrates: An Illustrated Guide to the Common and Important Invertebrate Animals*. FWS/OBS-83/16. U.S. Fish and Wildlife Service.

Schneider, P. 2008. 1980s survey of Favorite Creek. Unpublished data from USFS files, shared on December 11, 2008, from P. Schneider, Fisheries Biologist, U.S. Forest Service, Juneau to Leyla Arsan, Aquatic Biologist, SWCA Environmental Consultants.

Sempier, S. 2003. *Marine species with aquaculture potential off the coast of Oregon and the Pacific Northwest: red Irish lord*. Available at: http://hmsc.oregonstate.edu/projects/msap/PS/masterlist/fish/redirishlord.html. Accessed July 27, 2009.

SWCA. 2010a. *Subsistence Technical Report for the Angoon Airport Environmental Impact Statement*. Prepared for Federal Aviation Administration and Alaska Department of Transportation and Public Facilities. Salt Lake City, Utah: SWCA Environmental Consultants.

———. 2010b. *Vegetation, Wetlands, and Wildlife Technical Report for the Angoon Airport Environmental Impact Statement*. Salt Lake City, Utah: SWCA Environmental Consultants.

Talbot, S. 2009a. Results of genetic testing of *Zostera marina* samples from Angoon. E-mail communication on August 25, 2009, from S. Talbot, Research Geneticist, U.S. Geological Survey Alaska Science Center, Anchorage to Leyla Arsan, Aquatic Biologist, SWCA Environmental Consultants.

———. 2009b. Location and results of other genetically tested *Zostera marina* samples from southeast Alaska. E-mail communication on December 16, 2009, from S. Talbot, Research Geneticist, U.S. Geological Survey Alaska Science Center, Anchorage to Leyla Arsan, Aquatic Biologist, SWCA Environmental Consultants.

Talbot, S.L., S. Wyllie-Echeverria, D.H. Ward, J.R. Rearick, G.K. Sage, B. Chesney, and R. Phillips. 2006. Genetic characterization of *Zostera asiatica* on the Pacific coast of North America. *Aquatic Botany* 85:169–176.

Thedinga, J.S., S.W. Johnson, and D.G. Mortensen. 2006. Habitat, age, and diet of a forage fish in southeast Alaska: Pacific sandfish (*Trichodon trichodon*). *Fishery Bulletin* 104 (4):631–637.

Thorsteinson, F.V. 1962. Herring predation on pink salmon fry in a southeastern Alaska estuary. *Transactions of the American Fisheries Society* 91:321–323.

USFS. 2001. Chapter 20: Fish and aquatic stream habitat survey. R10 Amendment 2090.21-2001-1, dated November 16, 2001. In *Aquatic Habitat Management Handbook, FSH2090.21.* Juneau, Alaska: U.S. Forest Service.

———. 2002. *Mitchell Bay Watershed Landscape Assessment*. R10-MB-471. Alaska: U.S. Forest Service.

———. 2006. *Tongass National Forest Admiralty Island National Monument recreation fishing guide*, November 30, 2009. Available at: http://www.fs.fed.us/r10/tongass/districts/admiralty/fisheries/recfish.shtml. Accessed March 8, 2010.

———. 2008. Tongass Land Management Plan. R10-MB-603c. Juneau, Alaska: U.S. Forest Service.

———. 2009a. *Angoon Hydroelectric Project Final Environmental Impact Statement*. R10-MB-628. Juneau, Alaska: U.S. Forest Service.

———. 2009b. *Stream vector data for the Angoon, Alaska vicinity*. Available at: http://gina.uas.alaska.edu. Accessed January 12, 2010.

USGS. 2009a. *National Water Information System: web interface, USGS 15102000 Hasselborg Creek near Angoon, Alaska*. Available at: http://waterdata.usgs.gov/ak/nwis/inventory/?site_no=15102000&amp. Accessed January 10, 2010.

———. 2009b. *National Water Information System: web interface, USGS 15102200 Favorite Creek near Angoon, Alaska*. Available at: http://waterdata.usgs.gov/nwis/inventory/?site_no=15102200&amp. Accessed December 23, 2009.

VAI. 2010. *Draft Angoon Airport Environmental Impact Statement Water Resources Technical Memorandum*. Portland, Oregon: Vigil-Agrimis, Inc.

Vinzant, R.F., and J. Bednarski. 2010. *Kanalku Lake Subsistence Sockeye Project: 2009 Annual Report.* Fishery Data Series No. 10-67. Anchorage, Alaska: Alaska Department of Fish and Game.

Whalen, M.E. 1991. *Stock Assessment of Dolly Varden in the Buskin River, Kodiak, 1990*. Fishery Data Series No. 91-68. Anchorage, Alaska: Alaska Department of Fish and Game.

WRCC. 2010. *Period of record monthly climate summary: 9/1/1949 to 5/31/2006*. Available at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak0310. Accessed January 7, 2010.

Yanusz, R.J. 1997. *Status of Sea-run Cutthroat Trout, Sea-run Dolly Varden, and Steelhead Populations at Sitkoh Creek, Southeast Alaska, during 1996*. Fishery Data Series No. 97-23. Juneau, Alaska: Alaska Department of Fish and Game.

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Acronyms

AAC	Alaska Administrative Code
ADF&G	Alaska Department of Fish and Game
AFSC	Alaska Fisheries Science Center
AS	Alaska Statute
cm	centimeter
DEC	Alaska Department of Environmental Conservation
DOT&PF	Alaska Department of Transportation and Public Facilities
EFH	essential fish habitat
EIS	environmental impact statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FMP	fishery management plan
FSH	Forest Service Handbook
m	meter
MIS	management indicator species
MLLW	mean lower low water
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
NPS	National Park Service
P.L.	Public Law
PCR	polymerase chain reaction
ppt	parts per thousand
PSMFC	Pacific States Marines Fisheries Council
TLMP	Tongass Land Management Plan
U.S.C.	U.S. Code
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
VAI	Vigil-Agrimis, Inc.
WRCC	Western Regional Climate Center

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APPENDIX A. SPECIFICATIONS AND MEASUREMENTS OF STREAM CHANNELS INTERSECTING AIRPORT ALTERNATIVES

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Table A1. Specifications and Measurements of Field-Verified Stream Channels (Class I- IV) Intersecting Airport And Access Alternatives

Stream ID	USFS Channel Type and Stream Class	Substrate Type[1]	Bankfull Width	Wetted Width	Stream Gradient	SWCA Survey Date	Impact Area[2]	Notes on Depth
0 Favorite Creek	FPL1	CGR, SC	70 m	28 m	<2%	29-May-09	Access Alternative 2	0.45 m avg. depth
0 Favorite Creek	FPL1	CGR, SC	32 m	22 m	<2%	29-May-09	Access Alternative 3	0.65 m avg. depth, transitional area: LC2 channel type upstream of Access Alternative 3
0A	HC02	FGR, ORG	1.0 m	0.75 m	<6%	29-May-09	Access Alternative 2	0.07 m avg. depth
0C	HC02	SB, SC, MGR	1.0 m	1 m	6%	29-May-09	Access Alternative 3	0.07 m avg., 0.15 m max.
1	MM01	MGR, SC, BR	1–2.5 m	0.6–1 m	7%	8-Jun-09	Access Alternative 2	0.05 m avg., 0.3 m max.
1A	MM01	CGR, ORG	1 m	0.5 m	>6%	8-Jun-09	Access Alternative 2	0.025 m avg.
2	MM02	MGR, SC, BR	1–2 m	1–1.5 m	6–10%	25-Jun-09	Access Alternative 3	0.025–0.08 m avg.
2	MM01	SC	2 m	1.5 m	>5%	28-May-09	Access Alternative 2	0.05 m avg.
2A	PA01	MGR, SC, ORG	1 m	0.6 m	<2%	28-May-09	Access Alternative 2	0.025 m avg.
3	PA01	SS	1 m	0.7 m	<1%	13-Jul-09	Access Alternative 3	Narrow muskeg channel, 1 m avg.
3	MMM1	MGR, SC	8–10 m	3 m	1%	30-May-09	Access Alternative 2	0.2 m avg., 0.45 m max.
3	MCS1	BR, SC	10–15 m	1–1.5 m	2%	30-May-09	Access Alternative 2	0.45 m max.
4	MMS1	SS	2 m	1 m avg.	2–6%	30-May-09	Access Alternative 3	0.15 m avg.
4	MCS1	MGR, SS, SC	2 m	1.1 m	1%	30-May-09	Airport Alternative 4, Access Alternative 2	0.1 m avg.
4	MMS1	SS	2 m	0.8 m	2–6%	30-May-09	Airport Alternative 4	0.35 m avg.
4	PAB1	SS, ORG	5 m	3–3.7 m	1%	30-May-09	Airport Alternative 4	0.45 m avg.
5	PAS1	SS, ORG	1.0 m	1.0 m	<2%	31-May-09	Access Alternative 2, Access Alternative 3	Pondlike 0.5 m avg.
6	HC02	FGR, SS	1 m	0.6 m	≥6%	5-Jun-09	Airport Alternative 3a, Access Alternative 3	0.15 m max.
8	MM01	FGR, ORG	2 m	0.6 m	3%	2-Jun-09	Airport Alternative 3a	0.3 m max.

Table A1. Specifications and Measurements of Field-Verified Stream Channels (Class I- IV) Intersecting Airport And Access Alternatives

Stream ID	USFS Channel Type and Stream Class	Substrate Type[1]	Bankfull Width	Wetted Width	Stream Gradient	SWCA Survey Date	Impact Area[2]	Notes on Depth
8C	PA01	SS, ORG	1 m	1 m	1%	16-Jul-09	Airport Alternative 3a	0.5 m max.
9B	MMO1	FGR, ORG	2 m	1 m	3%	31-May-09	Access Alternative 3	
9D	PAB1	SS, ORG	4 m	2 m	2%	17-Jul-09	Airport Alternative 4	Beaver ponds 0.2 m avg.
9E	FP01	SS	1 m	<1 m	4%	31-May-09	Airport Alternative 4	0.3 m max.
9F	PAB1	SS	4 m	3 m	1%	17-Jul-09	Airport Alternative 4	1 m max.
9G	PAB1	SS	2 m	1.5 m	1%	17-Jul-09	Airport Alternative 4	0.5 m max.
10	PA02	FGR, SS	1 m	0.5 m	<2%	19-Jun-09	Airport Alternative 12a	0.1 m avg.
10A	FP02	FGR, SS	1 m	0.4 m	<2%	19-Jun-09	Airport Alternative 12a	0.1 m avg.
12	ESO1	SS	wetland	0.6 m channel	1%	1-Jun-09	Airport Alternative 12a	Pond 0.2 m max.
13	FP01	SS, FGR	2 m	0.5 m	2%	7-Jun-09	Airport Alternative 12a	0.05 m avg.
17	MM01	SS, ORG	0.6 m	0.6 m	1%	30-May-09	Access Alternative 2	Wetland pool near mouth, 0.025 avg.
22	MM01	SS, FGR, SC	2 m	1 m	2%–6%	4-Jun-09	Access Alternative 2	0.15 m max.
26	HC02	SS, FGR, SC	1 m avg.	0.6 m	8%	5-Jun-09	Airport Alternative 3a	0.3 m max.

Notes: Stream locations shown in Figure 3. Additional hydrologic descriptions of streams in VAI (2010). All units given in metric to meet USFS standards. Channel Types defined in Paustian et al (2009), stream class defined in USFS (2008).

[1] BR = Bedrock, CGR = Coarse Gravel, FGR = Fine Gravel, MGR = Medium Gravel, ORG = Organic, SB = Small Boulder, SC = Small Cobble, SS = Sand/silt

APPENDIX B. HABITATS USED BY FISH AND AQUATIC INVERTEBRATE SPECIES IN THE ANGOON AIRPORT STUDY AND LANDSCAPE AREAS

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Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
Sharks:						
salmon shark (*Lamna ditropis*) spiny dogfish shark (*Squalus acanthias*) blue shark (*Prionace glauca*) sleeper shark (*Somniosus pacificus*)	N/A	N/A	Salmon shark: pelagic; present year round; peak presence in summer during salmon and herring runs; mate in summer, birth in spring Spiny dogfish: migrate to shallow waters in summer for birthing Sep–Jan; usually near soft bottom <492 ft (<150 m)	Protected species (FMP)	(ADF&G 2009a; Carroll 2005; DEC et al. 2006; NOAA 2005)	Occasionally caught by sport anglers in Chatham Strait (anecdotal); in SE Alaska (Orsi et al. 2000; Orsi et al. 2004)
Skates:						
family Rajidae (Alaska skate, big skate, longnose skate, etc.)	N/A	Common in bays and shallow flats with little current; feed on clams and other infauna	On bottom; soft substrates; usually in deeper waters	Protected species (FMP)	(DEC et al. 2006; Mecklenburg et al. 2002)	In SE Alaska (DEC et al. 2006)
Herrings:						
Pacific herring (*Clupea pallasii*)	N/A	Occur in estuaries year-round; migratory; spawn in aquatic vegetation in shallow water Mar through Jun (peak Apr–May); present Mar through Oct	Migratory; spawn in aquatic vegetation in shallow water Mar through Jun (peak Apr–May); present year-round, peak presence Mar through Oct	Commercial, cultural, protected species (MSA)	(ADF&G 1994; DEC et al. 2006; PSMFC 1996; Thorsteinson 1962)	Adults (including fecund females) in Favorite Bay observed in 2009; historic spawning in Favorite Bay (SWCA 2010a)
Smelts:						
surf smelt (*Hypomesus pretiosus*)	Rarely	Sometimes found in brackish water	Migratory; schools spawn in surf on ocean beaches of coarse sand to fine gravel	Protected species (FMP, MSA)	(Bargman 1998; Mecklenburg et al. 2002)	In waters surrounding Admiralty Island (Johnson et al. 2005)

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
capelin (*Mallotus villosus*)	N/A	N/A	Neritic; spawn on intertidal sand/gravel beaches May–July; adults use waters 164–328 ft deep	Protected species (FMP, MSA)	(NOAA 2005)	In waters surrounding Admiralty Island (Johnson et al. 2005)
Salmons and trouts:						
cutthroat trout (*Oncorhynchus clarkii*)	Anadromous and nonmigratory types; spawn in small isolated headwater streams Apr–Jun; rear in streams, beaver ponds, sloughs, and lakes 2–4 years; adults typically overwinter in lakes	Anadromous; stay close to shoreline; may spawn 2–3 times; juveniles may rear in estuary during summer	Anadromous; stay close to shoreline; at sea 12–150 days; seldom travel more than 30–45 miles from home stream	Cultural, recreational	(ADF&G 1994; Mecklenburg et al. 2002)	In lakes, Favorite Creek, and Favorite Creek estuary (observed by SWCA in 2009)
pink salmon (*Oncorhynchus gorbuscha*)	Adults spawn in lower reaches of streams with gravel/cobbles Aug–Sep; juveniles leave fresh water soon after hatching in spring	Juvenile rearing late spring to summer; adult migration late summer; some adults observed spawning in the freshwater tidally influenced zone of lower Favorite Creek	Juvenile rearing late spring to summer; stay close to shore for several weeks (until 6–8 cm long) then move offshore; adults return in summer	Commercial, cultural, protected species (FMP, MSA), recreational	(ADF&G 1994; Groot and Margolis 1991; Mecklenburg et al. 2002)	Spawning observed in 2009 in Favorite Creek, juveniles in Favorite Bay
chum salmon (*Oncorhynchus keta*)	Adult migration late summer to fall; spawn primarily Aug–Sep in gravel areas with upwelling in lower reaches of streams or side channels; juveniles leave fresh water soon after hatching in spring	Juvenile rearing late spring to fall; adult migration late summer to fall; may spawn in the freshwater tidally influenced zone of lower Favorite Creek in gravel/cobbles	Juvenile rearing late spring to fall; stay close to shore for several months then move to open ocean; adults return after 3–6 years at sea	Commercial, cultural, protected species (FMP, MSA), recreational	(ADF&G 1994; Groot and Margolis 1991; Mecklenburg et al. 2002)	Spawning observed by SWCA in 2009 in Favorite Creek, juveniles in Favorite Bay

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
coho salmon (*Oncorhynchus kisutch*)	Adult migration late summer to fall; spawn in fall in gravels of headwater streams; fry emerge in spring and occupy shallow stream margins; rear 1–5 years in ponds, lakes, and pools with large wood or undercut banks; juveniles overwinter in off-channel areas	Smolt outmigration in spring; juvenile fry estuarine rearing spring–fall in brackish areas before returning to fresh water; adult migration late summer to fall	Smolt rearing in late spring to summer, gradually moving offshore; adults return after 1–3 years at sea	Commercial, cultural, protected species (FMP, MSA), recreational	(ADF&G 1994; Groot and Margolis 1991; Mecklenburg et al. 2002)	Adults observed in Favorite Bay, juveniles in Favorite Bay and Favorite Creek by SWCA in 2009
steelhead trout (*Oncorhynchus mykiss*)	Not known to use streams in the study area	Not known to rear in estuarine habitats in the study area	Adults may use study area for migration and foraging; may have multiple spawning migrations	Cultural, recreational	(ADF&G 1994; Mecklenburg et al. 2002)	Nearest spawning Hasselborg Creek (Geiger and ADF&G staff 2007)
sockeye salmon (*Oncorhynchus nerka*)	Adult migration in summer; spawning primarily in Sep in streams or along lake beaches with upwelling; juveniles emerge in the spring and rear in lakes 1–3 years; landlocked kokanee may be present in lakes year round	Juvenile rearing in spring and early summer; adult migration in summer	Juvenile outmigration in spring; rear close to shore before moving offshore; adults return to fresh water after 1–4 years at sea	Commercial, cultural, protected species (FMP, MSA), recreational	(ADF&G 1994; Groot and Margolis 1991; Mecklenburg et al. 2002; USFS 2006)	Primarily in Kanalku Bay and Hasselborg Creek; observed in Favorite Bay, one adult observed in Favorite Creek by SWCA in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
Chinook salmon (*Oncorhynchus tshawytscha*)	Not known to use streams in the study area	Juveniles not known to rear in estuarine habitats in the study area	Juvenile rearing year round in Chatham Strait; adults present in nearshore areas almost year-round (inside rearing stock), in Favorite Bay in spring	Commercial, cultural, protected species (FMP, MSA), recreational	(ADF&G 1994, 2008a; Groot and Margolis 1991; Halupka et al. 2000; Mecklenburg et al. 2002)	Adults in Favorite Bay observed by SWCA in 2009
Dolly Varden (*Salvelinus malma*)	Anadromous and nonmigratory types; spawn Aug–Nov in stream of origin; juveniles year-round in lakes and streams; adults typically overwinter in lakes	Juveniles present year-round, peak abundance in spring; adults migrate annually to salt water in spring, return to fresh water in fall; rarely spawn more than twice	Juveniles may be present year-round, peak abundance in spring; peak adult abundance in salt water May–Jul	Cultural, recreational	(ADF&G 1994)	In lakes, Favorite Creek estuary, and Favorite Bay observed in 2009
Cods:						
walleye pollock (*Theragra chalcogramma*)	N/A	N/A	Schools of juveniles abundant in northwest Favorite Bay in spring 2009; juveniles in upper 131 ft of water column; adults unlikely to use study area	Commercial, protected species (FMP, MSA)	(DEC et al. 2006; Mecklenburg et al. 2002; NOAA 2005)	Juveniles in Favorite Bay observed in 2009
Pacific cod (*Gadus macrocephalus*)	N/A	N/A	Benthic, demersal, and migratory: deep in winter/spring during spawning (Jan–Apr) and shallow (<328 ft [<100 m]) in summer; use mud, sand, and gravel substrates	Commercial, cultural, protected species (FMP, MSA)	(McCain et al. 2005)	In Favorite Bay observed in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
Rockfishes:						
copper rockfish (*Sebastes caurinus*) yelloweye rockfish (*S. ruberrimus*)	N/A	N/A	Demersal shelf rockfish assemblage, close to bottom in rocky, shallow-water areas; copper <393 ft (<120 m), in eelgrass and kelp; yelloweye >164 ft (>50 m)	Commercial, cultural, protected species (FMP, MSA), recreational	(Johnson et al. 2003; Mecklenburg et al. 2002)	In NMFS scoping comments (Mecum 2009), presence in study area unknown; yelloweye observed near Hood Bay by SWCA in 2009
rougheye rockfish (*Sebastes aleutianus*) shortraker rockfish (*S. borealis*) yellowtail rockfish (*S. flavidus*) Pacific ocean perch (*S. alutus*)	N/A	N/A	Slope assemblage; on bottom >328 ft (>100 m) depth (yellowtail >164 ft [>50 m] depth)	Commercial, cultural, protected species (FMP, MSA), recreational	(Mecklenburg et al. 2002)	In NMFS scoping comments (Mecum 2009), presence in study area unknown
silvergray rockfish (*Sebastes brevispinis*)	N/A	N/A	Slope assemblage; on bottom in offshore deeper waters (>328 ft [>100 m]), juveniles occasionally in bays and associated with kelp beds	Commercial, cultural, protected species (FMP, MSA), recreational	(AFSC 2009; Mecklenburg et al. 2002)	Observed in Chatham Strait in 2009
quillback rockfish (*Sebastes maliger*)	N/A	N/A	Demersal shelf; most common rockfish in Killisnoo Harbor during summer months; rocky bottom and reefs; inshore shallower than 476 ft (145 m)	Commercial, cultural, protected species (FMP, MSA), recreational	(Mecklenburg et al. 2002)	Observed in Killisnoo Harbor in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
dusky rockfish (*Sebastes ciliates*)	N/A	N/A	Pelagic shelf; in schools around rocky reefs; darker variant in waters <328 ft (<100 m); in eelgrass and kelp	Commercial, cultural, protected species (FMP,MSA), recreational	(Johnson et al. 2003; Mecklenburg et al. 2002)	Observed in Favorite Bay in 2009
black rockfish (*Sebastes melanops*)	N/A	N/A	Pelagic; rocky substrates and reefs; in schools 492 ft (150 m) to surface; juveniles nearshore in eelgrass and kelp during summer	Commercial, cultural, protected species (MSA), recreational	(Johnson et al. 2003; McCain et al. 2005; Mecklenburg et al. 2002)	Observed at Danger Point in 2009
yelloweye rockfish (*Sebastes ruberrimus*)	N/A	N/A	Demersal shelf; rocky substrates, reefs and boulder fields; 164–1,312 ft (50–400 m) deep	Commercial, cultural, protected species (FMP, MSA), recreational	(McCain et al. 2005; Mecklenburg et al. 2002)	Observed in Hood Bay in 2009
Sablefishes:						
sablefish (black cod) (*Anoplopoma fimbria*)	N/A	N/A	Soft substrates, juveniles nearshore in bays or shallow water near bottom 2–5 years; adults in deeper waters <2,297 ft (<700 m); spawn at depth in winter	Commercial, recreational, protected species (FMP, MSA)	(DEC et al. 2006; Mecklenburg et al. 2002)	Observed in Chatham Strait in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
Greenlings:						
lingcod (*Ophiodon elongates*)	N/A	Juveniles associated with kelp and eelgrass, rarely use shallow bays in SE Alaska inside waters, but may be present in estuaries	Juveniles use aquatic vegetation; spawn Dec through Apr (peak Jan–mid-Mar); inshore rocky reefs 33–328 ft (10–100 m) deep; high current areas	Commercial, cultural, recreational	(ADF&G 1994; AFSC 2009; DEC et al. 2006; McCain et al. 2005; Mecklenburg et al. 2002)	Observed in Hood Bay in 2009
kelp greenling (*Hexagrammos decagrammus*) whitespotted greenling (*H. stelleri*), etc.	N/A	Whitespotted most common greenling in bays and estuaries; around reefs and kelp beds	Shallow rocky areas and reefs; around algae and kelp beds; <328 ft (<100 m)	Cultural, juveniles important forage species in some areas, recreational	(DEC et al. 2006; Mecklenburg et al. 2002)	Kelp and whitespotted greenling observed in Favorite Bay in 2009
Sculpins:						
northern sculpin (*Icelinus borealis*)	N/A	N/A	Mud, silt, sand, gravel, pebble and shell bottoms at depths of 15–810 ft (4.6–247 m)	Protected species (MSA)	(Mecklenburg et al. 2002)	In waters surrounding Admiralty Island (Johnson et al. 2005)
silverspotted sculpin (*Blepsias cirrhosus*)	N/A	N/A	Near shore to depths of 154 ft (47 m); among seaweed and rocks	Protected species (MSA)	(Mecklenburg et al. 2002)	In waters surrounding Admiralty Island (Johnson et al. 2005)
ribbed sculpin (*Triglops pingelii*)	N/A	N/A	Sand, pebble, and rocky bottoms at depths of 66–492 ft (20–150 m)	Protected species (MSA)	(Mecklenburg et al. 2002)	Observed in Favorite Bay in 2009
buffalo sculpin (*Enophrys bison*)	N/A	N/A	Rocky and sandy areas; occasionally in tidepools; spawn in late winter–early spring	Protected species (MSA)	(Mecklenburg et al. 2002)	In waters surrounding Admiralty Island (Johnson et al. 2005)

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
red Irish lord (*Hemilepidotus hemilepidotus*)	N/A	N/A	Rocky intertidal to 328 ft, spawn in intertidal or shallow water	Protected species (FMP, MSA)	(Johnson et al. 2005; Mecklenburg et al. 2002; NOAA 2005)	Observed in Favorite Bay in 2009
Pacific staghorn sculpin (*Leptocottus armatus*)	Occasionally in lower reaches of rivers and streams	Sand/silt/shell-bottomed areas; eelgrass beds; typically in lower reaches of estuaries where salinity is high	Intertidal to subtidal sand/silt/shell-bottomed areas; eelgrass beds	Protected species (MSA)	(Mecklenburg et al. 2002)	Observed in Favorite Bay in 2009
great sculpin (*Myoxocephalus polyacanthocephalus*)	N/A	N/A	Intertidal on sand and mud bottoms; also around rocks; often near shore	Protected species (FMP, MSA)	(Johnson et al. 2005; Mecklenburg et al. 2002; NOAA 2005)	Observed in Favorite Bay in 2009
tidepool sculpin (*Oligocottus maculosus*)	N/A	Resident of tidepools and sheltered intertidal areas	Resident of tidepools and sheltered intertidal areas	Protected species (MSA)	(Mecklenburg et al. 2002)	Observed in Salt Lagoon in 2009
Surfperches:						
shiner perch (*Cymatogaster aggregata*)	Enters brackish and fresh waters	Enters brackish and fresh waters	Shallow waters in bays, near eelgrass, reefs, piers, and pilings	Potential forage fish for birds and fish	(Johnson et al. 2005; Mecklenburg et al. 2002)	Observed in Salt Lagoon and Favorite Bay in 2009
Pricklebacks:						
arctic shanny (*Stichaeus punctatus*) snake prickleback (*Lumpenus sagtta*), etc.	N/A	N/A	Shanny in shallow subtidal rocky to sandy; 180 ft (<55 m); on bottom; snake prickleback in sand with silt, pebbles, and stones 656 ft (<200 m)	Protected species (FMP, MSA)	(Mecklenburg et al. 2002)	Observed in Favorite Bay in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
Gunnels:						
crescent gunnel (*Pholis laeta*) penpoint gunnel (*Apodichthys flavidus*), etc.	N/A	N/A	Intertidal to subtidal in eelgrass, algae, or rocks	Protected species (FMP, MSA)	(Mecklenburg et al. 2002)	Crescent and penpoint gunnel observed in Favorite Bay in 2009
Sandfishes:						
Pacific sandfish (*Trichodon trichodon*)	N/A	N/A	Adults usually 328–656 ft (100–200 m) over sand or mud; spawn nearshore in algae; may school in bays; larvae and juveniles shallower, nearshore; partially bury in sand or mud; adults prey on juvenile salmon	Protected species (FMP, MSA)	(DEC et al. 2006; Froese and Pauly 2008; Mecklenburg et al. 2002; Orsi et al. 2000)	Habitat present; In waters surrounding Admiralty Island (Johnson et al. 2005)
Sand Lances:						
Pacific sand lance (*Ammodytes hexapterus*)	N/A	Euryhaline, use eelgrass beds, fine gravel and sand in shallow waters near shore	Use fine gravel and sand in shallow waters near shore; spawn Apr through Jun along sandy shorelines	Protected species (FMP, MSA)	(Conners and Guttormsen 2005; DEC et al. 2006; Johnson et al. 2005; Robards et al. 1999)	Habitat present; in waters surrounding Admiralty Island (Johnson et al. 2005)
Righteye flounders:						
arrowtooth flounder (*Atheresthes stomias*)	N/A	N/A	Juveniles rear in shallow waters; soft bottom; adults usually offshore	Commercial, cultural (bait fish), protected species (FMP, MSA)	(NOAA 2005)	Observed in Chatham Strait in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
flathead sole (*Hippoglossoides elassodon*)	N/A	N/A	Silty, muddy bottoms, near shore typically <1,201 ft (<366 m); spawn Feb–Apr at 164–984 ft (50–300 m) Inhabit deeper areas of bays, but move near shore to forage	Protected species (FMP, MSA)	(DEC et al. 2006; Mecklenburg et al. 2002; NOAA 2005; NPFMC 2008)	In NMFS scoping comments (Mecum 2009), presence in study area unknown
Pacific halibut (*Hippoglossus stenolepis*)	N/A	Adults and sub-adults in areas with sand, mud and gravel substrate	Juveniles in nearshore areas 7–164 ft (2–50 m) with soft substrates; spawns in winter 591–1,476 ft (180–450 m) along continental slope	Commercial, cultural, protected species (FMP), recreational	(ADF&G 2009a; AFSC 2009)	Observed in Favorite Bay and Killisnoo Harbor in 2009
English sole (*Parophrys vetulus*)	N/A	Soft bottom from lower intertidal to 820 ft (250 m); juveniles flourish in shallow bays and tidal flats	Soft bottom from lower intertidal to 820 ft (250 m); juveniles flourish in shallow bays and tidal flats	Protected species (FMP, MSA)	(Mecklenburg et al. 2002)	In Sitkoh Bay, Chichagof Island (Johnson et al. 2005)
yellowfin sole (*Limanda aspera*)	N/A	Spawn and rear in shallow subtidal areas of bays and estuaries	Soft bottoms, at depths of 33–1,969 ft, typically <492 ft; spawn and rear in shallow water; juveniles near shore 3–5 years	Protected species (FMP, MSA)	(DEC et al. 2006; Mecklenburg et al. 2002; NOAA 2005)	In waters surrounding Admiralty Island (Johnson et al. 2005)
southern rock sole (*Lepidopsetta bilineata*)	N/A	Sand and gravel bottom; demersal; inhabit deeper areas of bays, but often move into nearshore areas to forage	Sand and gravel bottom; demersal; juveniles can be abundant in shallow nearshore waters; spawn in summer	Protected species (FMP, MSA)	(AFSC 2009; DEC et al. 2006; NOAA 2005)	Observed in Favorite Bay in 2009

Table B1. Habitats Used by Important Fishes Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
starry flounder (*Platichthys stellatus*)	N/A	Soft-bottomed areas; spawn (late winter to early summer) and rear in shallow subtidal areas of bays and estuaries; resident in shallow flats, estuaries, and lagoons throughout their life	Soft-bottomed areas; spawn (late winter to early summer) and rear in shallow subtidal areas of bays and estuaries; resident in shallow flats, estuaries, and lagoons throughout their life	Protected species (FMP, MSA)	(DEC et al. 2006; Mecklenburg et al. 2002)	Observed in Favorite Bay and Killisnoo Harbor in 2009
rex sole (*Glyptocephalus zachirus*)	N/A	N/A	Sandy or muddy bottom; shallow water near shore to offshore; usually 164–1,476 ft (50–450 m); prefer deep portions of submarine canyons	Protected species (FMP, MSA)	(Mecklenburg et al. 2002; NPFMC 2008)	In NMFS scoping comments (Mecum 2009), presence in study area unknown

Note: [1] Table limited to species that are 1) protected (by the Magnuson-Stevens Fishery Conservation and Management Act [MSA] or Fishery Management Plans [FMP]), 2) commercially, culturally, or recreationally important; cultural significance determined from SWCA 2010b and/or 3) prey for sensitive marine mammals or bird species (SWCA 2010b).

All observations made by SWCA in 2009 were associated with this technical report. For exact locations of observations see Tables 3 and 8.

Table B2. Habitats Used by Important Invertebrates Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
Crustaceans:						
acorn barnacle (*Balanus glandula*)	N/A	Less common	Upper intertidal, mainly on rocks	Prey for sensitive bird species	(Cowles 2006)	Observed in Favorite Bay and Salt Lagoon in 2009
Dungeness crab (*Cancer magister*)	N/A	Up to head of tide in estuaries, often near eelgrass beds; juveniles in intertidal to shallow subtidal	Resident of sand/mud substrates, mate spring–fall; adults primarily subtidal to 756 ft (230 m)	Commercial, cultural	(ADF&G 1994; DEC et al. 2006)	Observed in Favorite Bay in 2009
Tanner crab (*Chionoecetes bairdi*)	N/A	N/A	Juveniles at 33–66 ft with mud substrates; diel migrations, near depth of chlorophyll maximum diurnally; mating Feb–Jun nearshore; peak hatching Apr–Jun	Commercial, cultural, protected species (FMP)	(ADF&G 1994; NOAA 2005)	Observed in Favorite in 2009
red king crab (*Paralithodes camtschaticus*)	N/A	N/A	Juveniles use boulders/cobbles at depths <164 ft; adults migratory, mate in shallow water <164 ft Jan–June	Commercial, cultural, protected species (FMP)	(NOAA 2005)	In SE Alaska (ADF&G 1997)
blue king crab (*Paralithodes platypus*)	N/A	N/A	Juveniles use gravel/cobbles with shell hash at depths 131–197 ft; adults use mud/sand at depths 148–246 ft, migrate to shallow water in late winter, mate in mid spring	Commercial, cultural, protected species (FMP)	(NOAA 2005)	In SE Alaska (ADF&G 1997)

Table B2. Habitats Used by Important Invertebrates Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
golden (brown) king crab (*Lithodes aequispinus*)	N/A	N/A	Usually >300 ft, steep sided ocean bottoms	Commercial, cultural, protected species (FMP)	(ADF&G 1997)	In SE Alaska (ADF&G 1997)
krill (order Euphausiacea)	N/A	N/A	In large swarms	Protected species (FMP, MSA)	(Conners and Guttormsen 2005)	In SE Alaska (DEC et al. 2006)
shrimp (family Pandalidae: spot, coonstripe, pink, sidestripe, humpy shrimp, etc.)	N/A	May use brackish waters	Coonstripes and spots generally near rockpiles, coral, and debris-covered bottoms; pinks, sidestripes, and humpy shrimp over muddy bottom; spawn in fall, hatch in spring	Commercial, cultural; recreational,	(ADF&G 1994; DEC et al. 2006)	Several species observed in Favorite Bay in 2009
Echinoderms:						
giant sea cucumber (*Parastichopus californicus*)	N/A	Primarily hard bottom with algae	Intertidal to subtidal: common in protected bays on hard and sandy substrates	Commercial, cultural	(ADF&G 2008b); Observed by SWCA in 2009	Observed in Favorite Bay in 2009
Mollusks:						
gumboot chiton (*Cryptochiton stelleri*) black leather chiton (*Katharina tunicata*) lined chiton (*Tonicella lineata*), etc.	N/A	Black leather chiton common in middle and low intertidal zones	Low intertidal to subtidal, on rocky substrates, especially in kelp beds	Cultural; prey for sensitive bird species	(Cowles 2006)	Observed in Favorite Bay in 2009; black leather chiton most common in study area

Table B2. Habitats Used by Important Invertebrates Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
squid (family Gonatidae)	N/A	N/A	Eggs of nearshore neritic species attached to rocks; reproduce spring–early summer; juveniles at all depths and near shore	Cultural, protected species (FMP, MSA)	(NOAA 2005)	In SE Alaska (Orsi et al. 2004)
giant Pacific octopus (*Enteroctopus dofleini*)	N/A	N/A	Eggs on rocks/cobble, adults may also use sand/mud	Cultural, protected species (FMP, MSA), recreational	(NOAA 2005)	Observed in Killisnoo Harbor in 2009
Clams: Pacific littleneck clam (*Protothaca staminea*) butter clam (*Saxidomus giganteus*) gaper clam (*Tresus capax*) Pacific geoduck (*Panopea abrupta*) softshell clam (*Mya arenaria*) cockle (*Clinocardium nuttalli*), etc.	N/A	Common in estuaries and bays; gapers and geoducks deeply embedded in sand or mud; cockles more abundant near eelgrass in Favorite Bay	Low intertidal to subtidal in sand, mud, or gravel; littlenecks may be in gravel among rocks on open coast	Commercial, cultural, recreational	(Cowles 2006; DEC et al. 2006; RaLonde 1996; Rudy and Rudy 1983); Observed by SWCA in 2009	All species except geoduck observed in Favorite Bay in 2009
Pacific blue mussel (*Mytilus trossulus*)	N/A	In quiet bays	Intertidal and subtidal up to 16 ft (5 m) deep; densely packed around rock, wood, or other solid structure	Prey for sensitive bird species and sea otters	(Cowles 2006)	Observed in Favorite Bay in 2009
mask limpet (*Tectura persona*), shield limpet (*Lottia pelta*), etc.	N/A	N/A	Upper intertidal rocky areas	Prey for sensitive bird species	(Cowles 2006)	Observed in Favorite Bay in 2009

Table B2. Habitats Used by Important Invertebrates Likely to Occur in the Study Area

Common Name (Scientific Name)	Habitat Use			Importance[1]	Species Information	Documentation in Study Area
	Freshwater	Estuary	Saltwater-Nearshore			
pinto abalone (*Haliotis kamschatkana*)	N/A	N/A	Usually along outside coast in marine waters; in thick kelp beds and near sandy bottom; primarily subtidal to 30–40 ft	Commercial, cultural	(ADF&G 1994)	In SE Alaska (ADF&G 1994)
Pacific weathervane scallop (*Patinopecten caurinus*)	N/A	N/A	Occur in beds; spawn in Jun and Jul; sand, gravel and rock bottoms 148–591 ft (45–180 m); juveniles attach to seaweed	Commercial, cultural, protected species (FMP), recreational	(ADF&G 1994; DEC et al. 2006)	In SE Alaska (ADF&G 1994)
pink scallop (bay scallop) (*Chlamys* sp.)	N/A	N/A	Occur shallower than weathervanes 49–197 ft (15–60 m)	Cultural, recreational	(DEC et al. 2006)	Observed in Favorite Bay in 2009

Note: [1] Table limited to species that are 1) protected (by the Magnuson-Stevens Fishery Conservation and Management Act [MSA] or Fishery Management Plans [FMP]), 2) commercially, culturally, or recreationally important; cultural significance determined from SWCA 2010b and/or 3) prey for sensitive marine mammals or bird species (SWCA 2010b).

All observations made by SWCA in 2009 were associated with this technical report. For exact locations of observations see Table 7.

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APPENDIX C. SEAGRASS OBSERVED IN THE STUDY AREA

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Seagrass collected June 4, 2009, in Favorite Bay, AK, preserved in ethanol.
Notched, closed leaf sheaths, blades about 1 mm wide, rhizomatous.

Table C1. A Comparison of Morphological Characteristics of Seagrasses

Parameter	Angoon Specimens (*Zostera marina*)	Pacific Eelgrass (*Zostera marina*)	Dwarf Eelgrass (*Zostera japonica*)
Habitat	Small patches (~5 square feet) documented on tidal flats (sand/silt/shell) in small depressions that held some water (≥3 inches) at extreme low tides	Sublittoral region, only rarely being exposed at low tide; occurs in more or less sheltered areas on soft mud or firm sand[1] Subtidal area[2]	Intertidal marine waters; −2 to 0 m[1] Mud flats between low and semi-high tide marks[2]
Leaf length	5.5 inches	Up to 3 feet long	4–12 inches
Leaf width	0.6 inches (1.5 mm)	Up to 3.1 inches (8 mm)	Barely 0.6 inches (1.5 mm)
Blades	3 nerved (some with flowering shoots)	3–7 nerved, and round at the apex	3 nerved
Sheath	Closed and notched	Leaf sheath tubular, without membranous flaps, rupturing with age[1]	Leaf sheath open, with 2 membranous flaps, which persist without rupturing[1], overlap each other, and may be up to 2 inches long
Notes	Collected June 4, 2009, near Angoon, Alaska; patches of *Z. marina* documented within 0.5 mile from sample collection point, with specimens much larger (18 inches long, 1.6 inches [4 mm] wide)	Native species; observed throughout study area	Not known to occur in Alaska; originally from Asia; introduced to Oregon, Washington, and British Columbia

Note: Z. marina and *Z. japonica* descriptions from Alaska Natural Heritage Program (2005). *Z. japonica* is considered by some to belong to the genus *Nanozostera*.

[1] Flora of North America Association (Flora of North America Association 2008)

[2] Burke Museum of Natural and Cultural History (Burke Museum of Natural and Cultural History 2006)

APPENDIX J
WATER RESOURCES TECHNICAL MEMORANDUM

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

Angoon Airport Environmental Impact Statement
Water Resources Technical Memorandum

Prepared for

The Federal Aviation Administration,

The Alaska Department of Transportation and Public Facilities, and

SWCA Environmental Consultants

Prepared by

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1.0 Introduction

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska (Figure 1 in Appendix A). At present, there is no land-based airport runway in or near Angoon. The DOT&PF prepared the Angoon Airport Master Plan (DOT&PF 2007) for their proposed airport location. The EIS is evaluating two alternative airport locations in addition to the DOT&PF's proposed location and multiple access road alternatives associated with those airport locations (Figure 2 in Appendix A). (Note: Access Alternative 5 was studied and is shown on Figure 3 [Appendix A] in this report, but it was subsequently dropped from consideration in the EIS.) Two of the airport alternatives and portions of their associated access roads are located on lands administered by the U.S. Forest Service (USFS) within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area).

The proposed land-based airport would be a small, commercial airport typical of other rural airports in the region. The initial construction would include a 3,300-foot-long paved runway, with the ability to extend the runway length to 4,000 feet in the future if air traffic warrants it. The airport would have a short, perpendicular taxiway leading from the runway to a small apron area, which may eventually contain a passenger shelter building. The proposed airport is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The access road would have a gravel surface and would be two lanes wide (one lane in each direction) with 9-foot-wide lanes and minimal shoulders.

This water resources technical report was completed by the FAA's water resources consultant team (Vigil-Agrimis, Inc.) to support the development of the EIS. Angoon is located on the western side of Admiralty Island in Southeast Alaska and is the island's only permanent settlement. The community of approximately 430 residents (2008 data (DOL&WD 2009) is located approximately 60 miles south of Juneau and 50 miles northeast of Sitka. Figure 1 (in Appendix A) is a vicinity map and Figure 2 (in Appendix A) is a project location map.

For the EIS analysis, three potential locations are being investigated that were either proposed in the Master Plan or are variations of locations proposed in the Master Plan (Figure 3 in Appendix A). When the water resources fieldwork was conducted and this technical report was originally prepared, four airport alternatives were under consideration for inclusion in the EIS. Subsequently, one alternative, Airport Alternative 3, was dropped. Data gathered for water resources for Alternative 3 are presented in this report for general information purposes only and to communicate the results of the field studies in that portion of the area. This document describes the existing conditions of the water resources within the vicinity of the airport and access alternatives. This area is hereafter referred to as the study area.

1.1 Project Issues

Three airport alternatives (Airport Alternatives 3, 3A, and 4) are located across Favorite Bay from Angoon (Figure 3 in Appendix A). These alternatives would require a choice of one of two road connections that would begin at the end of the current road system and parallel the Favorite Bay shoreline or a road connection that would cross Favorite Bay. Road options that would parallel the Favorite Bay shoreline would require crossings of five unnamed streams and several additional minor short stream segments as well as a bridge crossing of Favorite Creek at the southern end of Favorite Bay. An airport alternative (Airport Alternative12a) is located closer to the community because roads already exist in this area, and fewer airport access roads would need to be built (Figure 3 in Appendix A). Five additional unnamed streams have the potential to be impacted by the required clearing and grading of the airport alternatives.

Airport Alternatives 3, 3a, and 4 are mainly within the Monument–Wilderness Area with small portions of the alternatives being within Kootznoowoo Corridor Lands. The alternative closest to Angoon is entirely within the Kootznoowoo Incorporated Lands. The Kootznoowoo Incorporated Lands are a native claim, and therefore the use of the land would be established within the requirements of the Alaska Native Claims Settlement Act (ANCSA). The Monument–Wilderness Area is federally protected, and use of the land would be established within the requirements of the Alaska National Interest Lands Conservation Act (ANILCA). Wilderness areas, by definition, are protected lands that typically provide high quality water resources.

The airport alternatives and access alternatives, collectively, have the potential to impact 10 unnamed streams, Favorite Creek, and two lakes (Figure 3 in Appendix A). Figures 3 and 4 (in Appendix A) show the airport alternatives, the access alternatives, and potential water resources impacts to streams and lakes. These water resources support subsistence, commercial, and recreational fisheries that are very important to the Angoon economy. Additionally, these areas provide important habitat for other aquatic organisms and wildlife.

Note: Airport alternatives illustrated on figures throughout this report represent locations only and do not depict final areas of disturbance.

1.2 Scope of Studies

The airport alternatives are located in a wilderness where post-glacial landforms, abundant precipitation, and wide tidal fluctuations create and sustain a hydrologic environment. This report describes existing conditions for a number of water resources in the study area. The conditions described include:

- Stream hydrology
- Stream geomorphology
- Floodplains
- Freshwater quality

The information in this document is based on reviewing existing data and reports as well as field investigations conducted in May and September 2009. This document contains discussions of methods, scope of study, and findings for the water resources associated with the Airport development.

2.0 Admiralty Island Geology and Climate

Admiralty Island is the seventh largest island in the United States at approximately 1,680 square miles. It is located in Southeast Alaska in the Alexander Archipelago approximately nine miles southwest of Juneau (Figure 1 in Appendix A). The island is part of the Tongass National Forest with most of the island being part of the Monument–Wilderness Area.

Admiralty Island is primarily composed of siltstone, limestone, greywacke, chert, and volcanic rocks and has experienced marine geosynclinal deposition and deformation during the Paleozoic and Mesozoic (570 to 66 million years ago) (Lathrum et al. 1965). Favorite Bay follows a fault trace. The area in the vicinity of Angoon consists primarily of the Devonian Gambier Bay Formation on the west side of Favorite Bay. This formation consists of thick marble lenses and schist at least a few thousand feet thick. On the east side of Favorite Bay, the Tertiary Kootznahoo Formation dominates. A conglomerate with minor amounts of sandstone and shale is generally located closer to the Bay with sandstone, siltstone, shale, and minor conglomerate. Coal dominates farther east of the bay and to the north of Kootznahoo Inlet. South of Favorite Bay, Paleozoic and Mesozoic undifferentiated metamorphic rocks dominate the Favorite Creek area.

Admiralty Island has a maritime climate, with cool summers and relatively mild winters. According to the Western Regional Climate Center (WRCC), average temperatures in Angoon range from 60 degrees in the summer to 34 degrees in the winter (WRCC 2009). From 1949 to 2005 the maximum recorded temperature was 82 degrees and the lowest recorded temperature was -7 degrees (WRCC 2009). The community of Angoon and the area around Favorite Bay are in the rain shadow of Baranof Island; therefore, the amount of precipitation on Admiralty Island varies widely by location. According to the U. S. Geological Survey (USGS), average annual precipitation (rainfall and equivalent snowfall) ranges from 65 inches in Angoon to 160 inches on the northeast side of the island (USGS 1997). In Angoon the average rainfall is 42 inches and the average snowfall is 62 inches (WRCC 2009).

3.0 Water Resources and Watershed Context

Airport alternatives, access alternatives, and the associated freshwater resources of interest are shown in Figures 3 and 4 in Appendix A. The freshwater resources of interest include Favorite Creek, Streams 1 through 10, and Lakes 9-1 through 9-4:

- Favorite Creek which flows into the southern part of Favorite Bay
- Seven unnamed streams which flow into Favorite Bay which are numbered counterclockwise around the bay from one to seven
- Stream No. 8 which flows into the inlet of Mitchell Bay
- Stream Nos. 9, 9A, 9B, and 9D-G, which flow into various unnamed lakes, referred to as Lakes 9-1 thru 9-4, and subsequently discharge into Kanalku Bay
- Stream Nos. 10 and 10A which flow into Killisnoo Harbor

The creeks, streams, and lakes of interest that could be impacted by each airport and access alternative are listed in Figures 3 and 4 in Appendix A. Table 1 summarizes the water resources of interest associated with each of the airport alternatives examined for this report. For Airport Alternatives 3, 3a and 4, Favorite Creek and Streams 1, 2A, and 2 have the potential to be impacted by two of the access road alternatives. The rest of the streams, as well as the lakes, have the potential to be affected due to possible airport development activities and site management practices.

Favorite Creek, the largest stream in the immediate area, has an approximately 20.8 square mile watershed that ranges in elevation from sea level at its mouth to 3,100 feet above sea level at the top of its drainage (Figure 4 in Appendix A). The watershed ranges from sections of steep, unvegetated bedrock in the upper watershed to a narrow, gently sloping valley at the outlet into Favorite Bay. The entire watershed is completely undeveloped with portions of the watershed being within the Monument–Wilderness Area.

The ten small streams of interest have watershed areas between 2.7 and .05 square miles (Figure 3 in Appendix A). Key characteristics of the watersheds are listed in Table 2. The entire region was previously glaciated, and Streams 8 and 9, as well as Favorite Creek, contain lakes that may have been formed during glacial retreat from the region. All of the watersheds are completely undeveloped and are primarily covered in spruce-hemlock forest. Most of the studied streams have a portion or the majority of their watershed area within Monument–Wilderness Area. Streams 8, 9, 9A, 9B, and 9D-G are completely within the Monument–Wilderness Area, and Streams 10 and 10A are entirely outside of the Monument–Wilderness Area. Lakes 9-1, 9-2, 9-3, and 9-4, and the unnamed lakes within the Favorite Creek watershed are entirely within the Monument–Wilderness Area.

Table 1. Freshwater resources of interest associated with each airport alternative

Airport Alternative	Freshwater Resources of Interest
3*	Favorite Creek and Streams 1, 2, 2A 3, 4, 5, 5A 6, 7, 8, 9, and 9A; Lake 9-1. In addition, Stream 9B will be affected if Access Alt. 3 is chosen.
3a	Favorite Creek and Streams 1, 2, 2A, 3, 4, 5, 5A, 6, 7, and 8
4	Favorite Creek and Streams 1, 2, 2A, 3, 4, and 9D-G; Lake 9-3
12a	Streams 10 and 10A

* Alternative 3 has been dropped from consideration in the EIS. Data gathered for water resources for Alternative 3 are presented in this report for general information purposes only and to communicate the results of the field studies in that part of the area.

Table 2. Key characteristics of the watersheds associated with airport alternatives

Stream	Watershed Area (Square Miles)	Watershed Lake Percentage	Elevation (Feet Above Sea Level)	
			Highest	Lowest
Favorite Creek	20.8	0.1	3,100	10
1	0.18	0.1	435	0
2 (including 2A)	0.41	0.0	425	0
3	0.41	0.0	280	0
4	0.13	0.0	160	0
5 (including 5A)	0.12	0.0	155	0
6	0.33	0.0	160	0
7	0.05	0.0	145	0
8	0.19	0.1	180	0
9 (including 9A-G)	2.72	14	235	20
9A	1.24	18	225	55
9B	0.24	0.0	170	55
9D-G	0.63	9	235	55
10 (including 10A)	0.38	0.0	220	0

4.0 Objectives and Methodology

The objective of this report is to disclose baseline hydrologic conditions in the project area. This report will assist in the analysis of the possible impacts to current hydrologic conditions under the alternatives proposed for the Angoon Airport in the FAA's environmental impact statement. The disclosure of current conditions and potential impacts is required by the National Environmental Policy Act. The existing conditions of the freshwater resources in the vicinity of airport alternatives will be discussed in terms of:

- Hydrology, which describes the amount and spatial distribution of precipitation in a watershed and its pattern and rate of discharge into streams and other receiving bodies.
- Fluvial geomorphology, which describes the process of stream or river channel evolution as well as the physical characteristics of channel form.
- Water quality, which is defined by the water's physical, chemical, and biological characteristics.

The following section outlines the objectives and methodologies used for analyzing these characteristics of the water resources.

4.1 Hydrology Objectives and Methods

Hydrology is used to determine the peak flow and low flow events that occur in a watershed. When developing public infrastructure, it is important to understand peak flow events in order to avoid or reduce impacts to floodplain and habitat functions. Damage can occur to natural

resources and/or man-made facilities during flood events, particularly when infrastructure is improperly located or sized.

The magnitude of flood events is typically described by the event recurrence interval. The recurrence interval is the time between events equal to or greater than a given magnitude as determined statistically. For example, the recurrence interval familiar to most people is the 100-year flood. The 100-year flood will, on average, occur once in 100 years, and therefore has a 1% chance of occurring in any given year.

Determining the peak event flows is a key element of defining the spatial extent of a floodplain. Determining the spatial extent of the floodplain will be important for determining the appropriate dimensions of stream crossings associated with airport development. Determination of the spatial extent of the floodplain will be especially important for the access road crossing of Favorite Creek, which will require a bridge. Additionally, clearing of the alternatives has the potential to change the rate at which precipitation runoff moves through the watershed into streams and other water bodies.

The objectives of the hydrology assessment are to:

- Develop a planning-level understanding of watershed hydrology for Favorite Creek, streams, and lakes within the study area
- Describe the watershed characteristics of Favorite Creek, unnamed streams of interest, and lakes

The FAA's consultant team reviewed existing data and documentation describing stream discharge in Admiralty Island watersheds to meet the hydrology objectives. Sources included:

- *Estimating the Magnitude and Frequency of Peak Streamflows for Ungaged Sites on Streams in Alaska and Conterminous Basins in Canada* (USGS 2003)
- *Precipitation Map of Alaska* (USGS 1997)
- *Angoon, Alaska (500310) Period of Record Climate Summary* (WRCC 2009)
- *Favorite Creek Near Angoon, Alaska Flow Gage 15102200* (USGS 2008) (note: this gage is actually on a tributary to Favorite Creek)
- *WinTR-55,* (Natural Resources Conservation Service [NRCS] 2009a)
- *Small Watershed Hydrology WinTR-55 User Guide* (NRCS 2009b)

None of the waters of interest in the study area are currently gaged. A tributary to Favorite Creek (2.5 square mile basin area) was gaged for a brief period by the USGS between November 2000 and September 2003. However, due to the small watershed area and short period of record associated with this gage, reviewers were not able to use the data from this gage for hydrologic analysis.

Hydrologic analyses were conducted using both regional regression equations developed by Curran et al. (2003) and the WinTR-55 small watershed hydrology program developed by the NRCS (2009b) for watersheds between 0.01 mi^2 and 0.72 mi^2. The Curran et al. (2003) regional regression equations for Southeast Alaska are meant for watershed areas between 0.72 and 571 square miles (sq mi). Although most of the streams of interest for this project have watersheds that are smaller than 0.72 mi^2 (see Table 2), peak flow for watersheds greater than 0.72 mi^2 was estimated using Curran et al (2003). Hydrologic analyses of streams with watershed areas smaller than 0.72 square miles were calculated using the WinTR-55 small watershed hydrology program.

Regression equations typically use three to five parameters such as basin size, mean elevation, and annual average precipitation within the watershed to calculate streamflows ranging from two-year to 500-year recurrence intervals. These equations were used to calculate runoff for select recurrence interval flows for study area watersheds. Regional regression equations are based on gaged streams across southern coastal Alaska and have an average 40% standard error of prediction. An average annual precipitation of 65 inches and a mean minimum January temperature of 27 degrees Fahrenheit were used for the regression equation hydrologic analysis. The results of this analysis are presented in **Sections 5.1** and **6.2** of this report.

WinTR-55 is a widely used, single-event rainfall-runoff, small watershed hydrologic model. The model generates hydrographs (charts that show discharge for a specific area over time) from select sub areas throughout the watershed and routes them downstream through channels and reservoirs (NRCS 2009a). The WinTR-55 hydrologic analyses used 24-hour precipitation data provided by the model for Skagway-Hoonah-Angoon Census Area, Alaska, shown in Table 3.

WinTR-55 was originally developed for urban and agricultural areas; however, it is widely accepted in small watersheds due to its flexibility, reliability, and ease of use. Model input variables include hydrologic soils groups (A, B, C, D published for the entire United States), rainfall distribution types (1, 1A, II, III for 24-hour events published for the entire United States), curve numbers based on local ground conditions, and published rainfall intensities for Southeast Alaska as shown in Table 3.

Table 3. WinTR-55 24-hour precipitation data for Skagway-Hoonah-Angoon Census Area, Alaska

Recurrence Interval (year)	24-Hour Precipitation Amount (inches)
2	5
10	8
50	12
100	14

4.2 Fluvial Geomorphology Objectives and Methods

Fluvial geomorphic processes are described based on inputs of discharge, and the size and spatial distribution of sediment and habitat-forming large woody debris. Channel form is described based on measures of channel planform, channel slope, measures of geomorphic features such as pools and riffles, and channel cross-section characteristics. Airport access road development could affect Favorite Creek, the largest stream within the vicinity due to the need for a bridge crossing at the creek (Figure 3 in Appendix A). Streams 6, 7, 9, 9A, 9B, and 9D-G will not be directly affected by airport development, but may be indirectly affected. These streams were not in our scope for field investigation and are not included in the fluvial geomorphology analysis.

The objectives of the fluvial geomorphology assessment are to:

- Develop an understanding of the fluvial geomorphologic processes governing Favorite Creek
- Describe the channel characteristic and geomorphic features of Favorite Creek
- Develop a planning-level understanding of the Favorite Bay and Killisnoo Harbor tributaries

- Describe the basic channel characteristics and basic geomorphic features of streams with potential to be affected by one or more of the Airport and access road alternatives (Streams 1, 2, 3, 4, 5, and 10)

A field assessment was conducted from May 11th to 13th, 2009 and September 1st to 3rd, 2009 to meet the fluvial geomorphology objectives. Field methodologies used for Favorite Creek, Favorite Bay Tributaries, and Killisnoo Harbor tributaries are described in the following sections.

4.2.1 Favorite Creek

Field investigations of Favorite Creek followed the Tier Two survey procedures outlined in the USFS Aquatic Habitat Management Handbook (USFS 2001). Field investigation of Favorite Creek included:

- Observing the geomorphic features
- Measuring the geomorphic reach features throughout the lower portion of Favorite Creek
- Measuring the longitudinal profile throughout the stream reach
- Measuring nine cross sections throughout this reach
- Conducting a pebble count

Field investigations focused on the lower reach of Favorite Creek downstream of the log jam in the vicinity of Access Alt. 2 road crossing. Less-detailed field analysis was performed upstream of the log jam in the vicinity of Access Alt. 3. Several other assessments were conducted in the office. These included:

- Reviewing historic and current aerial photos to measure changes in channel sinuosity and planform characteristics over time
- Reviewing historic aerial photos to get a sense of the frequency and extent of log jams
- Processing of field analysis data to determine channel geometry and sediment gradation
- Mapping geomorphic reaches based on profile, sinuosity, entrenchment, bed material, and field observations

Favorite Creek is an alluvial system with varied flows and sediment transport patterns. Over hundreds of years these processes have formed the current channel configurations, dimensions, and profiles that are visible today. Mathematical models for predicting potential channel changes do not exist, so an analysis of pattern, dimension, and profile with attention to bed and bank conditions is used as a surrogate to describe the potential for change in these systems.

4.2.2 Unnamed Streams 1, 2, 3, 4, 5 and 10

Field investigations for unnamed Streams 1, 2, 3, 4, 5, and 10 included:

- Observing the geomorphic features between the location of the access alternative crossing and the stream outlet
- Measuring two to three cross sections at each potential channel crossing location
- Measuring stream slope at each potential channel crossing location

An analysis of channel dimensions and slope with attention to bed and bank conditions is used to describe the potential for change in these systems.

4.3 Surface Water Quality Objectives and Methods

Water quality standards for the freshwater bodies in the vicinity of the Airport and access route alternatives are based on their declared beneficial use. Under the Clean Water Act, beneficial uses are the desired uses that water quality should support. These physical, chemical, and biological standards determine if a water body is water quality-limited for their desired use. Contaminants from airport activities that might be transported into receiving water bodies could potentially present a risk to water quality. Stormwater runoff from the airport alternatives and associated roads could potentially transport contaminants and sediment into the surrounding water resources. The objectives of the water quality assessment are to:

- Review existing water quality standards for streams in the vicinity of the alternatives
- Evaluate the existing stormwater runoff at the location of each airport alternative
- Identify the potential for erosion and mass wasting in Favorite Creek and the unnamed streams in the vicinity of the alternatives

The existing surface water quality conditions near the Airport and access route alternatives were evaluated by:

- Reviewing historic and current land use in the area
- Reviewing available reports and studies conducted within the vicinity of the study area
- Conducting limited field surveys of the water resources
- Reviewing existing water quality standards

Testing the quality of all the water resources studied was outside of the scope of this report, as the project site is in a currently, and historically, uninhabited wilderness area with minimal potential for existing water quality issues.

5.0 Favorite Creek Hydrology and Geomorphology

The following section discusses Favorite Creek hydrology and geomorphic processes at the planning level. The hydrology discussion focuses on watershed characteristics and peak flow analysis while the geomorphic analysis focuses on channel planform, profile, and geometry.

5.1 Hydrology

Favorite Creek is fed by runoff and seasonal snowmelt from Kanalku Mountain, on the north side of the watershed, and Hood Mountain in the south part of the watershed. Small alpine lakes are present in the upper watershed; however, they only represent 0.1% of the entire 20.8 square mile watershed area. Three tributaries, which originate along Hood Mountain, flow north into the mainstem of Favorite Creek. The mainstem of the creek flows east to west for nine miles before it outlets into Favorite Bay. Stream systems with little storage such as Favorite Creek tend to have a wider range of flows between peak events and low flow events.

Favorite Creek is ungaged and regression equations developed by the USGS (Curran et al. 2003) were used to predict peak discharges. Peak discharges for select recurrence event flows are show in cubic feet per second (cfs) in Table 4.

Table 4. Favorite Creek discharges predicted using regression equations

Recurrence Interval (Years)	Discharge (cfs)
2	1,790
10	3,200
50	4,500
100	5,040

Hasselborg Creek is the only historically gaged waterway on Admiralty Island that would provide enough peak flow data for comparison to Favorite Creek. However, the Hasselborg Creek gage represented a much larger watershed (56 square miles) with over 11% of the watershed area consisting of lakes. Watersheds with a large lake presence express a slower response to rain events and therefore Hasselborg Creek would not respond to storm events the same way that Favorite Creek would respond.

Regression equations are generally considered to be conservative and provide a good basis for this planning-level analysis of Favorite Creek. Additionally, the channel characteristics measured in the field are in line with the predicted peak flows. Refer to *Sections 5.2, 5.6, and 5.8* for further information on the channel characteristics of Favorite Creek.

5.2 Fluvial Geomorphology

Fluvial geomorphic assessment of Favorite Creek focused on the area around the Access Alt. 2 bridge crossing. Less detailed analysis was performed in the area surrounding the Access Alt. 3 bridge crossing. Photo 1 provides an aerial view of lower Favorite Creek and Favorite Bay. The Access Alt. 2 reach ran 400 feet upstream and 750 feet downstream of the Access Alt. 2 bridge crossing location as shown in Figure 5 in Appendix A. This reach is characterized by a series of pools and riffles, with transition or glide-like features. The Access Alt. 3 bridge crossing reach was studied for 100 to 200 feet upstream and downstream of the bridge crossing. Both reaches are within and abut a wilderness area that has only been minimally changed by humans.

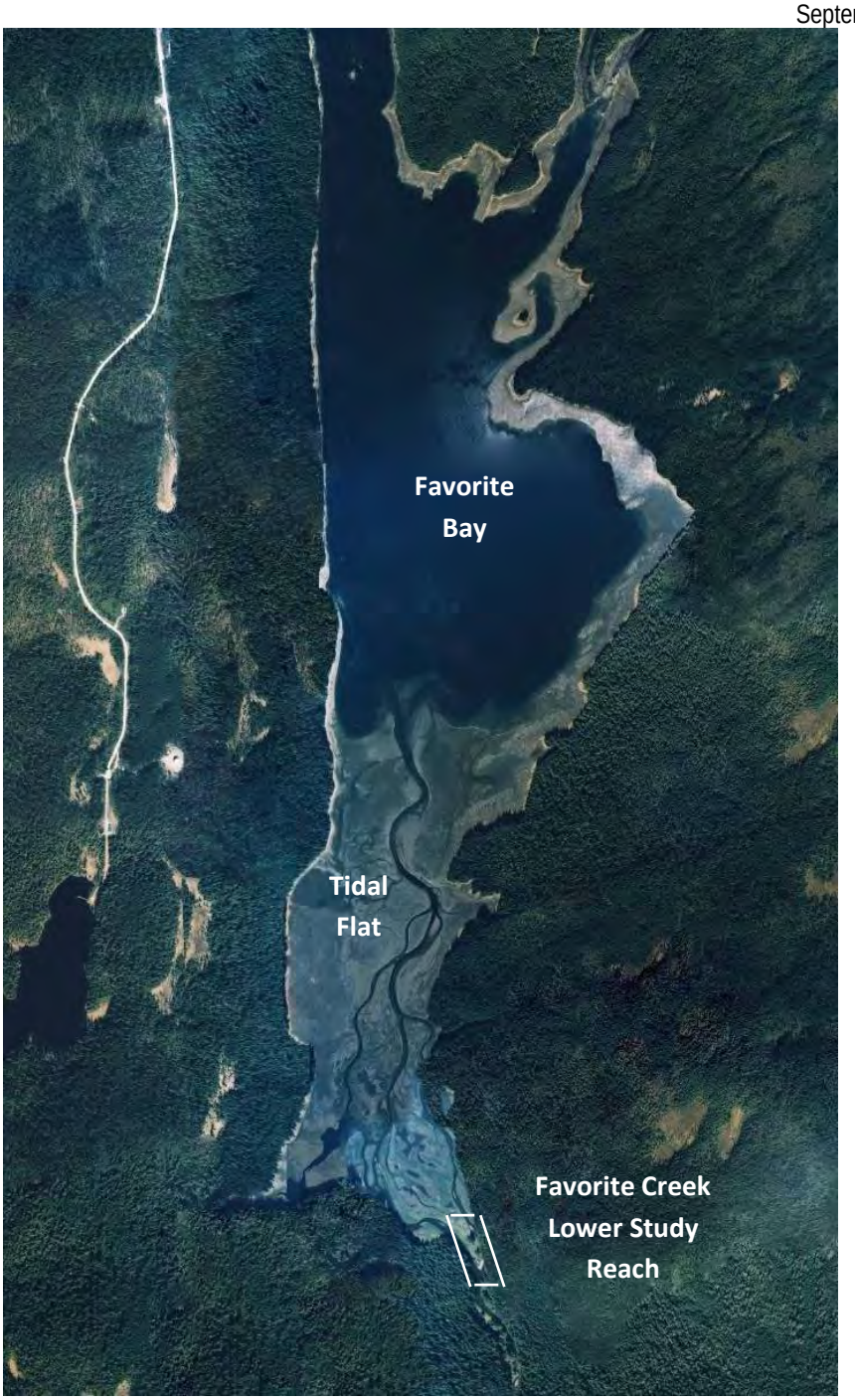

Photo 1. Aerial photograph of Favorite Bay and Favorite Creek. Top of photo is northwest.

5.2.1 Channel Sinuosity

Sinuosity is a measure of the degree of meander and is expressed as the ratio of channel length to valley length. Low sinuosity is in the range of 1.0 to 1.2, moderate sinuosity is in the range of 1.2 to 1.5, and high sinuosity is in the range of 1.5 to 4.0 (Rosgen 1996). Based on the most recently available aerial photography from 2001, the sinuosity of Favorite Creek within the Access Alt. 2

study reach is low—approximately 1.1 (Figure 6 in Appendix A). The sinuosity of the study reach is low due to its confinement between steep slopes to the north and south.

5.2.2 Channel Planform

Lateral channel migration within lower Favorite Creek (Figures 5, 6, and 7) was analyzed using aerial photos from 1948 and 2001. Figure 6 (in Appendix A) depicts the approximate centerlines of these historical channel alignments. In the vicinity of the Access Alt. 3 bridge crossing, where the river valley is confined by steep hillslopes, the path of the channel has changed very little between 1948 and 2001. Between the crossing locations, within the narrow river valley and in the current log jam area, the channel planform has also been very stable.

The major change in channel planform is the location of the channel split. Based on aerial photography, in 1948 it occurred shortly upstream of the Access Alt. 2 bridge crossing. Sometime before the 2001 imagery was taken, the channel split moved so that now it occurs approximately 500 feet lower in the system. The widening of the river valley below the log jam allows the channel to be more mobile in this area. The Favorite Creek channels in the tide flat have moved around somewhat, but altogether have remained relatively stable.

5.2.3 Channel Profile, Reach Breaks, and Large Wood

Figure 7 (in Appendix A) plots the Favorite Creek profile along the thalweg, or deepest part of the channel, and the water surface throughout the lower study area. Profiles typically alternate between steeper/shallower channel features that correspond to riffles and flatter/deeper features that correspond to pools. Transitions link riffles and pools and typically have slopes that match the mean channel slope.

The Access Alt. 2 Favorite Creek geomorphic study area can be broken into two main reaches based on their dominant hydraulic processes – the fluvial reach (near the lower road crossing) and the tidal reach. The fluvial reach is 700 feet long while the tidal reach is 450 feet long. These reaches are shown in Figure 7 (in Appendix A). The head of tide, or farthest location upstream where the creek is influenced by tidal hydraulics, is located approximately 100 feet upstream of the lower bridge crossing (Figures 5 and 7 in Appendix A). The location of the head of tide for Favorite Creek was determined based on observations of changes in stream bed material, channel slope, and vegetation.

The following section describes the Access Alt. 2 Favorite Creek geomorphic study area channel features. The lower fluvial reach is characterized by two sets of short riffles and pools which are separated by a long transition section (Photo 2; Figure 5 in Appendix A). No macro pools, as defined in the Aquatic Habitat Management Handbook (USFS 2001), were observed within the lower study reach. The Access Alt. 2 bridge crossing location is in the center of this transition section. The water surface elevation slope through the fluvial reach is approximately 0.26%. The reach is confined by two steep hillsides. Heavily vegetated floodplains with small high flow channels exist along both sides of the channel (Photo 3). Pools and transitions throughout this reach consist of gravel and cobble bed material mixed with small sections of sand deposits. Riffles consist of coarse gravel and cobble mixed with boulders. The channel form and bed material indicate that smaller material is transported downstream.

Photo 2. Long transition section in the fluvial reach at the location of Access Alt. 2 bridge crossing (looking upstream).

Photo 3. High flow channel within the right bank floodplain of Favorite Creek (looking downstream) in the vicinity of the Access Alt. 2 bridge crossing and in location of channel indicated in 1948 aerial photo.

The tidal reach is located at the outlet of Favorite Creek as it splits into two channels that flow into the wide valley of Favorite Bay (Photo 4; Figure 5 in Appendix A). The reach has a 0.14% water surface elevation slope. The upstream end of the reach consists of a long transition section as the channel splits in two. A riffle has developed along both channels at the upstream end of the island formed by the channel split. Along the western main channel the riffle extends to the end of the study reach.

At the downstream end of the study reach, large wood has accumulated across the eastern side channel and caused the formation of a deep pool (Photo 5). The top of the island contains Sitka spruce trees and appears to be a terrace (former floodplain) which is very rarely, if ever, inundated (Photo 6). The general lack of large wood deposits on the top of the island indicate that it is not affected by flooding; large woody debris (LWD) in the right channel does not extend onto the main portion of the island and is not racked against the Sitka spruce that have colonized the highest elevation area on the island. Bed material throughout this reach consists of sand and gravel mixed with cobbles. The channel form and bed material indicate that this reach is a material deposition zone.

The downstream end of the lower geomorphic study reach is part of the Favorite Creek Tidal Flat (see Photo 1). The combination of alluvial deposition from Favorite Creek outlet and tidal deposition at the upstream end of Favorite Bay has formed a large tidal flat area. This tidal flat area is much shallower than the rest of Favorite Bay and several highly meandering channels have formed to carry streamflow to Favorite Bay.

Evidence of active bank erosion was minimal throughout the lower study reach. The most apparent erosion occurred in the tidal reach, along the banks of the island. The erosion is minor and extends approximately 110 feet along the western side of the island and 150 feet along the eastern side. The island is composed of sandy material mixed with some cobble. This material is highly erodible and can become unstable during the cyclic soil saturation and drying that occurs under tidal conditions.

The Access Alt. 3 road crosses the fluvial reach of Favorite Creek upstream of the log jam complex (Photo 7). In this vicinity, the channel is made up of transitions and riffles with some pools created by channel-spanning wood. This reach is also alluvial with a substrate primarily composed of gravel, although bedrock does outcrop on the left bank in some locations. This reach is relatively similar geomorphically to the Access Alt. 2 fluvial reach.

LWD is important for geomorphic processes and stream habitat. It plays a role in forming pools, stabilizing streambanks, moderating sediment transport, and providing cover and refuge for aquatic species. LWD counts are a useful metric for describing stream habitat characteristics. Large wood was counted and classified in Favorite Creek on August 20, 2009 by the FAA's consultant according to the guidelines in the Aquatic Habitat Management Handbook (USFS 2001) and is summarized in Table 5 (Access Alt. 2 bridge crossing) and Table 6 (Access Alt. 3 bridge crossing).

Photo 4. Favorite Creek channel split at island near outlet into Favorite Bay (looking downstream).

Photo 5. Large wood along eastern channel during low tide (looking west below the Access Alt. 2 bridge crossing).

Photo 6. Log across eastern side channel at a very high tide, looking upstream, island on right. Note that island is not inundated.

Photo 7. Location of Access Alt. 3 bridge crossing of Favorite Creek.

Table 5. LWD classification from 200 feet below to 200 feet above Access Alt. 2 bridge crossing

Piece ID#	Type	Length (ft)	Max Diameter (ft)	Zone Location	Bank (looking downstream)	Rootwad (dia.)	Key Piece*
1	conifer	30	1.0	1	RB	No	No
2	conifer	13	0.7	1	RB	No	No
3	alder	20	1.3	1, 2, 3, 4	RB	No	No
4	conifer	39	0.7	1	RB	No	No
5	conifer	16	1.0	1	RB	No	No
6	conifer	52	1.5	1	RB	No	No
7	conifer	20	0.8	1, 2	RB	No	No
8	conifer	49	0.8	1, 2, 3, 4	RB	No	No
9	conifer	36	0.8	1	RB	No	No
10	alder	23	1.0	1	RB	No	No
11	conifer	26	1.0	1	RB	No	No
12	conifer	6.6	1.0	1	RB	No	No
12a	conifer	62	1.0	1	RB	No	No
13	conifer	13	1.3	1	RB	No	No
14	conifer	82	2.1	1, 2, 3, 4	RB	Yes (3 feet)	Yes
14a	conifer	20	0.8	1	RB	No	No
15	conifer	9.8	0.7	1	RB	No	No
16	conifer	9.8	0.7	1	RB	No	No
17	conifer	9.8	0.7	1	RB	No	No
18	conifer	9.8	0.7	1	RB	No	No
19	conifer	9.8	0.7	1	RB	No	No
20	conifer	9.8	0.7	1	RB	No	No
21	conifer	36	1.7	1, 2	RB	No	No
22	conifer	30	0.5	1, 2	RB	No	No
23	conifer	43	0.6	1, 2	RB	No	No
24	conifer	6.6	0.7	1	RB	No	No
25	conifer	13	0.7	1	RB	No	No
26	conifer	13	0.7	1	RB	No	No
27	conifer	20	0.7	1	RB	No	No
28	conifer	20	0.7	1	RB	No	No
29	conifer	15	1.4	1, 2	RB	No	No
30	conifer	9.8	1.3	1, 2, 3, 4	LB	No	No
31	conifer	9.8	0.5	2	LB	No	No

Source: SWCA 2011

*Key piece definition for streams 33 to 65 ft in width = ≥2.0 ft diameter and ≥49 ft length or ≥9.8 ft diameter rootwad

Table 6. LWD classification from 200 feet below to 200 feet above Access Alt. 3 bridge crossing

Piece ID#	Type	Length (ft)	Max Diameter (ft)	Zone Location	Bank (looking downstream)	Rootwad (dia.)	Key Piece*
0	alder	11	1.3	1, 2, 3	LB	No	No
1	conifer	56	1.5	1, 2, 3, 4	Across stream	Yes (13 ft)	Yes
2	conifer	56	1.3	1, 2, 3, 4	Across stream	Yes (13 ft)	Yes
3	conifer	66	1.1	1, 2, 3	LB	No	No
4	conifer	9.8	0.7	2	RB	No	No
5	conifer	9.8	0.7	2	RB	No	No
6	conifer	36	2.0	1, 2, 3, 4	LB	No	No
7	conifer	9.8	0.7	1	LB	No	No
8	conifer	9.8	0.7	1	LB	No	No
9	conifer	9.8	0.7	1	LB	No	No
10	conifer	13	1.6	1, 2, 3, 4	RB	No	No
11	conifer	13	1.0	1, 2, 3	RB	No	No
12	conifer	16	1.3	2, 3, 4	RB	No	No
13	conifer	11	1.1	1, 2	RB	No	No
14	conifer	9.8	0.7	1, 2	RB	No	No
15	conifer	16	0.5	1, 2	RB	No	No
16	conifer	16	0.8	1, 2	RB	No	No
17	conifer	39	1.1	2, 3, 4	LB	Yes (9.8 ft)	No**
18	conifer	13	1.0	1, 2, 3, 4	LB	No	No
19	conifer	18	1.6	1, 2	LB	No	No
20	conifer	23	0.8	1, 2, 3, 4	LB	No	No
21	conifer	26	1.5	1, 2	RB	No	No
22	alder	13	1.3	1, 2	LB	No	No
23	conifer	21	1.3	1, 2	RB	No	No
24	conifer	16	0.8	1, 2	RB	No	No

Source: SWCA 2011

*Key piece definition for streams 33 to 65 ft in width = >2.0 ft diameter or >49 ft length or >9.8 ft diameter rootwad.

**USFS (2001) states that rootwad must be in excess of 9.8 feet in order to qualify as a key piece.

A technical memorandum by the FAA's primary consultant, SWCA Environmental Consulting (SWCA), further describing the LWD survey is included in Appendix B (SWCA 2009). As defined by Robison and Beschta (1990), LWD locations are broken up by zones:

- Zone 1 – within the wetted width
- Zone 2 – above the wetted width but below the bankfull height within the bankfull width
- Zone 3 – above bankfull height within bankfull width
- Zone 4 – outside of bankfull width

Each piece of wood is classified by zone. Key pieces of wood are defined as those that are relatively large compared with the channel size and have important geomorphic functions. In order to be defined as a key piece in Favorite Creek, the LWD had to be at least 2 feet in

diameter, greater than 25 feet in stem length, and have a rootwad in excess of 9.8 feet in diameter (SWCA 2011). From 200 feet upstream to 200 feet downstream of the Access Alt. 2 bridge crossing, 33 pieces of LWD were counted, and one of them qualifies as a key piece based on length and diameter (see Table 5).

Upstream of the potential Access Alt. 2 bridge crossing study area, and downstream of the Access Alt. 3 bridge crossing, is a large and complex natural log jam (Photo 8). This log jam spans the entire channel for approximately 150 to 200 feet and provides habitat for both aquatic and terrestrial species. The massive log jam indicates that this reach of Favorite Creek receives abundant wood and has the potential to transport large logs downstream. It is also likely to play an important role in aquatic habitat.

Photo 8. Complex log jam between the Access Alt. 2 and Access Alt. 3 Favorite Creek bridge crossings.

Within the Access Alt. 3 bridge crossing area (200 feet downstream to 200 feet upstream), 25 pieces of LWD were classified (see Table 6). Two of the pieces met the criteria for key pieces based on rootwad diameter. These key pieces are channel-spanning logs that influence channel morphology (Photo 9) by forcing pool formation.

5.2.4 Channel Geometry

Channel cross sectional dimensions, entrenchment, and slope describe channel geometry within a given reach. Channel cross sectional dimensions vary in width, depth and flow area along the stream corridor as the channel transitions through pool and riffle zones. Dimensions also vary based on channel slope, amount of LWD, riparian area disturbances, and other factors.

Favorite Creek is an alluvial stream which builds and maintains its channel form and floodplain during high flow events. The dominant discharge or bankfull discharge is the flow that is considered to maintain the channel form. The bankfull discharge occurs when the channel begins to access its floodplain. Bankfull events typically occur about every other year.

Photo 9. Two channel-spanning logs are influencing channel morphology by forming a plunge pool.

Empirical studies by Leopold (1994) and Rosgen (1996) specify several stream indices that can be calculated using ratios of stream channel dimensions. The width to depth ratio and the entrenchment ratio are two indices that can be applied to alluvial streams such as Favorite Creek. The width to depth ratio indicates the level of channel incision, and is calculated as the bankfull width divided by the bankfull depth. Incised channels have width to depth ratios less than 12 (Rosgen 1996). The entrenchment ratio is a measure of the horizontal confinement of the stream and is calculated as the floodprone width divided by the bankfull width. The floodprone width for this analysis was determined to be the width of the channel at twice the bankfull depth. Entrenchment ratios less than 1.4 are considered entrenched, ratios between 1.4 and 2.2 are considered moderately entrenched, and ratios greater than 2.2 are slightly entrenched (Rosgen 1996).

The incision depth is measured as the height of the channel bank. The channel incision depth together with the entrenchment ratio measures “the ability of the stream channel to contain large flow events within the channel area” (USFS 2001). Channels with incision depths that are larger than the bankfull depth are considered to be more incised and have larger capacities. These channels do not spread flow across the floodplain as readily. Table 7 summarizes the cross-sectional geometry within Favorite Creek study reaches. Data for the fluvial section is from all available transition zone cross sections. The Access Alt. 2 bridge crossing fluvial reach is narrower and has a higher water surface slope than the tidal reach as the system changes from a narrower, steeper valley to a broader tidal flat. Likewise, the Access Alt. 3 bridge crossing fluvial reach is narrower and steeper than the Access Alt. 2 bridge crossing fluvial reach. Neither the

Access Alt. 3 nor the Access Alt. 2 bridge crossing fluvial reaches show signs of incision as demonstrated by an entrenchment ratio of 2.1 (slightly to moderately entrenched).

Table 7. Favorite Creek channel geometry

Channel Geometry	Access Alt. 3 Road Crossing Fluvial Reach	Access Alt. 2 Road Crossing Fluvial Reach	Tidal Reach
Incision Depth (feet)	5.1	3.1	1.7
Bankfull Width, *BFW* (feet)	63.8	103	N/A
Bankfull Depth, *BFD* (feet)	4.4	3	N/A
Floodprone Width *FPW* (feet)	131	218	N/A
Bed Width (feet)	58.4	96	195
Channel Water Surface Slope	N.D.	0.26%	0.14%
Channel Thalweg Slope	0.75%	0.43%	0.49%
Width to Depth Ratio (*BFW/BFD)*	14.7	33	N/A
Entrenchment Ratio (*FPW/BFW*)	2.1	2.1	N/A

N/A = not applicable; N.D. = not determined

5.2.5 Sediment Sampling

Bedload transport occurs along the stream bed when particles are moved by a combination of sliding, rolling, and saltation (short hops with temporary rests). The gradation of sediment samples taken within the channel provides information on current channel hydraulics. Generally, larger material deposits in areas of higher velocity and smaller materials deposit in areas of lower velocity. The purpose of the pebble count was to develop a general understanding of the size and distribution of bed material found within the study reach. This information helps to describe the velocity and sediment transport capacity of water flowing through the study area. A pebble count was conducted near transition number 1, just downstream of the Access Alt. 2 bridge crossing location at the transition between the fluvial reach and tidal reach.

Table 8 shows the gradation of the bed material from the pebble count. The percent finer is the percent of material less than the specified grain size. The dominant material is coarse gravel.

Table 8. Grain size distribution of bed material in the project reach

Percent Finer	Grain Size (mm)	Material
D_{16}	4.5	Fine gravel
D_{50}	29	Coarse gravel
D_{84}	51	Very coarse gravel
D_{95}	89	Small cobbles

5.2.6 Stream Classification

Stream classification systems are based on quantifiable field measurements and stream indices which produce consistent, reproducible descriptions of stream types. The USFS has two levels of stream classification which pertain to Favorite Creek. The upper level is the Aquatic Habitat Management Handbook Alaska Region (AHMHAR) stream value classification system which is based on subsistence, recreational, and economic fish harvest considerations (USFS 2001). The secondary level, which is based on formative geomorphic, hydrologic, and vegetative processes, is the Tongass National Forest Channel Type classification system (USFS 1992). The Rosgen classification system is also commonly used to describe geomorphic characteristics of streams (Rosgen 1996).

The FAA's consultant evaluated Favorite Creek using the USFS and Rosgen stream classification systems. Favorite Creek has anadromous fish and good quality fish habitat and therefore sections of it are considered to be a Class I stream according to the AHMHAR stream value classification system.

Based on Favorite Creek's geomorphic, hydrologic, and vegetative processes it also fits into the Tongass National Forest Channel Type FP5 (wide low-gradient floodplain channel) for the Access Alt. 2 study area. FP5 channel types are usually found in broad valley bottoms with numerous overflow side channels, extensive gravel bars, and large groups of log jams. Within the Access Alt. 2 study reach Favorite Creek has a wide bankfull width (103 feet) and low channel gradient (0.45%). The bed material consists of gravels, sands, and cobbles. Just upstream of the Access Alt. 2 study area extensive gravel bars were observed and a complex log jam exists. The watershed area is 20.8 square miles of primarily spruce-hemlock forest. Favorite Creek slightly differs from the FP5 channel type within the study area in that it has a somewhat narrow valley width (approximately 350 feet at its widest location).

At the Access Alt. 3 bridge crossing, Favorite Creek is transitioning channel types from FP5 and has some characteristics of a LC2 channel type (moderate gradient contained narrow valley channel). LC2 channels are characterized by narrow valleys in the middle to lower sections of watersheds. In LC2 channels, hillslopes and mountain slopes directly abut channels. Valley floors are narrow with little terrace development. Short falls, cascades, boulder runs, and bedrock knickpoints may be present. Upstream of the Access Alt. 3 bridge crossing, Favorite Creek becomes a LC2 channel (SWCA 2010).

According to the Rosgen classification system, Favorite Creek is a B4c stream type at both the Access Alt. 2 bridge crossing and Access Alt. 3 bridge crossing. This determination is based on the entrenchment ratio, a moderate width to depth ratio of 33 for the Access Alt. 2 bridge crossing and 14.7 for the Access Alt. 3 bridge crossing, moderate sinuosity, and gravel channel material. B4c streams are considered to be relatively stable.

5.2.7 10-Year and 100-Year Floodplains

The Federal Emergency Management Agency (FEMA) is responsible for mapping regulatory floodplain boundaries in the U.S. No FEMA mapping is available for Favorite Creek. The FAA's consultant team used the Hydrologic Engineering Center – River Analysis System (HEC-RAS, version 4.0.0) hydraulic software to create a planning-level existing conditions model of Favorite Creek. Developed by the U.S. Army Corps of Engineers (USACE 2008), HEC-RAS version 4.0.0 is a one-dimensional (1-D) hydraulic model and is one of the standard 1-D hydraulic models used

in the United States. The HEC-RAS model uses site topographic information including a combination of channel cross-sections surveyed by the FAA's consultant team during May 2009 as well as five-foot contour data collected by R&M Engineering in 2002 for the Airport Master Plan (DOT&PF 2007).

This model is suitable for planning-level, but not design-level, purposes. A new HEC-RAS model using more detailed site topography and improved elevation control will be necessary during the design phase of the project. Elevation data from the field survey was tied into a survey marker with poor elevation control. Poor GPS coverage during the survey limited the accuracy of the cross-section survey locations. Five-foot contours from the 2002 Airport Master Plan survey were used to supplement the field survey, but the contour data is not detailed enough for a design-level model. In some areas the field survey and contour data yielded conflicting information. The combination of these factors makes the model quality fair at best. This model is suited for comparison purposes but not for absolute water-surface elevations, exact floodplain boundaries, or precise water velocities. In some locations modeled floodplain widths and water surface elevations were not consistent with the five-foot contour survey due to the aforementioned issues. In these instances, judgment was used to create a planning-level floodplain boundary.

The Existing Conditions model was run for the 2-, 10-, and 100-year flows for both the Mean Lower Low Water (MLLW) and Mean Higher High Water (MHHW) boundary conditions under a subcritical flow regime. MHHW is defined as 13.0 feet for Favorite Bay (Kootznahoo Inlet), and MLLW is defined as 0.0 feet (National Oceanic and Atmospheric Administration [NOAA] 2009). The existing conditions model was completed early in the project to provide an understanding of the relationship between hydrologic processes and the Access Alt. 2 bridge crossing over Favorite Creek. The model was also used to produce a 10- and 100-year recurrence interval existing conditions planning-level floodplain boundary (Figure 8 in Appendix A). The planning-level floodplain boundaries illustrate the MHHW condition, consistent with FEMA coastal floodplain guidelines. These boundaries will be used to assist in avoiding or minimizing impacts to regulated floodplains as access road plans are developed.

Proposed Conditions modeling will be conducted later in the project when the airport alternatives and access alternatives have been further developed.

The planning-level 10-year floodplain is similar in form to and coincident with or narrower than the 100-year floodplain. The steep valley walls help to control the width of the floodplain in the fluvial reach. The floodplain widens in the lowermost tidal reach where it enters Favorite Bay and is not confined by the valley walls.

6.0 Stream Hydrology and Geomorphology

The following section discusses the hydrology and geomorphic processes of the streams of interest for the EIS, with the exception of Favorite Creek, which was discussed in Section 5. The hydrology discussion focuses on watershed characteristics and peak flow analysis while the geomorphic analysis focuses on stream geometry and form in the vicinity of the access road crossings.

6.1 Hydrology

The streams of interest are fed by runoff and snow melt throughout their watersheds. As discussed in *Section 3.0 Water Resources and Watershed Context* the watershed areas of these

streams vary from 0.05 to 2.65 square miles (see Table 2). Watershed elevations range from 145 to 435 feet at their highest elevations to sea level at their outlet. Streams 9, 9A, 9B, and 9D-G outlet into large lakes (Figure 3 in Appendix A). The rest of the streams are all tidally influenced at the outlet. The watershed areas of each stream are shown in Figure 3 in Appendix A. The streams are all very small; many of them have the potential to be dry during the summer months.

These streams are ungaged and regression equations developed by the USGS (Curran et al. 2003) and analysis using WinTR-55 (NRCS 2009b) were used to predict peak discharges. Peak discharges for select recurrence interval event flows are shown in Table 9. Admiralty Island does not have any gaged streams with similar watershed characteristics for comparison. However, regression equations are generally considered to be conservative and provide a good basis for this planning-level analysis. Additionally, the channel characteristics measured in the field (discussed further in **Section 6.2**) are generally consistent with channel dimensions that would be expected to support the predicted peak flows. Refer to **Section 6.2** for further information on the channel characteristics of Favorite Creek.

6.2 Fluvial Geomorphology

In addition to Favorite Creek, six small streams were examined. These streams may be grouped by their geographic location. Tributaries 1, 2, 3, and 4 drain into the southeastern tidal flat portion of Favorite Bay, in the same general area as Favorite Creek. The southern end of Favorite Bay has a very gentle gradient. During low tide, this portion of Favorite Bay drains, exposing large tidal flats, whereas during high tide the tidal flats are submerged.

Table 9. Peak discharges (cubic feet per second) predicted using regression equations for streams of interest

Stream	Recurrence Interval (years)			
	2	10	50	100
Stream 1	50	120	215	265
Stream 2	130	300	545	665
Stream 2A	15	35	65	75
Stream 3	80	190	350	460
Stream 4	25	65	120	145
Stream 5 (including 5A)	35	75	140	170
Stream 6	55	130	235	285
Stream 7	15	35	60	75
Stream 8	50	120	215	265
Stream 9 (including 9A-G)	130	230	320	360
Stream 9A	60	110	150	170
Stream 9B	55	130	240	295
Stream 9D-G	60	130	350	450
Stream 10A	35	80	140	175
Stream 10 (including 10A)	90	215	390	480

Stream 2A, also in this vicinity, drains to Stream 2 and therefore drains indirectly to Favorite Bay. Access road crossings of Tributaries 1, 2, and 2A are upstream of the tidally-influenced area of these tributaries. The crossings of Tributaries 3 and 4 are within the tidally-influenced reach. As a result, Tributaries 3 and 4 may be backwatered at high tide at their respective road crossings. All five of these crossings are low in their respective watersheds.

Tributaries 5, 6, and 7 drain to the northeastern portion of Favorite Bay beyond the main tidal flat. Tidal flats in this area are much narrower, less pronounced, and follow the shoreline closely. Stream 7 was not examined in the field as part of this study. Of these three tributaries, only Stream 5 would be likely to have a road crossing, and it would be outside of the tidally-influenced reach. This crossing would be located in the middle of the Stream 5 watershed.

Tributaries 8, 9, and 10 do not drain to Favorite Bay. Stream 8 flows into an inlet to Mitchell Bay. Stream 9A, 9B, and 9D-G drain into Lake 9-1 within the Stream 9 watershed and then into Stream 9 which discharges into Kanalku Bay. Neither Stream 8 nor anything in the Stream 9 watershed was investigated in the field. Stream 10A flows into Stream 10 which drains directly to Killisnoo Harbor as shown in Figure 3 in Appendix A. Airport Alternative 12a would cross Streams 10 and 10A outside of the tidally influenced area in the middle of the sub-watershed.

Compared with Favorite Creek, all of the unnamed streams near the alternatives are quite small. The average bankfull width, average bankfull depth, and channel slope at the various crossings are summarized in Table 10.

Table 10. Stream channel geometries

Stream	Average Bankfull Width	Average Bankfull Depth	Upstream Slope	Downstream Slope
1 Access Alt. 3 Road Crossing	3.4	0.8	3.0%	1.5%
1 Access Alt. 2 Road Crossing	4.8	0.9	2.5%	2.0%
2 Access Alt. 3 Road Crossing	10.7	1.6	~25%	~5%
2 Access Alt. 2 Road Crossing	10.6	0.6	2.5%	-
2A Access Alt. 2 Road Crossing	3.3	0.9	-	4.5%
3 Access Alt. 2 Road Crossing	10.0	-	1.0%	1.0%
4 Access Alt. 2 Road Crossing	5.8	0.8	1.0%	1.0%
5 Access Alt. 3 Road Crossing	N/A	N/A	<2%	<2%
5 Access Alt. 2 Road Crossing	3.1	-	1.0%	0.5%
10 Crossing	3.0	1.5	0.5%	0.5%

The Access Alt. 3 crossing of Stream 1 is located where the stream passes through a large wet meadow (Photo 10). It has a very narrow, incised channel within a broad, flat floodplain and has a very limited ability to convey sediment and wood. At the Access Alt. 2 crossing (Photo 11), the channel is wider, better defined, and passes through a forest with the potential for input and conveyance of LWD.

The Access Alt. 3 and Access Alt. 2 crossings of Stream 2 (Photos 12 and 13, respectively) are located in a heavily forested area with a coarse stream substrate containing many cobbles and large amounts of LWD spanning the channel. The stream is incised at the Access Alt. 3 crossing location but is not incised at the Access Alt. 2 crossing location. The channels are markedly wider than those of Stream 1 although they are also quite shallow. Stream 2A (Photo 14) is smaller than Stream 2 but is also heavily forested with a well-defined channel.

The Stream 3 Access Alt. 2 crossing has a somewhat different character due to it being so close to Favorite Bay and within the tidally influenced portion of Stream 3 (Photo 15). The stream channel appears broad and U-shaped and is confined by relatively widely spaced, gradual valley walls. The large trees adjacent to the stream do not extend down to the water's edge, presumably due to salinity, and there is essentially no underbrush near the stream (Photo 15). The substrate ranges from large cobbles to finer gravels and sand. A number of channel-spanning logs are present in this reach.

The Stream 4 Access Alt. 2 crossing (Photo 16) is surrounded by narrower, steeper valley walls than Stream 3, but is still within the tidally-influenced reach. There are large amounts of LWD in the channel and underbrush encroaches closer to the channel than at Stream 3. Again, the substrate ranges from larger cobbles to finer substrate, and channel-spanning logs are common.

The Access Alt. 3 crossing of Stream 5 is not a defined channel (Photo 17). The Access Alt. 3 crossing area is within the headwaters of Stream 5 and consists of a patchwork of seasonally-inundated wetlands and low spots vegetated with skunk cabbage and conifers with a soil substrate. Stream 5 only becomes a defined channel downstream of the Access Alt. 3 road crossing. At the Access Alt. 2 road crossing, Stream 5 (Photo 18) cuts through a wet meadow similar to that of the Stream 1 Access Alt. 3 crossing.

Stream 10 is very narrow (bankfull width is 3 feet) and is more incised than the other tributaries (Photo 19). It flows through a brushy, lightly forested area.

Photo 10. Stream 1. Photo was taken 100 feet downstream of Access Alt. 3 road crossing.

Photo 11. Stream 1. Photo was taken approximately 50 feet downstream of Access Alt. 2 road crossing. FAA's consultant team member is measuring the stream cross-section.

Photo 12. Stream 2. Photo shows vicinity of Access Alt. 3 road crossing.

Photo 13. Stream 2. Photo displays Access Alt. 2 road crossing vicinity.

Photo 14. Stream 2A. Photo was taken at Access Alt. 2 road crossing location.

Photo 15. Stream 3. Photo shows location of Access Alt. 2 road crossing.

Photo 16. Stream 4. Photo shows Access Alt. 2 road crossing location.

Photo 17. Stream 5. Photo shows the Access Alt. 3 road crossing vicinity.

Photo 18. Stream 5. Photo shows the Access Alt. 2 road crossing vicinity.

Photo 19. Stream 10. Photo shows vicinity of stream crossing.

7.0 Freshwater Quality

The quality of water is defined by its physical, chemical, and biological characteristics. These characteristics help determine the appropriateness for various beneficial uses of both surface water and groundwater. The FAA's consultant team evaluated existing surface water quality conditions near the potential airport by reviewing available documentation and limited field reviews. The following key documents were reviewed:

- *Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Database* (ADEC 2008)
- *18 AAC 70 Water Quality Standards* (ADEC 2009)

Additionally, the FAA's consultant team conducted field reviews on May 11-13 and September 1-3, 2009. These reviews included observing site conditions and drainage patterns throughout the area.

No documentation of groundwater conditions is known. No field reviews were conducted to evaluate groundwater conditions.

7.1 Beneficial Uses and Water Quality Standards

Beneficial uses are the purposes that a water body is intended to provide, such as for drinking water or the growth and propagation of fish, shellfish, and other aquatic life, or recreation. Water bodies can and often do support a number of different beneficial uses. Surface water is an important resource to the people of Angoon because it is their only source of public drinking water. The principal drinking water source for Angoon is Auk'Tah Lake (alternatively known as Tillinghast Lake Reservoir), which is shown in Figure 3 in Appendix A. Currently a 500,000 gallon water tank stores water at the Tillinghast Lake Water Treatment Plant a little over three miles from town. Water from the reservoir is treated and piped throughout the community. The access road alternatives are mostly below the elevation of Auk'Tah Lake. However, the initial road segment of Access Alts. 2 and 3 is within the Auk'Tah Lake watershed uphill from the reservoir (Figure 3 in Appendix A).

In addition to Auk'Tah Lake, another potential future domestic drinking water source is a tributary to Favorite Creek (name and location unknown) (City of Angoon 1990).

The U.S. Environmental Protection Agency (EPA) and ADEC regulate the quality of waters in the State of Alaska by defining "beneficial uses" for each water body and setting appropriate water quality standards for these uses, as required by the Federal Clean Water Act. Table 11 is a summary of the beneficial uses for the key water bodies of interest to this study. Alaska's water quality standards (AWQS) require that all waters of the state be regulated for all freshwater beneficial uses unless they have been reclassified and are exempt from these regulations (Jim Powell, ADEC, pers. comm., 2008). Water bodies that do not meet water quality standards are termed "water quality limited." There are currently 25 water quality limited water bodies in Alaska (ADEC 2009). However, no water bodies in the study area are classified as water quality limited (EPA 2004).

Water quality standards are the reference levels (or acceptable characteristics) for individual water quality parameters that must be met in order to support the recognized beneficial uses for a waterway. For example, in order to protect the beneficial use of aquatic life, waters used by anadromous and resident fish must typically contain dissolved oxygen (DO) concentrations of

more than 7 milligrams per liter (mg/L). Table 12 is a summary of the AWQS for conventional water quality parameters for fresh water.

Table 11. Beneficial uses of water bodies of interest in the vicinity of the potential Angoon Airport

Beneficial Uses	Favorite Creek	Tributaries (All)
(1) FRESHWATER USES		
(A) Water Supply	X	X
(i) drinking, culinary, and food processing		
(ii) agriculture, including irrigation and stock watering		
(iii) aquaculture		
(iv) industrial		
(B) Water Recreation	X	X
(i) contact recreation		
(ii) secondary recreation		
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	X	X

Source: ADEC 2009

Table 12. AWQS for conventional water quality parameters for fresh water

Parameter	Applicable Water Quality Standard	Most Restrictive "Beneficial Use" for Parameter
Fecal coliform (FC) bacteria	Mean may not exceed 20 FC/100 ml, and not more than 10% of the samples may exceed 40 FC/100 ml. For groundwater, the FC concentration must be less than 1 FC/100 ml, using the FC Membrane Filter Technique, or less than 3 FC/100 ml, using the FC most probable number (MPN) technique.	water supply*
Dissolved gas	DO must be greater than 7 mg/L in waters used by anadromous and resident fish. In no case may DO be less than 5 mg/l to a depth of 20 cm in the interstitial waters of gravel used by anadromous or resident fish for spawning. For waters not used by anadromous or resident fish, DO must be greater than or equal to 5 mg/l. In no case may DO be greater than 17 mg/l. The concentration of DO may not exceed 110% of saturation at any point of sample collection.	aquatic life
pH	May not be less than 6.5 or greater than 8.5. If the natural condition pH is outside this range, substances may not be added that cause an increase in the buffering capacity of the water.	recreation (primary contact)

Table 12. AWQS for conventional water quality parameters for fresh water

Turbidity	May not exceed 5 nephelometric turbidity units (NTU) above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU.	Water supply*
Temperature	May not exceed 20°C at any time. The following maximum temperatures may not be exceeded, where applicable: -Migration routes 15°C, -Spawning areas 13°C, -Rearing areas 15°C, -Egg & fry incubation 13°C For all other waters, the weekly average temperature may not exceed site-specific requirements needed to preserve normal species diversity or to prevent appearance of nuisance organisms.	Aquaculture & Aquatic Life
Dissolved inorganic substances	Total dissolved solids (TDS) from all sources may not exceed 500 mg/l. Neither chlorides nor sulfates may exceed 250 mg/l.	Water supply*
Sediment	The percent accumulation of fine sediment in the range of 0.1 mm to 4.0 mm in the gravel bed of waters used by anadromous or resident fish for spawning may not be increased more than 5% by weight above natural conditions (as shown from grain size accumulation graph). In no case may the 0.1 mm to 4.0 mm fine sediment range in those gravel beds exceed a maximum of 30% by weight (as shown from grain size accumulation graph). In all other surface waters no sediment loads (suspended or deposited) that can cause adverse effects on aquatic animal or plant life, their reproduction or habitat may be present.	Aquatic life
Toxics and other deliterious (organic and inorganic substances)	The concentration of substances in water may not exceed the criteria shown in Table I or in Table V, column A of the *Alaska Water Quality Criteria Manual.* Substance concentration in water may not exceed any chronic and acute criteria established in this chapter, for a toxic pollutant of concern to protect sensitive and biologically important life stages of resident species of this state. there may be no concentration of toxic substances in water or in shoreline or bottom sediments that, singly or in combination, cause or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests.	Water supply* & Aquatic life
Color	May not exceed 15 color units or the natural condition, whichever is greater. Color or apparent color may not reduce the depth of the compensation point for photosynthetic activity by more than 10% from the seasonally established norm for aquatic life.	Water supply* & Aquatic life
Petroleum hydrocarbons, oils, and grease	Total aqueous hydrocarbons (TAqH) in the water column may not exceed 15 µg/l. Total aromatic hydrocarbons (TAH) in the water column may not exceed 10 µg/l. There may be no concentrations of petroleum hydrocarbons, animal fats, or vegetable oils in shoreline or bottom sediments that cause deleterious effects to aquatic life.	Aquaculture

Table 12. AWQS for conventional water quality parameters for fresh water

	Surface waters and adjoining shorelines must be virtually free from floating oil, film, sheen, or discoloration.	
Radioactivity	May not exceed the concentrations specified in Table 1 of the Alaska Water Quality Criteria Manual for radioactive contaminants and may not exceed limits specified in 10 C.F.R. 20 and National Bureau of Standards, Handbook 69.	Water supply* & Aquatic life
Residues (floating solids, debris, sludge, deposits, foam, scum, or other residues)	May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. May not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines, or cause leaching of toxic or deleterious substances, or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.	Aquatic life

Source: ADEC 2009

7.2 Water Quality Conditions

A limited amount of information is available on existing surface water quality conditions in the area. Based on a review of the ADEC Contaminated Sites Database (ADEC 2008), there are no open contaminated sites in the Angoon vicinity; cleanup is complete at sites in the Angoon vicinity in the database.

Surface water sources have a high susceptibility to contamination. However, most of the area is undeveloped by humans and has been set aside as a wilderness area. Therefore, the risk of humans having contaminated the surface waters in this area is considerably less than in more developed, industrialized, or urbanized areas.

During high tides, marine water from Favorite Bay flows up Favorite Creek and the other Favorite Bay creeks identified for study and mixes with fresh water causing brackish conditions. The transition zone, where water mixes and shifts from brackish to fresh water, is an important habitat for salmonids.

Wetlands can provide water quality benefits by trapping sediments and pollutants as well as capturing excess nutrients. Watersheds with more wetlands have the potential for higher water quality and have more capability to filter pollutants. Table 13 shows the percentage of each watershed that is various vegetation types.

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Table 13. Percentage of vegetation type in each watershed

Watershed	Bog Forest	Bog Wood-land	Disturbed	Estuary	Fen	Fresh Water	Salt Marsh	Spruce-Hemlock Forest	Un-vegetated Tidal	No Data	Tannins Noted May 2009
FAVORITE CRK	0%	0%	0%	0%	0%	0%	0%	3%	0%	97%	No
STREAM 1	0%	2%	1%	0%	9%	1%	0%	88%	0%	0%	No
STREAM 2	0%	0%	0%	0%	3%	0%	0%	83%	0%	13%	No
STREAM 2A	0%	0%	0%	0%	11%	0%	0%	88%	0%	0%	N.D.
STREAM 3	0%	2%	0%	0%	3%	0%	0%	93%	0%	1%	Yes
STREAM 4	0%	0%	0%	0%	0%	1%	0%	99%	0%	0%	No
STREAM 5	0%	8%	0%	0%	6%	1%	0%	85%	0%	0%	Yes
STREAM 5A	0%	18%	0%	0%	6%	2%	0%	74%	0%	0%	N.D.
STREAM 6	16%	14%	0%	0%	2%	0%	0%	60%	0%	8%	N.D.
STREAM 7	0%	5%	0%	0%	1%	0%	0%	93%	0%	0%	N.D.
STREAM 8	0%	5%	0%	0%	6%	0%	0%	81%	0%	8%	N.D.
STREAM 9	1%	2%	0%	0%	1%	2%	0%	23%	0%	72%	N.D.
STREAM 9A	0%	0%	0%	0%	0%	0%	0%	4%	0%	96%	N.D.
STREAM 9B	6%	12%	0%	0%	1%	0%	0%	80%	0%	1%	N.D.
STREAM 9D-G	0%	2%	0%	0%	2%	6%	0%	56%	0%	34%	N.D.
STREAM 10	4%	31%	3%	0%	0%	0%	0%	61%	0%	0%	N.D.
STREAM 10A	5%	32%	3%	0%	0%	0%	0%	60%	0%	0%	N.D.

Source: SWCA 2010

N.D.: No data. Presence or absence of tannins not noted

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More than 20% of Stream 5A's, 6's, 10's, and 10A's watersheds are covered by water-quality-enhancing bogs and fens. Ten to 20% of Stream 1's, 2A's, 5's, 8's, and 9B's watersheds are covered by bogs and fens, while 5% to 10% of Stream 3's and 7's watersheds are covered by bogs and fens. The remainder of the watersheds, including Favorite Creek and Streams 2, 4, 9, 9A, and 9D-G are covered by less than 5% bogs and fens.

Both bog forest and bog woodlands tend to be acidic and are poor in nutrients and minerals. Bogs obtain their water and nutrients from precipitation and are therefore ombrotrophic. In contrast, fens range from slightly acidic to slightly alkaline and have mineral-rich waters which are richer in nutrients than those found in bogs. Fens obtain their water and nutrients primarily from groundwater discharge or seepage and are therefore minerotrophic. Spruce-hemlock forests are also acidic. Tannins are produced from decaying vegetation and are more abundant in acidic waters, such as those draining bogs and spruce-hemlock forests. Generally speaking, more tannins are present in the water during winter and snow melt times.

Several lakes occur within watersheds 9, 9A, and 9D-9G (Figure 3 in Appendix A). These lakes are primarily surrounded by spruce-hemlock forest. The spruce-hemlock forest shades the streams and lakeshore and helps to keep water temperatures moderate both in the tributary streams and along the lakeshore during warmer weather. In addition, the tree roots provide water-quality benefits to the lakes by stabilizing the banks of the lakes and streams, therefore inhibiting bank failure and helping to limit sediment from entering the water. The water quality benefits that the vegetation provides to the streams likewise helps to provide higher water quality to the downstream lakes (Table 13).

Watershed slope may also play a role in water quality, as slope is one factor in mass wasting susceptibility. Steeper watershed slopes are more prone to mass wasting events, such as mudflows, debris flows and debris avalanches. Debris flows and debris avalanches typically initiate on slopes steeper than 35%, and may initiate on slopes up to about 100%. These mass movements may then travel downslope where they may deposit on slopes with only a 10% or shallower slope.

Earthflows are more common on more gradual slopes between about 5% and 25%. All mass wasting can contribute considerable amounts of sediment to streams. This sediment can disturb aquatic life and may be problematic for infrastructure.

Table 14 displays the percent of each watershed belonging to various slope categories. Data are somewhat limited for watersheds 9 and 9A, with 10% and 22% lack of slope data, respectively, although they are included in this analysis.

Based solely on the percentage of watershed area with slopes steeper than 35%, 30% or more of the area of watersheds 2, 2A, and 8 may be prone to mudflows, debris flows, and debris avalanche initiation, which may make these watersheds prone to having higher sediment loads and therefore lower water quality. Twenty-two percent of Stream 1's watershed is above a 35% slope, and 10% to 20% of watersheds 3, 5, 7, 9, 9A, 9D-G, 10, and 10A have slopes in excess of 35%.

Table 14. Watershed slope by percent area.

Watershed	0-5%	5-10%	10-15%	15-20%	20-25%	25-30%	30-35%	35-40%	40-45%	45-50%	Greater than 50%	No Data
FAVORITE CREEK	8	12	11	9	7	7	6	6	5	5	25	0
STREAM 1	11	13	13	13	12	9	8	6	5	5	6	0
STREAM 2	5	9	12	12	13	9	9	8	8	9	7	0
STREAM 2A	10	10	15	11	8	5	6	8	13	10	4	0
STREAM 3	25	21	18	11	7	5	3	3	3	1	3	0
STREAM 4	23	28	21	10	5	4	4	2	1	1	0	0
STREAM 5	16	8	11	11	9	10	16	8	4	3	3	0
STREAM 5A	23	16	13	7	9	12	12	4	1	1	0	0
STREAM 6	48	20	12	7	5	3	1	1	1	1	2	0
STREAM 7	16	8	25	18	10	8	3	1	1	2	9	0
STREAM 8	19	8	12	9	8	7	7	6	5	4	15	0
STREAM 9	29	12	10	8	6	5	5	3	3	3	6	10
STREAM 9A	29	9	8	7	5	4	4	3	2	3	5	22
STREAM 9B	36	27	15	7	4	3	1	1	2	2	3	0
STREAM 9D-G	25	16	13	9	9	6	7	4	4	3	4	0
STREAM 10	19	15	15	11	8	9	8	5	4	2	5	0
STREAM 10A	19	17	14	11	7	10	9	4	3	2	3	0

Source: SWCA 2010

Note: Data is somewhat limited for watersheds 9 and 9A, with 10% and 22% lack of slope data, respectively.

All of the watersheds contain large amounts of land that is potentially prone to mass movements, such as earthflows, which may occur on more gradual slopes.

Steep stream slopes produce more stream power for water to undercut banks and transport material than do gradual stream slopes, so stream slope may also play a role in water quality. Table 15 displays average stream slopes throughout the streams' length. The majority of the streams' slopes are less than 5%, although Streams 2, 2A, and 7 have slopes of 11.5%, 5.5%, and 5.0%, respectively. These steeper stream slopes give the streams more energy to erode their banks and transport material downstream. On a whole, the combined steeper watersheds and steeper stream gradients for Streams 2 and 2A make them more prone to potentially high erosion rates than the more gradually sloped watersheds and streams.

Table 15. Average stream slope

Stream	Average Stream Slope
Favorite Creek	3.0%
1	3.0%
2	11.5%
2A	5.5%
3	2.0%
4	3.5%
5	3.0%
5A	3.0%
6	3.0%
7	5.0%
8	2.5%
9	0.4%
9A	0.5%
9B	2.4%
9D-G	0.3%
10	2.5%
10A	4.4%

7.3 Stormwater

Stormwater is defined as precipitation that encounters man-made surfaces, such as roads, runways, and rooftops, which may concentrate its flow, increase runoff, decrease infiltration, and introduce pollution. Because the airport and access alternatives are in currently undeveloped areas, all precipitation currently either infiltrates native substrate or runs off into natural streams.

7.4 Groundwater Conditions

An aquifer is a geologic formation that is sufficiently saturated to allow the movement of economic quantities of water to wells or springs. No information is available on the groundwater conditions in Angoon. No groundwater wells or injection wells are known in the Angoon area. The location of the freshwater/saltwater interface in groundwater has not been determined in the Angoon vicinity.

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Literature Cited

ADEC. 2009. Water Quality Standards 18 AAC 70, Alaska Department of Environmental Conservation, March 23, 2006.

————. 2008. Contaminated Sites Program Database Search. ADEC Division of Spill Prevention and Response website, last accessed 11/5/2009 at http://www.dec.state.ak.us/spar/csp/db_search.html.

City of Angoon. 1990. Angoon Coastal Management Plan Enforceable and Administrative Policies, effective May 25, 1990.

Curran, J. H., D. F. Meyer, and G. D. Tasker. 2003. Estimating the magnitude and frequency of peak streamflows for ungaged sites on streams in Alaska and conterminous basins in Canada: U.S. Geological Survey Water-Resources Investigations Report 03-4188.

DOL&WD. 2009. Online databases on population estimates and projections. http: //laborstats.alaska.gov/?PAGEID=67&SUBID=115. Accessed July 2009.

DOT&PF. 2007. Angoon Airport Master Plan. Alaska Department of Transportation & Public Facilities, May 2007.

EPA. 2004. Assessment Data for Alaska, Admiralty Island Watershed (8 Digit USGS Cataloging Unit), Year 2008, located at http://iaspub.epa.gov/tmdl_waters10/w305b_report_all.huc?p_huc=19010204&p_state=AK&p_cycle=2008, last accessed 12/23/09.

Lathrum, E. H., J. S. Pomeroy, H. C. Berg, and R. A. Loney. 1965. Reconnaissance Geology of Admiralty Island Alaska, U.S. Geological Survey Bulletin 1181-R, 48 p., 2 plates, 1:250,000.

Leopold, L. B. 1994. *A View of the River*. Harvard University Press, Cambridge, MA, 290 p.

NOAA. 2009. E-mail from Todd Ehret, Physical Oceanographer at NOAA, to Linda Mark, Vigil-Agrimis, Inc., November 13, 2009, regarding tidal datums for station Favorite Bay, Kootznahoo Inlet, Alaska.

NRCS. 2009a. Small Watershed Hydrology, WinTR-55 User Guide. USDA Natural Resources Conservation Service, Conservation Engineering Division, January 2009, 47 pages plus appendices.

————. 2009b. WinTR-55 Small Watershed Hydrology Computer Program Version 1.00.09. USDA Natural Resources Conservation Service, Conservation Engineering Division, 2009.

Powell, J. 2008. Alaska Department of Environmental Conservation, Juneau, Alaska. Personal communication with Mauria Pappagallo (Vigil-Agrimis, Inc.) regarding water quality standards. January 11, 2008.

Robison, E.G., and R. L. Beschta. 1990. Characteristics of coarse woody debris for several coastal streams of southeast Alaska, USA. *Canadian Journal of Fisheries and Aquatic Sciences* 47:1684–1693.

Rosgen, D. 1996. *Applied River Morphology*. Wildland Hydrology Books, Pagosa Springs, Colorado, 390 p.

SWCA. 2011. Angoon Airport EIS – Favorite Creek Large Woody Debris Survey Technical Memorandum, April 12, 2011 revision, Portland, Oregon, 19 p.

————. 2010. E-mail from Rachel Johnson at SWCA, Inc. to Linda Mark at Vigil-Agrimis Inc., January 8, 2010, containing unpublished data.

USACE. 2008. HEC-RAS River Analysis System, Version 4.0.0, March 2008. U.S. Army Corps of Engineers Hydrologic Engineering Center, Davis, CA.

USFS. 1992. A Channel Type User Guide for the Tongass National Forest, Southeast Alaska. USDA Forest Service, Alaska Region, R10 Technical Paper 26, April 1992, 179 p.

————. 2001. Alaska Region Aquatic Habitat Management Handbook. FSH 2090.21, Chapter 20 - Fish and Aquatic Stream Habitat Survey, 182 p.

USGS. 1997. Precipitation Map of Alaska, Alaska Geospatial Data Clearinghouse, accessed at http://agdc.usgs.gov/data/usgs/water/metadata/ak_precip.html.

————. 2008. USGS Flow Gage 15102200 Favorite Creek near Angoon Alaska, http://ida.water.usgs.gov/ida/available_records.cfm?sn=15102200, website last modified 2008.

WRCC. 2009. Angoon, Alaska (500310) Period of Record Climate Summary, Western Regional Climate Center, http://www.wrcc.dri.edu/index.html, last accessed 12/23/09.

Acronyms

1-D	one-dimensional
ADEC	Alaska Department of Environmental Conservation
AHMHAR	Aquatic Habitat Management Handbook Alaska Region
ANCSA	Alaska Native Claims Settlement Act.
ANILCA	Alaska National Interest Lands Conservation Act
AWQS	Alaska's water quality standards
cfs	cubic feet per second
DO	dissolved oxygen
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	environmental impact statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FC	fecal coliform
FEMA	Federal Emergency Management Agency
HEC-RAS	Hydrologic Engineering Center – River Analysis System
LWD	large woody debris
mg/L	milligrams per liter
MHHW	mean higher high water
MLLW	mean lower low water
MPN	most probable number
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity units
SWCA	SWCA Environmental Consultants
TAqH	total aqueous hydrocarbons
TAH	total aromatic hydrocarbons
TDS	total dissolved solids
USFS	U. S. Forest Service
USGS	U. S. Geological Survey
WRCC	Western Regional Climate Center

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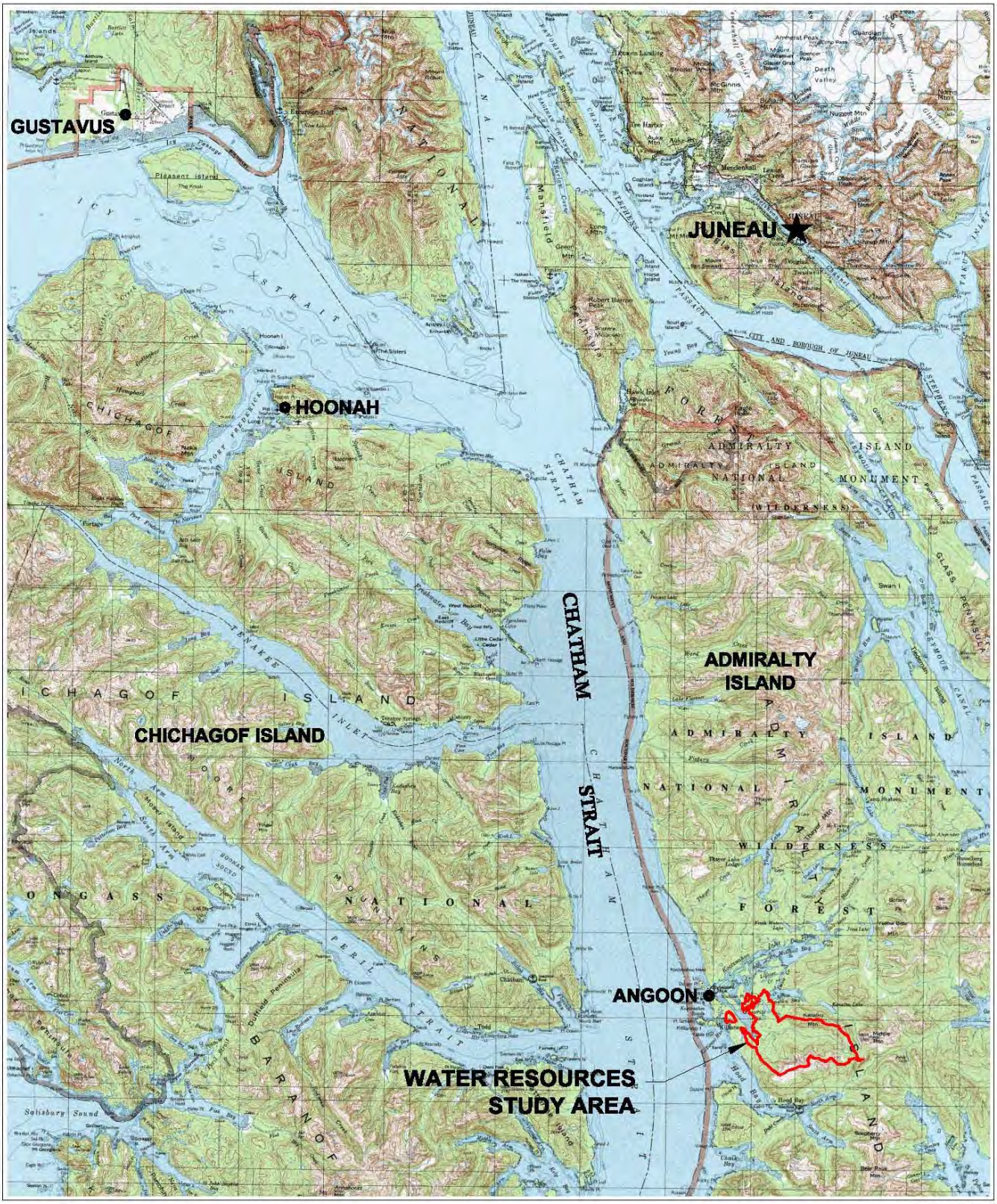
Appendix A. Figures



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0 2.5mi 5mi 10 miles 20 miles

FIGURE 1
VICINITY MAP

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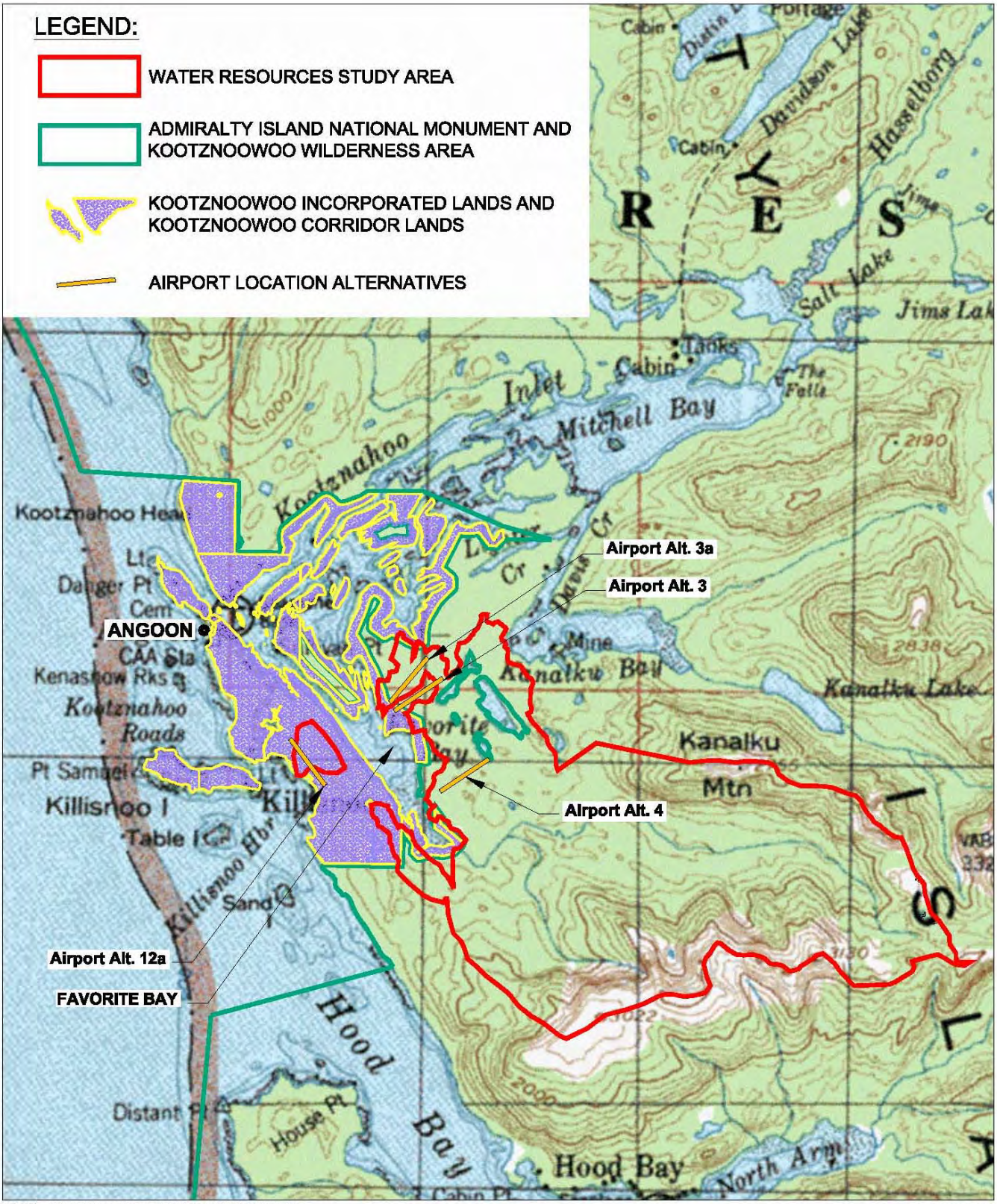
design professionals



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NOTE: AIRPORT ALT. 3 IS NO LONGER UNDER CONSIDERATION IN THE ENVIRONMENTAL IMPACT STATEMENT.

FIGURE 2
PROJECT LOCATION MAP

0 .50mi 1mi 2 miles 4 miles

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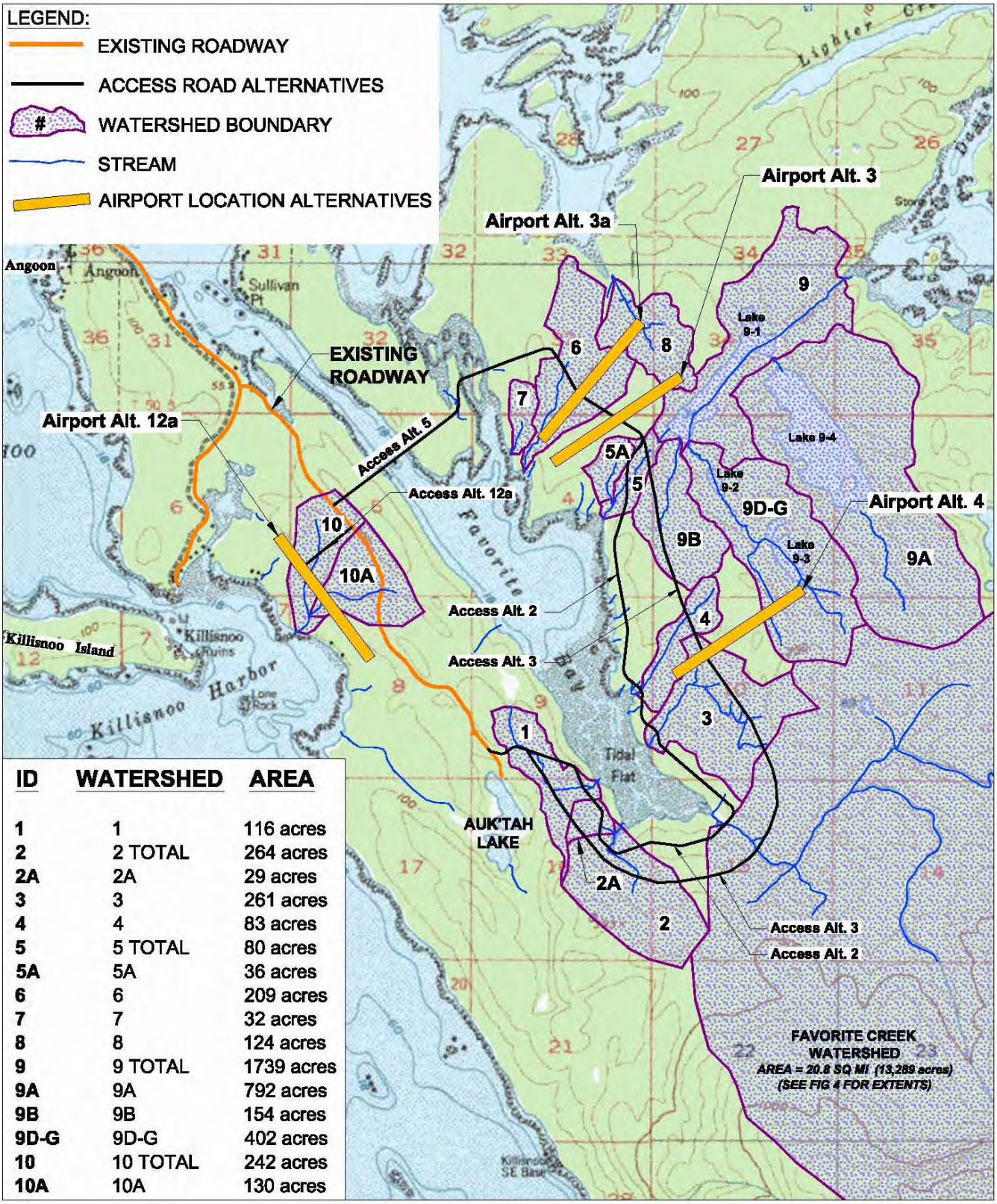

ID	WATERSHED	AREA
1	1	116 acres
2	2 TOTAL	264 acres
2A	2A	29 acres
3	3	261 acres
4	4	83 acres
5	5 TOTAL	80 acres
5A	5A	36 acres
6	6	209 acres
7	7	32 acres
8	8	124 acres
9	9 TOTAL	1739 acres
9A	9A	792 acres
9B	9B	154 acres
9D-G	9D-G	402 acres
10	10 TOTAL	242 acres
10A	10A	130 acres

NOTE: AIRPORT ALT. 3 IS NO LONGER UNDER CONSIDERATION IN THE ENVIRONMENTAL IMPACT STATEMENT.

0 1000 2000 4000 8000

SCALE: 1" = 4000 feet

FIGURE 3
WATERSHEDS OF INTEREST AND POTENTIAL AIRPORT ALTERNATIVES IN THE ANGOON AIRPORT STUDY AREA

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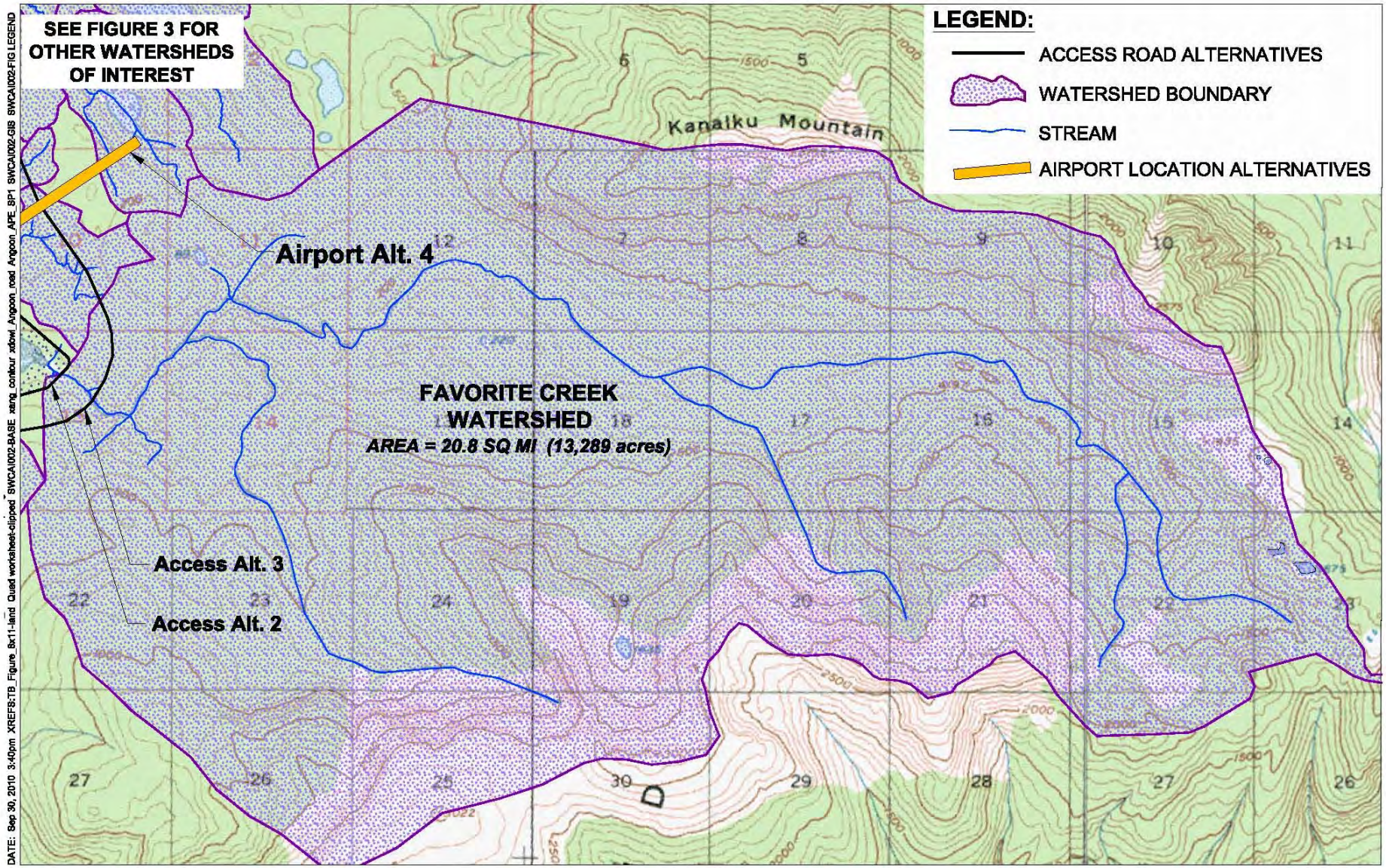

FIGURE 4
WATERSHEDS OF INTEREST - FAVORITE CREEK WATERSHED

0 1000 2000 4000 8000
SCALE: 1" = 4000 feet

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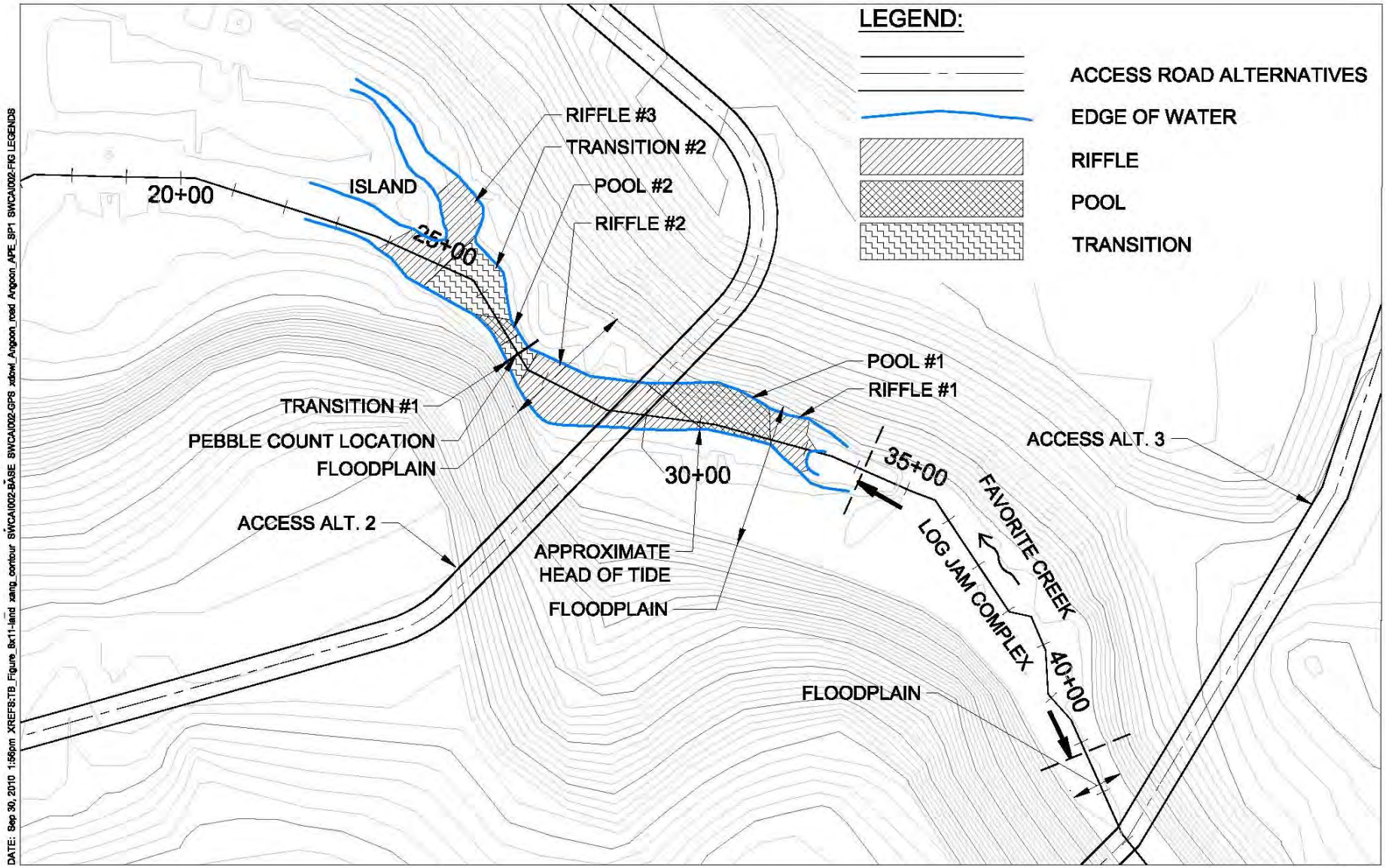

FIGURE 5
FAVORITE CREEK STUDY REACH

0 125 250 500
SCALE: 1" = 250 feet

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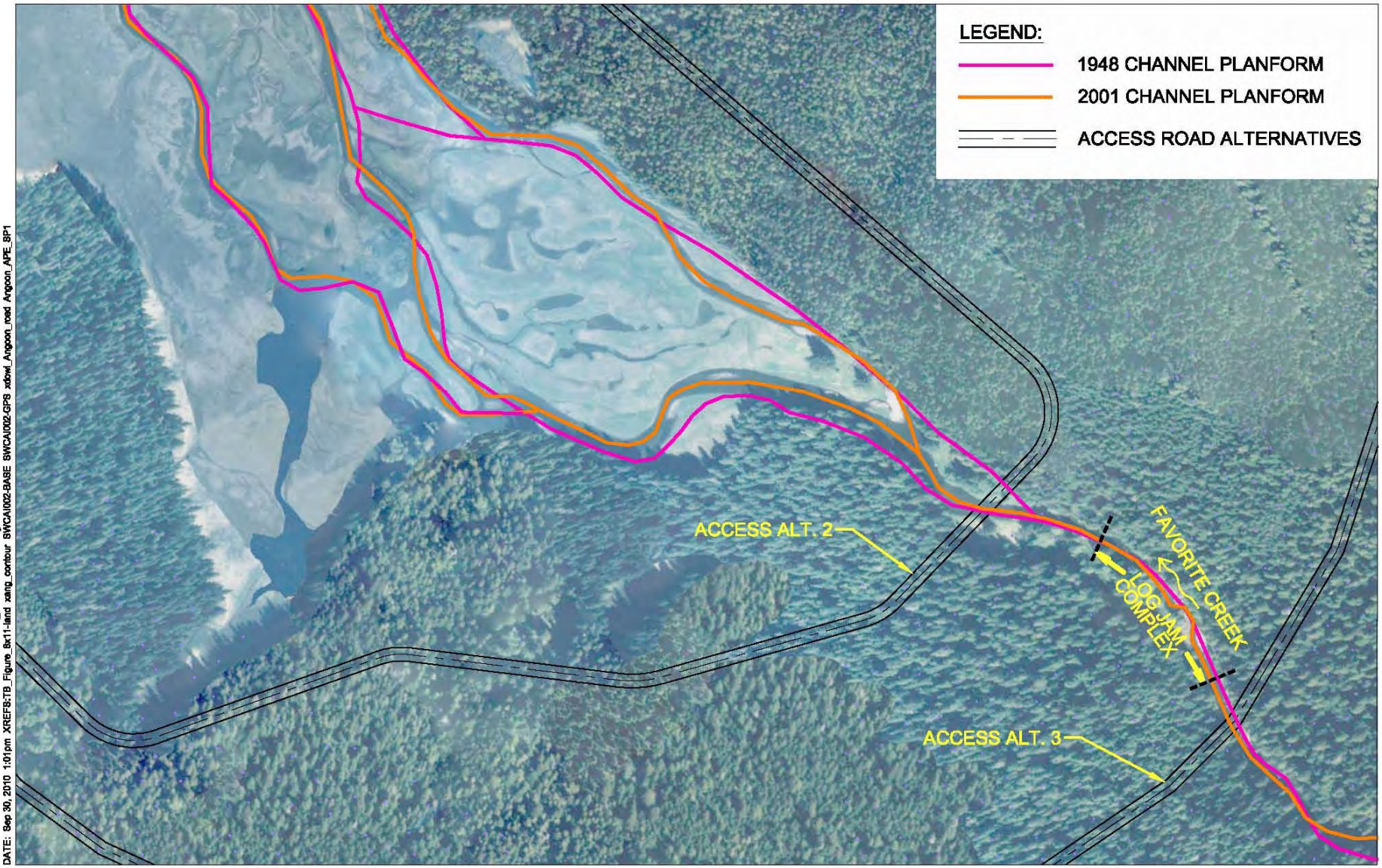

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Source: 2001 Aerial Photo

FIGURE 6
FAVORITE CREEK HISTORIC PLANFORM

0 250 500 1000
SCALE: 1" = 500 feet

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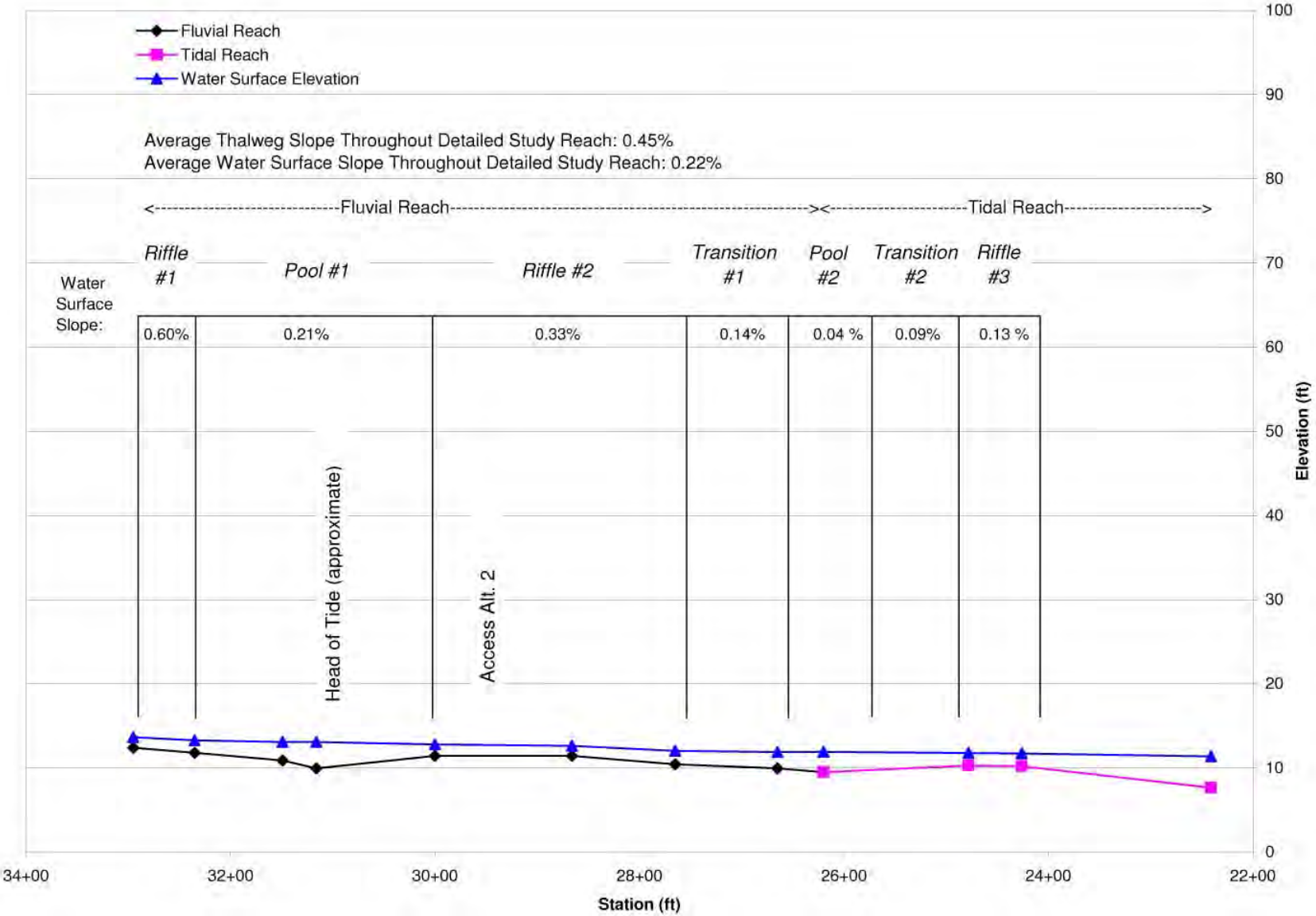

FIGURE 7
FAVORITE CREEK PROFILE

Angoon Airport EIS - Water Resources Technical Memorandum
Angoon, AK

VIGIL AGRIMIS
design professionals

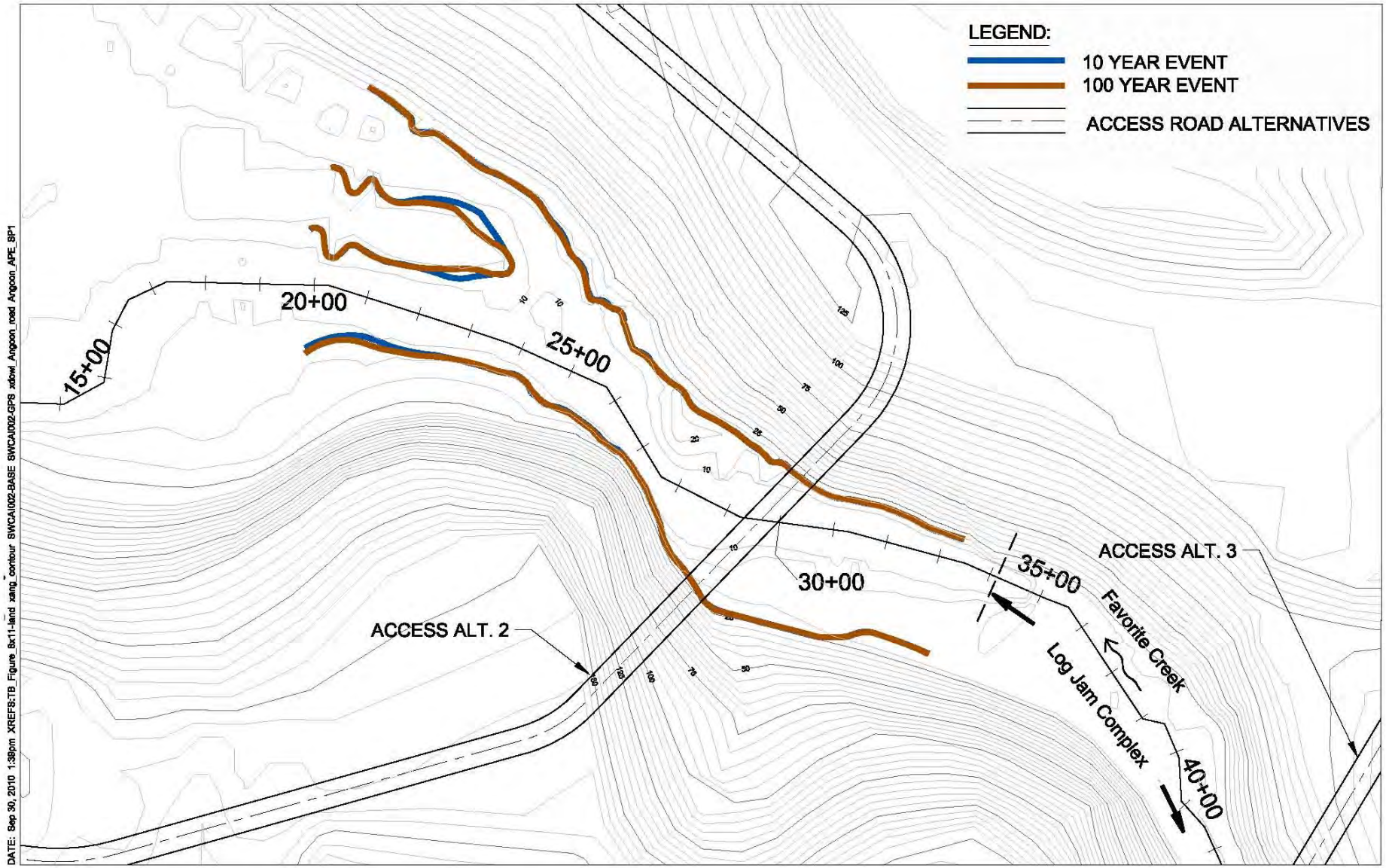

FIGURE 8
FAVORITE CREEK EXISTING CONDITIONS FLOODPLAIN BOUNDARY MAP

0 125 250 500
SCALE: 1" = 250 feet

Angoon Airport EIS - Water Resources Technical Memorandum
Angoon, AK

VIGIL AGRIMIS
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Appendix B. Angoon Airport EIS–Favorite Creek Large Woody Debris Study

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Technical Memorandum

To: Linda Mark, Vigil-Agrimis
From: Ryan French, SWCA Aquatic Biologist
Leyla Arsan, SWCA Aquatic Biologist
Date: April 12, 2011 *revision*
Subject: Angoon Airport EIS – Favorite Creek Large Woody Debris Survey

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Introduction

A Tier II survey for large wood in Favorite Creek was performed by SWCA Environmental Consultants on August 20, 2009. This information was collected for Vigil-Agrimis to be used in preparing the Water Resources Technical Report for the Angoon Airport EIS. The area surveyed included 200 feet upstream and 200 feet downstream from the centerline of the proposed upper and lower road crossings on Favorite Creek, tributary of Favorite Bay, Alaska. The survey area for each road crossing was approximately 400 linear feet as determined by a Trimble GeoXT GPS unit.

Methods

As per the US Forest Service Aquatic Habitat Management Handbook (USFS 2001), only pieces that met the minimum qualifying dimensions, were within the bankfull width of the stream, and located in zones 1 and 2 were counted. The minimum qualifying dimensions were 0.1 meters in diameter (measured at the widest point) and 1.0 meters in length. Live trees or dead standing snags overhanging the channel were not counted, as none were actively creating pools or contributing to channel forming processes.

Key piece minimum dimensions vary based on stream size, which is differentiated by average channel bed width. The average channel bed width of Favorite Creek ranged from 10-19.9 meters; therefore key piece minimum dimensions were either 0.6 meters in diameter and >7.6 meters stem length, or >3 meters rootwad diameter.

Digital photos were taken of all qualifying large wood pieces and are included in Appendix 1. GPS satellite signal was not strong enough at the time of the survey to delineate each individual piece of large wood. Wood pieces were measured with a 2 meter range-pole with 1 centimeter increments. A site overview sketch of the position and orientation of qualifying large wood pieces was documented in field notes and is included in Appendix 1.

Results

Thirty-three pieces of qualifying large wood were counted at the proposed lower road crossing and 25 pieces were tallied at the proposed upper road crossing within the 400 foot survey corridors along the stream. No pieces met the minimum qualifying dimensions of key pieces for all three categories (diameter, length, and rootwad diameter) at either the upper or lower road crossings. Several pieces met the criteria for one or two categories. One piece at the lower road crossing qualified as a key piece based on length and diameter. Two pieces at the upper road crossing qualified as key pieces based on rootwad diameter.

All data are included in Appendix 2.

Discussion

Three pieces that were observed qualified as key pieces. One additional piece at the upper road crossing was very close to qualifying as a key piece (rootwad diameter = 3 meters), however the USFS (2001) states that the diameter must be greater than 3 meters to qualify.

There are a significant amount of key pieces between the proposed lower and upper road crossing, including a large logjam. The potential for recruitment of large wood downstream to the lower road crossing is high, as some of these key pieces are likely to be transported during major storm events.

Tidal influence was observed up to and slightly above the lower road crossing during high tide on August 20, 2009. The tidal influence was not apparent during earlier surveys when freshwater discharge was higher and tidal amplitude was lower. The tide height during the August 20, 2009 observation was 17.8 feet (per the Juneau tide table). Gradient and stream velocity decrease in the reach adjacent to the lower road crossing, which may allow for the deposition of large wood pieces.

References

US Forest Service. 2001. Aquatic Habitat Management Handbook. Alaska Region, R-10 2090.21-2001-1, Chapter 20 Fish and Aquatic Stream Habitat Survey.

Appendix 1. Photos and Site Overviews

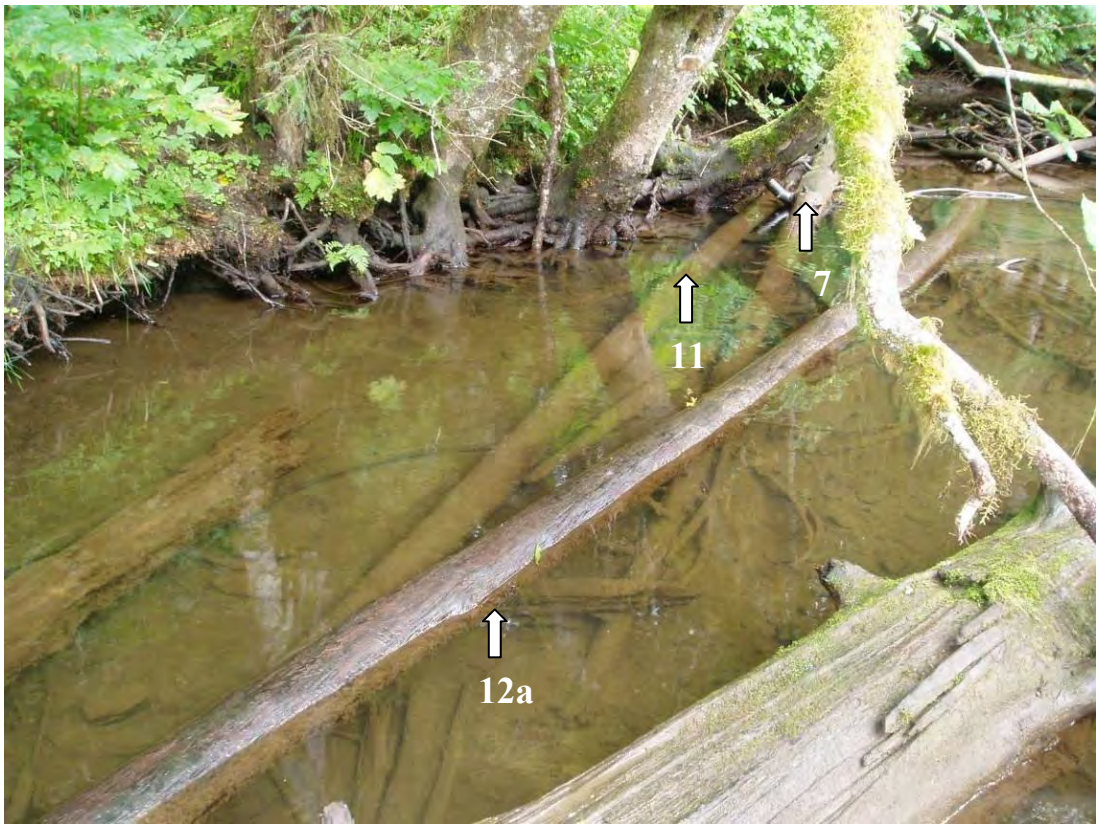
Lower Road Crossing

Piece 1

Piece 3

Piece 4, 5, 6

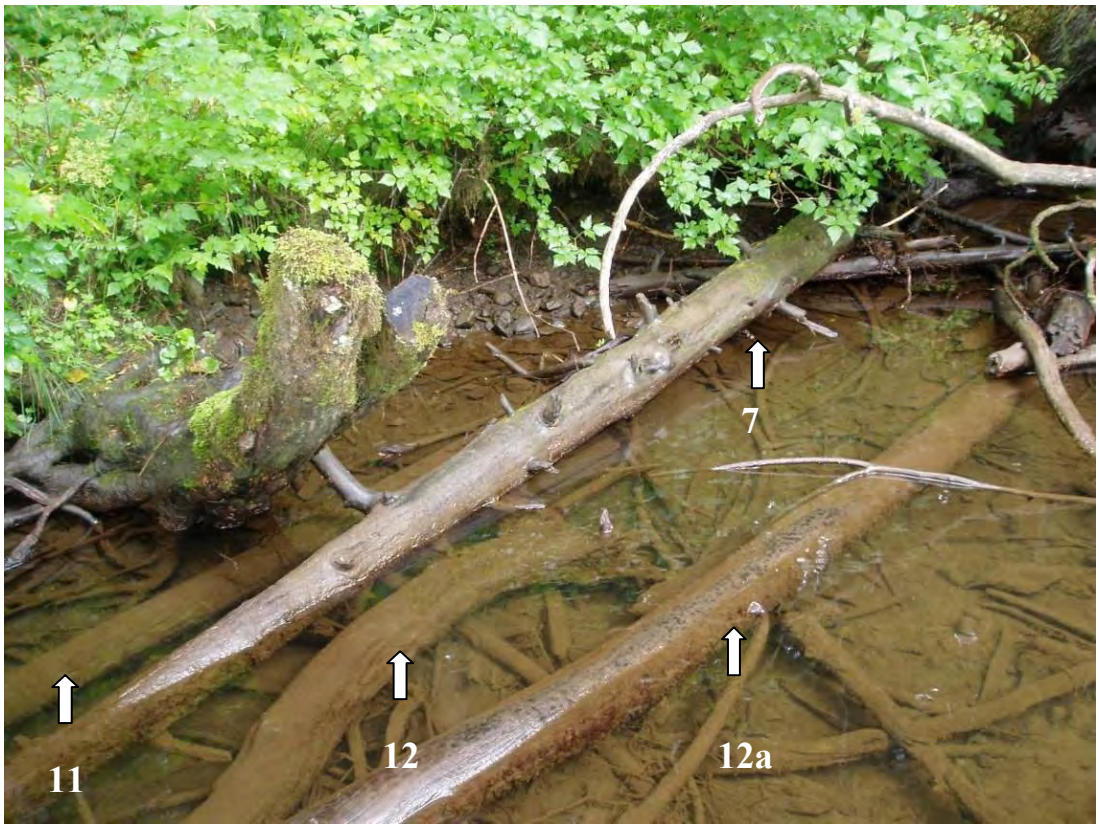
Piece 6



Piece 7, 11 and 12a

Piece 8 and 9

Piece 10 (with pink salmon)



Piece 7, 11, 12 and 12a

Piece 13

Piece 14* (*qualifies as key piece)

Piece 14*, 14a, 15, 16, 17, 18, 19, 20 (*qualifies as key piece)

Piece 21

Piece 22

Piece 14*, 23, 24, 25, 26, 27 and 28 (*qualifies as key piece)

Piece 29

Piece 30

Piece 31

Upper Road Crossing Photos

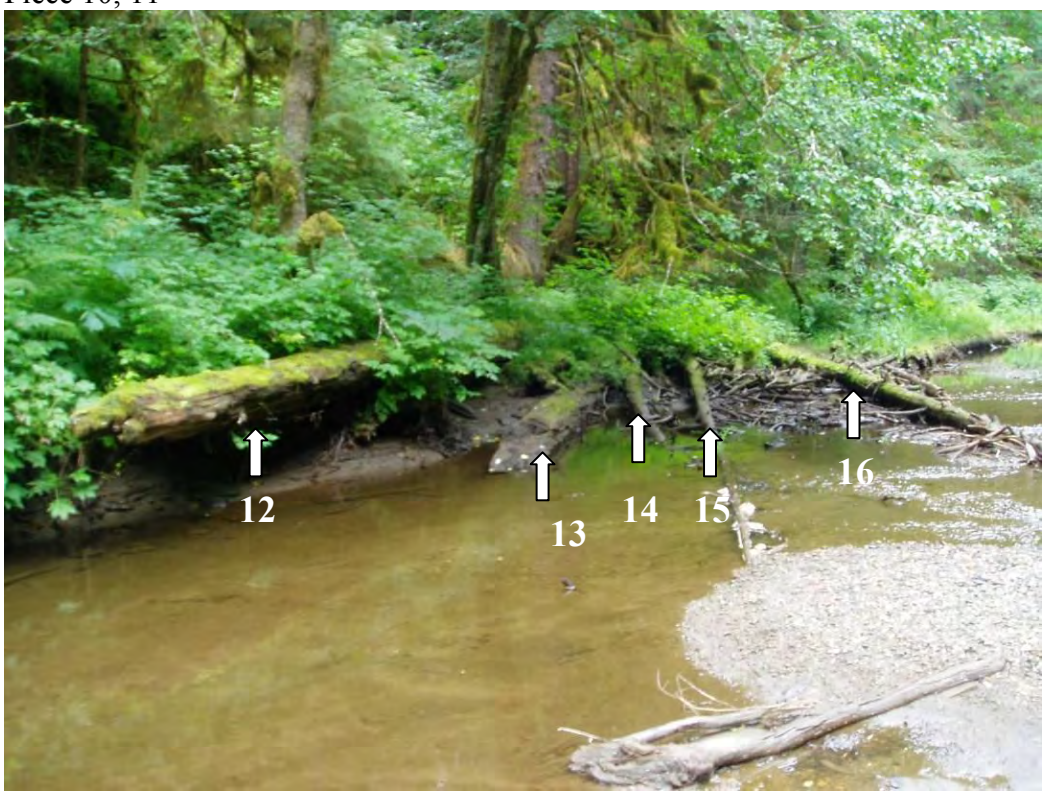
Piece 0, 1*, 2*, 3 (*qualifies as key piece)

Piece 4

Piece 5

Piece 6, 7, 8, 9

Piece 10, 11



Piece 12, 13, 14, 15, 16

Piece 17, 18, 19

Piece 20

Piece 21

Piece 22

Piece 23

Piece 24

Appendix 2. Large Woody Debris Data

From 200' below to 200' above lower road crossing

Piece ID#	Type	Length (m)	Max Diameter (m)	Zone Location	Bank (looking upstream)	Rootwad (dia.)	Key Piece*
1	conifer	9	0.3	1	LB	No	No
2	conifer	4	0.2	1	LB	No	No
3	alder	6	0.4	1,2,3,4	LB	No	No
4	conifer	12	0.2	1	LB	No	No
5	conifer	5	0.3	1	LB	No	No
6	conifer	16	0.45	1	LB	No	No
7	conifer	6	0.25	1,2	LB	No	No
8	conifer	15	0.23	1,2,3,4	LB	No	No
9	conifer	11	0.25	1	LB	No	No
10	alder	7	0.3	1	LB	No	No
11	conifer	8	0.3	1	LB	No	No
12	conifer	2	0.3	1	LB	No	No
12a	conifer	19	0.3	1	LB	No	No
13	conifer	4	0.4	1	LB	No	No
14	conifer	25	0.65	1,2,3,4	LB	Yes (1m)	Yes
14a	conifer	6	0.25	1	LB	No	No
15	conifer	3	0.2	1	LB	No	No
16	conifer	3	0.2	1	LB	No	No
17	conifer	3	0.2	1	LB	No	No
18	conifer	3	0.2	1	LB	No	No
19	conifer	3	0.2	1	LB	No	No
20	conifer	3	0.2	1	LB	No	No
21	conifer	11	0.51	1,2	LB	No	No
22	conifer	9	0.16	1,2	LB	No	No
23	conifer	13	0.19	1,2	LB	No	No
24	conifer	2	0.2	1	LB	No	No
25	conifer	4	0.2	1	LB	No	No
26	conifer	4	0.2	1	LB	No	No
27	conifer	6	0.2	1	LB	No	No
28	conifer	6	0.2	1	LB	No	No
29	conifer	4.5	0.44	1,2	LB	No	No
30	conifer	3	0.4	1,2,3,4	RB	No	No
31	conifer	3	0.15	2	RB	No	No

From 200' below to 200' above upper road crossing

Piece ID#	Type	Length (m)	Max Diameter (m)	Zone Location	Bank (looking upstream)	Rootwad (dia.)	Key Piece*
0	alder	3.5	0.4	1,2,3	RB	No	No
1	conifer	17	0.45	1,2,3,4	Across stream	Yes (4m)	Yes
2	conifer	17	0.4	1,2,3,4	Across stream	Yes (4m)	Yes
3	conifer	20	0.35	1,2,3	RB	No	No
4	conifer	3	0.2	2	LB	No	No
5	conifer	3	0.2	2	LB	No	No
6	conifer	11	0.62	1,2,3,4	RB	No	No
7	conifer	3	0.2	1	RB	No	No
8	conifer	3	0.2	1	RB	No	No
9	conifer	3	0.2	1	RB	No	No
10	conifer	4	0.5	1,2,3,4	LB	No	No
11	conifer	4	0.3	1,2,3	LB	No	No
12	conifer	5	0.4	2,3,4	LB	No	No
13	conifer	3.5	0.35	1,2	LB	No	No
14	conifer	3	0.2	1,2	LB	No	No
15	conifer	5	0.15	1,2	LB	No	No
16	conifer	5	0.25	1,2	LB	No	No
17	conifer	12	0.35	2,3,4	RB	Yes (3m)	No**
18	conifer	4	0.3	1,2,3,4	RB	No	No
19	conifer	5.5	0.5	1,2	RB	No	No
20	conifer	7	0.25	1,2,3,4	RB	No	No
21	conifer	8	0.45	1,2	LB	No	No
22	alder	4	0.4	1,2	RB	No	No
23	conifer	6.5	0.4	1,2	LB	No	No
24	conifer	5	0.25	1,2	LB	No	No

*Key piece definition for streams 10-19.9m in width = [>0.6m diameter and >15m length] or >3m diameter rootwad

** USFS (2001) states that rootwad must be >3m in order to qualify as a key piece

APPENDIX K
CULTURAL RESOURCES TECHNICAL REPORT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

CULTURAL RESOURCES TECHNICAL REPORT FOR THE AREA OF POTENTIAL EFFECTS FOR AIRPORT 12A WITH ACCESS 12A (PREFERRED ALTERNATIVE)

ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ANGOON, ALASKA

Prepared for

Federal Aviation Administration
Alaska Department of Transportation and Public Facilities

Prepared by

Certus Environmental Solutions

and

SWCA Environmental Consultants

SWCA Cultural Resources Report No. 13-494

SWCA Project No. 24650

August 2014

CONTAINS PRIVILEGED INFORMATION – NOT FOR PUBLIC RELEASE

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1.0 INTRODUCTION

This report outlines studies conducted in support of a proposal to construct a land-based public airport to serve the community of Angoon in Southeast Alaska (Figure 1). The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF) for funding and other approvals for the new airport. The FAA is the lead federal agency, and the FAA's approvals and funding would constitute the agency's undertaking as defined in the implementing regulations of the National Historic Preservation Act (NHPA). SWCA Environmental Consultants (SWCA) carried out the cultural resource studies under the direction of the FAA. Dr. Robert Kopperl served as the principal investigator, and Molly Odell served as the field lead.

The FAA is considering three potential airport locations (i.e., alternatives) and multiple access road alternatives associated with those airport locations. Two of the three potential airport locations and portions of their associated access roads are located on lands administered by the U.S. Forest Service (USFS) within the Admiralty Island National Monument and Kootznoowoo Wilderness Area. The third alternative occurs on privately owned lands and lands owned by the City of Angoon and Kootznoowoo, Inc. The FAA has identified this latter alternative, known as Airport 12a with Access 12a, as its preferred alternative for the draft EIS.

The FAA, in consultation with the Alaska State Historic Preservation Officer and the USFS, implemented a phased approach to identifying cultural resources that could be affected by construction and operation of the airport. These phases consist of Phase 1 (preliminary studies of all three airports and their associated access road locations) and Phase 2 (expanded studies of only the FAA's preferred alternative). The Phase 1 studies are described in Cultural Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement, which is attached as Appendix A to this report (SWCA 2012). The FAA recognized that the preliminary nature of the field studies conducted during Phase 1 would not provide sufficient information to fulfill the Section 106 requirements of the NHPA for any alternative but would be sufficient for the EIS to compare the relative risk to cultural resources from each alternative.

Once a preferred alternative was identified by the FAA, the agency carried only that preferred alternative through the remainder of the Section 106 process; that is, the FAA moved forward with Section 106 consultation for the preferred alternative only. As such, the FAA focused Phase 2, intensive-level field studies, on Airport 12a with Access 12a. Two potential materials (e.g., gravel, rock, etc.) source locations that were identified after the Phase 1 reconnaissance studies were also included in the FAA's Phase 2 study efforts.

This technical document reports the findings of the Phase 2 studies for the preferred alternative and the potential materials sources (described in section 3.0 below). It also provides updates to archival research and descriptions of field methods. Information contained in the Phase 1 report is incorporated by reference, and relevant information from that report has also been included in this Phase 2 technical report. Consultation with the State Historic Preservation Office (SHPO) and other consulting parties will continue throughout the EIS process, and additional revisions may be made to this report in the future.

For the purposes of this report, cultural resources are defined as archaeological, historic, prehistoric, and traditional cultural (heritage) properties. The term "historic properties" is also used in this report. This term refers to cultural resources that have gone through a formal evaluation of their eligibility for listing on the National Register of Historic Places (NRHP), regardless of their resource type, age, or

particular cultural affiliation. This report includes information on cultural resources that occur or have the potential to occur in the vicinity of the airport and access road alternative. Raw data collected during the field studies are available for review to the extent allowable by federal law and policy (i.e., within the parameters of protecting confidential information as allowed by federal law). This report also provides the cultural resource consultant's recommendations of NRHP eligibility for cultural resources identified in the Phase 2 area of potential effects (APE).

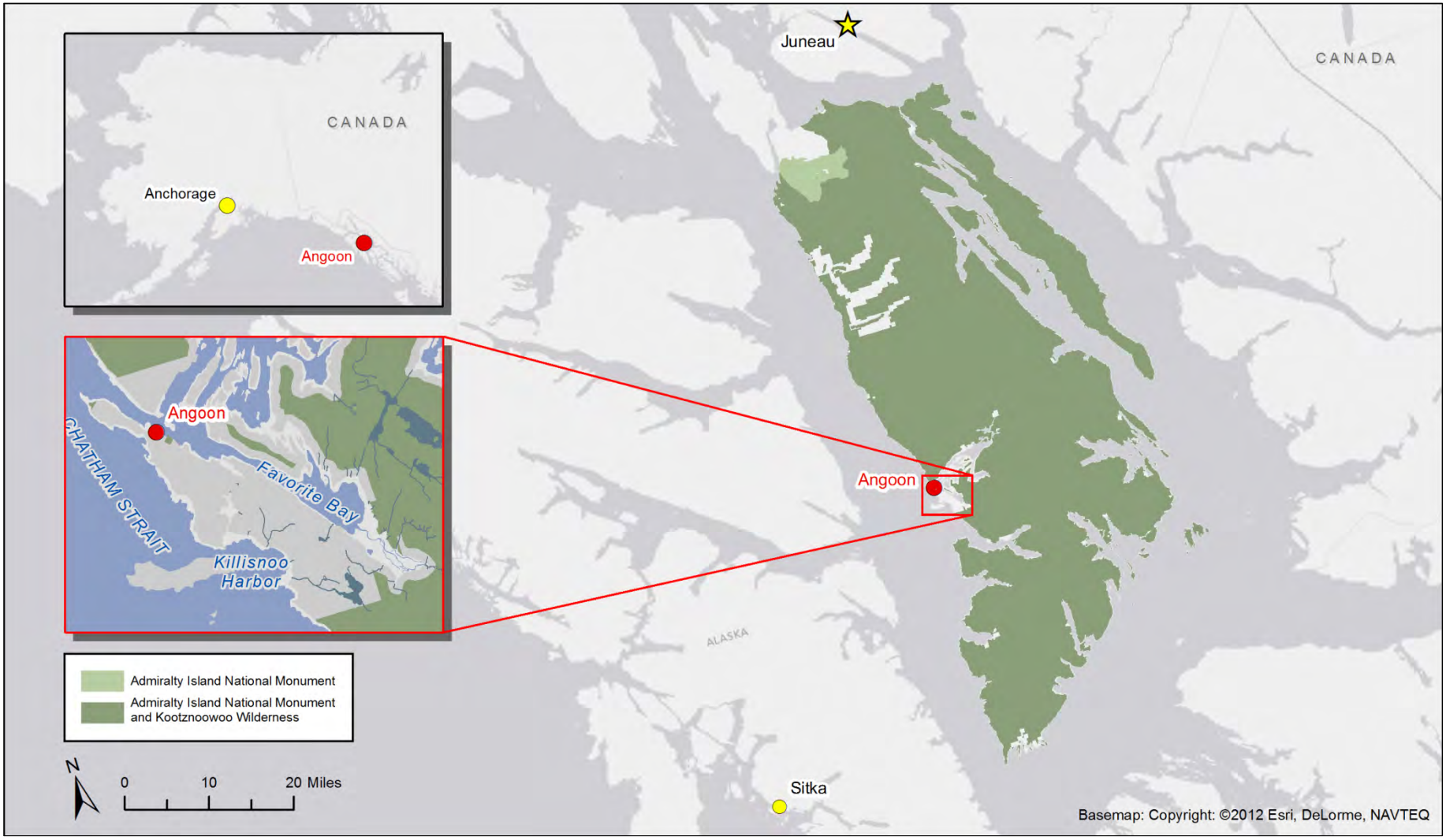

Figure 1. General location of Angoon Airport project.

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2.0 PROPOSED UNDERTAKING

As noted above, the proposed undertaking by the FAA would be the issuance of their approvals and funding for the airport as proposed by the DOT&PF. The proposed airport project consists of construction and operation of a land-based airport and airport access road for the community of Angoon, which currently has no land-based airport. The DOT&PF would own and operate the airport. The land-based airport would accommodate small, wheeled aircraft and would include a single runway with an apron. A new access road for the airport would need to be constructed. The components of the airport are summarized below.

Components of the airport project:

- Runway: Paved; 3,300 feet long and 75 feet wide, with future expansion to 4,000 feet long*
- Runway safety areas: 150 feet wide, centered on runway centerline, extending 300 feet beyond each runway end
- Object free area: 500 feet wide, centered on runway centerline, extending 300 feet beyond each runway end
- Runway protection zone: Standard visual approach dimensions of 500 × 1,000 × 700 feet
- Single, perpendicular taxiway: Paved
- Aircraft apron: Paved
- Navigational aid: Rotating beacon
- Visual approach aid: Precision approach path indicator
- Runway lights: Pilot-controlled, medium-intensity lights
- Terminal space: Sufficient area for a future terminal or passenger shelter
- Lease lots: Approximately 65,000 square feet available for leasing
- Electrical control building: Near future terminal site
- Perimeter fence: For security and wildlife control
- Passenger parking lot: Paved, near future terminal site
- Support facilities: Weather station, communication, etc.
- Access road: Two, paved, 10-foot lanes and 5-foot shoulders
- Overhead utility lines: Power and telephone lines located within the access road corridor**

*Future expansion would be subject to additional environmental review when proposed for construction.

**Utility lines would only be installed if it is determined to be cost-effective.

Construction of the airport would include the following activities:

- Vegetation removal related to the airport, road, and certain avigation easements (clearing of all vegetation for construction, line of sight, and open areas for flight approach and takeoff)
- Tree felling in certain avigation easements (cutting down the trees but not other vegetation). For the effects analysis where tree felling is identified in certain avigation easements, it is assumed that all trees in these easements would be felled (cut down).
- Terrain disturbance related to the airport, airport access road, and access roads to avigation easements (cutting and filling of soil or blasting of bedrock to level the ground)
- Terrain disturbance from potential extraction of construction materials such as gravel, soil, and rock from an on-island materials source
- Laying of pavement related to the airport and road (creating impervious surfaces)
- Culverting, re-routing, or filling of streams

- Movement of construction equipment and vehicles along roads
- Construction activity and equipment in work areas
- Illumination of construction areas and of some equipment for low-light daytime and nighttime construction
- Barging of construction materials to the island and unloading of barged materials at the ferry terminal
- Construction of airport perimeter fence

3.0 Area of Potential Effects

Implementation of the proposed undertaking (i.e., construction and operation of an airport at location Airport 12a with Access 12a) has the potential to affect historic properties in a variety of ways. Construction-related ground disturbance and manipulation of vegetation has the potential to directly affect such properties through physical alteration or damage. Construction- and operation-related noise and visual changes in the existing landscape caused by construction of the airport have the potential to indirectly affect historic properties. To assess the effects from direct disturbance, visual intrusion, and noise, the FAA identified APEs for each of these anticipated types of effect. In some cases, the different APEs overlap or coincide with each other, such as the Noise APE, which is fully encompassed by the Direct APE. In other cases, such as for the Visual APE, the area of anticipated effect is distinct from other APEs. The sections below discuss and describe the different APEs defined by the FAA.

The locational information for the APEs as described below are as follows:

- Direct APE - Sections 5, 6, 7, and 8, Township 51 South, Range 68 East, Copper River Meridian, Sitka B-2
- Visual APE - Section 6 and 7, Township 51 South, Range 68 East, Copper River Meridian, Sitka B-2
- Noise APE - Sections 5, 6, and 8, Township 51 South, Range 68 East, Copper River Meridian, Sitka B-2

In addition to defining specific APEs, the FAA assessed the overall potential for vibration effects to historic properties. This was accomplished by considering resource types vulnerable to adverse effects from vibration during construction. The evaluation of potential vibration effects is discussed further in section 5.5, below.

3.1 Direct APE

The Phase 2 studies focus on the FAA's preferred alternative—Airport 12a with Access 12a—and two potential materials source locations, the Kootznoowoo, Inc. Proposed Materials Source and Materials Source 2, identified after the Phase 1 studies were completed. All of the lands within the Phase 2 Direct APE are privately owned or owned by the City of Angoon.

The Phase 2 Direct APE, shown below in Figure 2, encompasses an area of 267.91 acres on the greater Angoon peninsula and includes all areas that would be subject to vegetation removal, terrain disturbance, and tree felling. The Phase 2 Direct APE is limited to areas that would experience direct effects from landscape disturbance. The FAA received concurrence on the Direct APE from the Alaska State Historic Preservation Office (SHPO) in August 2013 (Bittner 2013). Subsequent to receiving the SHPO's concurrence, the FAA expanded the Phase 2 Direct APE to include the potential materials source locations where ground disturbance may also occur, based on information from the City of Angoon (2008).

As shown on Figure 2, the Phase 2 Direct APE overlaps with a portion of the Phase 1 APE and has been, in some locations, reduced in size from the Phase 1 APE. Additional Phase 2 studies were completed in

portions of the Phase 2 Direct APE that were previously unsurveyed during Phase 1 and in some overlapping portions that were considered most sensitive for cultural resources to provide additional data for identification and evaluation of potentially significant historic properties. All portions of the Phase 2 Direct APE were surveyed during either the Phase 1 or Phase 2 field investigations. The results of relevant Phase 1 studies that examined portions of the Phase 2 Direct APE are incorporated into the Phase 2 findings and reported below (see section 7.0).

The information in this figure is protected by federal law. It is not for public release.

Figure 2. Phase 2 Direct APE and Alaska Heritage Resources Survey (AHRS) point sites within 1 mile of this APE.

3.2 Visual APE

Based on an analysis of anticipated changes to the visual nature of the landscape as a result of the airport project, the FAA defined an APE for visual effects to historic properties (Figure 3). Dense tree cover in the area of Airport 12a, as for all other alternatives, obscures the potential landscape changes associated with the airport and access road from most viewpoints around Angoon; that is, the locations from which landscape changes would be visible are discrete and localized. There are two viewpoints from which the landscape changes associated with Airport 12a would be visible:

1. On the eastern shore of Killisnoo Island. Previous surveys have identified cultural resources that may be sensitive to visual intrusion.
2. Along the exiting ferry road next to the Salt Lagoon. There are no known sites within this part of the Visual APE.

The FAA included these areas and the known sites in the Visual APE.

3.3 Noise APE

Areas of potential noise effects were identified through a noise model analysis and using FAA guidelines on significant noise effects (Figure 3).

The FAA relies on the day-night average sound level (DNL), which describes the average noise level experienced during an entire 24-hour day, as their primary metric for assessing noise. Using a database of aircraft performance and engine noise characteristics, the FAA used Integrated Noise Model (INM) Version 7.0b to generate and plot DNL noise contours based on airport operational information, such as the number of flights and weather conditions.

For the purposes of this analysis, the Noise APE consists of all lands that would fall within the DNL 65 dBA contour as a result of Airport 12a operation. This APE is based on FAA Order 1050.1E, which states that an action alternative is considered to have a significant effect if it would cause the noise levels at noise-sensitive areas currently exposed to DNL 65 dBA or higher to increase by at least DNL 1.5 dBA.

The information in this figure is protected by federal law. It is not for public release.

Figure 3. Phase 2 indirect APEs and AHRS recorded sites within these APEs.

4.0 Cultural and Environmental Setting

The area around the community of Angoon is rich in history, heritage, and cultural resources. It has been home to Alaska Natives for thousands of years, and Alaska Natives make up the majority of the population in the community today. The inlets and bays around Angoon offer abundant natural and subsistence resources, as evidenced by large populations of salmon, halibut, other freshwater and saltwater fishes, seals, deer, bears, and a wide variety of marine and upland plants. The area supports a subsistence lifestyle and the maintenance of a unique cultural heritage tied closely to the natural environment. Full discussion of the cultural and environmental setting of the project is presented in the 2012 (Phase 1) technical report (Appendix A; SWCA 2012), which includes pre-contact and ethnographic Native American cultural contexts, historic contexts of Euro-American settlement and industry in the area, and the physical and biological environmental setting in the vicinity of the Phase I APE. This background information was used to develop expectations of sensitivity for cultural resources in the Phase 2 Direct APE and the methods designed to identify resources during the Phase 2 fieldwork. As the 2012 report is provided (Appendix A), only updated information and conditions specific to the Phase 2 APE are presented here.

4.1 Update to Prehistoric Context

Limited archaeological evidence exists for the Early Period (10,000–5,000 B.P.) (see USFS 2009:3–74) in Southeast Alaska, and prior to 2009, there was no evidence from the immediate Angoon area. During the Phase 1 field investigations, however, an obsidian microblade fragment was found in a shovel probe excavated at the Favorite Bay Garden Site (SIT-00302) in another airport alternative (SWCA 2012:37–38). Microblades are diagnostic of Early Holocene cultural traditions in Northern and Central Alaska. While their temporal range is not well-established in Southeast Alaska, the presence of a microblade suggests that humans may have been present in the Angoon area during the Early Period.

4.2 Update to Ethnographic Context

Recent ethnographic research (not available at the time of Phase 1 investigations) has synthesized traditional Tlingit place-names throughout Southeast Alaska—names in which cultural information about the importance, history, resources, and dangers that characterize particular places on the landscape is embedded (Thornton 2012). For lands or features in the vicinity of, but outside, the Phase 2 APEs, 10 traditional place-names have been documented by collaboration between Tlingit elders and modern ethnographers (Thornton 2012:113–118). *S'igedí Deiyí* ("Beaver Trail") was the primary travel corridor that ran from Killisnoo Harbor to the present-day village of Angoon, and *Wooch Géide Tliséet* refers to the channel north of Killisnoo Island. *Kadus.áak'w* ("Little Lake On It") refers to the saltwater lagoon northwest of the proposed airport runway. *Tlaaguwu Noow* ("Ancient Fort") was a defensive site on the shore of Killisnoo Harbor west of the proposed airport. A cluster of traditionally named places are located along the shore of the same harbor southwest of the proposed airport, and include *Keitanji Aan* ("Village Where It Continually Lifts Up"), *Dákde Yakatan Aas* ("Tree Leaning Out"), *Daasakwt'aagaanoow* ("Fort of the Village Alongside Daasákw"), and *Tsax̲'adaadzaayí Aan* ("Seal's Mustache Land"). *Féeshwaan Aaní* ("Fisherman's Town") was a settlement on Favorite Bay east of one of the potential materials sources examined during the Phase 2 survey. On Killisnoo Island is *Kanasnoow* ("Windbreak"), which refers to the Killisnoo Settlement, presumably the same settlement recorded as SIT-00014. Some of these names are likely associated with archaeological remains of settlements de Laguna (1960) investigated during her anthropological field investigations in this area. Though none refer to places specifically within the boundaries of the Phase 2 APEs, the names attest to the rich history of the *Xutsnoowú Kwáan,* whose territory is centered on the community of Angoon (Thornton 2012:107).

4.3 Environmental Setting

The majority of the Phase 2 APEs are covered in a dense spruce-hemlock forest. In places the understory is mossy and relatively free of brush, but with abundant deadfall (Figure 4). In other places, there is a thick understory of alder (*Alnus viridis* [*crispa*]), Devil's club (*Oplopanax horridum*), and blueberry (*Vaccinium* spp.) (Figure 5). In addition, there are areas of hydric soils and standing water blanketed by grasses, sedges, skunk cabbage (*Lysichiton americanus*), and a sparse pine-spruce forest (Figure 6).

Figure 4. Overview in southeastern portion of the Phase 2 Direct APE, view to the northwest.

Figure 5. Overview of non-contiguous northwest avigation easement, view to the southeast.

Figure 6. Overview of the northeastern edge of the Phase Direct 2 APE in the northeastern portion of the APE, view to the northwest.

5.0 METHODS

As part of Phase 1 investigations, the FAA cultural resource consultant team conducted background research and preliminary fieldwork to identify cultural resources that may be impacted by the development of an airport and access road and assessed the eligibility of those resources for the NRHP. As noted previously, this research and initial fieldwork addressed all three airport location alternatives considered in the EIS.

The background research included a literature review of records at the Alaska Office of History and Archaeology (OHA) in Anchorage as well as published and archival sources at public and university libraries, and tribal consultation and interviews with elders, culture bearers, and residents of Angoon.

For Phase 2, the FAA cultural resource consultant team updated the background research to account for the expanded areas of the Phase 2 APE and to include ethnographic data and pertinent cultural resource reports made available since the Phase 1 studies were completed. In addition, the consultants conducted field investigations of the new Phase 2 Direct APE (as shown on Figure 2 and discussed in section 3.0 above). The consultant team also revisited areas investigated during the Phase 1 fieldwork that the team, for various reasons, considered to have a high probability of containing cultural resources.

5.1 Literature Review

As part of the literature review conducted during the Phase 1 studies, the FAA's cultural resource consultant team reviewed the OHA citation database, Alaska Heritage Resources Survey (AHRS) records and location editor (geographic information system [GIS] site locator maps), Alaska Resources Library and Information Services data archives, and the Tongass National Forest Heritage Resources Survey data. Additionally, the consultant reviewed the works of de Laguna (1960), Erlandson and Moss (1983), and Moss and Erlandson (1985), all of whom have conducted extensive work in the Angoon area, as well as the broader regional works of Goldschmidt and Haas (1946) and others. The specific data resources of the OHA and AHRS records were reviewed to identify relevant documentation and information for past archaeological and ethnographic studies and previously documented archaeological sites within 1 mile of the Phase 1 APE. Because the Phase 1 and 2 APEs are slightly different, the cultural resource consultant team updated the literature review search area to a 1-mile radius around the Phase 2 Direct APE. In addition, the search included sources not available at the time of the Phase 1 studies. The updated literature review occurred in July 2013.

5.2 Field Inventory

As discussed above in section 3.0 and shown on Figure 2, much of the Phase 2 Direct APE was surveyed during the Phase 1 investigations (SWCA 2012). Phase 1 involved pedestrian survey using transects spaced 20 meters (66 feet) apart as permitted by vegetation, terrain, and hydrography. Shovel probes were excavated in high-probability locations as allowed by soil conditions. The probes were 30 to 40 centimeters (cm) in diameter to depths allowable by hand tools, which varied between 50 and 100 cm below surface (cmbs). All excavated sediment was screened through ¼-inch mesh. These methods and the resulting coverage across the Phase 1 APE were considered adequate in most areas and were not revisited during Phase 2. The goals of the Phase 2 survey were to 1) complete pedestrian survey transect coverage in areas of the Phase 2 Direct APE not surveyed during the Phase 1 investigations, including the potential materials source locations; 2) excavate shovel probes in places within the previously unsurveyed portions of the Phase 2 Direct APE considered to be sensitive for buried archaeological resources, and 3) revisit high-probability portions of the APE previously surveyed during Phase 1 studies and excavate additional shovel probes.

The locations of all shovel probes and notable cultural features were recorded using a handheld Trimble GeoXT 6000 global positioning system (GPS) unit with an external antenna. Digital photographs were taken in all Phase

2 survey areas. These photographs include overviews, profiles of typical shovel probes, and cultural resources. Non-digital field data were recorded on standardized field forms, and included daily work records, photograph logs, resource inventory forms, shovel probe forms, and hand-drawn maps.

5.2.1 Sensitivity Analysis Methods

Sensitivity for cultural resources in the Phase 2 Direct APE was assessed using a combination of the USFS's (2002) sensitivity zone model, described in detail in the Phase 1 technical report (SWCA 2012); review by the project principal investigator of various GIS layers to prioritize fieldwork; and professional judgment of the field crew regarding topography, proximity to tidewater and known prehistoric and historic sites, information obtained from local residents (i.e., traditional knowledge), hydrography, and the presence of certain ecotone habitats. While no portion of the Phase 2 APEs falls in USFS lands, the FAA cultural resource consultants, in consultation with FAA and SHPO, agreed to use the USFS sensitivity zone model for all portions of the EIS field investigations for reasons of consistency. The desktop review of GIS layers and descriptions of the various terrains of Airport 12a from the Phase 1 fieldwork identified high-potential areas to be revisited. They also indicated which areas had greater sensitivity for, and potential preservation of, both aboveground resources and buried archaeological deposits. Factors considered included topographic characteristics (relatively level terraces, saddles, and topographic high-points, as opposed to moderate or steep slopes), vegetation zones (ecotones and forested land, as opposed to the centers of bogs and wetlands), and proximities (known cultural resources and tidewater).

While most of the areas in the Phase 2 Direct APE that were not part of the Phase 1 APE lie in regions predicted to have low sensitivity for cultural resources, shovel probes were excavated in places where topography and well-drained soils combined to create a depositional environment likely to preserve buried archaeological materials if present, as well as in ecotone habitats. In addition, the overall sensitivity of the Kootznoowoo, Inc. Proposed Materials Source was given greater consideration when the bear guards accompanying the field crew noted that ancient battles, prior to contact with Euro-Americans, occurred along the hillsides overlooking Favorite Bay (personal communication, A. Johnson 2013; personal communication, D. Johnson 2013). No specific locations or resources were noted by the bear guards, although the Kootznoowoo, Inc. Proposed Materials Source is situated on this aspect. Both pedestrian survey transects and shovel probes on level surfaces and saddles between smaller knolls were used to identify cultural resources that may be present in this area.

Additional shovel probes were excavated in two areas of the Phase 2 Direct APE that were also investigated during the Phase 1 fieldwork. The northwestern portion of the Phase 2 APE near the Salt Lagoon was considered sensitive for cultural resources due to its proximity to tidewater. In addition, the southwestern boundary of the Phase 2 Direct APE near Killisnoo Harbor was subject to additional shovel probing due to its proximity to the known site SIT-00169, the previously documented boundary of which is somewhat ill-defined. Shovel probes were placed on private parcels within the Direct APE that line the eastern Killisnoo Harbor shoreline where right-of-entry had been obtained from the landowners. A 600-meter-long (1,969-foot-long) section of the northwest-southeast-trending boundary of the Phase 2 Direct APE in this area was surveyed with 10-meter (33-foot) transects extending 10 meters (33 feet) outside the APE on the seaward side and 30 meters (98 feet) inside the APE on the inland side. In addition, the field crew located surface features and artifacts associated with SIT-00169 (remains of a collapsed cabin, depressions, garden furrows, and historic debris) and followed their inland-most extent. SIT-00169 was found not to extend into the Phase 2 Direct APE, and all observed surface features associated with the site are more than 17 meters (56 feet) away from the APE boundary.

Field investigations were not conducted in most portions of the Indirect APE (e.g., visual and noise) that extend outside the Phase 2 Direct APE. The Noise APE is located entirely within the Phase 2 Direct APE and was adequately investigated during the Phase 1 field survey. The Visual APE, while in a high-sensitivity zone according to the USFS model, has been investigated previously and is unlikely to contain additional cultural resources. One site (SIT-0016) containing structural remains was known to be present in the immediate area of the construction footprint near Killisnoo Harbor. This specific site was visited and assessed for potential vibration effects.

5.2.2 Pedestrian Survey

The Phase 2 field survey was conducted between July 25 and August 2, 2013, in weather that was adequate for surface visibility and note taking. The 2013 field survey personnel included three archaeological technicians (Mary Ahonen, Jeanette Hayman, and Allison Neterer) and a geoarchaeological technician (Cyrena Undem), supervised by Molly Odell, M.A. Principal investigator Robert Kopperl, Ph.D., was present for the first three days of the survey. Two bear guards, local residents Alvin and Donald Johnson, accompanied the team during all fieldwork. Michael Kell, Alaska DOT&PF archaeologist, visited the crew during their fieldwork on July 26 and 27, 2013.

Surveys for Phase 2 were completed using pedestrian survey transects spaced at 10 to 20 meter (33 to 66 foot) intervals to the extent permitted by vegetation, landform, and hydrography. Dense, impenetrable vegetation in some areas made a complete survey with straight transects impractical. In those instances, the field crew made every practical attempt to investigate the area. Pedestrian survey involved examination of all surfaces exposed along the transects, taking every opportunity to observe erosion profiles and mineral soil matrices adhering to the root mass of tree-tips, given the overall thickness of forest duff, preponderance of deadfalls, and density of shrubwood that compromise surface and near-ground visibility year-round. These exposures were examined for artifacts, features, and other evidence of human occupation or cultural modification such as shell midden deposits and anthropogenic charcoal lenses. The pedestrian survey also included examination of potential aboveground features such as culturally modified trees (CMTs), historic structures, and modified landscapes.

5.2.3 Shovel Probes

Shovel probes were excavated by hand with shovels and trowels. Each probe was 35 to 40 cm in diameter and was dug until impenetrable rocks, roots, or the water table was encountered, or until hand excavation was no longer possible. Excavated soils were sifted through ¼-inch screen, and stratigraphic characteristics of excavation profiles were documented prior to backfilling the probes. A total of 105 shovel probes were excavated during the Phase 2 field investigations.

5.3 Visual Analysis

For lands in the Visual APE, the FAA did not conduct additional field studies. The area within the APE has been surveyed before, and cultural sites have been documented. The sites were, however, revisited during the course of field studies for the airport project—either during the Airport 12a survey reported herein or during informal visits associated with previous surveys for the airport alternatives (SWCA 2012). This approach is consistent with the industry standard for identifying visual effects from such undertakings as cell towers, wind farms, solar arrays, and similar structures.

Cultural resources that are sensitive to visual intrusions created in the viewshed of the resource are generally those where the viewshed is or was important to the historical use of the site or the intended design and setting of the site. More specifically, sensitive resources are those whose viewshed is important to the resource's

eligibility for listing on the NRHP. Generally speaking, resources that are eligible for the NRHP under Criterion B for associations with important persons or Criterion D for their information potential are not considered sensitive to visual intrusion. In contrast, resources that are eligible for the NRHP under Criterion A for their particular use in a historically important event or pattern of events and those that are eligible under Criterion C for their structural elements are typically considered to be more sensitive to visual intrusion. However, in both cases, the viewshed must be important to the reasons the resource is eligible under one of the two criteria. For example, a building that is eligible for the NRHP and that is intentionally situated on the landscape and designed to integrate the viewshed into the use of the building—such as a residence with large picture windows looking out on a particular viewshed—would be considered sensitive to visual intrusion within that viewshed.

Potential effects on these sites from anticipated visual changes to the landscape associated with the construction and operation of Airport 12a are evaluated in the Results section of this report (section 7.3).

5.4 Noise Analysis

Because the Noise APE is completely encompassed by the Direct APE, field surveys within the Direct APE covered all lands wherein noise effects would have the potential to damage or otherwise impair the use of historic properties. As such, no additional efforts to identify historic properties were needed specific to the Noise APE.

5.5 Vibration Analysis

As noted in section 3.4, potentially damaging vibration could occur during construction if blasting is necessary Given the geology of the immediate area in and around Airport 12a, damaging vibration is expected to attenuate very quickly (i.e., over a short distance). Because the exact locations where blasting might occur are not known at this time, and will not likely be known until more detailed engineering of a selected alternative is carried out, the FAA considered potential vibration effects on a broad scale by assessing the presence/absence of resources of the types known to be vulnerable to adverse effects from vibration. Those types of resources are generally limited to standing structures, and exclude sites of a purely archaeological nature. One such resource is present in the vicinity of the construction footprint, and the potential effects to it from vibration are discussed below.

6.0 Previous Research and Known and Potential Cultural Resources

Several previous assessments for historical, architectural, archaeological, and cultural resources have occurred in the vicinity of the Phase 2 APEs and the general Angoon area. Cultural research and archaeological investigations have been formally documented since the 1940s, spurred by academic interest and more recently by undertakings requiring compliance with Section 106 (36 Code of Federal Regulations [CFR] 800) or Section 110, or both, of the NHPA. Many of these studies have been conducted by the USFS or in conjunction with proposed development. Tables 1 and 2 summarize past cultural resource investigations and known sites within a 1-mile buffer around the Phase 2 Direct APE; this 1-mile buffer encompasses all of the indirect effects APEs. Of the investigations listed below, only two, by Yarborough (2005) and SWCA (2012), took place inside the boundary of the Phase 2 Direct APE. Neither identified any cultural resources in the Phase 2 Direct APE.

Table 1. Previous Investigations within 1 Mile of the Phase 2 Direct APE

Report Title	Author (Year)	Resources Identified within the File Search Study Area
Possessory Rights of the Natives of Southeastern Alaska	Goldschmidt and Haas (1946)	SIT-00302
The Story of a Tlingit Community: A Problem in the Relationship Between Archaeological, Ethnological, and Historical Methods	de Laguna (1960)	SIT-00295, SIT-00303, SIT-00305, SIT-00306, SIT-00169, SIT-00177, SIT-00014, SIT-00015
Archaeological Reconnaissance of the Angoon-Killisnoo Harbor Road	Clark (1976)	SIT-00015
Cultural Resource Investigation at Killisonoo [sic] Harbor	Fields and Davidson (1979)	SIT-00015, SIT-00169, SIT-00177, SIT-00680, SIT-00014
Archaeological Reconnaissance of Favorite Bay, Admiralty Island	McAfee et al. (1982)	SIT-00302
Results of Archaeological Reconnaissance on Admiralty Island National Monument, Southeast Alaska	Erlandson and Moss (1983)	SIT-00169, SIT-00262, SIT-00295
Preliminary Results of Archaeological Investigations on Admiralty Island, Southeast Alaska: 1985 Field Season	Moss and Erlandson (1985)	SIT-00124
1989 Archaeological and Historical Site Monitoring Program for the Chatham Area, Tongass National Forest	Lively and Davis (1989)	SIT-00015
Archaeology and Cultural Ecology of the Prehistoric Angoon Tlingit	Moss (1989)	SIT-00124, SIT-00033
The Antiquity of Tlingit Settlement on Admiralty Island, Southeast Alaska	Moss et al. (1989)	SIT-00124, SIT-00033
An Archaeological Survey of the Angoon-Kootznahoo and Seaplane Base Roads Paving Project, Admiralty Island, Alaska	Campbell (1996)	SIT-00487, SIT-00488, SIT-00489, SIT-00490, SIT-00491
Haa Aani Our Land: Tlingit and Haida Land Rights and Use	Goldschmidt and Haas (1998)	SIT-00302
Cultural Resources Inventory of the Angoon Proposed Airport	Yarborough (2005)	SIT-00169, SIT-00680, SIT-00262, SIT-00033, SIT-00302, SIT-00502, SIT-00034
Cultural Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement Angoon, Alaska	SWCA (2012)	SIT-00302
Angoon Administrative Site, 49SIT-00960, Determination of Eligibility R2013100534010	Gilliam (2013)	SIT-00960

Note: Data obtained through USFS Tongass National Forest Heritage Resources Archives and OHA, Anchorage.

Table 2. Alaska Heritage Resources Sites within 1 Mile of the Phase 2 Direct APE

AHRS Number	Site Type	Site Name	Eligibility
SIT-00014	Historic Tlingit village/Euro-American commercialism [graves, village site, cannery remains]	Killisnoo (Killisnoo Ruins/Kenasnow/ KanasNu/Killishoo/ Killisnoo Island Village)	Undetermined
SIT-00015	Prehistoric/historic Tlingit fort/cemetery	Killisnoo Harbor Fort and Cemetery	Undetermined
SIT-00017	Location of late-nineteenth-century Angoon village	Angoon	Undetermined
SIT-00033	Prehistoric/historic stake fish weir	Favorite Bay Fish Weir	Undetermined
SIT-00034	Prehistoric/historic Tlingit site	Favorite Bay Midden/Garden	Undetermined
SIT-00041	Pictographs	Magpie Point Pictographs	Undetermined
SIT-00056	Historic religious building site (Russian Orthodox)	St. Andrew's Church	Undetermined
SIT-00124	Prehistoric Tlingit site	Killisnoo Picnic Ground Midden	Undetermined
SIT-00135	Possible location of a fort, buried cultural material	Ganaxca Nuwu (Ganax Women's Fort)	Undetermined
SIT-00169	Historic Tlingit occupation site	Ketintci-'an (Killisnoo Harbor Village)	Undetermined
SIT-00177	Historic Tlingit site/possible fort/cemetery remains	South Killisnoo Village (Dadakatak Nuwu/Dasuqtag-an/Potato Point)	Undetermined
SIT-00262	Prehistoric midden	Dukdeiyukutun As Midden	Undetermined
SIT-00295	Prehistoric/historic Tlingit occupation site [cabins/lithics/middens/cache pits]	Ta Uk Aan Nee Shoo (Takwanicu/End of Winter Village)	Undetermined
SIT-00302	Prehistoric deposits, historic gardens	Favorite Bay Garden Site	Determined eligible by SHPO and agency
SIT-00303	Historic Tlingit site	Xicwan-'ani (Fisherman's Town)	Undetermined
SIT-00304	Prehistoric/historic midden site	Xanaxaye (Garnes Point Shell Midden)	Determined not eligible by SHPO and agency
SIT-00305	Historic Tlingit garden site	Kootznahoo Roads Garden	Undetermined
SIT-00306	Historic Tlingit cabins and midden site	Scott's Ranch and Midden	Undetermined
SIT-00307	Historic Tlingit structure, garden, and midden site	Kenasnow Camp and Midden	Undetermined
SIT-00308	Midden with possible prehistoric and historic components	South Angoon	Undetermined
SIT-00487	Paleontological shell midden	N/A	Undetermined
SIT-00488	Rectangular depressions	N/A	Undetermined
SIT-00489	Collapsed grave house	N/A	Undetermined
SIT-00490	Three-sided shelter used as drying rack	N/A	Undetermined

Table 2. Alaska Heritage Resources Sites within 1 Mile of the Phase 2 Direct APE

AHRS Number	Site Type	Site Name	Eligibility
SIT-00491	Cluster of buildings	"Japantown"	Undetermined
SIT-00502	Historic Tlingit garden	Garden Site	Undetermined
SIT-00680	Historic Euro-American water flue	N/A	Undetermined
SIT-00749	Historic Aleut and Russian Orthodox cemetery	Killisnoo Cemetery	Undetermined
SIT-00960	Mid-twentieth-century wood frame building	Angoon Administrative Site	Determined not eligible by SHPO and agency

Detailed discussion of the previous cultural resource investigations listed in Table 1, above, can be found in the Phase 1 report (Appendix A; SWCA 2012), except for three specific studies, the information for which became available after the Phase 1 report was complete. One of these studies was for the first known federally mandated investigation in the search area and was a survey for the Angoon-Killisnoo Harbor Road. This study included documentation of SIT-00015 by USFS archaeologists (Clark 1976). The second study was a 1996 cultural resource survey conducted as part of the Angoon-Kootznahoo and Sea Plane Base Roads Paving Project for Alaska DOT&PF, resulting in the identification of SIT-00490 and SIT-00491 (Campbell 1996). The third study, conducted by the USFS in 2013, assessed the NRHP eligibility of the Angoon Administrative Site (SIT-00960) (Gilliam 2013).

7.0 Results

The Phase 2 assessment resulted in the identification of four cultural resource sites and 10 CMTs. All four cultural resource sites had been previously documented as a result of undertakings not related to the airport project. Three of these sites (SIT-00014, SIT-00056, and SIT-00749) are located wholly or partially in the Visual APE on Killisnoo Island, and one (SIT-00169) adjacent to the Direct APE was identified as having structural remains that could be susceptible to vibration impacts from construction activities in the Direct APE. No cultural resource sites were located in the Direct APE, Noise APE, or the portion of the Visual APE next to the Salt Lagoon.

In addition to the 10 newly identified CMTs, all of which are located in the Direct APE, two CMTs identified during the Phase 1 surveys are also located in the Phase 2 Direct APE. Thus, a total of 12 CMTs are present in the Phase 2 Direct APE.

The findings of the field survey and the analyses of visual, vibration, and noise effects are discussed below. General information about the findings of shovel probes is also provided.

7.1 Findings of Shovel Probes

At total of 113 shovel probes were excavated in the Phase 2 Direct APE. Of these, 8 were excavated during the Phase 1 field studies (SWCA 2012) and 105 were excavated during the Phase 2 studies. The shovel probes encountered no cultural material but provided valuable stratigraphic data that confirmed the relative geologic age and depositional contexts of the particular landforms that were tested. A shovel probe summary table is given in Appendix B for probes excavated during Phase 2 field investigations. Previously excavated shovel probes are described in the Phase 1 report (Appendix A)(SWCA 2012).

Twenty-four of the shovel probes excavated during Phase 2 field investigations were placed near the edge of the Phase 2 Direct APE near Killisnoo Harbor with the specific purpose of testing whether any evidence of a previously documented site—SIT-00169—extended into that APE. No cultural material was located in any of the probes. While shovel probes in this area were only placed on private parcels where right-of-entry had been obtained from the landowners, the FAA believes the coverage was sufficient to suggest that site SIT-00169 does not contain subsurface deposits extending into the Direct APE.

Among the shovel probes excavated in the Direct Effects APE, those shovel probes located in well-drained areas uncovered layers of silt, sand, and angular pebbles and gravels and were terminated at thick roots, regolith, or bedrock. In low-lying areas with hydric soils, probes uncovered organic-rich silt and were terminated at the water table. Several of the shovel probes along the border of the Phase 2 Direct APE near Killisnoo Harbor uncovered evidence of paleo-beach deposits between 80 and 120 cmbs. While identifying paleo-shorelines in subsurface excavations can sometimes lead to the discovery of archaeological material of relatively great antiquity, no cultural materials were found during the testing conducted along the edge of the Direct APE near Killisnoo Harbor.

7.2 Culturally Modified Trees

As noted above, 12 CMTs were identified in the Phase 2 Direct APE. Several different types of CMTs were identified during the Phase 2 fieldwork, including trees with blazes, springboard notches, axe marks, burning, stripped bark, and cut and stacked logs.

Table 3. CMTs Identified in the Phase 2 Direct APE

Field No.	Condition of Tree	Type of Modification	UTM Northing	UTM Easting
CU72109_1	Standing dead	Three springboard notches	[redacted]	[redacted]
CU72109_2	Living tree	Blaze	[redacted]	[redacted]
AGN-1	Stumps and cut logs	Cut and stacked logs	[redacted]	[redacted]
AGN-2	Living tree	Blaze	[redacted]	[redacted]
AGN-4	Stump	Possible springboard notch	[redacted]	[redacted]
AGN-5	Living tree	Axe and burn marks	[redacted]	[redacted]
AGN-5B	Living split trunk tree	Blaze, one on each trunk	[redacted]	[redacted]
AGN-5C	Stump	Axe marks near base	[redacted]	[redacted]
AGN-6	Living tree	Stripped bark	[redacted]	[redacted]
AGN-7	Living tree	Axe mark	[redacted]	[redacted]
AGN-8	Living tree	Stripped bark	[redacted]	[redacted]
AGN-9	Stump	Springboard notch	[redacted]	[redacted]

Note: Universal Transverse Mercator (UTMs) collected in North American Datum (NAD) 83 UTM Zone 8N.

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Figure 7. Shovel probe and CMT locations in the northwestern portion of the Phase 2 Direct APE.

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Figure 8. Shovel probe and CMT locations in the northeastern portion of the Phase 2 Direct APE.

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Figure 9. Shovel probe and CMT locations in the southern portion of the Phase 2 Direct APE.

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Three blaze trees, identified as having a scar cut through the bark, were identified (Figures C-1, C-2, and C-3 in Appendix C). The blaze trees in the Phase 2 Direct APE are distributed widely and do not occur in clusters. The FAA cultural resource consultant field crew could not discern clear functions for any of the blaze trees; however, the blazes could mark property boundaries, old timber units, old trails, or hunting locales. While exact ages could not be determined, the blazes appear to be at least somewhat recent and may have been created in the last 50 years.

Three CMTs with springboard notches or possible springboard notches were also recorded in the Phase 2 Direct APE and Kootznoowoo, Inc. Proposed Materials Source (Figures C-4, C-5, and C-6). Associated with historic logging, the notches were created for the insertion of a plank on which a logger stood while swinging an axe or wielding a cross-cut saw to cut the tree at an acceptable height above its base. Such notched trees are common throughout Southeast Alaska and the Pacific Northwest.

Two of the CMTs recorded in the Phase 2 APE exhibit axe marks (Figures C-7 and C-8). Another exhibits both axe and burn marks (Figure C-9), and two others exhibit areas of stripped bark (Figures C-10 and C-11).

Another type of CMT includes three cut stumps and a stack of cut log rounds (Figure C-12). No roads or trails were visible in the vicinity of the cut trees, and moss growth indicated they had been stacked for quite some time, possibly several decades. No cultural materials were found in shovel probes in the vicinity of the stacked logs. Anecdotal evidence suggests these trees may have been cut for shake (personal communication, A. Johnson 2013).

Six of the identified CMTs are located near Killisnoo Harbor in close proximity to SIT-00169. The FAA cultural resource consultant has determined that these CMTs are not associated with SIT-00169. All six CMTs are located inland from SIT-00169 and are geographically separated from the site by a swale that runs roughly parallel to and just outside the northwest-southeast-trending boundary of the Direct APE. The CMTs appear to be associated with more than one activity or episode, and in some cases their function cannot be determined; one is a possible springboard notch, one is a blaze tree, two are trees with axe marks, one exhibits both axe and burn marks, and one tree has stripped bark. Similarly, the CMTs appear to be from a variety of time periods. The blazes appear quite recent, possibly made in the last 10 to 15 years, while the springboard notches on another tree may be more than several decades old. Time frames for many of the CMTs cannot be determined. No cultural materials were found on the surface or in subsurface probes in the area that might tie activities near the CMTs to SIT-00169, which is discussed in more detail below.

7.2.1 NRHP Eligibility of Culturally Modified Trees

While CMTs can be eligible for the NRHP—typically under Criterion A for association with historical events or Criterion D for information potential—the trees must meet certain eligibility criteria. In general, CMTs associated with the early historic period or prehistoric period or those associated with significant events or themes regardless of their time period are more likely to be determined eligible for the NRHP. Recent CMTs or those associated with non-significant land uses or themes are unlikely to be considered eligible. Those found in association with archaeological sites may be considered to be a contributing feature of the site rather than eligible in their own right.

None of the CMTs in the Phase 2 Direct APE are known to be associated with any specific historical events or people or hold potential to yield information important to history or prehistory. While the springboard notched CMTs in the Phase 2 survey area are presumably associated with historical logging, logging was never a significant industry in Angoon. Rather, it was short-lived and of limited scale. Most historical logging in the Phase 2 Direct APE was undertaken by local residents or commercial operators to obtain wood for construction of buildings and similar structures. Occasional trees would have also been felled for the construction of canoes

or similar watercraft. However, such associations cannot be identified for a specific CMT based on the evidence at hand. Therefore, the CMTs in the Phase 2 Direct APE do not appear to meet the criteria to be considered significant resources. As such, all 12 CMTs are recommended ineligible for the NRHP under all criteria.

7.3 Cultural Resource Sites

As noted above, four cultural resource sites—all of which were documented prior to the current undertaking—are located within the indirect [redacted]. As such, the FAA specifically evaluated the potential for vibration during construction in the Direct APE to affect site SIT-00169. The sections below provide descriptions of the sites, discussion of their NRHP eligibility, and an assessment of anticipated effects from the airport undertaking.

7.3.1 SITE SIT-00014, KILLISNOO ISLAND VILLAGE

SIT-00014 is the Killisnoo Island Village site—a historic Tlingit and Euro-American village and commercial/industrial site (Figure 10). It is located within the Visual APE for the current undertaking. The village was destroyed by a fire in 1928. The site was first documented by the USFS in the early 1970s (Fields and Davidson 1979). Additional documentation was reportedly completed by the USFS for an NRHP nomination form that was never submitted to the NPS, and Saleeby and Mobley investigated the site in 2008 (see Mobley 2012).

Figure 10. Killisnoo Island Village, ca. 1908.

The site is located [redacted]. No buildings or building ruins from old Killisnoo Island Village remain; landscape features and artifacts are present on land—primarily in the forested inland area west of the fishing lodge complex—and in the intertidal zone (Mobley 2012:107). Artifacts are scattered across the landscape, though their provenience is questionable in some instances due to the high frequency of recreational exploration on the island, intentional land clearing, and other disturbances. Subsurface archaeological deposits are also likely present in the site area. Artifacts and features represent both the pre-1928 fire period of whaling operations and trading post as well as the World War II and immediate post-war industrial periods of Killisnoo Island.

NRHP Eligibility Review

The FAA has determined that this site is eligible for the NRHP under Criteria A and D. The assessment of the site's historical significance and eligibility for the NRHP is outlined below.

Although much of the former Killisnoo Island Village site has been altered through modern ground disturbance and land development, the bulk of the site retains integrity of at least location. The integrity of setting, feeling, association, workmanship, design, and materials has been compromised somewhat by the modern land uses.

Due to the destruction and/or demolition of all of the buildings and the near-complete lack of building ruins, the site does not appear to retain sufficient integrity to be eligible under Criteria B and C—that is, the site lacks sufficient integrity to convey its historical associations with any specific historical person or to reflect specific architectural or engineering types, styles, or manners of construction.

The herring plant at Killisnoo in the late 1800s was one of the first industrial enterprises in Alaska after the territory was purchased by the U.S. government (Mobley 2012:95). The whaling operations from the village are also associated with one of the most infamous events in the history of Angoon, namely the shelling of Angoon by the U.S. Navy in 1882. The shelling, which resulted in the deaths of many Alaska Natives from either injury or slow starvation from the destruction of food stores, was a turning point in settlement in the area; following the shelling, many surviving villagers from Angoon relocated to Killisnoo Island, at least seasonally. Further bolstering its association with important historical events, Killisnoo Island Village is directly associated with the relocation of Aleuts from Atka during World War II. For all of these reasons, the FAA has determined that the village site is eligible for the NRHP under Criterion A.

The FAA has also determined that the village site is eligible for the NRHP under Criterion D. The investigations conducted extensively by Mobley (2012) and less extensively by the FAA's consultants in 2009 clearly indicate the potential for both surface and subsurface archaeological deposits that could expand the understanding of the history of Killisnoo Island Village. The artifact assemblage has the potential to yield information dating as far back as the prehistoric period and all of the different use periods since then. In particular, the assemblage could provide information about the interactions of the different ethnic, religious, and culture groups that occupied the village both over time and at the same time. Such topics as differential access to goods, cultural adaptation, and industrial technology from the late 1800s to mid-1900s may be addressed by the artifact assemblage.

Effects Analysis

Site SIT-00014 is located in the Visual APE for the current undertaking. The characteristics for which the site appears to be eligible for the NRHP are not sensitive to visual intrusion. The historical village site was not located on the eastern shore of Killisnoo Island because of its particular viewshed. Rather, all indications are that the village was located as such because of the calm waters afforded by Killisnoo Harbor. During its period of industrial and residential development, the situating of buildings does not appear to have been specifically influenced by the viewshed and was defined by available land, the island's topography, and the development of different zones (e.g., industrial and residential) to separate, at least to a certain degree, living quarters and social activities from the industrial facilities. The historical associations of the village site under Criterion A are not affected by the viewshed of the site.

The eligibility of the Killisnoo Island Village site under Criterion D for its information potential is not vulnerable to changes in the viewshed of the site; the extent, nature, or quality of the data that could be recovered would be in no way affected by alteration of the landscape across the harbor from the site.

Based on the reasons presented above, the anticipated landscape changes from the Airport 12a alternative would have *no adverse effect* on the Killisnoo Island Village site (SIT-00014).

7.3.2 SITE SIT-00056, ST. ANDREW'S CHURCH

The St. Andrew's Church site was documented in AHRS records in 1974 through an archival exercise associated with Russian Orthodox Church buildings and sites in Alaska. No fieldwork was conducted at that time to verify the existence of the church or any archaeological remains. The documented site location is on the [redacted]. This area is located within the Visual APE for the current undertaking.

As noted in the discussion of site SIT-00014, approximately two-thirds of the site is now occupied by the Whaler's Cove Lodge complex. A reconnaissance of the documented location of the St. Andrew's Church site during the Phase 1 field studies for the Angoon Airport project in 2009 concluded that the property on which the St. Andrew's Church was located remains undeveloped [redacted]; however, there are no physical remains of the church present on that property.

NRHP Eligibility Review

Although St. Andrew's Church played a prominent role in the lives of the Russian Orthodox in Killisnoo Village and was an important outpost in the battle between the Russian Orthodox Church and other religious institutions to gain converts among Alaska Natives, the site lacks the integrity to reflect this association or its association with important individuals. Lacking structural remains and standing features, the site also lacks the integrity to represent a particular architectural type or style, method of construction, or artistic design. Given this, the FAA has determined that the site, independent of the Killisnoo Island Village site (SIT-00014), is not eligible for the NRHP under Criteria A, B, and C. The FAA does find, however, that the potential for subsurface cultural deposits does exist, although such deposits are likely to be both sparse and shallow due to the relatively short period of time over which the church existed. Therefore, the FAA has determined that site SIT-00056, the St. Andrew's Church site, is eligible for the NRHP under Criterion D, at least until proven otherwise by subsurface investigations.

Effects Analysis

Site SIT-00056 is located in the Visual APE for the current undertaking. The apparent eligibility of the St. Andrew's Church site under Criterion D for its information potential is not vulnerable to changes in the viewshed of the site; the extent, nature, or quality of the data that could be recovered would be in no way affected by alteration of the landscape across the harbor from the site.

Based on the reasons presented above, the anticipated landscape changes from the Airport 12a alternative would have ***no adverse effect*** on the St. Andrew's Church (SIT-00056).

7.3.3 SITE SIT-00169, KILLISNOO HARBOR VILLAGE

Site SIT-00169 is the Killisnoo Harbor Village site. It is located on the eastern shoreline of Killisnoo Harbor, south of the current Angoon ferry terminal. The first archaeological investigations of the site appear to have been by de Laguna who learned from residents of Angoon that the village had been abandoned after an epidemic, perhaps in the 1830s (de Laguna 1960). She observed garden furrows and found traces of midden in subsurface tests. In the 1970s the site was investigated and formally recorded by Sealaska at which time the remains of two cabins, historical debris, and extensive gardens were noted (Sealaska and Wilsey & Ham 1975). Shortly thereafter, Fields and Davidson (1979) conducted a cursory examination of the area and recorded four decaying cabins, historical debris, depressions, garden plots, and crushed shell possibly indicative of midden deposits.

During field efforts to determine if any portion of the site, particularly subsurface components, extended into the Phase 2 Direct APE where ground disturbance is expected, the FAA's cultural resource consultants observed a

collapsed cabin feature, depressions, garden furrows, and historical debris previously noted by Sealaska (1975) and Fields and Davidson (1979). All of these features and items were located outside the Direct APE, but some of them, including the collapsed cabin feature, were located near the edge of the Direct APE, where construction-related vibration could occur.

NRHP Eligibility Review

No formal determination of eligibility has been made for site SIT-00169 as a result of its prior documentation. For the purpose of the current undertaking, the FAA assessed existing information about the site, as well as information gathered during the field investigations discussed herein, and determined that the Killisnoo Harbor Village site (SIT-00169) is eligible for the NRHP under Criterion D because it could yield information important in expanding the understanding of historical land uses in the Angoon area, albeit over an apparently short period of time. Additionally, analysis of the artifact assemblage could yield information that may shed additional light on the occupants of the area and any cultural, ethnic, or other reasons why they chose to live outside the larger village sites in the area. The FAA has determined that the site is not eligible for the NRHP under Criterion A, B, or C.

Effects Analysis

Site SIT-00169, Killisnoo Harbor Village, is located near the Direct APE, where construction-related vibration may occur. As discussed in section 5.5, above, cultural resources known to be susceptible to damage or impairment from vibration are, with a few exceptions, predominantly structural in nature. Since the soil composition in the vicinity of the site is stable and not defined by loose deposits that could allow for movement of subsurface artifacts due solely to vibration, the archaeological component of this site does not appear vulnerable to vibration effects.

The structural component of site SIT-00169 consists of collapsed cabin remains. Because these structures have already collapsed and become overgrown and heavily weathered, they no longer appear susceptible to damage or impairment from potential vibration associated with construction of the airport on adjacent lands. As such, the FAA anticipates ***no adverse effect*** to this site from the proposed undertaking.

7.3.4 SITE SIT-00749, KILLISNOO CEMETERY

SIT-00749 is a historical Aleut and Russian Orthodox cemetery (Killisnoo Cemetery) located [redacted] (Figure 11). It is unclear when the site was first documented and by whom, but the most recent documentation was carried out by Saleeby and Mobley, who investigated and evaluated the site in 2008 (see Mobley 2012).

Figure 11. Killisnoo Cemetery, ca. 1908.

The cemetery contains several dozen graves of primarily Russian Orthodox Alaska Natives. Several Aleut persons, who died during their forced relocation from Atka—in the Aleutian Chain—to Killisnoo during World War II, are also buried in the cemetery, as are at least a few persons of

Japanese or Japanese-American descent. Grave markers and remnants of burial houses are still present, though heavily weathered. There is no evidence that the cemetery constitutes a designed landscape.

NRHP Eligibility Review

As a general rule, the NPS, the keeper of the NRHP, does not consider cemeteries and graves eligible for inclusion in the NRHP (Potter and Boland 1992:1). However, the NPS has created exceptions to this rule. These exceptions are known as Criteria Considerations. Criteria Consideration D applies specifically to cemeteries. Under Criteria Consideration D, a cemetery may be eligible for inclusion in the NRHP if it can be nominated individually under Criteria A, B, or C; a cemetery is not eligible for the NRHP if it is chiefly eligible because of its information potential (i.e., under NRHP Criterion D). A cemetery may be eligible under Criteria A, B, or C if it "derives its primary significance from graves or persons of transcendent importance, from age, from distinctive design features, or from association with historic events" (Potter and Boland 1992:16).

The FAA has determined that the Killisnoo Cemetery is eligible for the NRHP under Criterion A. The cemetery does not appear to meet the criteria consideration for associations with persons of "transcendent importance" or retain sufficient integrity of structural features to merit eligibility under Criteria B or C.

Under Criterion A, the cemetery is a significant site for its associations with the history of Killisnoo Island and Killisnoo Island Village. The Killisnoo Cemetery still reflects strong associations with the various cultural and religious affiliations of Killisnoo Island's residents over time. Russian Orthodox, Aleut, Tlingit, Japanese, and Euro-American grave markers are all present and represent the small island's varied occupants. The cemetery also reflects the different periods of occupation of nearby Killisnoo Island Village, from the late 1800s to the mid-1900s. For these reasons, the cemetery site is eligible for the NRHP under Criterion A and meets the criteria considerations set forth by the NPS for cemetery sites.

Effects Analysis

Site SIT-00749, the Killisnoo Cemetery, is located in the Visual APE for the current undertaking. The site is located in a moderately dense, second-growth spruce-hemlock forest. Visibility from the cemetery grounds to the surrounding landscape offshore of Killisnoo Island is somewhat limited by the forest landscape.

Although cemeteries are often intentionally situated on the landscape to take advantage of viewsheds afforded by certain topographic features, that does not appear to be the case with the Killisnoo Cemetery. Rather, the cemetery's location appears from historical maps of the island to be as much, if not more, a matter of available land near the Killisnoo Village as a specific selection based on viewshed. Additionally, the reasons for which the Killisnoo Cemetery is eligible for the NRHP are not specifically because of its role as a cemetery site but rather due to its associations with and ability to reflect the historical activities and cultures of Killisnoo Village and Killisnoo Island over time. These facets of the site's importance are not sensitive to visual intrusion from the landscape across Killisnoo Harbor. As such, the visual changes to the landscape anticipated from Airport 12a are expected to have ***no adverse effect*** on the significance of site SIT-00749, the Killisnoo Cemetery.

8.0 SUMMARY

Two phases of investigation, including archival research, local interviews, field investigations with pedestrian survey and shovel probe excavation, and visual, noise, and vibration effects analysis have been undertaken in the APEs for the FAA's preferred airport and access road location (Airport 12a with Access 12a) for the community of Angoon. Two potential materials source sites that could be used during airport construction have also been investigated in a similar manner.

The investigations resulted in the identification of 12 CMTs in the Direct APE. None of the CMTs are recommended eligible for the NRHP. No archaeological sites or prehistoric or historic structures were identified in the Direct APE or the Noise APE during any of the investigations. Three sites (SIT-00014, SIT-00056, and SIT-00749) are located in the Visual APE and one (SIT-00169) is adjacent to the Direct APE, where construction-related vibration might extend outside of the construction footprint. The FAA has determined sites SIT-00014, SIT-00169, and SIT-00749 are eligible for the NRHP. FAA evaluated each of these three sites relative to the criteria of the NRHP under which they are eligible for the listing and assessed the sensitivity of these sites to visual or vibration effects in relation to the applicable criteria. Based on this analysis the FAA concludes that the proposed undertaking would have no adverse effect on any of the three properties being treated as historic properties for Section 106 purposes. Therefore, the FAA has made a determination that the undertaking would result in a finding of No Historic Properties Adversely Affected.

9.0 LITERATURE CITED

Bittner, Judith E. 2013. *Determination of Eligibility for the Favorite Bay Garden Site (SIT-00302), Angoon Airport Project*. Submitted to Federal Aviation Administration. Anchorage, Alaska: Office of History and Archaeology.

Campbell, Chris R. 1996. *An Archaeological Survey of the Angoon-Kootznahoo and Seaplane Base Roads Paving Project, Admiralty Island, Alaska*. Prepared for the Alaska Department of Transportation and Public Facilities. Ketchikan, Alaska: Cultural Resources Consultants.

City of Angoon. 2008. *City of Angoon Resolution 09-01. A Resoulution [sic] of the City of Angoon Allowing the Current Kootznoowoo Rock Quarry and Adjacent Subsurface to be Utilized by the Alaska Native Health Consortium, with Map Showing Kootznoowoo, Inc., – City of Angoon 14C3 Reconveyance Selection and "Central Park" Favorite Bay Open Space/Recreation Area*. Adopted September 9, 2008. Certified by Albert Howard, Mayor. Angoon, Alaska.

Clark, Gerland H. 1976. *Archaeological Reconnaissance of the Angoon-Killisnoo Harbor Road.* Prepared for the U.S. Bureau of Indian Affairs. Juneau, Alaska: U.S. Forest Service.

de Laguna, Frederica. 1960. *The Story of a Tlingit Community*. Washington D.C.: United States Government Printing Office.

Erlandson, Jon M., and Madonna L. Moss. 1983. *Results of Archaeological Reconnaissance on Admiralty Island National Monument, Southeast Alaska.* Alaska Office of History and Archaeology ID No. 2408. NADB No. 1400710. Department of Anthropology, University of California, Santa Barbara, and U.S. Department of Agriculture Forest Service, Admiralty Island National Monument, Tongass National Forest, Southeast Alaska.

Fields, Ross, and Hugh Davidson. 1979. *Cultural Resource Investigation at Killisonoo Harbor.* U.S. Forest Service, Tongass National Forest, Chatham Area. Manuscript on file, Alaska Office of History and Archaeology, Anchorage.

Gilliam, Myra. 2013. *Angoon Administrative Site, 49SIT-00960, Determination of Eligibility R2013100534010.* Juneau: U.S. Forest Service, Tongass National Forest, Admiralty Island National Monument Office.

Goldschmidt, Walter R., and Theodore H. Haas. 1946. *Possessory Rights of the Natives of Southeastern Alaska, a Report to the Commissioner of Indian Affairs*. Washington D.C.

———. 1998. Haa Aani *Our Land: Tlingit and Haida Land Rights and Use*. Originally published 1946. Seattle and London: University of Washington Press.

Johnson, Alvin. 2013. Discussion about cut logs in non-contiguous northwest avigation easement and ancient battle ground in Materials Source 1. In-person communication between Alvin Johnson, Angoon resident and bear guard, and Molly Odell and Robert Kopperl, SWCA Environmental Consultants, July 25, 2013.

Johnson, Donald. 2013. Discussion about ancient battle ground in Materials Source 1. In-person communication between Donald Johnson, Angoon resident and bear guard, and Molly Odell and Robert Kopperl, SWCA Environmental Consultants, July 25, 2013.

Lively, Ralph A., and Stanley D. Davis. 1989. 1989 Archaeological and Historical Site Monitoring Program for the Chatham Area, Tongass National Forest.

McAfee, Melanie L., Gale Bjotvedt, and Noreen Fritz. 1982. *Archaeological Reconnaissance of Favorite Bay, Admiralty Island*. Sitka, Alaska: U.S. Forest Service, Tongass National Forest, Chatham Area.

Mobley, Charles M. 2012. *World War II Aleut Relocation Camps in Southeast Alaska*. U.S. Department of the Interior, National Park Service.

Moss, Madonna L. 1989. Archaeology and Cultural Ecology of the Prehistoric Angoon Tlingit. Ph.D. dissertation, Department of Anthropology, University of California, Santa Barbara. University Microfilms, Ann Arbor.

Moss, Madonna L., and Jon M. Erlandson. 1985. *Preliminary Results of Archaeological Investigations on Admiralty Island, Southeast Alaska: 1985 Field Season.* NADB No. 1400726. Santa Barbara: University of California, Department of Anthropology.

Moss, Madonna L., Jon M. Erlandson, and Robert Stuckenrath. 1989. The Antiquity of Tlingit Settlement on Admiralty Island, Southeast Alaska. *American Antiquity* 54(3):534–543.

Potter, Elisabeth W., and Beth M. Boland. 1992. *Guidelines for Evaluating and Registering Cemeteries and Burial Places*. National Register Bulletin 41. U.S. Department of the Interior, National Park Service.

Sealaska Corporation and Wilsey & Ham, Inc. 1975. Native Cemetery and Historic Sites of Southeast Alaska: preliminary report. Juneau.

SWCA Environmental Consultants (SWCA). 2012. *Cultural Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement*. Prepared for Federal Aviation Administration and Alaska Department of Transportation and Public Facilities. Salt Lake City, Utah: SWCA.

Thornton, Thomas F. 2012. *Haa léelk'w hás aaní saax'ú = Our grandparents' names on the land*. Juneau: Sealaska Heritage Institute, and Seattle: University of Washington Press.

U.S. Forest Service (USFS). 2002. *Second Amended Programmatic Agreement Among the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer Regarding Heritage Resource Management on the National Forests in Alaska.* Agreement # 02MU-111001-076. U.S. Forest Service.

————. 2009. *Angoon Hydroelectric Project Final Environmental Impact Statement.* U.S. Forest Service, Tongass National Forest.

Yarborough, Michael. 2005. *Cultural Resources Inventory of the Angoon Proposed Airport*. Anchorage, Alaska: Cultural Resource Consultants, LLC.

Acronyms

AHRS	Alaska Heritage Resources Survey
APE	area of potential effects
CASA	Civil Aviation Safety Authority
CFR	Code of Federal Regulations
cmbs	centimeters below surface
CMT	culturally modified trees
DOT&PF	Department of Transportation and Public Facilities
EIS	environmental impact statement
FAA	Federal Aviation Administration
GIS	geographic information system
GPS	global positioning system
NAD	North American datum
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
OHA	Office of History and Archaeology
SHPO	State Historic Preservation Officer
SWCA	SWCA Environmental Consultants
USFS	U.S. Forest Service
UTM	Universal Transverse Mercator

APPENDIX A. PHASE 1 CULTURAL RESOURCES EXISTING CONDITIONS TECHNICAL REPORT FOR THE ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT

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CULTURAL RESOURCES EXISTING CONDITIONS TECHNICAL REPORT FOR THE ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ANGOON, ALASKA

Prepared for

Federal Aviation Administration

and

Alaska Department of Transportation and Public Facilities

Prepared by

SWCA Environmental Consultants

Under authority of U.S. Forest Service ARPA Permit No. JUN709

SWCA Cultural Resources Report No. 2010-20

SWCA Project No. 15489

April 2012

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska (Figure 1). At present, there is no land-based airport runway in or near Angoon. The DOT&PF prepared the Angoon Airport Master Plan (DOT&PF 2007) for their proposed airport location. In addition to the DOT&PF's proposed airport location, the EIS considers two alternative airport locations and multiple access road alternatives associated with those airport locations (Figure 2). (*Note*: Access Alternative 5 was studied and is shown on maps throughout this report, but it was subsequently dropped from consideration in the EIS.) Two of the three potential airport locations and portions of their associated access roads are located on lands administered by the U.S. Forest Service (USFS) within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area).

In consultation with the USFS, DOT&PF, the Angoon Community Association (ACA), Sealaska Corporation (Sealaska), and the Central Council of Tlingit and Haida Indian Tribes of Alaska (CCTHITA), the FAA directed its cultural resource consultant team (SWCA Environmental Consultants) to conduct field studies to identify cultural resources that could be directly or indirectly affected by the proposed undertaking. This technical report was prepared to document the area of investigation, the methods employed, and the results of these studies. The information contained herein will assist the FAA and USFS in assessing the potential impact of the proposed airport project on cultural resources and in engaging other agencies and consulting parties through processes associated with Section 106 of the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA).

This report provides a detailed description of the first phase of studies to identify cultural resources potentially affected by implementation of the proposed airport project. For the purposes of this report, *cultural resources* are defined as archaeological, historic, prehistoric, and traditional cultural (heritage) properties. The term *historic properties* is also used in this report. This term refers to those cultural resources that have gone through a formal evaluation relative to their eligibility for listing on the National Register of Historic Places (NRHP). This report includes information on cultural resources that occur or have the potential to occur in the vicinity of the airport and access road alternatives. Raw data collected during the field studies are available for review to the extent allowable by federal law and policy (i.e., within the parameters of protecting confidential information as allowed by federal law). This report also provides the consultant team's recommendations of NRHP eligibility for those cultural resources identified in the survey area. Those sites recommended "eligible" for the NRHP would be considered *historic properties* upon a final determination of eligibility by the FAA in consultation with the appropriate consulting parties. No findings of effect have yet been made, as the alternatives being considered in the EIS are still being designed. The FAA and USFS will issue joint determinations of eligibility and findings of effect under separate cover when design plans are sufficiently defined to allow for an evaluation of anticipated impacts.

All field investigations took place on privately owned lands, lands owned by the City of Angoon and Kootznoowoo, Inc., and lands administered by the USFS. Investigations carried out on lands administered by the USFS were conducted under authority of USFS Archaeological Resources Protection Act (ARPA) Permit No. JNU709. Field investigations were carried out from July 11 to July 25, 2009, and again on August 29, 2009.

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Figure 1. Southeast Alaska regional overview map showing the location of Angoon.

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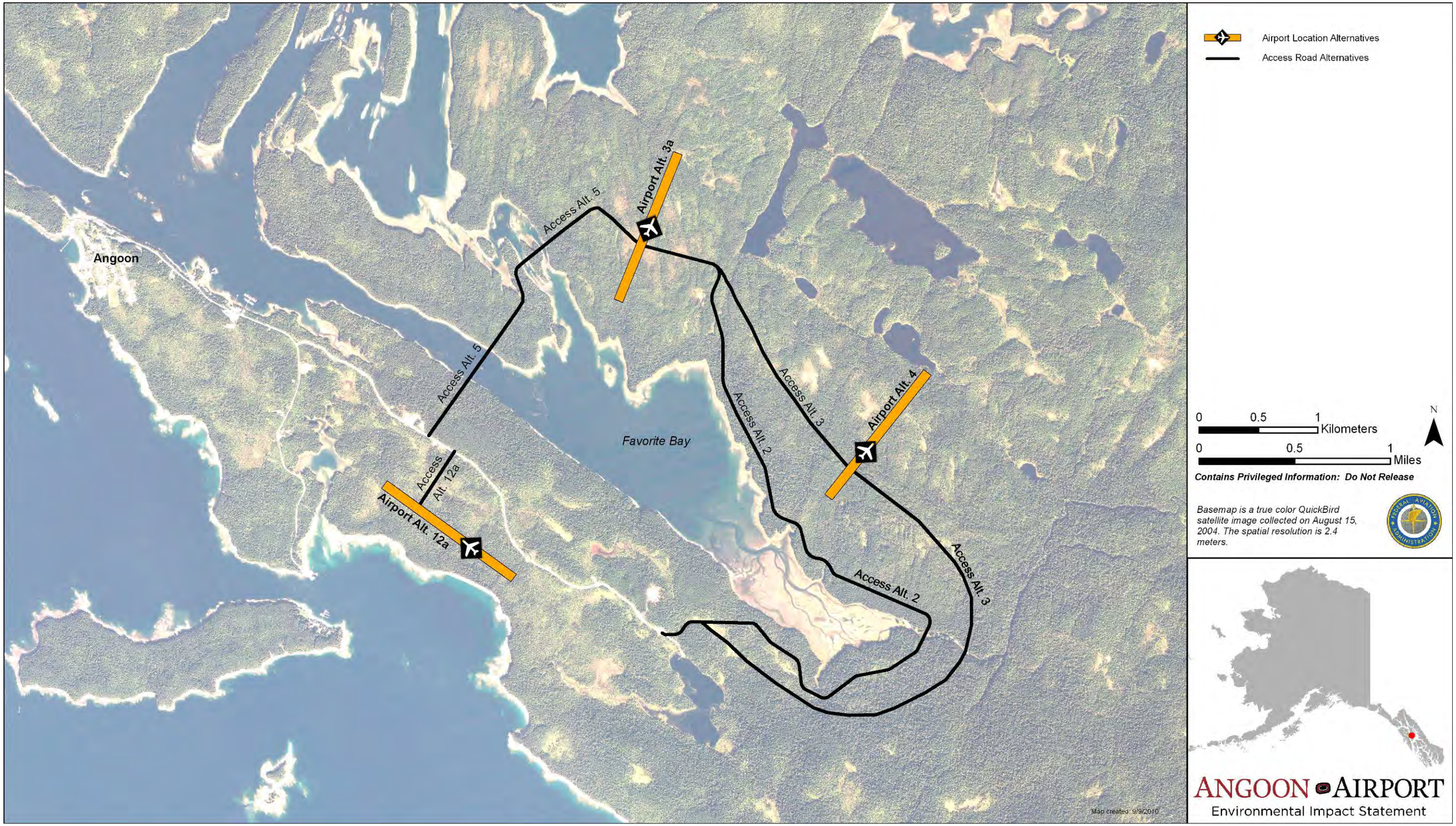

Figure 2. Locations of airport alternatives and access road alternatives. *Note*: Airport alternatives illustrated on this figure represent locations only and do not depict final areas of disturbance.

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2.0 Proposed Undertaking

The proposed airport project consists of construction and operation of a land-based airport and airport access road for the community of Angoon, which currently has no land-based airport. The DOT&PF would own and operate the airport, and they have prepared a master plan for the proposed airport (DOT&PF 2007), identifying a preferred location (see Airport Alternative 3a on Figure 2). They submitted a proposed airport layout plan to the FAA, who has conditionally approved it. The DOT&PF intends to apply to the FAA for construction funding. Before granting final approval of the airport layout plan and funding, the FAA must evaluate and disclose the anticipated impacts of the airport project, consider alternatives to the DOT&PF's proposed action, and identify impact minimization and mitigation measures. To this end, the FAA is preparing the aforementioned EIS, which considers three potential land-based airport locations and associated access alternatives (see Figure 2), as well as the no action alternative. The FAA has not yet identified a preferred alternative.

The land-based airport would be a small, commercial airport typical of other rural airports in the region. The initial construction would include a 3,300-foot-long paved runway; runway length could be extended to 4,000 feet in the future if air traffic warrants it. The runway would be 75 feet wide. Runway safety areas would be 150 feet wide and centered on the runway centerline, and would extend 300 feet beyond each runway end. The airport would have a short, perpendicular taxiway leading from the runway to a roughly 70,000-square-foot apron area, which may eventually contain a small passenger shelter building similar to the facility currently present at the airport in the village of Kake. The airport layout is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, taxiway, and apron would all be paved with asphalt, while the runway safety areas would remain unpaved. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Additional areas of vegetation clearing and/or terrain alteration outside the airport boundary may also be needed for some of the airport locations under consideration in the EIS. At the time the cultural resources field studies were conducted, the exact layouts, boundaries, and additional cleared areas were not known. See section 3.0 below for additional information on the phased approach to identifying cultural resources.

Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The access road would have a gravel surface and would be two lanes wide (one lane in each direction) with 9-foot-wide lanes and minimal shoulders. The road right-of-way width will vary depending on terrain and cut and fill. Overhead power and utility lines may be placed inside the right-of-way. For two of the access road alternatives considered in the EIS, bridges would need to be constructed over Favorite Creek.

3.0 Area of Potential Effects (APE)

The three airport build alternatives being considered in the EIS are Airport Alternatives 3a, 4, and 12a (see Figure 2). These locations were identified through detailed aviation planning, which indicated that extreme terrain in the area in and around Angoon limits the potential locations for airports that would meet FAA requirements for safe aircraft operations, particularly for approaches and departures. Therefore, only a very small number of potential airport locations is considered viable, and the alignments of the runways at these locations are limited to within a few degrees of variation. Three airport access road alternatives are also under consideration in the EIS: Access Alternatives 2, 3, and 12a (see Figure 2). At the time the field studies reported herein were conducted, a fourth access road alternative, Access Alternative 5, was also under consideration, but the FAA has since eliminated this alternative from consideration.

The extent of the area of potential effects (APE) for any airport and access road built in Angoon depends largely on factors such as terrain and potential uses of the road for purposes other than accessing the airport. For example, for airport locations where the terrain is irregular more cut and fill would be required than would be necessary in a location where the terrain is flatter and more even. Additionally, access road alternatives extending around Favorite Bay are more likely to be used for non-airport purposes, such as accessing subsistence areas, than is a road to an airport on the Angoon peninsula. The non-airport use of access roads would pose a potential risk of indirect impacts to cultural resources near the access roads. However, because the vegetation through which the roads around Favorite Bay would pass consists of thick spruce-hemlock forest with an extremely dense understory, the magnitude of potential cross-country travel from an airport access road is expected to be very different depending on the distance of the road from the shoreline of Favorite Bay. A road closer to the shoreline is expected to see much greater non-airport use than a road farther from the shoreline due to the substantial use of the bay for subsistence gathering by Angoon residents. Access Alternative 2 is located near the shoreline of the bay, and Access Alternative 3 is located approximately 0.20–0.75 miles inland from the shoreline, in an upland area.

Because of the nature of EIS preparation and the timing during which potentially significant resource conflicts must be identified, field studies for cultural resources (and other resources) generally must take place before the design of a proposed action and any alternatives to it are sufficiently advanced. A distinct project footprint and all project design features must be identified to a degree that a firm APE for direct and indirect effects can be established. For this reason, and because of the high cost of conducting cultural resource field studies in Angoon, the FAA opted to proceed with a process of phased definition of the APE and phased identification of historic properties so that survey of areas not directly or indirectly affected by the final alternatives and their designs are limited. The FAA offered the Alaska State Historic Preservation Officer (SHPO), USFS, DOT&PF, and other consulting parties the opportunity to comment on the APE and provide information on cultural resources in and near the APE that should be taken into consideration for the project.

FAA's objectives for defining the APE in phases are as follows:

- Phase 1: Establish an APE sufficient for comparison of alternatives in the Draft EIS. The FAA identified an area—referred to herein as the Phase 1 APE—around the potential runway locations within which the majority of direct effects from construction of the runway, taxiway, apron, and safety areas is likely to occur. The Phase 1 APE also includes a 50-foot-wide corridor along each road alignment for the access road alternatives. This Phase 1 APE, which encompasses 615 acres, does *not* capture areas within which *indirect effects* might occur. Field studies were conducted within the Phase 1 APE, and therefore it is also referred to in this report as the "survey area." The purpose of these studies was to obtain sufficient information to compare alternatives in the EIS relative to known or potential direct risk to historic properties. Relative potential direct effects on historic properties are also estimated using the USFS cultural resources sensitivity model (see section 5.2.1). Information obtained for the Phase 1 APE is also used in partial fulfillment of the Section 106 process but is insufficient to complete the Section 106 process. The survey of this Phase 1 APE is reported here. The Phase 1 APE is illustrated in Figure 3.

  Phase 2: Refine the APE sufficiently to complete the Section 106 process. When the airport and access road locations and designs have progressed sufficiently to allow for more concrete definition of the APE, the APE would be redefined to include all areas of anticipated direct *and* indirect effects. At this time, additional field studies would be conducted as necessary to fulfill the Section 106 process. This phase of APE definition is expected to occur between the Draft EIS and Final EIS, when the FAA has considered public and agency comments on the airport and access road locations and modifies the project designs accordingly or, possibly, eliminates alternatives from further consideration. The FAA fully anticipates that this Phase 2 APE will be larger than the Phase 1 APE. A separate report of survey methods and findings for the Phase 2 APE will be prepared at a later date.

In summary, the identification efforts for historic properties discussed herein apply only to the Phase 1 APE. Additional identification efforts will be necessary to fully capture the extent of direct and indirect effects on historic properties that may result from an airport and access road in Angoon. The FAA will consult with the USFS, SHPO, DOT&PF, and other consulting parties to define the boundaries of the Phase 2 APE and the appropriate level of effort to identify historic properties within those areas. Any cultural resources identified during the subsequent investigations will be addressed per the requirements of Title 36 of the Code of Federal Regulations (CFR), Part 800 with regard to determinations of eligibility, findings of effect, and resolution of adverse effects, should any be identified.

4.0 CULTURAL AND ENVIRONMENTAL SETTING

The area around the community of Angoon is rich in history, heritage, and cultural resources. It has been home to Alaska Natives for thousands of years, and Alaska Natives make up the majority of the population in the community today. The inlets and bays around Angoon offer abundant natural and subsistence resources, as evidenced by large populations of salmon, halibut, other freshwater and salt water fishes, seals, deer, bear, and a wide variety of marine and upland plants. The area supports a subsistence lifestyle and the maintenance of a unique cultural heritage tied closely to the natural environment.

4.1 Cultural Context

The following sections provide a brief discussion of the important cultural contexts and periods of significance for the Angoon area. The discussion addresses both chronological sequencing and temporal themes relevant to understanding the cultural resources in the Angoon peninsula and Favorite Bay area.

4.1.1 PREHISTORIC PERIOD

Archaeological evidence dates prehistoric occupation of Southeast Alaska to at least 7,000 years before present (B.P.). However, archaeological investigations on Admiralty Island, and specifically around Angoon and Favorite Bay, have been limited. For these reasons, the scientific and anthropological understanding of the area's cultural history is still being developed. The lack of documented archaeological evidence of prehistoric occupation in and around Angoon is most likely due to the relative scarcity of detailed archaeological studies in the area and not to an actual lack of sites. It is important to note that regardless of the current state of archaeological data, Angoon Tlingit oral histories document a long-term occupation extending back millennia.

The prehistoric chronology of Admiralty Island has been categorized in different ways by different researchers. The USFS, in preparing its environmental analysis for the Thayer Lake Hydroelectric Project near Angoon, assigned the prehistory of the Admiralty Island area to the general chronology of the Northwest Coast cultural sequence (USFS 2009:3–74). That coarse sequence comprises three temporal periods as follows: Early Period (10,000–5,000 B.P.); Middle Period (5,000–1,500 B.P.), and Late Period (1,500 B.P.–A.D. 1741).

The Early Period in Southeast Alaska is known only from a few archaeological sites. No sites from this period have been documented in the immediate Angoon area. The archaeological hallmark of these sites is the presence of microblade tools. Research on the microblade tool tradition is most well developed for northern and central Alaska and less understood for Southeast Alaska, and it is presently unclear if microblade tools from archaeological contexts in Southeast Alaska represent the same temporal range as they do for areas farther north, or if their use persisted into more recent periods as cultural traditions made their way south along the Alexander Archipelago.

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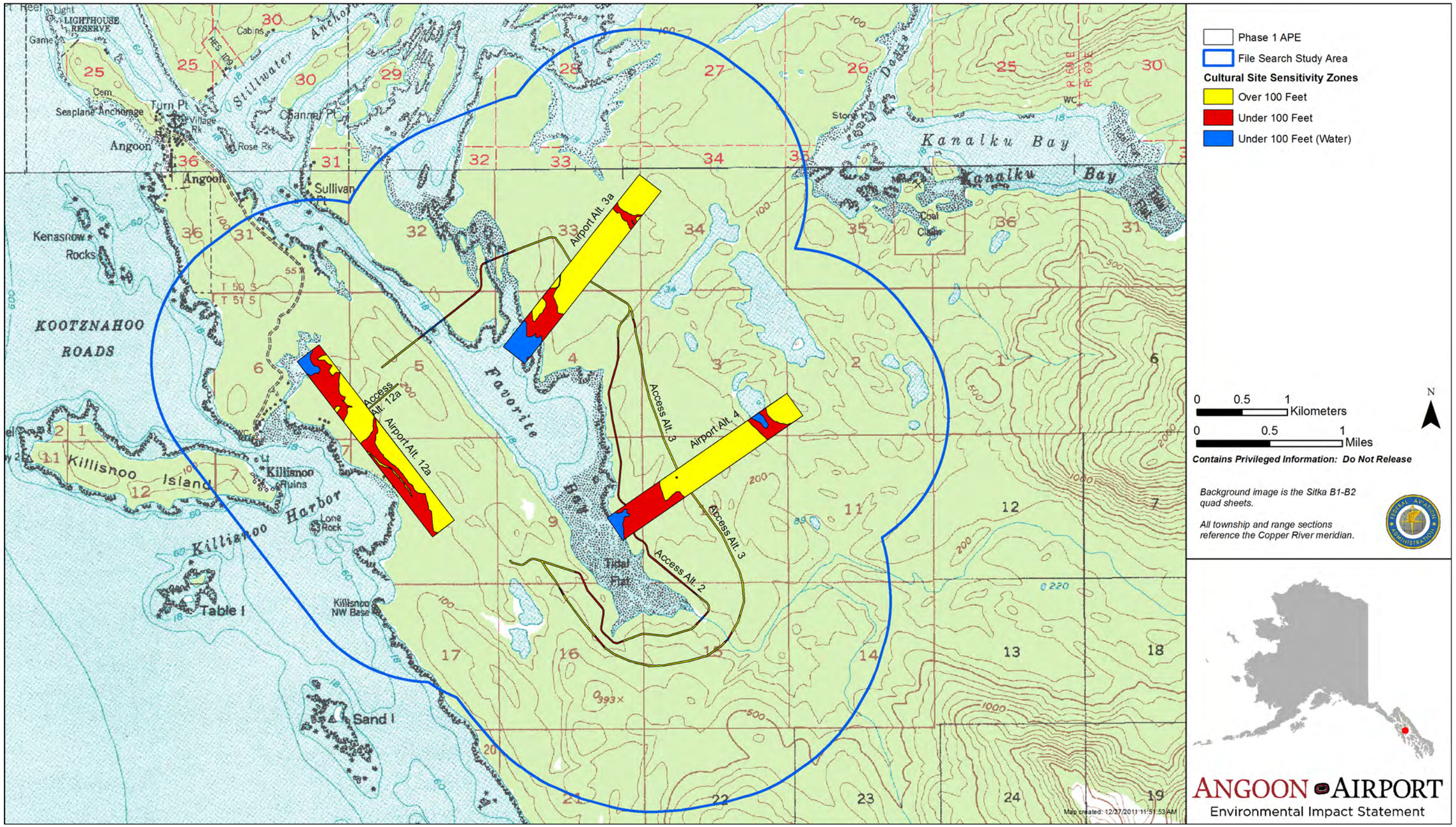

Figure 3. Location of the Phase 1 APE, also referred to as the survey area, including high-sensitivity zones distinguished by elevation.

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As a general rule, known sites from the Early Period are rare, but as with essentially all periods in the history of Southeast Alaska, the material evidence of those few sites depicts a clear reliance of the prehistoric occupants on maritime resources. However, the maritime cultural tradition was not yet fully developed.

By the Middle Period, adaptation to a true maritime culture was in full swing. This is reflected in the archaeological record by an apparent intensified occupation of coastal zones, an expansion of the diversity and volume of stone and bone tools designed for use in acquiring and processing marine resources, and more extensive use of wood stake fish weirs and fish traps for catching large quantities of fish, suggesting there was a need to feed a larger number of people in a localized area. Archaeological evidence of larger and more permanent camp sites (often referred to as fort sites) has also been found. In the Angoon area, the Favorite Bay Fish Weir site (SIT-00033) and the Killisnoo Picnic Ground Midden site (SIT-00124) have been dated to this period. The oldest archaeological evidence for human occupation of the Angoon and Favorite Bay areas comes from the Favorite Bay Fish Weir site. Radiocarbon dating of this weir yielded an oldest date of just over 3,200 years B.P. and a youngest date of just over 2,170 years B.P., suggesting prolonged use of the site.

The Late Period on Admiralty Island and in the Angoon area appears to be marked more by intensification of coastal occupation and increasing population than a change in cultural tradition or material culture. Fort sites datable to the period are more common and tend to be larger than those of the Middle Period. Many such fort sites are known throughout the general Angoon area, particularly in the vicinity of Kootznahoo Inlet and Mitchell Bay. No such fort sites have yet been identified in the immediate Favorite Bay area. Garden plots appear in association with many terminal Late Period archaeological sites, but archaeological research is sufficiently limited that it is unclear whether this is a result of Late Period horticultural activity or ethnographic period re-occupation of Late Period sites.

4.1.2 Ethnographic Period

During the ethnographic period (the period immediately after initial European contact in the mid-1700s), several Tlingit villages were located around the shores of Favorite Bay, on the Angoon Peninsula, and on various islands in the surrounding area (see de Laguna 1960; Moss 1989; Moss and Erlandson 1985; Moss et al. 1989). It is unclear whether villages were occupied at the same time or sequentially. Ethnographic data indicate that occupants of these early Angoon villages periodically relocated to new places in the area for a variety of reasons, the most recent of which was the bombing of the last known historical village by the U.S. Navy in the late 1800s. During this period, and extending well into the historic period, the Tlingit food economy was based on a combination of horticulture and seasonal round subsistence gathering. Along the shores of Favorite Bay and other bays and islands in the Angoon area, villagers established garden plots where root vegetables, particularly potatoes and turnips, were grown. The gardens are a clear reflection of cultural trade and intermingling, with the initial root stock for the crops coming not through native plant species but through cultural exchange. Archaeological evidence of these gardens remains intact at numerous sites along the eastern shoreline of Favorite Bay.

The ethnographic Tlingit of the area are described by Yarborough (2005) interpreting information provided by de Laguna (1960) as having “an economy based upon fish (particularly anadromous fish); settled villages; a highly sophisticated woodworking industry; a highly developed and distinctive art form; a social organization structured around lineages, clans, and phratries; and a ritual life focused upon totemism, shamanism, and the attainment of status through potlatching.” Yarborough further describes a pattern of movement across the landscape and resource use consistent with a seasonal round lifeway wherein centralized villages are occupied during the winter but largely abandoned at other times of the year when individuals and families relocated to fishing and hunting camps. The lifeway of the ethnographic Tlingit peoples left its mark on the landscape surrounding Favorite Bay in the form of structural remains, occasional isolated artifacts, and distinctive marks left on trees in the dense spruce-hemlock forest. In particular, various types of cuts visible on tree trunks today reflect past

Tlingit activities such as gathering pitch for waterproofing canoes and other items, marking trails or routes to subsistence gathering areas, or obtaining materials for the extensive woodworking for which the Tlingit peoples are still well known today.

Ethnographically, the Angoon Tlingit traditional territory was first occupied by the Gaanaxteidi' (Raven) clan of the Raven moiety. Later, the Deisheetaan (Beaver) clan of the Raven moiety arrived, having followed Beaver across the isthmus, according to oral tradition. The Gaanaxteidi' eventually left the area, giving all rights to the village to the Deisheetaan. Other clans of the Raven moiety, as well as clans of the Eagle/Wolf moiety migrated into the Angoon area over time. In addition to the Deisheetaan, the Raven moiety included the Aanxaakhittaan clan (Dog Salmon House). The Eagle/Wolf moiety included the Wooshkeetaan clan (Shark House), Teikweidi clan (Bear house), and Daklaweidi clan (Killer Whale House).

4.1.3 HISTORIC PERIOD

The historic period—the period of written history—began in Southeast Alaska with the 1741 arrival of Russian explorer Vitus Bering's ships off the west coast of Prince of Wales Island, about 150 miles south of Angoon (Betts and Bowers 1994:18). More than 50 years later, in 1794, the ships of British Royal Navy Captain George Vancouver made their way to Admiralty Island, visiting a native village in the vicinity of Killisnoo Island, which is located just off the coast of the peninsula on which modern-day Angoon is located. This village may have been an earlier location of Angoon (de Laguna 1960:172).

Killisnoo and the Whaling Industry

The Russian empire laid claim to Alaska and established its capital at Sitka (then called New Archangel) in 1799. Euro-American explorers and traders forayed into the Angoon area for the next several decades, but none appears to have established permanent settlements around Angoon. It was not until 1878, 11 years after the United States purchased Alaska from the Russians, that large-scale permanent non-native settlement took place around Angoon in the form of a Northwest Trading Company trading post on Killisnoo Island. A few years later, the Northwest Trading Company opened a whaling station on the island. The whaling operation provided employment to many of the Tlingit villagers from Angoon, and a large number of Angoon families left the native village and moved to Killisnoo Island, where facilities including a school and church were available. Despite certain mutual benefits to the Northwest Trading Company and the Tlingit villagers from their coexistence, it was an uneasy arrangement at best. Interracial tensions fomented by cultural misunderstanding led to many confrontations, including one of the darkest chapters in Angoon's history. In the late fall of 1882, the accidental death of a Tlingit shaman working on a whaling vessel thrust the cultural ignorance and intolerance to the fore, ultimately culminating in the shelling of the native village of Angoon and a nearby summer subsistence camp by the U.S. Navy. The destruction of the village food stores just before winter left many of the surviving villagers to starve to death.

The attack on the village of Angoon understandably dampened the whaling operation on Killisnoo Island for many years. But there was money to be had, and the Northwest Trading Company began processing herring oil and fish guano at Killisnoo in 1887 under the name of the Alaska Oil and Guano Company. The new operations brought new employment opportunities for Tlingit villagers, and the settlement at Killisnoo once again grew. The processing facilities operated for more than two decades before suspending operations in 1915 and then operating off and on until their final closure in 1931 (de Laguna 1960:197). The loss of monetary employment caused many native villagers to return to the former village at Angoon. The town of Angoon was organized in its present location in 1917, and was organized as a city in 1963.

Substantial archaeological evidence of this period remains in the Angoon area. Though most structural evidence directly associated with the whaling and trading company operations are found on Killisnoo Island (for example site SIT-00014/Killisnoo Ruins on Figure 3), artifacts from the period can be found in archaeological contexts on

the Angoon peninsula and surrounding areas. Several unexploded artillery rounds from the Navy's shelling of Angoon have reportedly been found on land surrounding Favorite Bay.

Admiralty Island's Timber and Mining Heritage

Unlike many other areas of Southeast Alaska, that portion of Admiralty Island around Angoon has seen little in the way of mining and logging over the area's history, although logging most certainly occurred around Angoon, including the Favorite Bay area, during the late 1800s and early 1900s in support of construction and barrel stave manufacture associated with the commercial operations on Killisnoo Island. Shortly after President Theodore Roosevelt created the present-day Tongass National Forest by proclamation in 1907, the USFS began promoting the timber industry on Admiralty Island, but it gained little traction near Favorite Bay. The most recent commercial logging of note near Angoon occurred to the south and east of Favorite Bay in the 1950s and 1960s, prior to the establishment of the Monument–Wilderness Area. Evidence of these activities is relatively abundant in the area and in the form of cut tree stumps, springboard notches in tree stumps, logging cables, and other small artifacts of the logging industry.

As with logging, large-scale and commercial mining activity has also been very limited around Angoon and has focused on coal mining. The most substantial mining activity on Admiralty Island has occurred at the extreme north end of the island, at Funter Bay, where gold mining began in the 1920s. In the mid to late 1800s, steamer ships recovered coal from the Sepphagen Coal Mine in Kootznahoo Inlet. However, the quality of the coal was too poor for use in steamer ship boilers, and development of the coal vein never progressed in a meaningful way. Around 1895, the Admiralty Island Coal and Fuel Company was formed and began extracting coal from the southern end of Admiralty Island at Murder Cove. More than 30 years later, in 1928, the company opened the Hardrader Mine in Kanalku Bay, just east of Angoon. The mine operated for less than a year because of legal troubles and produced less than 1,000 tons of coal (Mobley 1994:31; USFS 2011). Kootznoowoo, Inc., the village native corporation for Angoon, owns a coal lease in the vicinity of the former Hardrader Mine, but it is not currently under development.

The Monument–Wilderness Area

Admiralty Island National Monument, which encompasses the vast majority of Admiralty Island and on which the DOT&PF's proposed airport and one airport location alternative would be located, was set aside for monument purposes in 1978 by a presidential proclamation (43 F.R. 57009) from President Jimmy Carter. The proclamation stated

> protection of the entire island [Admiralty Island], exclusive of the Mansfield Peninsula, is necessary to preserve intact the unique scientific and historic objects and sites located there. Designation of a smaller area would not serve the scientific purpose of preserving intact this unique coastal island ecosystem.

The monument was formally established in 1980 as a provision of the Alaska National Interest Lands Conservation Act (ANILCA) (§ 503 (b)). ANILCA § 503(c) defined the purpose for the monument as follows:

> Subject to valid existing rights and except as provided in this…section, the [Monument] shall be managed by the Secretary of Agriculture as units of the National Forest System to protect objects of ecological, cultural, geological, historical, prehistorical, and scientific interest.

The Kootznoowoo Wilderness Area was also established by ANILCA in 1980 and was known as the Admiralty Island Wilderness Area at that time (ANILCA § 703(a)(1)). It was established in accordance with the Wilderness Act of 1964, which holds as its core purpose maintaining "an enduring resource of wilderness" (Public Law 88-577 § 2(a)). The Wilderness Act further clarifies the purpose of a wilderness area as a means of administering lands for the "use and enjoyment of the American people in such manner as would leave them unimpaired for

future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness" (Public Law 88-577 § 2(a)).

The monument and wilderness area overlap significantly, with the wilderness area boundary being only slightly smaller than the monument boundary because of certain lands that were excluded from wilderness designation because their development and use does not meet the criteria for wilderness. The USFS has managed the lands of the monument and wilderness area for its intended purposes since they were established. This management has meant severely limiting permanent development and use of motorized vehicles and equipment.

Direct archaeological and historic evidence of monument and wilderness area establishment and management is extremely limited, primarily consisting of the occasional boundary marker. Historic USFS cabins on the island generally pre-date the monument and wilderness area period. None of these cabins are located in the immediate vicinity of any of the airport or access road alternatives; the closest cabin is located at Jims Lake, approximately 12 miles east-northeast of Angoon by air. The most significant archaeological legacy of the monument and wilderness area is the de facto preservation of both Tlingit cultural resource sites and historic logging and cabin sites on Admiralty Island. This is certainly apparent along the east side of Favorite Bay near Angoon, where sites associated with early Tlingit settlement and ethnographic use remain largely intact.

4.2 Environmental Setting

Southeast Alaska has some of the most rugged terrain found in North America. The rainforests of the Monument–Wilderness Area are no exception. The Phase 1 APE is situated 2–5 miles (3–8 kilometers [km]) southeast of Angoon. Dense spruce-hemlock forests with large areas of dense alder (*Alnus viridis* [*crispa*]), devil's club (*Oplopanax horridum*), and blueberry (*Vaccinium* spp.) dominate this area. Field crews found vegetation to be less dense on the east side of Favorite Bay than on the west side, closer to Angoon.

The surrounding area is broken up by a maze of bays, inlets, tidal channels, and smaller islands that are situated in a southwest-northeast orientation. Numerous similarly oriented bedrock ridges were encountered under the forest canopy, suggesting massive glacial scouring with glacial activity likely originating in the nearby Hasselborg Lake area. Soils within the project area are variable, ranging from meters of organic overburden to exposed bedrock to only centimeters of mineral soils overlying bedrock. Within the project area, the topographic landscape is relatively flat when compared to the steep snow-covered peaks of interior Admiralty Island; however, incised drainages are present throughout the area.

The environmental conditions in and around Airport Alternative 3a, the northernmost of the two airport alternatives on the east side of Favorite Bay, were similar to those in and around Airport Alternative 4, though vegetation cover was slightly less dense. Vegetation was most dense toward the head of Favorite Bay and became less dense to the north. The overstory consisted of typical spruce-hemlock forest with trees reaching heights of 100 feet or more. The understory was a mixture of blueberry and alder, with small amounts of devil's club and skunk cabbage (*Lysichiton americanum*) in wetter areas. Numerous areas opened up into sphagnum (*Sphagnum* sp.*)* meadows with standing or running water in most, creating large areas of hydric soils. Numerous areas of exposed bedrock were observed in the northern half of the Airport Alternative 3a survey area. The survey areas nearest the water were wet and muddy, conditions that provide good habitat for numerous species of clams and sea asparagus (*Ensis macha*).

The survey area encompassing Airport Alternative 4 exhibited similar environmental conditions to Airport Alternative 3a but had a more mature overstory of spruce and hemlock. Large areas of blowdown were observed near the survey area's southwest end and northeast end. Blueberry is the dominant understory vegetation and was extremely dense within many of the blowdown areas. As with Airport Alternative 3a, the

survey area for Airport Alternative 4 had numerous occurrences of sphagnum meadows with standing and running water. The survey area intersects an unnamed lake near its northeastern extent. Numerous bedrock outcrops forming north-south ridges measuring up to 10 meters (m) (33 feet) tall were observed south of the lake. Toward the southwest end of the Airport Alternative 4 survey area, Favorite Creek forms a channel providing fresh water and salmon runs. Chum salmon (*Oncorhynchus keta*) and pink salmon (*O. gorbuscha*) were observed in large numbers heading up Favorite Creek at the time of the field studies.

Airport Alternative 12a had the deepest soils, wettest conditions, and densest understory of all three airport alternatives investigated. The southeastern half of the survey area for this airport alternative had the wettest conditions and thickest vegetation. The northwestern half of the survey area was drier and contained more timber because of its higher elevation. The hydric soils allow for dense wetland vegetation such as devil's club, skunk cabbage, and alder.

5.0 METHODS

A three-pronged approach was used to identify cultural resources that may be impacted by the development of any of the airport and access road alternatives. Initially, two of FAA's consultants, archaeologists Sheri Ellis and Amy Schlenker, conducted preliminary records and files searches at the Tongass National Forest Admiralty Island National Monument office in Juneau, Alaska, on August 19, 2008, and the Alaska Office of History and Archaeology (OHA) in Anchorage on June 22, 2009. Additional sources of information were consulted, including community and university libraries, journals, and books addressing the history, prehistory, and archaeology of the Angoon area. The second component of the research consisted of investigative pedestrian field surveys to look for the presence or absence of previously recorded and previously unidentified cultural resources within the survey area. The third component consisted of tribal consultation and interviews with elders, culture bearers, and residents of Angoon with special knowledge of the location and cultural significance of cultural resources in the Favorite Bay area. The sections below describe each of these lines of inquiry in greater detail.

5.1 Literature Review

As part of the literature review regarding previous environmental, historical, archaeological, and heritage resource investigations and known resource sites within the survey area, the FAA's cultural resource consultant reviewed the OHA citation database, Alaska Heritage Resources Survey (AHRS) records and location editor (GIS site locator maps), Alaska Resources Library and Information Services data archives, and the Tongass National Forest Heritage Resources Survey data. Additionally, the FAA's cultural resource consultant reviewed the works of de Laguna (1960), Erlandson and Moss (1983), Moss and Erlandson (1985), all of whom have conducted extensive work in the Angoon area, as well as the broader regional works of Goldschmidt and Haas (1998) and others. The specific data resources of the OHA and AHRS records were reviewed to identify all relevant documentation and information for past archaeological and ethnographic studies and previously documented archaeological sites within 1-mile of the Phase 1 APE. This literature review area is referred to in this report as the "project area".

The archival review indicated that portions of the survey area have been inventoried for cultural resources as part of previous investigations; however, most of these investigations were associated with academic research rather than project development. The FAA's cultural resource consultant re-inventoried all areas within the current survey area that were inspected during these previous efforts. The data acquired from the literature review are discussed at length in section 6.0.

5.2 Field Inventory

As noted previously, field investigations were conducted in July and August 2009. Crews encountered mixed weather, which ranged from clear skies and 70° temperatures to dark, wet, rain-soaked 40° days. Overall, the weather was favorable for conducting cultural resource surveys. Access to the survey areas was gained by foot, boat, or automobile, depending on the area being investigated. Walking conditions varied from moderately easy to very difficult. A dense understory of mosses and blueberry limited ground visibility. In many areas, plant cover was so dense that all but the most obvious signs of human use, such as aboveground resources, would have been covered and reclaimed by the dense vegetation. Because of this limitation, field investigations included subsurface shovel tests and soil probes.

Most of the previously documented and undocumented but known cultural resource sites in the area are located along the shoreline of Favorite Bay. As such, field crews focused particular effort along shoreline areas within the survey area. Numerous bedrock outcrops forming north-south ridges measuring up to 10 m (33 feet) tall were observed within the survey area for Airport Alternative 4. This area, as well as the shorelines, was given particular scrutiny during field studies due to the known association of such outcrops with cultural resource sites elsewhere in the region. All previously documented cultural resource sites in or immediately adjacent to the survey area were also revisited as part of the studies.

5.2.1 Sensitivity Analysis Methods

Because a portion of the survey area is located on lands administered by the USFS, the FAA's cultural resource consultant incorporated the USFS's sensitivity zone model into the approach to field investigations by tailoring the nature of field investigations to include more intensive methods in areas considered high sensitivity zones under the USFS model. The model was established in the *Second Amended Programmatic Agreement (PA) Among the USDA Forest Service Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer Regarding Heritage Resource Management on National Forests in Alaska* (USFS 2002). Appendix E of the PA defines sensitivity zones that guide field crews while performing field inventories. High sensitivity zones are defined as follows:

- Land between mean lower low water and 100 feet in elevation above mean high water, with no consideration of slope
- Areas of former lode and placer mining
- River valleys, lake and river systems providing passes or portages across larger land masses
- Lake and stream systems containing or known to have contained anadromous fish runs, including a focus of barrier falls locations in such systems
- Elevated or fossil marine, river, and lake terrace systems
- Caves and rockshelters, areas of karst landforms, and rock formations known for caves and rockshelters
- Areas associated with myths and legends (e.g., traditional cultural properties or cultural landscapes)
- Known sources of potential raw materials (e.g., obsidian sources, exceptional concentrations of cedar trees)
- Alpine areas, if ethnographic or historic evidence or previous surveys conducted nearby indicate cultural use
- Other areas identified through oral history research or other sources

Lands within the survey area that met any one of the above criteria were afforded additional attention beyond simple surface inspection. Field supervisors, using their professional judgment, also defined areas of high probability on the basis of microenvironments encountered during survey even if these areas did not meet any of the above criteria. Based on the criteria of the USFS model, approximately 33% of the survey area was categorized as high sensitivity for cultural resources. All such areas were subjected to subsurface sampling through shovel probes and soil probes.

5.2.2 Surface Inventory Methods

The FAA consultant field personnel consisted of two bear guards (Ryan French and George Weekley), four archaeologists (Brian Durkin, Cyrena Undem, Mary Pearce, and Michael Farrell), and one field archaeology supervisor (Omar Ramirez). This team performed an archaeological inventory of the survey area between July 11 and 25, 2009, and again on August 29, 2009. Sheri Ellis (principal investigator), Myra Gilliam (archaeologist for the Admiralty Island National Monument), and Rachel Myron (seasonal archaeologist for the Admiralty Island National Monument) provided additional assistance at various times throughout the field sessions.

Field crews walked each of the airport alternative and access road alternative survey areas while maintaining regular 20-m (66-foot) transect intervals to the extent permitted by vegetation and landforms. In some situations dense, impenetrable vegetation was encountered, making a complete survey impracticable. The crews made every effort to investigate lands covered in dense vegetation. The presence of such dense vegetation may necessitate implementation of an on-site monitoring program during construction, should an action alternative be selected through the EIS process. During the field inventory archaeologists examined the survey area for artifacts, features, and other evidence of cultural occupation, such as shell middens; charcoal-stained sediments; peeled and blazed trees; historic structures, such as dugout foundations and linear sites (e.g., trails, roads, and canals); and historic camps.

All site features, such as site boundaries, tree lines, and distinctive environmental features, as well as point data, such as the site datum, cultural features, shovel probes, and select individual artifacts (e.g., temporally diagnostic tools) were mapped with a Trimble geographical positioning system (GPS) unit when satellite alignment and tree canopy allowed. When GPS signals were unavailable, field crews drew detailed maps to record information obtained by compass and metric tape. These data were later digitized into ArcMap. Field GPS data for sites was post-processed using Trimble Pathfinder software and projected into Universal Transverse Mercator (UTM), Zone 8 North, North American Datum (NAD) 1983. All GPS data were exported into ArcMap 9.3.1 shapefiles and plotted onto the associated georeferenced U.S. Geological Survey (USGS) quadrangle (Sitka B-2) to ensure accuracy; subsequently the data were used to produce location maps of the resources. In addition to the site mapping, project personnel took overview photographs of each resource recorded, with a minimum of two compass bearings. Associated features and diagnostic artifacts were described, measured, recorded with GPS units, and photographed (where photography was illustrative), as appropriate. All non-digital field data including photograph logs, feature forms, site/isolated occurrence forms, shovel probe forms, and hand-drawn maps were recorded on field forms or in field notebooks.

5.2.3 Subsurface Inventory Methods

As noted previously, dense vegetation and groundcover in the survey area may obscure evidence of cultural resources, and the FAA's cultural resource consultant included subsurface sampling in field inspections to help address this issue. A 1-inch soil core was used to investigate soils for the potential to yield cultural resources. This core was also used to probe subsurface soils, mostly by sound and feel, for unidentified shell middens and other unnatural occurrences of materials. When good soils were encountered on lands identified by the model as high sensitivity for cultural resources, shovel probing was conducted.

Under certain conditions, like those found along the shoreline of Favorite Bay, it is reasonable to anticipate the existence of buried cultural deposits based on the known intensity of past land uses in this area. In areas of high probability/sensitivity for site occurrence and low ground visibility, judgmental shovel probing was conducted with probes ranging between 30 and 40 centimeters (cm) (12–16 inches) in diameter and averaging 50 cm (20 inches) deep. Probes excavated deeper than 50 cm (20 inches) were continued to depths allowable by hand tools (i.e., less than 1 m). Excavated soils were sifted through ¼-inch (0.6-cm) screen to identify cultural material. Shovel probes containing cultural material were terminated after two sterile levels (arbitrary 10-cm [4-inch] levels) had been encountered. Where bedrock, hydric soils, or impenetrable tree roots were encountered during subsurface testing, or where the probe was too deep to continue hand excavation, the shovel probe was terminated. Any artifacts uncovered during subsurface probing were documented, bagged, and returned to the hole from which they came. The locations of all subsurface probes were recorded using handheld GPS units with sub-meter accuracy.

5.2.4 Airport Alternative-specific Field Methods

The surface and subsurface inventory methods described above outline the overall approach to field identification of cultural resources. Because the microenvironment of each airport and access road alternative differs from the others, field crews tailored the application of the overall approach to specific portions of the survey areas. The following sections discuss the specific approach to each airport alternative.

Airport Alternative 12a

Airport Alternative 12a is situated on a northwest–southeast alignment paralleling the greater Angoon Peninsula (see Figure 3). The road to the village water treatment facility parallels the Airport Alternative 12a to the northeast, and Killisnoo Harbor is located to the southwest. An all-terrain vehicle trail provided clear pedestrian access to the south end of the survey area.

Field crews found the soils along the southwest margin of the airport survey area to be largely hydric and difficult or impossible to screen. The field approach was to look for higher ground above the hydric soils and out of the swampy areas. After walking the entire survey area for this airport alternative, the field archaeologists focused their shovel probing efforts in the northern portion of the survey area, which, based on professional opinion, appeared to have the highest potential for cultural resources.

The extremely wet conditions in the survey area support densely growing vegetation, including thick patches of devil's club, skunk cabbage, and alder. On occasion the field crew was forced to deviate from their parallel transects to avoid dense vegetation or standing water.

Airport Alternative 3a

Airport Alternative 3a is situated in a northeast–southwest orientation with the southwest end of the airport survey area beginning just off the shoreline of Favorite Bay (see Figure 3). Vegetation was densest in the southwestern part of the survey area (i.e., from Favorite Bay upland for 500 m) but thinned out toward the middle of the survey area. Subsurface sampling was carried out in the southwestern portion of the survey area, because this area was categorized as a high sensitivity zone for cultural resources based on the aforementioned criteria. Shovel probing was conducted in locations that field supervisors deemed as having the highest likelihood of buried or obscured cultural resources. Soils in the survey area were mixed evenly between wet hydric soils and drier organic soils overlying bedrock.

Numerous sphagnum meadows with standing and running water were identified in the northeastern portion of the survey area. Soils around the meadows were hydric and were only investigated visually.

Airport Alternative 4

Airport Alternative 4 is situated in a northeast–southwest orientation beginning near the shoreline at the head of Favorite Bay, north of Favorite Creek and south of an unnamed lake (see Figure 3). Vegetation in this survey area is made up of spruce-hemlock overstory and blueberry understory. The blueberry was especially thick in the southwestern half of this survey area. The southwestern third of the survey area was categorized as having high sensitivity for cultural resources based on elevation, proximity to Favorite Creek, and other factors. The area surrounding the unnamed lake near the northeastern extent of the survey area was also categorized as a high sensitivity area. As noted previously, numerous areas of bedrock outcrops were investigated near the lake. All of the high sensitivity areas were subjected to intensive inspection, including subsurface sampling.

5.3 Consultation and Interviews

Consultation was undertaken in advance of this report to identify and evaluate cultural resources within the survey areas for the airport and access road alternatives. This consultation includes federally recognized tribes and Alaska Native organizations, Native corporations, local individuals, and other interested parties. While this technical report marks a milestone in the consultation process, it does not constitute an end to that consultation. The FAA will continue to consult with the agencies, Tribe, and other consulting parties throughout the preparation of the EIS and until the Section 106 process of the NHPA has been completed. Future consultation will specifically address findings of effect from the proposed project; however, FAA will also continue consultation related to identifying historic properties that could be affected by the undertaking.

Among the agencies consulted to date regarding cultural resources and the project APE are the Alaska SHPO and the USFS. This consultation has occurred through a combination of written correspondence, meetings, and informal conversations.

Consultation is also being undertaken by the FAA with the tribal council of the Angoon Community Association (the federally recognized tribal government in Angoon) and the Central Council of the Tlingit and Haida Indian Tribes of Alaska. Consultation is occurring at a government-to-government level to the extent desired by the tribes themselves. The FAA Angoon Airport Project Manager is leading these consultation efforts. Consultation to date has consisted of meetings and written correspondence. Government-to-government consultation will occur throughout the life of the project.

In addition to the government-to-government consultation with federally recognized tribes, the FAA is soliciting the input of the appropriate Native corporations. Sealaska Corporation is the regional corporation for the area, and Kootznoowoo, Inc. is the village corporation. The FAA has contacted these corporations through written correspondence, telephone conversations, and in-person meetings. Throughout the EIS process to date, the FAA has invited, and will continue to invite, representatives of the corporations to participate in project-related group meetings with regulatory agencies and other parties.

The final category of parties engaged by the FAA in discussions about cultural resources in the survey area is individual elders and culture bearers in the Angoon community and the non-governmental organizations Friends of Admiralty Island (FOA) and Southeast Alaska Conservation Council (SEACC). The FAA's cultural resource consultant conducted numerous interviews with individual elders and culture bearers in Angoon. Using maps, aerial photographs, and field visits, consultant staff members requested information on known cultural resources; general land uses in the past; traditional, myth, or legend sites; and current cultural uses of lands and sites that could be affected by any of the airport or access alternatives. Many individuals interviewed expressed concern about divulging such information, citing past instances in which agencies or others have removed artifacts from the area and taken them to curation facilities or museums outside of Angoon and Southeast Alaska. Given this sensitivity, the FAA and its consultant have ensured confidentiality of specific site information to the extent allowable by law but will use the information to thoroughly assess potential project

impacts and refine alternatives as appropriate to avoid or minimize impacts. Interviews and discussions with elders and community members will continue throughout the life of the project.

While not specifically focused on cultural resources, members of FOA and SEACC have a wealth of knowledge about cultural resources in the vicinity of Favorite Bay and general cultural tradition in the area. FOA and SEACC have been engaged by the FAA in general project discussions as part of the public involvement program for the EIS, and several of the discussions have addressed cultural resource issues. The inclusion of these parties in discussion of cultural resources in the Angoon area was focused on identifying known resources rather than evaluating the cultural significance of these resources and was geared at taking advantage of the collective knowledge of NGO members who have spent considerable time in and around of the area of Angoon. Evaluation of the cultural significance of cultural resources identified in the survey area was carried out by FAA in consultation with the USFS, ACA, SHPO, DOT&PF, and other consulting parties having either a designated role in the Section 106 process or ascribing patrimonial affiliation to the resources in question.

6.0 Previous Research and Known and Potential Cultural Resources in and around the Phase 1 APE

The locations of the airport and access alternatives and the surrounding lands have been subject to several previous assessments for historical, architectural, archaeological, and cultural resources potential. Cultural research and archaeological investigations have been formally documented since the 1940s, spurred by academic interest, and more recently, by undertakings requiring compliance with Section 106 or Section 110, or both, of the NHPA (36 CFR 800). Many of these studies have been conducted by the USFS or in conjunction with proposed development. Table 1 summarizes past cultural resource investigations within a 1-mile buffer around the Phase 1 APE, referred to as the file search study area. Following the table are more detailed discussions of these investigations and known and potential cultural resource sites in the Phase 1 APE.

6.1 Academic Research

Academic documentation of traditional lifeways and activities of Alaska Natives (primarily Tlingit) of Admiralty Island began in the mid 1940s with the research of Goldschmidt and Haas (1946; republished 1998). The duo conducted extensive ethnographic work through greater Southeast Alaska, focusing on the Tlingit and Haida peoples. Their early work, published in 1946, documented the geographic locations of distinct clans and moieties, traditional use areas, and subsistence hunting and fishing areas. Goldschmidt and Haas continued to chronicle the historical and contemporary lifeways of the Tlingit peoples for nearly 50 years through the transcription of stories and ethnographic interviews they conducted with Tlingit and Haida tribal members (Goldschmidt and Haas 1998).

De Laguna began her intensive academic studies on Admiralty Island in the mid 1950s (de Laguna 1960). De Laguna's work recorded the traditional use areas of the Tlingit peoples of Angoon. During this research she identified and gathered preliminary documentation on a variety of heritage sites ranging from structures such as forts and fish weirs to archaeological sites such as garden rows and shell middens. Many of the sites identified by de Laguna are located around Favorite Bay. De Laguna documented the oral histories associated with many of the sites and sought to understand their significance to the people of Angoon. Subsequent research at sites identified by de Laguna in the general Angoon area has included limited testing and excavation and has provided invaluable data for understanding the past uses of the area. Sites in the file search study area that de Laguna visited are SIT-00295, SIT-00303, SIT-00305, SIT-00306, SIT-00169, SIT-00177, SIT-00014, and SIT-00015.

Using de Laguna's work as a guide, Moss and Erlandson began their research on Admiralty Island in the early 1980s. Moss, a USFS employee at the time, and Erlandson, an instructor at the University of California, Santa Barbara, used baseline USFS data as a stepping stone to academic research, culminating in Moss's 1989 dissertation, *Archaeology and Cultural Ecology of the Prehistoric Angoon Tlingit.* Moss and Erlandson's work has helped to establish the cultural chronology of Angoon by focusing on archaeological sites and testing carboniferous materials located within features of the sites. Their work has also documented the traditional uses of many of the natural resources located within and around Admiralty Island through analysis of faunal remains at three primary site types: villages, forts, and fishing sites (Moss 1989). Moss and Erlandson conducted archaeological excavations at many site locations around Angoon, and the resulting data complements de Laguna's archaeological research and contributes to a much broader view of traditional lifeways in Angoon (Moss 2004). Moss's work continues today through the University of Oregon. Traditional or heritage sites documented by Moss and Erlandson within the file search study area are SIT-00169, SIT-00262, SIT-00295, SIT-00124, and SIT-00033.

While not entirely academically based, Sealaska Corporation's publication *Native Cemetery and Historic Sites of Southeast Alaska* (Sealaska Corporation 1975) also provides valuable information about cultural resources in the general area of Angoon. Published in 1975, Sealaska's study identifies sites that could be eligible for conveyance as historic or cemetery sites under section 14(h)1 of the Alaska Native Claims Settlement Act.

Table 1. Previous Investigations within the File Search Study Area

Report Title	Author (Year)	Resources Identified within the File Search Study Area
Possessory Rights of the Natives of Southeastern Alaska	Goldschmidt and Haas (1946)	SIT-00302[1]
The Story of a Tlingit Community: A Problem in the Relationship Between Archaeological, Ethnological, and Historical Methods	de Laguna (1960)	SIT-00295, SIT-00303, SIT-00305, SIT-00306, SIT-00169, SIT-00177, SIT-00014, SIT-00015
Cultural Resource Investigation at Killisonoo [sic] Harbor	Fields and Davidson (1979)	SIT-00015, SIT-00169, SIT-00177, SIT-00680, SIT-00014
Archaeological Reconnaissance of Favorite Bay, Admiralty Island	McAfee et al. (1982)	SIT-00302[1]
Results of Archaeological Reconnaissance on Admiralty Island National Monument, Southeast Alaska	Erlandson and Moss (1983)	SIT-00169, SIT-00262, SIT-00295
Preliminary Results of Archaeological Investigations on Admiralty Island, Southeast Alaska: 1985 Field Season	Moss and Erlandson (1985)	SIT-00124
1989 Archaeological and Historical Site Monitoring Program for the Chatham Area, Tongass National Forest	Lively and Davis (1989)	SIT-00015
Archaeology and Cultural Ecology of the Prehistoric Angoon Tlingit	Moss (1989)	49SIT124, 49SIT33
The Antiquity of Tlingit Settlement on Admiralty Island, Southeast Alaska.	Moss et al. (1989)	SIT-00124, SIT-00033
A Cultural Resource Management Plan for Admiralty Island National Monument - DRAFT	Mobley (1994)	–

Table 1. Previous Investigations within the File Search Study Area

Report Title	Author (Year)	Resources Identified within the File Search Study Area
Haa Aani Our Land: Tlingit and Haida Land Rights and Use	Goldschmidt and Haas (1998)	SIT-00302[1]
Cultural Resources Inventory of the Angoon Proposed Airport	Yarborough (2005)	SIT-00169, SIT-00680, SIT-00262, SIT-00033, SIT-00302, SIT-00502, SIT-00034
Archaeological Investigation of Cape Addington Rockshelter: Human Occupation of the Rugged Seacoast on the Outer Prince of Wales Archipelago, Alaska	Moss (2004)	–

Note: Data obtained through USFS Tongass National Forest Heritage Resources Archives, and OHA, Anchorage.

[1] Site is in the current survey area.

While the sites documented by De Laguna and Moss and Erlandson are located in the general airport and access road file search study area, they are located outside of the Phase 1 APE. However, the information obtained by the work of these researchers is valuable in identifying the types of archaeological, historic, and heritage resources that occur in the area. Since the majority of these studies focused on the immediate shorelines of Favorite Bay, Mitchell Bay, and other bays and inlets in and around Angoon, they are most useful in predicting coastal site locations and types; they provide less information about upland site types and locations. The results of these studies clearly indicate intensive prehistoric and historic use of shorelines in the area and suggest that any airport or access road alternative extending into the immediate shoreline area would have a high probability of encountering archaeological, historic, and traditional resources.

6.2 Federally Mandated Investigations

Proposed development, improvements to existing infrastructure, and resource management needs have triggered nine research investigations in the vicinity of the file search study area under Sections 106 and 110 of the NHPA. The following section describes these efforts.

Most of the land on Admiralty Island is managed by the USFS, and a number of research efforts have been completed by the agency over the last 30 years. The proposed construction of the Killisnoo Harbor Pipeline triggered a cultural resources review of the proposed pipeline route under Section 106. This project and its related investigations were located along the western edge of Admiralty Island (Fields and Davidson 1979). The investigation was conducted by USFS archaeologists and consisted of a pedestrian survey along the shorelines and higher-probability areas. The survey was supplemented with limited excavation of test units. Four sites were identified and addressed during this effort: SIT-00177, SIT-00680, SIT-00169, and SIT-00015. [redacted]

Efforts to establish hydroelectric facilities on Admiralty Island for the benefit of the community of Angoon began in the 1980s, after provisions for such facilities were included in the Alaska National Interest Lands Conservation Act. In the early 1980s, a hydroelectric facility, along with a fish hatchery and electric powerhouse, were proposed and feasibility studies were begun. The USFS conducted a cultural resource reconnaissance to assess potential impacts to resources resulting from the geotechnical drilling associated with the study (McAfee et al. 1982). The investigation documented sites SIT-00302 and SIT-00034. [redacted] The FAA's cultural resource consultant team revisited this site during the studies for the current undertaking and conducted

additional investigations to establish the NRHP eligibility of the site. Section 7.0 of this document provides more information about this site. SIT-00034 is located outside the anticipated disturbance zones of the airport and access road alternatives under consideration in the EIS.

During the 1990s, the USFS began a series of site monitoring projects, which consisted of revisiting known sites to document their current condition and identifying and documenting newly discovered sites. These monitoring activities focused on the Chatham Straight area (Lively and Davis 1989). In 1994 the USFS contracted to Charles Mobley and Associates to prepare a cultural resource management plan for Admiralty Island National Monument (Mobley 1994). The plan, which was never finalized, established a cultural chronology for the island, using a combination of ethnographic interviews and data collected over the years by academic scholars and USFS archaeologists, and set forth the management direction at the time. A key component of the plan was a complete re-inventory of all known cultural resource sites and traditional land use areas located on Admiralty Island National Monument lands, which numbered more than 50. Of the sites identified in the plan by Mobley, none are located within the file search study area. Since the completion of the plan, the USFS has conducted additional monitoring of known archaeological sites, including those around Favorite Bay. Specifically, SIT-00302 has been subject to such monitoring.

In 2003 fieldwork was conducted in and around the community of Angoon by Cultural Resource Consultants (Yarborough 2005) for the proposed Angoon Airport project (which has undergone many phases and investigations during the efforts to move the project forward and reach NEPA compliance). The resulting report from the 2003 investigations indicates that the goal of the fieldwork, which was referred to as a "field reconnaissance", was to identify some, but not all, cultural resources that may be affected by the locations of the proposed project's airport and access alternatives in an effort to identify the archaeological sensitivity of the general area of the airport and access alternatives (Yarborough 2005). Coastal, estuary, and wetland areas were not investigated, and the resulting findings consisted of a handful of cut stumps and culturally modified trees. Previously identified sites SIT-00169, SIT-00680, SIT-00262, SIT-00033, SIT-00302, SIT-00502, and SIT-00034, located in the file search study area, are discussed and further documented in the report.

The most recent known study associated with cultural resources in the vicinity of the file search study area was the documentation by the USFS of a Tlingit legend site, [redacted]

As with the aforementioned academic research, most of the studies carried out under federal mandate have occurred within the shoreline areas of bays and other waterways around Angoon. These studies further confirm the intensity of prehistoric and historic uses of this landform.

6.3 Known and Potential Sites and Resources in the General Area around the Angoon Peninsula and Favorite Bay

As noted, the various investigations described above resulted in the identification of numerous cultural resource sites in the immediate vicinity of the general area around the Angoon peninsula and Favorite Bay. Additionally, these studies yielded information that suggests other resources may be present although they have not yet been identified or documented. This section further summarizes the known and potential cultural resources in the file search study area. While most of the known resources are located outside of the Phase 1 APE and in portions of the file search study area that are not expected to experience any effects from the proposed undertaking, they provide valuable insight into the array of site types—from maritime subsistence sites to garden sites to legend sites—that are found in the general area.

6.3.1 ALASKA HERITAGE RESOURCES SURVEY SITES AND U.S. FOREST SERVICE HERITAGE RESOURCE SITES

The OHA maintains a database of archaeological and historical resources identified and documented within the state. This information is referred to as the Alaska Heritage Resources Survey. The vast majority of resource information in the database is derived from inventories conducted in advance of federal undertakings or other projects subject to state and federal preservation laws. Other resources have been added to the database as a result of academic studies and other scientific investigations. Similarly, the USFS maintains an internal archive of documented, and undocumented but known, resources. Much of this resource information is a result of USFS archaeologists inventorying the agency's lands in conjunction with planning, management, and maintenance activities. As noted above, the records of the OHA database and the USFS were examined as part of the resource identification efforts associated with this technical report. The OHA and USFS records included information on 19 documented archaeological and heritage sites within the file search study area. These resources are listed in Table 2 and discussed below. Only one of these, SIT-00302, is located wholly or partly within the current cultural resources survey area.

The 19 previously documented sites represent a variety of prehistoric and historic activities and include such resources as buildings and structures, forts, cemeteries, middens, garden rows, fish weirs, village or other occupation sites, and a legend site. Most are affiliated with past Tlingit occupation of the area, although some are associated with the activities of Euro-Americans or others. No NRHP eligibility determinations are on file for any of these previously documented sites. Figure 4 shows the locations of these sites.

As noted, the only previously documented heritage resource located within an area that may be directly affected by any of the airport or access alternatives currently under consideration in the airport EIS is SIT-00302. This site is known as the Favorite Bay Garden Site. It was first documented by Goldschmidt and Haas in 1946, and the USFS also reported on the site (McAfee et al. 1982). The site was formally entered into the OHA site archives as a result of its documentation by Moss and Erlandson in 1985. Since that time, the USFS has periodically monitored the condition of the site, which contains historic Tlingit garden rows, cultivated crabapple trees, and blazed trees. The site may be related to the adjacent fish weir site, SIT-00033, located to the west of site SIT-00302.

[redacted]

Table 2. Documented Cultural Resources Located within the File Search Study Area

Alaska Heritage Resources Survey Number	Site Type	Site Name	Eligibility
SIT-00302*	Historic Tlingit garden	Favorite Bay Garden Site	Undetermined
SIT-00169	Historic Tlingit occupation site	Ketintci-'an (Killisnoo Harbor Village)	Undetermined
SIT-00033	Prehistoric/historic stake fish weir	Favorite Bay Fish Weir	Undetermined
SIT-00502	Historic Tlingit garden	Garden Site	Undetermined
SIT-00177	Historic Tlingit site/possible fort/cemetery remains	South Killisnoo Village (Dadakatak Nuwu/Dasuqtag-an/Potato Point)	Undetermined
SIT-00262	Prehistoric midden	Dukdeiyukutun As Midden	Undetermined

Table 2. Documented Cultural Resources Located within the File Search Study Area

Alaska Heritage Resources Survey Number	Site Type	Site Name	Eligibility
SIT-00680	Historic Euro-American water system	Water Flume	Undetermined
SIT-00749	Historic Aleut and Russian Orthodox cemetery	Killisnoo Cemetery	Undetermined
SIT-00014	Historic Tlingit village/Euro-American commercialism [graves, village site, cannery remains]	Killisnoo (Killisnoo Ruins/Kenasnow/ KanasNu/Killishoo/ Killisnoo Island Village)	Undetermined
SIT-00056	Historic religious buildings site	St. Andrew Church (Russian Orthodox)	Undetermined
SIT-00015	Prehistoric/historic Tlingit fort/cemetery	Killisnoo Harbor Fort and Cemetery	Undetermined
SIT-00124	Prehistoric Tlingit site	Killisnoo Picnicground Midden	Undetermined
SIT-00305	Historic Tlingit garden site	Kootznahoo Roads Garden	Undetermined
SIT-00306	Historic Tlingit cabins and midden site	Scott's Ranch and Midden	Undetermined
SIT-00307	Historic Tlingit structure, garden, and midden site	Kenasnow Camp and Midden	Undetermined
SIT-00295	Prehistoric/historic Tlingit occupation site [cabins/lithics/middens/cache pits]	Ta Uk Aan Nee Shoo (Takwanicu/End of Winter Village)	Undetermined
SIT-00303	Historic Tlingit site	Xicwan-'ani (Fisherman's Town)	Undetermined
SIT-00034	Prehistoric/historic Tlingit site	Favorite Bay Midden/Garden	Undetermined
SIT-781 [USFS]	Prehistoric/historic legend site	Beaver Tail Rock	Undetermined

***** Resource located within current survey area.

6.3.2 Sealaska Corporation and Angoon Coastal Management Plan Sites

Two other sources of information about known and potential cultural resource sites in the general project area are the aforementioned Sealaska Corporation's 1975 publication *Native Cemetery and Historic Sites of Southeast Alaska* (Sealaska Corporation 1975), and the now void Angoon Coastal Management Plan (City of Angoon 1992). Several of the sites reported by these two sources are also documented in the Alaska Heritage Resources Survey program (see Table 2); these consist of Killisnoo Harbor Fort, Killisnoo Harbor Village, Killisnoo Island Village, South Killisnoo Village, and Sullivan Point Favorite Bay Village. Several others of the sites are located well outside the file search study area and will not be considered further as part of the EIS and related studies. These sites consist of Turn Point Village, Channel Point Village, Danger Point Village, Stillwater Anchorage Fort, and Kootznahoo Roads Petroglyph.

Three other potential sites were identified through the Sealaska and Angoon Coastal Management Plan sources; however, their exact locations are not known. These sites consist of the Angoon Favorite Bay Seasonal Village, Favorite Bay Village Site, and South of Angoon Burial Site. The FAA consultant's cultural resource field crews attempted to identify the locations of these sites through interviews with local elders, but the names of the sites as published were not recognized, and the elders were unsure as to what locations they represented.

6.3.3 Burials and Human Remains

Individual burials and historic cemeteries are present in a variety of locations around Angoon and the broader landscape surrounding the village. Table 2 identifies those formally documented sites containing human remains that are within the file search study area. None of these sites are located in areas that would be directly or indirectly affected by development of an airport and associated access road at any of the locations under study in the EIS. However, given the intense history of long-term occupation of the Angoon and Favorite Bay area, it is likely that additional, yet-to-be-identified burials are present in the general area.

Goldschmidt and Haas (1998:14) refer to a burial on an island in Favorite Bay, as does de Laguna (1960:46). De Laguna notes that "a Decitan man is buried on the little island off the north shore of Favorite Bay, near the upper entrance to the lagoon behind Sullivan Point Island." The exact location of the island described by de Laguna is unknown, and no elders interviewed about known and potential cultural resources in the file search study area could or would confirm the location of any burials in the Favorite Bay area. The cultural resource survey area for Airport Alternative 3a encompasses an island in Favorite Bay, and the FAA's cultural resource consultant team thoroughly examined this island and found no evidence of any burials.

7.0 Survey Results

No new archaeological, historical, or traditional/heritage sites were identified during the field inventory. The FAA's consultant team documented one new isolated occurrence and revisited and conducted additional investigations at one previously recorded site. In the State of Alaska an isolated find, or isolated occurrence, is defined as consisting of a single artifact, whereas sites are defined as occurrences of two or more artifacts. Field crews revisited one previously documented site to confirm its location relative to the survey area but did not update the site record. Additionally, field crews identified in the survey area numerous culturally modified trees (CMT), which are ubiquitous across Southeast Alaska. Information about all of these resources is provided below. The locations of the CMTs, the newly documented isolated occurrence, and the updated archaeological site are depicted on Figure 5.

The information in this figure is protected by Federal law. It is not for public release.

Figure 4. Locations of previously documented sites.

The information in this figure is protected by Federal law. It is not for public release.

Figure 5. Locations of CMTs, newly documented isolated occurrence, and updated archaeological site.

7.1 Newly Documented Isolated Occurrence

One new isolated occurrence was identified during field survey, and consists of a historic boring or jackhammer bit.

Field Isolate Number: OR71209-1

Site Type: Historic boring bit or jackhammer bit

Temporal Component(s): Historic mining or logging

Physiographic Province: Admiralty Island/Southeast Alaska

UTMs (NAD83): [redacted]

Legal Description: [redacted]

USGS Topographic Quad and Sheet: [redacted]

City/Village, State: Angoon, Alaska

Landowner: Kootznoowoo, Inc.

NRHP Eligibility Recommendation: Not Eligible

Description: [redacted]

The steel bit measures 25 inches long and 0.75 inch thick. It has a slight counterclockwise twist to it (Figure 6). It is octagonal in cross section and pointed on one end where it has four sides that appear to have been hand-forged, as they are rather roughly shaped. The pointed portion of the bit measures approximately 4 inches long (Figure 7). The entire bit is badly rusted, suggesting it has been exposed to the elements for a prolonged period. Artifacts relating to historic mining and logging are common throughout the greater Angoon area. No other artifacts, features, or other cultural materials were found in association with this item.

Figure 6. Isolate OR71209-1, historic boring or jackhammer bit.

Figure 7. Close-up of pointed end of bit.

7.2 Updated Site

[redacted] No determination of the site's eligibility for the NRHP had been made as a result of its earlier documentation. Field crews revisited the site to evaluate its current condition and gather additional data necessary to make a recommendation of NRHP eligibility to the FAA and USFS. The relevant information about the site and the consultant team's NRHP evaluation follow.

Field Site Number: SIT-00302

Site Type: Historic garden and pre-contact lithic scatter

Temporal Component(s): Historic garden; unknown prehistoric/historic

Physiographic Province: Admiralty Island/Southeast Alaska

UTMs (NAD83): [redacted]

Legal Description: [redacted]

USGS Topographic Quad and Sheet: [redacted]

City/Village, State: Angoon, Alaska

Landowner: USFS, Tongass National Forest, Admiralty Island National Monument

NRHP Eligibility Recommendation: Eligible under NRHP Criterion D

Period(s) of Significance: Prehistoric (Middle and Late Periods: 5,000 B.P. to A.D. 1741) and Ethnographic Period

Description: [redacted] In 1982 a USFS crew conducting an archaeological reconnaissance of Favorite Bay recorded and mapped SIT-00302. The site was reported as a historic garden site in 1985 by Moss and Erlandson, and was noted in 1946 by Goldschmidt and Haas.

Upon revisiting the site for the airport project, the FAA's cultural resource consultant team found the site still retained much of what was described in the original site description. However, the collapsed shelters and "shelf," which were identified during previous documentations, could not be found.

The Favorite Bay Garden Site consists of extensive garden plots stretching for 70 –75 m (230 –246 feet) in an L-shaped pattern of elevated rows (Figures 10 and 11), which are oriented perpendicular to the shoreline of Favorite Bay. The garden rows, measuring approximately 5–15 m long (16.4–49.2 feet), are just inside the forest fringe and have spruce trees, some of which are up to 75 cm (29.5 inches) in diameter, growing on top of them. There are 13 furrowed garden rows oriented east–west in the northwest portion of the site and 31 furrowed garden rows oriented north–south in the southern portion of the site. Farther inland from the garden rows is an open 20 × 30–m (65.6 × 98.4–foot) area consisting of a flat natural terrace with crabapple trees on its south end. A major tidal channel of Favorite Creek with a stake fish weir (SIT-00033) is located to the west of the site and may be associated with subsistence activities at SIT-00302 (see Figure 4 for location of SIT-00033). In addition to the garden rows, two other distinct features were identified. Feature 1 is located in the southwest portion of the site, and Feature 2 is located in the northernmost portion of the site

Figure 8. Overview of SIT-00302, view facing south from the northern edge of the site.

Figure 9. Overview of SIT-00302, view facing west and overlooking the datum.

The information in this figure is protected by Federal law. It is not for public release.

Figure 10. Site map of SIT-00302 with locations of shovel probes.

Figure 11. Raised furrowed garden rows (running from left to right) at SIT-00302, view facing northeast.

Feature 1 (Figure 12) is a stone-ringed hearth made up of seven visible stones. It is slightly oval in shape, measuring roughly 1.1 × 1.0 m (3.6 × 3.1 feet). The stones are approximately 50% covered in moss and are almost completely silted in. The hearth is located near the southwestern site boundary, just inside the tree line. A small amount of modern trash was observed in the vicinity of the hearth, suggesting the area is still used as a camping or resting area.

Feature 2 (Figure 13) represents a culturally modified tree with multiple cuts through the bark to remove pieces of wood for fire starter. Pitch wood is a very good source of fire starter and will burn easily in wet conditions. The stripped area of the tree is large, covering approximately one-third of the tree's circumference.

NRHP Eligibility Investigations and Recommendation: During the revisit to the site, there were two main goals: 1) establishing the site's boundary and condition and 2) gathering sufficient information to make a recommendation of eligibility for the NRHP. To these ends, surface evidence of the site was examined and limited subsurface sampling was conducted through soil and shovel probing. Some portions of the site boundary were based on topographic features that form clear limits on the extent of a garden site, such as the waterline of Favorite Bay.

In all, 27 shovel probes measuring 30–40 cm (12–16 inches) in diameter were excavated across the site. Depth of the shovel probes ranged from 28 to 70 cm (11 to 28 inches) below surface (cmbs) depending on the gravel, bedrock, and root content of 10-m (30-foot) intervals. Twelve of the probes were placed north of the site's visible boundary based on features, and eight probes were placed east of the site's previously defined boundary. The site's south and west boundaries are established by tidal waters. Soils were sifted through ¼-inch-mesh screen and inspected for cultural materials. The shovel probes were supplemented by 50 soil probes excavated with a 1-inch auger. See Figure 10 for the location of the shovel probes and Appendix A for a table of relevant information for all shovel probes.

Figure 12. Feature F1, stone-ringed hearth, at SIT-00302, view facing northwest.

Figure 13. Feature F2, a CMT with pitch cuts, at SIT-00302, view facing north.

Seven evenly spaced shovel probes were placed along a north–south line within the previously defined western perimeter of the site. An additional 20 shovel probes were excavated on a north–south grid, spaced at 10-m (30-foot) intervals. Twelve of the probes were placed north of the site's visible boundary based on features, and eight probes were placed east of the site's previously defined boundary. The site's south and west boundaries are defined by tidal waters. Soils were sifted through ¼-inch-mesh screen and inspected for cultural materials. A minimum of two consecutive negative shovel probes beyond the site's previously defined boundary were deemed appropriate to verify the established site boundary. Soil probes using the auger were randomly placed throughout the site.

During shovel probing six lithic artifacts were uncovered. All were found in the seven shovel probes placed within the western perimeter of the previously defined site boundary. No artifacts were found during excavation of the additional 20 shovel probes excavated beyond the boundary defined by surface features.

Of the six artifacts uncovered within the site, one is chert, one is obsidian, and four are silicified sediment. Three of the artifacts are tertiary flakes and three are secondary reduction flakes. One of the artifacts is size class 2 (1–2 cm); three artifacts are size class 3 (2–3 cm); and two artifacts are size class 4 (3–4 cm). Of particular importance is the obsidian artifact, which is an obsidian microblade midsection (Figures 14 and 15). The artifact was found in shovel probe 145. Microblade technology is known to be associated with the early prehistory of Alaska, and this is the first documented microblade known to be found on Admiralty Island. Microblades have also been found roughly 30 miles to the southwest across Chatham Straight, at the Hidden Falls archaeological site. The microblade assemblage at Hidden Falls was dated to approximately 9000 B.P. (Ackerman 2007). Groundhog Bay II Site is another Southeast Alaska microblade site. It is located at the confluence of Chatham Strait and Icy Strait, and its microblade assemblage was dated to around 10,000 B.P. (West 1996). In North America, microblades are primarily found throughout Alaska, Oregon, Washington, and western Canada. The earliest examples of microblades originate in Asia and date from 40,000 to 30,000 B.P. (Yaroslav et al. 2007).

While few of the shovel probes and none of the soil probes yielded subsurface artifacts, the presence of the microblade found in a subsurface context is significant. Shovel and soil probing can, at best, be considered a reconnaissance-level sampling of a site and not a definitive determination of the full presence/absence of cultural materials. The recovery of the microblade and other subsurface artifacts, though limited in number, suggests not only that intact cultural deposits may be present at the site but also that the site may have far greater antiquity than previously believed. The microblade, with appropriate analysis, has the potential to yield information about the obsidian source, possible trade relationships, and/or toolstone procurement strategies. Additionally, the presence of the microblade at SIT-00302 is consistent with speculation that the site may be temporally associated with the 3,000-year-old fish weir (SIT-00033) located just offshore in Favorite Bay. However, further research into site SIT-00302 will be needed to confirm such an association. Regardless of whether site SIT-00302 is indeed associated with the fish weir, it is evident from the recovery of the microblade that the site has yielded information and has the potential to yield additional information to significantly refine existing knowledge regarding the little understood prehistory of the Favorite Bay area. For these reasons, site SIT-00302 is recommended as eligible for the NRHP under Criterion D.

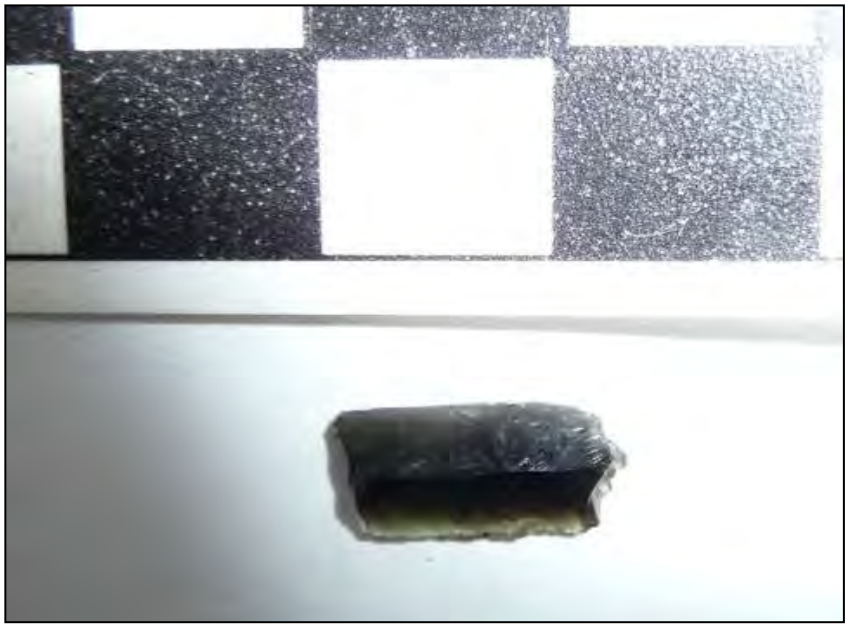

Figure 14. Dorsal view of microblade fragment recovered from shovel probe 145 at SIT-00302.

Figure 15. Ventral view of microblade fragment recovered from shovel probe 145 at SIT-00302.

7.3 Culturally Modified Trees within the Survey Area

Nine CMTs were identified during field surveys (see Figure 5). These trees were documented similarly to isolated occurrences. Three varieties were noted, including blazed trees, springboard trees, and pitch-cut trees. No clusters or stands of CMTs were identified. Rather, the CMTs are distributed randomly across the survey areas.

Blazed trees (Figure 16) were identified as having a small to large scar cut through the bark; they generally appear to mark trails or property boundaries based on their proximity to such features. Many of the blazed trees were found on the boundary line between stands of trees of different age classes, suggesting the blazes were used to mark old timber units.

Springboard trees (Figures 17 and 18) are typically associated with historic logging. Springboard notches are found at about chest height on large trees throughout Southeast Alaska and the Pacific Northwest. A deep notch is cut into a tree and a plank is inserted (end-in) into the notch to provide a place for a logger to stand while swinging an axe or wielding a cross-cut saw to cut the tree at an acceptable location above its base.

Pitch-cut trees are cut through the bark near their base at an angle and allowed to bleed sap or pitch (Figures 19 and 20). Pitch has many uses, including as fire starter, binding agent, glue, and waterproof sealant.

While CMTs can be eligible for the NRHP – typically under Criterion A for associations with historical events or land uses or Criterion D for information potential – the trees need to meet certain criteria. In general, CMTs associated with the early historic period or prehistoric period or those associated with significant events or themes regardless of their time period are more likely to be determined eligible for the NRHP. More recent CMTs or CMTs associated with non-significant land uses or themes are less likely to be considered eligible. Those found in association with other archaeological sites are likely to be considered to be a contributing feature of the site rather than eligible in their own right.

Of the CMTs identified during the survey and not associated with other archaeological sites, nearly all are springboard trees or blazed trees associated with historic logging activity. As noted in section 4.1.3 of this report, logging was never a significant activity in the Angoon area of the Tongass National Forest. Minor logging events did occur but did not play the role in shaping the economy or land use that such logging has played in other areas of Southeast Alaska. For these reasons, the CMTs associated with logging are not considered historically significant or eligible for the NRHP.

Two pitch-cut trees were found during the survey. One is associated with site SIT-00302, and the other was found independent of any other cultural resources. The one present on site SIT-00302 is considered a contributing feature of that site. The isolated pitch-cut tree still retains visible axe cut marks suggesting that while it may be from the historic period, it dates to the more recent part of that period. This conclusion is bolstered by the small, second-growth nature of the tree. Although pitch-cut trees are most commonly associated with Alaska Native land uses and activities, the relatively recent nature of this particular specimen in association with stands of trees logged by Euro-Americans suggests the tree could be associated with other land uses and non-native cultures. This lack of clear association supports a recommendation that this CMT is not eligible for the NRHP.

Figure 16. Close-up of a tree blaze.

Figure 17. A large springboard stump, view facing northwest; note crew member for approximate scale of stump.

Figure 18. Close-up of a springboard notch.

Figure 19. A pitch-cut tree from SIT-00302, view facing northeast.

Figure 20. A pitch-cut tree, view facing southeast.

8.0 Management Summary

The DOT&PF has proposed a land-based airport and associated access road for the community of Angoon in Southeast Alaska. The DOT&PF has requested funding from the FAA for the proposed project. Prior to authorizing any funding or approving the proposed airport layout plan, the FAA is conducting an evaluation of potential environmental impacts through the preparation of an EIS. Through the EIS, the FAA is considering alternatives to the DOT&PF's proposed action to evaluate and compare anticipated impacts to the natural and cultural environment. The FAA is considering three airport location alternatives, including the DOT&PF's proposed location at Airport Alternative 3a, and various access alternatives to reach those locations. Because two of the airport location alternatives are located on Monument–Wilderness Area lands, which are administered by the USFS, the FAA is working closely with the USFS in fulfilling requirements under both NEPA and the Section 106 process of the NHPA.

Among the studies conducted in association with the EIS are those related to archaeological, historical, and cultural resources. The studies conducted to date are reported here and consist of pedestrian inventory with limited subsurface probing in high-sensitivity areas, interviews with local elders, and archival research. While many archaeological sites are known to be present in the general project area, only one (the Favorite Bay Garden Site, SIT-00302) was located *within* the survey area. No determination of eligibility had been made for the site prior to the investigations reported here. Based on the information gathered during these field studies, it is recommended that site SIT-00302 (the Favorite Bay Garden Site) be considered eligible for the NRHP under Criterion D. In addition to this site, several CMTs were documented during the field survey.

The exact areas that will be directly affected, and that could be indirectly affected, by any of the airport and access alternatives are not yet known. Additional refinement of alternatives, including more detailed engineering design, is necessary before the final (Phase 2 APE discussed in section 3.0) APEs for the airport alternatives and their associated access roads will be known. For these reasons, additional field investigations may be necessary prior to the FAA and USFS issuing their findings of effect and requesting comment from the SHPO and other consulting parties. The nature and timing of any additional studies will be discussed with the consulting parties as well. At the present time, the FAA proposes to conduct these studies at such time as the agency has identified its preferred alternative for both the airport and its associated access road. Any additional studies deemed necessary would focus on these alternatives rather than on all alternatives considered in the EIS.

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Literature Cited

Ackerman, Robert E. 2007. *The Microblade Complexes of Alaska and the Yukon: Early Interior and Coastal Adaptations*. Archaeological Press, Simon Frasier University, Burnaby, British Columbia.

Betts, Robert, and Peter Bowers. 1994. *Draft Cultural Resources Literature Search and Inventory Plan: Port Houghton/Cape Fanshaw Environmental Impact Statement*. Northern Land Use Research, Inc., Fairbanks. Submitted to USDA Forest Service, Tongass National Forest, Stikine Area, Contract No. 53-0109-00390.

City of Angoon. 1992. *Angoon Coast Management Program and Areas Meriting Special Attention Plan for Mitchell, Hood and Chaik-Whitewater Bays*. City of Angoon, Angoon.

de Laguna, Frederica. 1960. *The Story of a Tlingit Community*. United States Government Printing Office. Washington D.C.

DOT&PF. 2007. *Angoon Airport Master Plan*. Available at: www.angoonairporteis.com. Accessed January 2010.

Erlandson, Jon M., and Madonna L. Moss. 1983. Results of Archaeological Reconnaissance on Admiralty Island National Monument, Southeast Alaska. Alaska Office of History and Archaeology ID No. 2408. NADB No. 1400710. Department of Anthropology, University of California, Santa Barbara, and USDA Forest Service, Admiralty Island National Monument, Tongass National Forest, Southeast Alaska.

Fields, Ross, and Hugh Davidson. 1979. Cultural Resource Investigation at Killisonoo Harbor. U.S. Forest Service, Tongass National Forest, Chatham Area. Manuscript on file at the Alaska Office of History and Archaeology, Anchorage.

Goldschmidt, Walter R., and Theodore H. Haas. 1946. Possessory Rights of the Natives of Southeastern Alaska, a Report to the Commissioner of Indian Affairs. Washington D.C.

————. 1946 (republished 1998). Haa Aani *Our Land: Tlingit and Haida Land Rights and Use*. University of Washington Press, Seattle and London.

Lively, Ralph A. and Stanley D. Davis. 1989. 1989 Archaeological and Historical Site Monitoring Program for the Chatham Area, Tongass National Forest.

McAfee, Melanie L., Gale Bjotvedt, and Noreen Fritz. 1982. Archaeological Reconnaissance of Favorite Bay, Admiralty Island. U.S. Forest Service, Tongass National Forest, Chatham Area, Sitka, Alaska.

Mobley, Charles M. 1994. *A Cultural Resource Management Plan for Admiralty Island National Monument.* [Draft] U.S. Forest Service Purchase Order #43-0114-2-0399. Charles M. Mobley & Associates, Anchorage.

Moss, Madonna L. 1989. *Archaeology and Cultural Ecology of the Prehistoric Angoon Tlingit.* Ph.D. dissertation, Department of Anthropology, University of California, Santa Barbara. University Microfilms, Ann Arbor.

————. 2004. Archaeological Investigation of Cape Addington Rockshelter: Human Occupation of the Rugged Seacoast on the Outer Prince of Wales Archipelago, Alaska. Anthropological Paper No. 63. University of Oregon, Eugene.

Moss, Madonna L., and Jon M. Erlandson. 1985. *Preliminary Results of Archaeological Investigations on Admiralty Island, Southeast Alaska: 1985 Field Season.* NADB No. 1400726. Department of Anthropology, University of California, Santa Barbara.

Moss, Madonna L., Jon M. Erlandson, and Robert Stuckenrath. 1989. The Antiquity of Tlingit Settlement on Admiralty Island, Southeast Alaska. *American Antiquity* 54(3):534–543.

Myron, Rachel. 2008. Alaska Heritage Resources Survey Site Record for Site SIT-781). U.S. Forest Service, Tongass National Forest, Admiralty Island National Monument Office, Juneau.

Sealaska Corporation. 1975. *Native Cemetery and Historic Sites of Southeast Alaska*. Sealaska Corporation, Juneau. Manuscript submitted to Sealaska Corporation by Wilsey & Ham, Inc., Seattle.

USFS. 2002. *Second Amended Programmatic Agreement Among the USDA Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the Alaska State Historic Preservation Officer Regarding Heritage Resource Management on the National Forests in Alaska.* Agreement # 02MU-111001-076.

————. 2009. *Angoon Hydroelectric Project Final Environmental Impact Statement.* USDA Forest Service, Tongass National Forest.

————. 2011. *Coal Mining and Steam Ships.* Available at http://www.fs.fed.us/r10/tongass/districts/admiralty/heritage/coalmining.shtml. Accessed on December 21, 2011.

West, Fredrick Hadleigh (editor). 1996. *American Beginnings: The Prehistory and Palaeoecology of Beringia*. The University of Chicago Press, Chicago and London.

Yarborough, Michael. 2005. *Cultural Resources Inventory of the Angoon Proposed Airport*. Cultural Resource Consultants, LLC, Anchorage, Alaska.

Yaroslav, V. Kuzmin, Susan G. Keates, and Chen Shen (editors). 2007. *Origin and Spread of Microblade Technology in Northern Asia and North America*. Archaeological Press, Simon Frasier University, Burnaby, British Columbia.

Acronyms

amsl	above mean sea level
APE	area of potential effects
ARPA	Archaeological Resources Protection Act
B.P.	before present
CFR	Code of Federal Regulations
cmbs	centimeters below ground surface
CMT	culturally modified tree
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	environmental impact statement
FAA	Federal Aviation Administration
FOA	Friends of Admiralty Island
GPS	global positioning system
NAD	North American Datum
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
OHA	Alaska Office of History and Archaeology
PA	Programmatic Agreement
SHPO	State Historic Preservation Office
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator

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APPENDIX A. SIT-00302 SHOVEL PROBE DATA

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Table A-1. SIT-00302 Shovel Probe Data

Shovel Probe No.[1]	Max. Depth (cmbs)	Stratigraphy	Material Recovered
108	70	0–20 cmbs (level 1): moss/hemlock needles and organic detritus.	Chert angular shatter (n=1)
		20–40 cmbs (level 2): very dark grayish brown silt loam (10YR 3/2) with 50% matrix configuration of organic detritus and roots.	
		40–70 cmbs (level 3): brown silt loam (10YR 4/3) with approximately 10% bedrock regolith without roots.	
112	57	0–17 cmbs (level 1): moss, roots, organic detritus with small amount of shell.	Fire-cracked rock (FCR [n=1]) and secondary silicified sediment size class 4 debitage (n=1); recovered from approximately 30 cmbs
		17–40 cmbs (level 2): very dark brown silt loam (10YR 2/2) with 50% matrix configuration of organic detritus and roots.	
		40–53 cmbs (level 3): dark brown silt loam (10YR 3/3) with approximately with a small amount of shell present.	
		53–57 cmbs (level 4): brown silt loam (10YR 4/3) with approximately 15% gravels throughout. Terminated at bedrock.	
113	49	0–10 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		10–40 cmbs (level 2): very dark grayish brown silt loam (10YR 3/2) with roots and 10% gravels.	
		40–49 cmbs (level 3): residual clay loam (5Y 5/2) olive gray with gravels and residual bedrock.	
114	50	0–5 cmbs (level 1): moss/hemlock needles and organic detritus.	Chert debitage (n=2); recovered from approximately 25 cmbs
		5–20 cmbs (level 2): dark yellowish brown silt loam (10YR 3/4) with roots and organic detritus.	
		26–50 cmbs (level 3): bedrock regolith with small rootlets, light olive brown.	

1 Shovel probe number not necessarily sequential. This table lists all probes *inside* the final boundary of Site SIT-00302. Other shovel probes (i.e., probes 109-111 and 117-124) were excavated outside the site boundary.

Table A-1. SIT-00302 Shovel Probe Data

115	46	0–7 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		7–23 cmbs (level 2): loosely compacted dark yellowish brown silt loam (10YR 3/4) with roots and organic detritus.	
		23–25 cmbs (level 3): reddish brown silt loam with organic detritus.	
		25–46 cmbs (level 4): bedrock regolith without rootlets.	
116	62	0–12 cmbs (level 1): moss, roots, hemlock needles, organic detritus.	FCR (n=1)
		12–27 cmbs (level 2): loosely compacted very dark brown silt loam (10YR 2/2) with small amount of gravels.	
		27–40 cmbs (level 3): dark olive brown silt loam (2.5Y 3/3) with gravels.	
		40–55 cmbs (level 4): very dark brown silt loam (10YR 2/2).	
		55–57 cmbs (level 5): black silt loam (10YR 2/1).	
		57–62 cmbs (level 6): reddish brown silt loam (2.5YR 4/3).	
125	36	0–10 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		10–33 cmbs (level 2): loosely compacted very dark brown silt loam (10YR 2/2), matrix configuration of roots and organic detritus.	
		33–36 cmbs (level 3): light olive brown silt loam and degraded bedrock (2.5YR 5/4) with small rootlets.	
126	44	0–10 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		10–17 cmbs (level 2): loosely compacted dark yellowish brown silt loam (10YR 3/4) with roots and organic detritus.	
		17–40 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		40–44 cmbs (level 4): degraded bedrock without rootlets. Terminated at root impasse.	

Table A-1. SIT-00302 Shovel Probe Data

127	40	0–15 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		15–20 cmbs (level 2): dark yellowish brown silt loam (10YR 3/4) with 40% roots and organic detritus throughout.	
		20–35 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		35–40 cmbs (level 4): small cobbles without rootlets. Terminated at root impasse at 40 cmbs.	
128	45	0–6 cmbs (level 1): moss/hemlock needles and organic detritus.	None Charcoal identified at 40-45 cmbs but not collected (see notes at left)
		6–30 cmbs (level 2): dark yellowish brown silt loam (10YR 3/4) with 30% roots and organic detritus throughout.	
		30–40 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks, charcoal flecking, and rootlets throughout.	
		40–45 cmbs (level 4): compacted light olive brown silt loam with small amount of bedrock regolith (2.5YR 5/6) without rootlets. Thin lens of gray (10YR 3/2) calcium carbonate at 43 cmbs. Charcoal sample wrapped in aluminum foil and buried in hole. Terminated at root impasse.	
129	43	0–6 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		6–15 cmbs (level 2): dark yellowish brown silt loam (10YR 3/4) with 40% roots and organic detritus throughout.	
		15–35 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		35–43 cmbs (level 4): compacted light olive brown silt loam with small amount of bedrock regolith (2.5YR 5/6) without rootlets. Thin lens of gray (10YR 3/2) calcium carbonate at 43 cmbs. Terminated at root impasse.	
130	50	0–10 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		10–31 cmbs (level 2): dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout.	
		31–42 cmbs (level 3): dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout.	
		42–50 cmbs (level 4): compacted light olive brown silt loam with small amount of bedrock regolith (2.5YR 5/6) without rootlets.	

Table A-1. SIT-00302 Shovel Probe Data

131	40	0–15 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		15–37 cmbs (level 2): dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout.	
		37–40 cmbs (level 3): dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout. Terminated at root impasse.	
132	40	0–5 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		5–27 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		27–40 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout. Terminated at bedrock.	
133	47	0–10 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		10–30 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		30–42 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout.	
		42–47 cmbs (level 4): compacted light olive brown silt loam with small amount of bedrock regolith (2.5YR 5/6) without rootlets. Terminated at bedrock.	
134	30	0–12 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		12–27 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		27–30 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout. Terminated at bedrock.	
135	43	0–9 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		9–31 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		31–40 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout.	
		40–43 cmbs (level 4): increasing bedrock regolith. Terminated at root impasse.	

Table A-1. SIT-00302 Shovel Probe Data

136	32	0–15 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		15–26 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		26–32 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout. Terminated at root impasse.	
137	33	0–10 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		10–28 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		28–32 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		32–33 cmbs (level 4): compacted light olive brown silt loam (2.5Y 5/6) without rootlets. Terminated at root impasse.	
138	28	0–9 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		9–22 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		22–28 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout. Terminated at root impasse.	
139	22	0–14 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		14–20 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		20–22 cmbs (level 3): compacted dark yellowish brown silt loam (10YR 3/4) with 20% roots and organic detritus throughout. Terminated at root impasse.	
140	44	0–7 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		7–31 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		31–40 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		40–44 cmbs (level 4): compacted light olive brown silt loam (2.5Y 5/6) without rootlets. Terminated at cobblestone.	

Table A-1. SIT-00302 Shovel Probe Data

141	35	0–17 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		17–28 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		28–32 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		32–35 cmbs (level 4): compacted light olive brown silt loam (2.5YR 5/6) without rootlets. Terminated at cobblestone.	
142	48	0–15 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		15–36 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		36–42 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		42–48 cmbs (level 4): compacted light olive brown silt loam (2.5YR 5/6) without rootlets. Terminated at cobblestone.	
143	32	0–15 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		15–20 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		20–27 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		27–32 cmbs (level 4): compacted light olive brown silt loam (2.5YR 5/6) without rootlets. Terminated at root impasse.	
144	41	0–20 cmbs (level 1): moss/hemlock needles and organic detritus.	None
		20–30 cmbs (level 2): loosely compacted very dark grayish brown silt loam (10YR 3/2) with 20% roots and organic detritus throughout.	
		30–38 cmbs (level 3): compacted light olive brown silt loam (10YR 2/3) with small rocks and rootlets throughout.	
		38–41 cmbs (level 4): compacted light olive brown silt loam (2.5YR 5/6) without rootlets. Terminated at root impasse.	

Table A-1. SIT-00302 Shovel Probe Data

145	47	0–6 cmbs (level 1): moss/hemlock needles and organic detritus.	Obsidian microblade (n=1) and chert flake (n=1); recovered between 25–30 cmbs
		6–17 cmbs (level 2): dark yellowish brown silt loam (10YR 3/6) with numerous large roots and organic detritus.	
		17–35 cmbs (level 3): light olive brown silt loam (2.5YR 5/4) with traces of bedrock regolith and small rootlets throughout.	
		35–47 cmbs (level 4): light olive brown silt loam and bedrock regolith (2.5YR 5/6) without rootlets. Terminated at bedrock.	

APPENDIX B. SHOVEL PROBES

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Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
1	6371518	525876	0–14	Decomposing duff and wood (O horizon)
			14–20	Black, organic-rich silt with few angular pebbles (A horizon)
2	6371509	525866	0–25	Duff, roots, and other organics (O horizon)
			25–28	Organics, rotted wood
			28–33	Gray sandy silt with charcoal flecks
			33–39	Regolith
3	6371621	525785	0–24	Duff, roots, and wood (O horizon)
			24–29	Light gray silty, fine sand; clear boundaries
			29–34	Black to very dark gray fine sandy silt
			34–39	Reddish brown, silty, gravelly fine to coarse sand (regolith)
4	6371626	525777	0–23	Duff, roots, other organics (O horizon)
			23–37	Gray sandy silt with angular quartzite pebbles; saturated
5	6371665	525767	0–16	Duff, roots, and other organics (O horizon)
			16–24	Organic soil mixed with angular pebbles, one cobble
6	6371650	525773	0–22	Duff, roots, wood (O horizon)
			22–25	Very light gray, slightly silty, fine to medium sand
			25–31	Very dark gray to black, organic-rich, very fine sandy silt, pieces of charcoal
			31–52	Reddish and orangish brown fine to coarse sandy silt, oxidized
7	6371236	527171	0–22	Duff, roots, decaying wood (O horizon)
			22–28	Dark gray silty sand
			28–33	Dark gray organic-rich silt with pebbles and charcoal pieces
			33–45	Orangish brown gravelly, silty, sand
			45–75	Brown coarse sandy gravel
8	6371225	527157	0–11	Duff, roots, and other organics (O horizon)
			11–29	Light reddish brown sandy silt with angular pebbles
9	6371216	527176	0–9	Duff, organic-rich soil (O horizon)
			9–12	Gray silty sand
			12–14	Black silty buried soil horizon
			14–60	Orange red sandy silt, angular pebbles
			60–70	Small, angular pebbles
10	6371264	527171	0–20	Duff, roots, organics (O horizon)
			20–28	Light gray silty sand with angular pebbles
			28–33	Blackish-brown very compact organic-rich silt
			33–84	Light reddish brown silty sand with angular pebbles

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
11	6369165	528287	0–20	Duff, roots, organics (O horizon)
			20–55	Dark brown silty organic-rich soil, common roots
			55–69	Medium brown silty organic-rich soil
12	6369161	528301	0–7	Duff, roots, organics (O horizon)
			7–38	Dark brownish-black organic soil; very water saturated
13	6369158	528311	0–20	Dark brown water saturated organic-rich material
			20–75	Light brown organic-rich material with few pebbles, water table at 20 cmbs
14	6369162	528325	0–28	Very dark gray and brown fibrous peat becomes siltier with depth; many roots and rootlets
			28–45	Very dark gray, very silty peat, few angular pebbles
15	6369148	528333	0–15	Very dark grayish-brown, fibrous peat with few angular pebbles
			15–25	Reddish brown decaying wood, discontinuous
			25–55	Very dark brown silty peat, many rootlets
16	6369149	528319	0–5	Duff, roots, organics (O horizon)
			5–38	Dark brown water saturated organic-rich material; few pebbles; water table at 38 cmbs
17	6369163	528278	0–7	Dark brown organic layer (O horizon)
			7–35	Light brown organic-rich soil, very water-saturated
18	6369155	528295	0–19	Duff, dense organics, roots (O horizon)
			19–33	Dark reddish-orange-brown silt, many roots
			33–53	Dark brownish-orange organic-rich silt, decomposing wood; very water saturated
19	6369123	528238	0–10	Recent duff, needles, moss
			10–18	Orangish-brown silty decomposing organic material; many roots and rootlets (O horizon)
			18–45	Light gray silty, sandy, angular small pebbles to cobbles, cobbles increase with depth
20	6369103	528250	0–14	Duff, roots, decaying wood (O horizon)
			14–20	Light gray fine sandy silt with small pebbles
			20–24	Dark gray silt with few pebbles and charcoal
			24–31	Orange-brown gravelly silty sand
			31–50	Brown coarse gravelly sand
21	6369072	528253	0–7	Dark-brown organic-rich soil with roots (O horizon)
			7–12	Dark reddish-brown soil with decomposing wood, roots
			12–19	Dark brown organic-rich silty sand with subangular pebbles
			19–40	Gray coarse sand with subangular pebbles, roots

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
22	6369044	528247	0–4	Duff, roots, organics (O horizon)
			4–16	Light brown sandy silt with organic material
			16–28	Patches of light gray sandy silt with small pieces of charcoal
			28–61	Reddish-brown silt with angular cobbles, gravels, and pebbles
23	6369012	528263	0–8	Dark brown organic-rich soil, roots (O horizon)
			8–20	Medium brown silty sand, subangular pebbles, roots, water-logged wood
			20–33	Light brown clayey silt with subangular pebbles
24	6368999	528276	0–12	Moss, pine needles, duff (O horizon)
			12–20	Gray very fine to coarse sandy silty
			20–45	Brown silty gravelly sand with angular pebbles and cobbles
25	6368985	528289	0–9	Duff, roots, organics (O horizon)
			9–16	Light gray silty sand with angular pebbles
			16–18	Grayish/light brown silt
			18–50	Light reddish-brown silt with angular pebbles and cobbles
26	6368955	528290	0–15	Duff, roots, dark brown soil (O horizon)
			15–28	Gray fine sandy silt with small cobbles
			28–57	Light brown/orange sand with angular pebbles
27	6370661	526973	0–24	Dark brown decomposing wood, soil, roots, moss (O horizon)
			24–27	Dark gray fine sandy silt with small pebbles
			27–29	Dark black organic-rich soil
			30–66	Orangish-brown sand with angular pebbles and gravel
28	6370668	526984	0–25	Duff, roots, decaying wood (O horizon)
			25–29	Gray sandy silt, some organics
			29–85	Light reddish-brown silt with organic material and angular pebbles
29	6370660	526992	0–35	Duff and fibrous decayed organics, many roots (O horizon)
			35–41	Black and light gray, beds of charred organics
			41–55	Orangish-brown silty sand with angular gravels
30	6370654	526998	0–13	Very dark brown duff with roots; fine silty sand (O horizon)
			13–19	Gray fine sand with subangular pebbles, roots
			19–38	Orangish-brown silty sand, pebbles and cobbles, roots
			38–42	Light to medium brown fine sandy silt with subangular pebbles and roots
31	6370454	527116	0–20	Very dark brown to black peaty silt (O horizon)
			20–40	Dark reddish-brown fibrous peat; water table at 25 cmbs
32	6370459	527131	0–10	Light brown dense organic material; very water-saturated
			10–24	Dark brown silty soil with organic material; very water-saturated

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
33	6370467	527158	0–5	Duff, organics, roots (O horizon)
			5–41	Dark brown soil, water-saturated, roots, water table at 41 cmbs
34	6370483	527157	0–3	Duff, organics, roots (O horizon)
			3–85	Dark brownish-black organic-rich soil; very water saturated; water table at 75 cmbs
35	6369134	527882	0–9	Dark brown silty soil with roots (O horizon)
			9–22	Very dark brown sandy silt; decomposing wood; angular pebbles; roots
			22–32	Gray clayey silt with angular pebbles
			32–47	Dark orangish-red clayey silt with subangular pebbles
36	6369133	527874	0–13	Duff, roots, organics (O horizon)
			13–42	Brown soil, decaying organics, roots
37	6369143	527892	0–25	Dark brown soil, organic-rich with roots (O horizon)
			25–42	Brown silt with decaying wood and roots
			42–46	Light gray silt with pebbles
			46–70	Orangish-brown sand with small angular pebbles
38	6369145	527896	0–35	Duff, moss, decaying organics (O horizon)
			35–44	Light gray fine sandy silt, few pebbles, charcoal
			44–55	Brown, gravelly, silty, fine to coarse sand
39	6369051	527836	0–28	Dark brown soil with roots and decaying wood (O horizon)
			28–82	Dark brownish-black silty clumpy clay-textured wet silt
			82–86	Gray silt
40	6369051	527845	0–14	Darky brown clayey silty sand, many roots; very water-saturated (O horizon)
			14–60	Black clayey silt, clumpy, with many roots; very water-saturated
			60–76	Dark brown organic-rich clayey silt, few small pebbles
			76–80	Gray clayey silt; water table
41	6369046	527845	0–4	Duff, roots (O horizon)
			4–42	Very dark brown organic-rich layer; water saturated
			42–50	Very dark gray clay; water saturated
			50–60	Dark reddish-brown soil with angular gravels; water saturated
42	6369044	527842	0–30	Duff, moss, fibrous peat with large roots (O horizon)
			30–55	Black organic-rich silt; many large roots
			55–62	Gray fine to medium sandy silt
			62–75	Brown to gray fine sandy silt with angular pebbles and small cobbles

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
43	6369052	527937	0–50	Black silty peat with many rootlets and decaying wood fragments (O horizon)
			50–70	Dark brown fibrous peat
			70–80	Dark gray, slightly silty gravelly sand, angular to subrounded pebbles
44	6369057	527931	0–9	Root mat (O horizon)
			9–51	Dark brown organic-rich silt; water-saturated
			51–60	Gray coarse sand with angular gravels; water-saturated
45	6369058	527927	0–19	Dark reddish-brown silty sand with roots and organics (O horizon)
			19–32	Very dark brown clayey silt, decomposing wood, roots; water-saturated
			32–36	Gray clayey silt with sand
			36–62	Dark brownish-black clayey silt
46	6369065	527930	0–20	Dark brown silty with roots and decaying wood (O horizon)
			20–74	Brown/gray silt; water-saturated
			74–79	Light gray silt and sand with small pebbles
47	6368749	528313	0–8	Dark brown root mat, organics (O horizon)
			8–11	Light gray fine sandy silt
			11–17	Dark reddish-brown coarse sandy silt
			17–60	Reddish-brown silt with angular pebbles, gravels, and cobbles
48	6368759	528293	0–21	Dark brown silt with roots and decaying wood; water-saturated (O horizon)
			21–50	Light brown silty soil with angular gravels and cobbles
49	6368777	528279	0–6	Dark brown organic sandy silt with roots (O horizon)
			6–15	Reddish-brown organic-rich sandy silt with roots and decomposing wood
			15–18	Gray silty sand with subrounded pebbles
			18–22	Black clayey silt, roots, pebbles
			22–48	Dark reddish-orange sandy silt with subrounded pebbles and roots
			48–60	Grayish-brown sandy silt with subrounded pebbles and roots
50	6368793	528273	0–18	Duff, moss, fibrous organic debris (O horizon)
			18–28	Orangish brown silty fine sand with angular pebbles
			28–34	Very light gray slightly silty fine sand
			34–52	Brown slightly silty sand with angular to subrounded pebbles to cobbles
51	6368734	528357	0–10	Dark brown organic-rich sandy silt with roots; water-saturated (O horizon)
			10–16	Very dark brown organic-rich silt with roots and subangular pebbles; water-saturated
			16–20	Light brownish-orange clayey silt with subangular pebbles and cobbles

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
52	6368714	528357	0–21	Dark brown soil with roots (O horizon)
			21–33	Gray leached silt layer with pebbles
			33–63	Orangish-brown silt with angular pebbles
53	6368716	528347	0–12	Brown, organic-rich root mat (O horizon)
			12–17	Light gray silt with coarse sand
			17–40	Light reddish-brown silt with angular gravels and cobbles
54	6368702	528360	0–15	Duff, moss, and decaying organics (O horizon)
			15–23	Gray, fine to coarse sandy with angular pebbles to cobbles
55	6369368	527549	0–13	Dark brown silt with rootlets, moss, and decaying wood (O horizon)
			13–25	Light brown organic-rich soil with decaying wood and rootlets
			25–30	Light brown silt with few small pebbles; water-saturated
			30–57	Dark brown silt with few pebbles and decaying wood at the bottom; water-saturated
56	6369371	527551	0–32	Duff, moss, and decaying organics (O horizon)
			32–43	Reddish brown, fine sandy silt; bioturbated with worms
			43–80	Gray medium to coarse sand with subrounded to angular pebbles and gravel
57	6369370	527533	0–10	Light brown silty sand with moss and other organics (O horizon)
			10–28	Dark brown organic-rich silty sand, angular pebbles, water-logged wood; water-saturated
			28–57	Dark brown with some gray sand; very water-saturated
58	6369465	527425	0–20	Moss and fibrous peat (O horizon)
			20–36	Black, organic-rich silt with many roots and woody debris
			36–40	Brown, organic-rich silt
			40–50	Slight gray and orange very fine sandy clay with subrounded to angular pebbles
59	6369456	527418	0–15	Moss, dark soil, decaying wood, roots (O horizon)
			15–17	Water-logged wood
			17–63	Dark grayish-brown silt with gravel, pebbles, and few cobbles; water-saturated
60	6369459	527420	0–5	Root mat (O horizon)
			5–35	Very dark brown organic-rich silt with small gravels; water-saturated
			35–37	Light gray clayey silt with gravels, water table
61	6369461	527414	0–6	Light brown organic-rich sandy soil (O horizon)
			6–24	Very dark brown organic-rich silty sand
			24–42	Dark brownish-gray coarse sandy silt with small pebbles
			42–60	Gray coarse pebbly sandy clayey silt; water table

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
62	6369462	527419	0–16	Duff, moss, and other organics (O horizon)
			16–34	Dark brown organic-rich sandy silt; very water-saturated with water-logged wood
			34–40	Fine sandy clay
63	6369458	527418	0–12	Duff, moss, roots, dark brown silt (O horizon)
			12–32	Dark brown silt; very water-saturated with water-logged wood
			32–47	Fine dark brown silt; water-saturated; water table at 40 cmbs
64	6369599	527320	0–19	Light brown silt, duff, moss, roots, decaying wood (O horizon)
			20–34	Dark brown organic-rich silt with roots
			34–80	Very dark brown clayey silt with roots and few small pebbles
			80–124	Gray silty sand with dark brown silt with angular pebbles; water-saturated
65	6369609	527311	0–14	Medium brown organic duff (O horizon)
			14–50	Very dark brownish-black fine clayey silt; water-saturated
			50–80	Dark brown silt; water-saturated with water-logged wood; water table at 50 cmbs
66	6369616	527326	0–9	Moss, organics, roots (O horizon)
			9–78	Dark brown organic-rich silt with roots
67	6369607	527336	0–30	Duff, moss, organics (O horizon)
			30–75	Very dark gray to black organic-rich silt, common roots
			75–85	Brown fine sandy silt
			85–100	Gray gravelly medium to very coarse sand with organics, few decaying shell fragments
68	6369602	527332	0–20	Duff, moss, rootlets and organic debris (O horizon)
			20–80	Very dark brown organic-rich silt; one barnacle at 20-40 cmbs; decaying wood
69	6369607	527337	0–27	Dark brown duff, roots, rootlets, and other organics (O horizon)
			27–48	Dark brown organic-rich soil with rootlets
			48–60	Light orange coarse sandy silt; water-saturated
			60–100	Gray coarse sandy silt with beach-rounded pebbles, gravels, and small cobbles
70	6369615	527342	0–4	Duff, moss, roots, rootlets, decaying wood (O horizon)
			4–42	Dark brownish-black organic-rich silt with few small pebbles; water table at 34 cmbs
71	6369628	527354	0–45	Duff, moss, woody debris (O horizon)
			45–93	Very dark gray and brownish black organic-rich silt with common rootlets
			93–105	Gray, medium to very coarse sand with few subrounded pebbles

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
72	6369702	527272	0–19	Duff, moss, organic-rich brown silt with decaying wood (O horizon)
			19–30	Organic-rich dark brownish-black silt with rootlets
			30–59	Dark brownish-black silt with pebbles, gravels, and cobbles; water-saturated
73	6369711	527261	0–25	Duff, moss, roots and fibrous organic materials (O horizon)
			25–80	Very dark gray organic-rich silt, wet with many rootlets and one large angular cobble
			80–95	Very dark brown organic-rich, compact silt
			95–102	Gray fine to very coarse sand with angular to subrounded gravels
74	6369677	527264	0–28	Duff, moss, dark brown loose organics with many roots (O horizon)
			28–58	Very dark brown silt with few subrounded pebbles
			58–87	Dark gray gravelly coarse silty sand, common subrounded pebbles
			87–100	Dark brown silt with subrounded gravels; water-saturated
75	6369686	527247	0–25	Moss, root mat, rootlets, and other organics (O horizon)
			25–46	Dark reddish-brown fine sandy silt with moderate organic material and rootlets
			46–58	Coarse gray sand with rounded beach pebbles
			58–95	Medium coarse gray sand with small rounded pebbles; water table at 95 cmbs
76	6369674	527256	0–40	Duff, moss, fibrous organic debris with many roots and rootlets (O horizon)
			40–60	Very dark brown organic-rich silt/silty peat
77	6369681	527257	0–25	Organic-rich dark brown silt, decaying wood, roots, rootlets (O horizon)
			25–65	Dark brownish-black silt with subangular pebbles and gravels; water table at 56 cmbs
78	6369768	527196	0–55	Dark brown silty duff and roots (O horizon)
			55–63	Gray silty gravelly fine sand, subrounded pebbles
			63–85	Very dark brown fine to coarse sand with subrounded pebbles and few pebbles
79	6369775	527185	0–18	Dark brown organic duff with sandy silt and small subrounded pebbles
			18–25	Very dark brown silt with subrounded pebbles
			25–60	Dark brown sandy silt with subrounded pebbles
			60–80	Black clayey silt with pebbles
			80–85	Dark brown coarse sandy gravelly; very compact

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
80	6369786	527178	0–22	Dark silt, duff, moss, decaying wood, roots, rootlets (O horizon)
			22–42	Dark brown silt with gravel, pebbles, and small roots
			42–47	Gray leached soil layer with some small pebbles
			47–70	Dark brown silt, subrounded and rounded pebbles, one large root
81	6369748	527199	0–20	Moss, reddish-brown organic-rich layer with rootlets (O horizon)
			20–24	Light gray silt with small angular gravels
			24–87	Very dark brown very compact fine sandy silt with dense gravels; water-saturated
82	6369928	527442	0–5	Duff, light brown organic-rich sand (O horizon)
			5–16	Dark reddish-brown organic-rich silty sand
			16–57	Very dark brown fine clayey silt
			57–70	Medium brown clayey silt, few subangular pebbles, one cobble
			70–89	Very compact coarse gray sand mottled with orange sand, dense subangular pebbles
83	6369931	527451	0–30	Moss on fibrous organics and roots (O horizon)
			30–60	Black organic-rich silts with rootles and one large rounded cobble
			60–70	Brown, fine sandy silt
			70–90	Greenish-gray silt, very coarse sand with angular pebbles, gravels, and cobbles
84	6369935	527464	0–5	Moss
			5–21	Dark brown organics with roots and rootlets
			21–45	Very dark brown organic layer; water-saturated
			45–60	Light brown silt, few angular pebbles; water-saturated
85	6369966	527467	0–27	Moss, duff, decaying wood, dark silt, rootlets and large roots
			27–49	Dark wilt with decaying wood and rootlets
			49–60	Orange saturated very fine silt
			60–80	Gray silt with angular pebbles, one large subrounded cobble; water table at 80 cmbs
86	6371018	526499	0–20	Dark brown silt, duff, roots, rootlets (O horizon)
			20–90	Orange sand, angular pebbles, crumbly pieces of gravel-size bedrock
87	6371001	526460	0–20	Duff, moss, and fibrous organics (O horizon)
			20–35	Decaying wood and roots (O horizon)
			35–50	Brown, organic-rich silt with many roots
			50–56	Bluish-gray, slightly silty fine sand
			56–70	Brown, fine sandy silt with angular cobbles and large roots

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
88	6370976	526511	0–14	Dark silt, moss, duff, roots, and rootlets
			14–29	Dark black silt with decaying wood and few subangular rocks
			29–38	Dark black silt
			38–61	Light orangish-brown silt with small pebbles and larger angular pieces of regolith
89	6370980	526536	0–25	Duff, moss, decaying organics, roots, and rootlets (O horizon)
			25–30	Light gray fine sandy silt with angular gravels
			30–45	Reddish-brown compact sandy silt with degrading regolith
90	6370745	527598	0–19	Duff, moss, decaying wood, roots, rootlets, small subangular pebbles
			19–30	Light gray silt with gravel and few subangular pebbles
			30–71	Light brownish-orange silt with gravel and subangular pebbles and gravel
91	6370765	527627	0–5	Dark brown sandy duff, moss, organics (O horizon)
			5–8	Gray sand with subangular pebbles
			8–12	Dark brown fine sand with organics, subangular pebbles
			12–90	Orange silty sand with subangular pebbles; charcoal spot at 68 cmbs
92	6370787	527643	0–10	Moss and duff
			10–17	Bluish gray silt with organics, roots, and rootlets
			17–42	Orange-brown silt with some organics and few rootlets; degrading regolith
93	6370810	527662	0–9	Duff, moss, roots, and fibrous organics (O horizon)
			9–15	Bluish-gray silty fine sand with angular to subangular pebbles and roots
			15–38	Dark brown fine sandy wilt with angular to subangular pebbles and small cobbles
94	6370844	527504	0–14	Moss, duff, decaying wood, rootlets, roots (O horizon)
			14–27	Bluish/gray silt with moderate organics, angular pebbles, and few rootlets
			27–35	Grayish-brown sandy silt with angular pebbles
95	6370878	527520	0–18	Dark brown fine silty sand, duff, organics, decomposing wood (O horizon)
			18–81	Orangish-brown silty fine sand with angular pebbles and root
96	6370908	527527	0–15	Duff, moss, roots, rootlets, and decaying wood (O horizon)
			15–21	Light gray leached layer; silty sand with some angular pebbles
			21–40	Crumbling bedrock
97	6370895	527540	0–9	Duff, moss and fibrous organics (O horizon)
			9–12	Bluish-gray silty fine sand
			12–15	Dark brown fine sandy silt with few pebbles and organics
			15–49	Brown to yellowish-brown medium sandy silt with subangular gravels

Table B-1. Shovel Probe Data

Shovel Probe No.	UTM Northing	UTM Easting	cmbs	Sediment Description (no cultural material was found in any of the shovel probes)
98	6370978	527412	0–18	Duff, moss, roots, and fibrous organics (O horizon)
			18–28	Bluish-gray slightly silty fine sand
			28–55	Dark brown to brown fine sandy silt with few pebbles
			55–68	Reddish-brown very silty fine sand with angular gravels
99	6370959	527425	0–19	Dark brown silt, moss, decaying wood, roots, rootlets, angular pebbles (O horizon)
			19–23	Light gray leached layer of fine silt with dark brown silt layers interspersed
			23–28	Dark brown silt with angular pebbles and a large rock
100	6370953	527404	0–9	Dark brown duff, many rootlets and medium roots (O horizon)
			9–24	Grayish-blue very silty sand with many angular pebbles
			24–88	Orangish-reddish-brown clayey silty sand, angular pebbles, gravels, and cobbles
101	6370938	527419	0–32	Moss, duff, organics, roots, rootlets (O horizon)
			32–45	Dark reddish-brown coarse sandy silt with organics and few angular pebbles
			45–75	Reddish-brown coarse sandy silt with angular pebbles and small cobbles, very compact
102	6371056	527306	0–18	Duff, roots, rootlets, decaying wood, dark silt, with few gravels (O horizon)
			18–29	Light gray leached silt with sand and angular pebbles and gravels
			29–34	Black organic-rich silt with small gravels
			34–61	Light brownish-orange angular rocks and pebbles (regolith)
103	6371077	527289	0–15	Duff, moss, roots, and fibrous organics
			15–25	Brown to black fine sandy silt with few angular regolith pebbles
104	6371103	527291	0–22	Moss, duff, organics, roots, rootlets (O horizon)
			22–24	Light gray very fine sandy silt
			24–30	Black silt, water-saturated, few small pebbles
			30–40	Reddish-brown coarse sandy silt with angular pebbles; very water-saturated
			40–55	Grayish-brown fine sandy silt; very water-saturated
			55–70	Chunks of regolith with water-saturated silt in-between
105	6371109	527260	0–19	Dark brown sandy duff, moss, rootlets, medium roots, and other organics (O horizon)
			19–23	Gray fine silty sand with angular pebbles
			23–30	Dark brown dry soft silty sand, roots, pebbles, one large rock

Note: Universal Transverse Mercator (UTMs) collected in NAD83 UTM Zone 8N.

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APPENDIX C. CULTURALLY MODIFIED TREE PHOTOS

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Figure C-1. CMT with blaze (field #CU72109_1).

Figure C-2. CMT with blaze (field #AGN-2).

Figure C-3. Spit-trunk CMT with blaze on each trunk (field #AGN-5B).

Figure C-4. CMT with springboard notch (field #CU72109_1).

Figure C-5. CMT with possible springboard notch (field #AGN-4).

Figure C-6. Field crew member pointing to springboard notch (field #AGN-9).

Figure C-7. CMT with axe marks (field #AGN-5C).

Figure C-8. CMT with axe mark (field #AGN-7).

Figure C-9. CMT with axe and burn marks (field #AGN-5).

Figure C-10. CMT with stripped bark (field #AGN-6).

Figure C-11. CMT with stripped bark (field #AGN-8).

Figure C-12. Pile of cut logs (field #AGN-1).

APPENDIX L
VISUAL RESOURCES TECHNICAL REPORT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

VISUAL RESOURCES EXISTING CONDITIONS TECHNICAL REPORT FOR ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ANGOON, ALASKA

Prepared for

Federal Aviation Administration

and

Alaska Department of Transportation and Public Facilities

Prepared by

SWCA Environmental Consultants

September 16, 2011

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska. At present, there is no land-based airport runway in or near Angoon. The DOT&PF prepared the Angoon Airport Master Plan (DOT&PF 2007) for their proposed airport location. The EIS is evaluating two alternative airport locations in addition to the DOT&PF's proposed location and multiple access road alternatives associated with those airport locations.

The proposed land-based airport would be a small, commercial airport typical of other rural airports in the region. The initial construction would include a 3,300-foot-long paved runway, with the ability to extend the runway length to 4,000 feet in the future if air traffic warrants it. The airport would have a short, perpendicular taxiway leading from the runway to a small apron area, which may eventually contain a passenger shelter building. The proposed airport is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The proposed access road would have a gravel surface and would be two lanes wide (one lane in each direction) with 9-foot-wide lanes and minimal shoulders.

The purpose of this report is to provide a detailed description of the current visual, aesthetic, and scenic resources potentially affected by implementation of the Airport project on lands that are part of Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area) (which is managed by the U.S. Forest Service [USFS]), on lands owned and managed by Kootznoowoo, Inc. (the Alaska Native village corporation) for the City of Angoon, or on the Kootznoowoo Corridor Lands jointly administered by the USFS and Kootznoowoo, Inc. (the Kootznoowoo Corridor Lands are those designated areas that extend 660 feet inland from the Favorite Bay shoreline) (DOT&PF 2007). The information in this report will be used to prepare the Affected Environment section of the EIS and as the baseline condition against which visual impacts from the proposed project will be measured for the Environmental Consequences section of the EIS.

This report includes information on the existing landscape character and scenic integrity in the project area viewshed (hereafter referred to as the visual study area), and information on human-caused alterations of the natural landscape that are visible within the visual study area as seen from USFS-listed travel routes and use areas. Scenic or landscape character (as defined and applied by the USFS) refers to the overall visual impression created by an area's visual attributes (line, form, color, and texture, as seen by the casual viewer; these attributes are described below in section 3.2, Methods). Scenic integrity is the degree to which the landscape character is or appears to be intact, unaltered, and natural-appearing. Human-caused alterations include structures such as houses and docks, timber harvesting clear cuts, roads, trails, and power lines (USFS 1995).

2.0 VISUAL STUDY AREA

Three airport location alternatives and several airport access roads are being considered by the FAA (Figure 1). Two of the airport alternatives are located on the east side of Favorite Bay, east of Angoon, and one is located on the peninsula south of Angoon. The two airport alternatives east of Favorite Bay are located wholly or partially within the boundaries of the Monument–Wilderness Area. The third is located on municipal (City of

Angoon) and private lands and lands owned or managed by Kootznoowoo, Inc. (DOT&PF 2007). The study area for visual resources was determined based on the locations and viewsheds encompassing both the airport alternatives and the associated access road alternatives and on the criteria for selecting visual analysis viewpoints issued by the USFS for the Tongass National Forest. The approach to defining the visual resources study area and selecting viewpoints was discussed with USFS staff prior to any onsite data collection.

As discussed and as directed in Appendix F of the *Tongass National Forest Land and Resource Management Plan* (hereafter referred to as the *Forest Plan*) (USFS 2008b), visual priority routes (VPRs) and use areas should be used as viewpoints to assess existing scenic integrity. Thus, as discussed in the appendix, ship routes, small- and mid-sized-boat routes, roads, hiking trails, saltwater use areas, communities, dispersed recreational areas, and boat anchorages should be the locales of primary consideration when establishing visual analysis viewpoints.

Accordingly, the final visual study area for the Airport project includes the tidal estuary, shoreline, and open water within Favorite Bay; the community of Angoon; the Alaska Marine Highway ferry terminal and water reservoir access roads south of town; and the outlying shoreline and nearshore locations within Chatham Strait to the south and west of Angoon.

The Favorite Bay and Angoon areas were included because intense onshore and offshore use by Angoon residents in these locales could constitute a saltwater use area. These activities (primarily subsistence related) are presently conducted near Airport Alternatives 3a and 4. Also, these areas provide some access for tourists traveling inland for adventure touring (e.g., kayaking, bear watching, hunting). Chatham Strait is a major marine highway and the access route to the Angoon Ferry terminal, and an important commercial and private fishing area. The ferry currently passes the Airport Alternative 12a locale while en route to and from the ferry dock. The Angoon ferry dock and nearby Whalers' Cove Lodge would potentially allow short-distance views of Airport Alternative 12a surface disturbances and visual quality impacts. Thus, Favorite Bay and Chatham Strait, because of their heavy use and proximity to all the Airport alternatives, would potentially provide casual points of view of Airport construction impacts to Angoon residents, tourists, recreational and commercial fishermen, and Alaska Marine Highway travelers.

Potential viewpoints within the Monument–Wilderness Area were also considered, however, undulating terrain and dense forest vegetation obscure the airport and access road alternative locations from view from all but one of these USFS-designated high priority VPRs and use areas. The lone potential VPR from which any component of the proposed airport location, its alternative locations, or the access roads could be seen is an undesignated primitive trail extending from the east shore of Favorite Bay to the lakes east of the bay. This trail is occasionally used by local residents for subsistence resource access or to take visitors up to the lakes for bear watching. Because of the extremely limited use (i.e., low volume of users) of the trail, it was excluded as a formal visual analysis viewpoint.

3.0 VISUAL RESOURCES

This section of the technical report describes the regulatory setting, the visual analysis methodology, and the representative scenic character and integrity in and around the visual study area, which consists of the three airport alternatives, the access alternatives, and the surrounding areas with potential to be affected by construction and long-term use of these facilities.

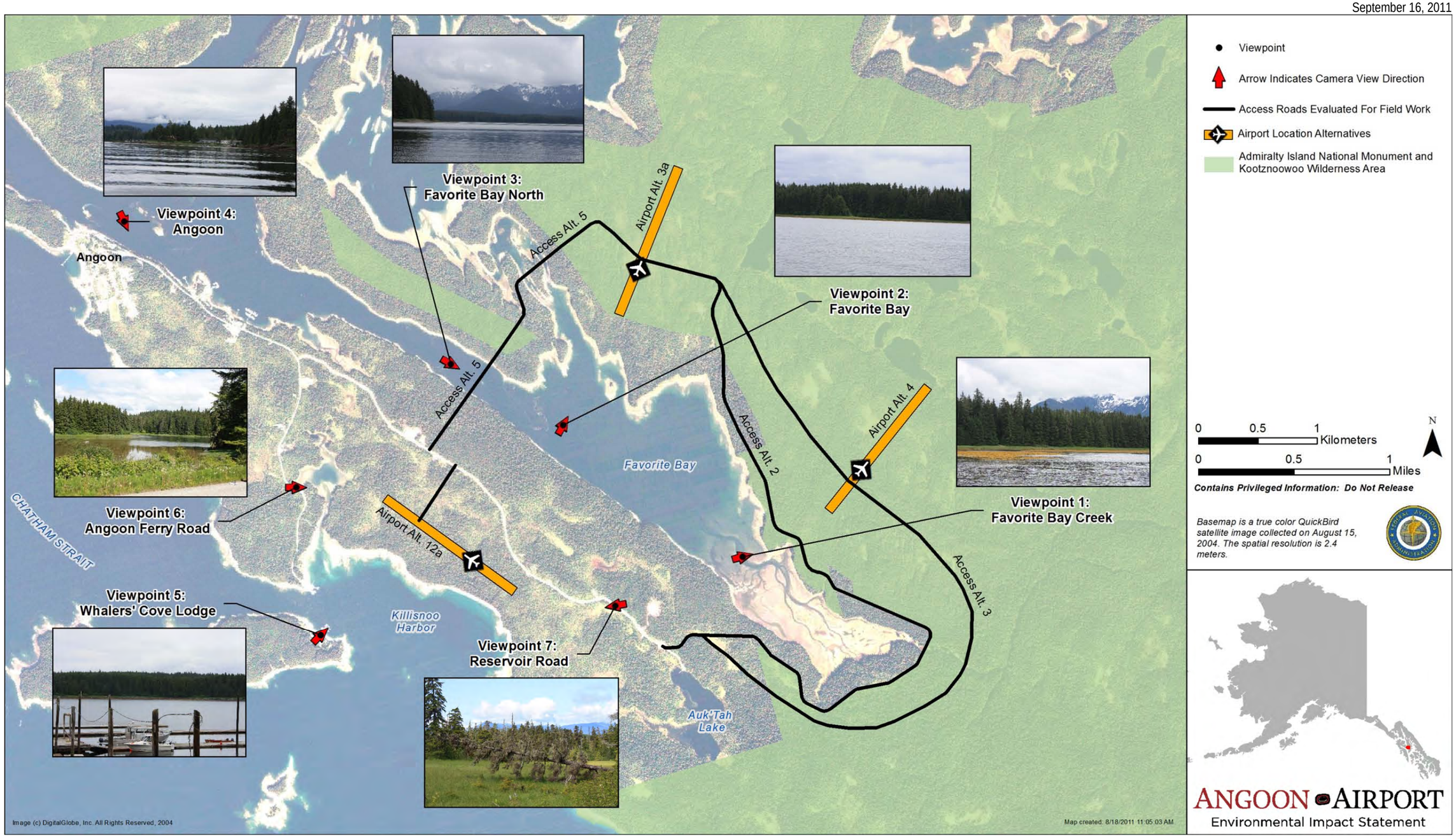

Figure 1. Visual study area viewpoints. Access Alternative 5 was studied but has been dropped from consideration in the EIS. NOTE: Airport alternatives illustrated on this figure represent locations only and do not depict final areas of disturbance.

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3.1 Regulatory Setting

3.1.1 FEDERAL AVIATION ADMINISTRATION

FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, requires the consideration of visual resources (i.e., aesthetic or scenic resources) and light emissions in environmental analyses conducted for FAA undertakings. FAA Order 1050.1E (Appendix A.12) states the following with regard to light emission and visual impacts:

- 12.2a. Light Emissions…. The responsible FAA official considers the extent to which any lighting associated with an action will create an annoyance among people in the vicinity or interfere with their normal activities.
- 12.2b. Visual Impacts.... Aesthetic impacts deal more broadly with the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast to be objectionable.

The FAA's *Environmental Desk Reference for Airport Actions* (FAA 2007) a supplement to FAA Order 5050.4B, *NEPA [National Environmental Policy Act] Implementing Instructions for Airport Actions,* also provides general guidance for the consideration of visual impacts in FAA NEPA analysis. Specifically, Chapter 16, *Light Emissions and Visual Effects,* sections 1(a) and 1(b) state the following:

- 1.a. Light Emissions…. Airport-related lighting facilities and activities could visually affect surrounding residents and other nearby light-sensitive areas such as homes, parks, or recreational areas. If there is a potential for airport lighting to disturb these sensitive land uses, the responsible FAA official should ensure the environmental document examines those effects.
- 12.2b. Visual Effects.... It is important to determine if a community or a jurisdictional agency considers visual effects from the proposed action objectionable.

3.1.2 U.S. FOREST SERVICE

The *Forest Plan* (USFS 2008b) implements the regulations, policies, and guidance set forth in the overarching National Forest Management Act of 1976. The *Forest Plan*, in compliance with the act, provides specific management goals, directions, management prescriptions, and desired scenic quality conditions for federally administered lands in the Tongass National Forest. These include the following:

- Applying the USFS Scenery Management System (SMS) and its procedures and processes for the inventory and analysis of aesthetic values on national forest lands.
- Minimizing the visibility of timber harvesting and other developments as seen from VPRs and use areas.
- Recognizing the scenic value of Tongass National Forest lands as seen from popular roads, trails, waterways, recreation sites, bays, and anchorages; modifying timber harvest practices when these values are recognized.
- Applying high scenic integrity objectives (SIO) in the foreground, middleground, and background of wilderness national monument land use designation (LUD) viewsheds as seen from VPRs and use areas. Applying the same high SIO to seldom seen/non-priority travel routes and use areas.
- Performing viewshed analysis in conjunction with project developments to provide directions for retaining or creating scenically attractive landscapes.

- Designing roads and trails to be compatible with the characteristic landscape.
- Managing areas designated wilderness and wilderness national monument so that design activities are not evident to the casual observer; applying USFS standards and guidelines applicable to high or very high SIO.
- Maintaining visual absorption capability (VAC) settings that are compatible with an area's SIO.
- Providing USFS visitors with visually appealing scenery emphasizing areas seen along the Alaska Marine Highway, tour ship and small boat routes, state highways, and major USFS roads, and from popular recreation places.

3.1.3 COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act (Alaska Statute 46 and 44) requires local governments to develop coastal management plans for incorporation into the statewide Alaska Coastal Management Program. The federal law that authorizes the program (15 CFR 923, Subpart E, Section 923.47) states that "coordination with governmental agencies having interests and responsibilities affecting the coastal zone, and involvement of interest groups as well as the general public is essential to the development and administration of State coastal management programs." It also states that agency coordination requirements include "the wise use of coastal land and water resources with full consideration for ecological, cultural, historic, and aesthetic values and needs for compatible economic development" (emphasis added).

3.2 Data Sources

The following data sources were used to characterize the visual resources within the visual study area, and will be used in the subsequent visual resource analyses:

- Geographic information system (GIS) data: Field maps, including GIS coverages of scenic quality management within the visual study area, and VPRs and use areas (e.g., Chatham Strait, Favorite Bay).
- Field survey: A field survey was conducted in June 2009 in the visual study area. It included surveying existing roads and trails as well as visual priority and marine travel routes identified in the *Forest Plan*, as discussed above. Surveys were also conducted in Favorite Bay, in Chatham Strait, and along the Alaska State Ferry Route approach into Angoon. Analysis viewpoints were selected based on the results of the survey.
- The *Forest Plan* (USFS 2008a): This was referenced for its policy and management directions.
- The *Mitchell Bay Watershed Landscape Assessment* (USFS 2002): This was referenced for its descriptions and characterizations of scenic quality within the visual study area.
- The *Angoon Hydroelectric Project Final Environmental Impact Statement* (USFS 2009): This was referenced for its viewshed and scenic quality characterization, including those portions of the final EIS project area that lie within the Airport visual study area.
- *Landscape Aesthetics. A Handbook for Scenery Management* (USFS 1995): This definitively describes landscape character, SIO, landscape visibility, distance zones, and the SMS that guides the inventory and analysis of aesthetic values on USFS-managed federal lands.
- *National Forest Landscape Management* (USFS 1974): This precursor to the SMS management handbook provides useful information on acceptable management activities and allowable disturbances on SIO-designated landscapes.

3.3 Methods

Two of the three Airport alternative locations are located wholly or partially on lands administered by the USFS; the remaining alternative is located on private, municipal, and Alaska Native corporation lands. To provide consistency relative to visual resource considerations, the USFS methods for evaluating scenic quality will be applied to all alternatives.

The USFS developed the SMS as a method to describe landscapes and to analyze project-level impacts to the scenic quality of landscape. The goal of the SMS is to apply a level of objectivity and consistency to the scenic resources inventory and analysis process, and to reduce the subjectivity associated with assessing landscape visual quality. The SMS applies SIOs that provide management direction and objectives for landscapes within USFS LUDs, which can include areas designated as wilderness; wilderness national monument; scenic viewshed; semi-remote recreation; timber production; various corridors for transportation and utility systems; and wild, scenic, or recreational river. The SIOs, as described in the *Forest Plan* (USFS 2008b), refer to the degree of acceptable change or alteration of the landscape caused by project developments.

The concept used by the USFS to assess scenic quality, and to analyze potential impacts to scenic quality, is to compare the degree of visual contrasts potentially created by an activity with the existing landscape or scenery within or surrounding that proposed activity (the visual study area). This comparison is applied within the context of scenic integrity (landscape intactness or wholeness), designated SIO (the levels of change allowed in an area as designated in the *Forest Plan*), visibility to the public from designated use areas (e.g., trails, roads, waterways), and landscape sensitivity (the concern the public may have for the scenic values of an area) (USFS 1995).

3.3.1 LANDSCAPE CHARACTERIZATION

The landscape features used in the comparison are the forms, colors, textures, and lines that compose and characterize the existing and potentially modified landscape. Landscape form refers to the unified masses or shapes of the landscape being analyzed, such as existing structures, topography, and natural objects (e.g., conical peaks, blocky mesas, rolling grassland). Landscape color refers to the colors of structures, vegetation, soil, water, rock, and sky. Landscape texture is the variation, pattern, density, and graininess of the landscape surface (e.g., uneven, sparse, and seemingly random-ordered shrubs in an arid landscape; even, orderly, and dense rows of trees in an orchard), and the dimensions of those surface variations (e.g., tall conifers, short grasses). Linear landscape features are the real or imagined paths that the eye follows when perceiving abrupt changes in form, color, or texture. These are often noticeable as the edge effect created at the boundary of two contrasting areas (e.g., a line of trees along a rocky slope or ledge, the abrupt boundary between forest and grassland, a dark ridgeline silhouetted against a bright sky). It should be noted that all these observable landscape features (line, form, color, and texture) can be affected by environmental factors that include the viewing distance (i.e., the foreground, middleground, and background views mentioned above), the slope and angle of view, atmospheric effects (e.g., haze, fog, dust, smoke), lighting conditions, and time of day.

In general, the project-related landscape changes that repeat the natural features of the landscape or are well integrated with existing landscape features and characteristics are considered to be in harmony with the natural landscape. These changes produce low levels of contrast, and are considered to have a low impact on existing scenic quality or on the aesthetic values of the landscape. Landscape modifications that do not harmonize with the surrounding natural landscape are considered to be in contrast with that landscape. The contrasts appear obvious, they stand out, and they can be scenically displeasing to viewers because they are not well integrated with the existing natural landscape.

For the visual study area, aesthetic or visual analysis involves determining the degree of visual change between the existing landscape and the landscape that would be produced by the development described in the

forthcoming Angoon Airport EIS Chapter 2 project description. The USFS-administered landscape within the visual study area has a LUD of wilderness national monument. *Forest Plan* standards and guidelines for viewsheds in lands designated as wilderness national monument indicate a preference for Very High SIO (USFS 2008) in the foreground, middleground, and background. Under high SIO, the landscape integrity appears intact, and surface disturbances may be present but must repeat the landscape characteristics so that they are not evident to the casual viewer. Design activities and surface disturbances should not be evident to the casual viewer when viewed from VPRs and use areas. Disturbances should not be evident in the foreground, middleground, background, or in seldom seen/non-priority areas (USFS 2008b).

It should be noted that a portion of the visual study area lies on private land and lands managed by Kootznoowoo, Inc. under the Alaska National Interest Lands Conservation Act (ANILCA); see *Land Use Technical Report for Angoon Airport Environmental Impact Statement* (Southeast Strategies 2010). For method and project consistency, and because no analysis methods have been developed for analyzing scenic impacts under ANILCA, the method and concepts described for analyzing impacts to scenic quality on USFS-managed lands would be applied to lands managed by Kootznoowoo Inc., as well.

3.3.2 Scenery Management System and Selecting Viewpoints

The USFS SMS assessment process, which will be used for the Airport EIS and was used to guide the gathering of baseline scenic condition data presented herein, is essentially a comparison of the existing scenic character and contrasts within the visual study area to the contrasts potentially imposed on the visual study area by a project. The SMS considers scenic quality as a combination of the viewshed from the foreground (less than 0.5 miles from selected viewpoints), middleground (0.5–5.0 miles from viewpoints), and background (5–15 miles from viewpoints) and viewer sensitivity, the project area's VAC, potential views from priority routes and use areas, and the designated land use objectives for the area.

The SMS process includes the following steps to establish the baseline scenic/visual condition of a project area:

1) Identifying the designated SIO within the visual study area. For the Airport project, areas designated wilderness national monument have been assigned high SIO; areas managed by Kootznoowoo, Inc. do not have USFS SIO, but are regulated under ANILCA. ANILCA does not specify how scenery would be managed, but does require that federal agencies "cooperate with adjacent landowners and land managers, including Native Corporations" in "protecting the continued viability of all wild renewable resources" (Title VIII, Section 802(3)).

2) Selecting representative viewpoints from which the visual study area landscapes are described and the impacts to visual resources will be determined. The following criteria for selecting representative viewpoints are used:

    - Visual sensitivity areas: These are areas with scenic attractiveness or natural beauty.
    - VPRs and use areas: As described in the *Forest Plan* (USFS 2008a), VPRs include the Alaska Marine Highway, tour ship routes, roads, small and mid-size tour boat routes, and hiking trails; use areas include saltwater use areas, dispersed recreation areas, communities, cabins, developed recreation sites, and boat anchorages. The VPRs and use areas for the visual study area would include the Chatham Straits waterway, the Alaska Marine Highway ferry routes arriving at and departing from Angoon ferry dock, potential views of the alternatives from Angoon, public roads and trails near the alternatives, and the shoreline of Favorite Bay. Non-priority routes and use areas and areas not visible from the VPRs are analyzed as seldom seen. These areas could include trails, cabins, timber sales, roads, logging camps, recreational facilities, fish enhancement structures, and gravel pits. The guidelines for

identifying or determining scenic analysis viewpoints are discussed in Appendix F and in Scenery Standards and Guidelines of the *Forest Plan* (USFS 2008a).

- Designated SIO and LUDs: As documented in the *Forest Plan* (USFS 2008a), and as mentioned above, the designated SIOs are high for all areas designated wilderness national monument.
- Viewing distance and project-area landscape visibility when seen from selected viewpoints: This is a function of the duration of the view by observers; the degree of detail that could potentially be discerned by viewers in the foreground, middleground, and background; and the number of viewers that could potentially see the project area. As mentioned above and as specified in the *Forest Plan* (USFS 2008a), foreground is the visible area within 0.5 miles of the analysis viewpoint, middleground ranges from 0.5 miles to 5 miles, and background is greater than 5 miles and less than 15 miles from the viewpoint.

3) Describing the visual study area landscape or scenery characteristics from the selected viewpoints with the landscape elements or attributes of form, line, color, and texture as discussed above. The purpose of characterizing or describing the landscape is to document a baseline of existing scenic values and aesthetic quality. Typically, the visual study area scenery is digitally photo-documented from the selected viewpoints, the precise location of the viewpoint is recorded using global positioning system (GPS) equipment to acquire coordinates, and any relevant field notes are recorded at that time. The digital photographs are then used to prepare the scenery descriptions.

Field data (photo-documentation and GPS points) to be used for scenery characterization and impacts analysis were collected on June 14–16, 2009. Data collection was conducted within the visual study area, which includes the tidal estuary, shoreline, and open water in Favorite Bay; the Chatham Strait and Favorite Bay shoreline near the City of Angoon; the Alaskan Marine Ferry route approaching and departing from the Angoon Ferry Dock; near-shoreline points in Chatham Strait between the community of Angoon and the Ferry Dock; and the Angoon Ferry and Reservoir access roads.

Data collection consisted of first reviewing the locations of the Airport alternatives and Access alternatives, determining the VPRs and use areas by reviewing the USFS *Forest Plan* in relation to the Airport alternatives and Access alternatives, and then documenting the locations or points of view within the visual study area where potential Airport impacts would likely be visible to casual viewers. The USFS principles for designating VPRs were applied to the identification of VPRs for alternatives not located on lands administered by the USFS.

An extensive number of potential visual analysis viewpoints were documented during field data collection. All high priority VPRs and use areas designated by the USFS in the vicinity of the visual resources study area were assessed as to whether any of the airport alternative locations or access road alternatives would be visible from the VPR or use area. Undulating terrain and dense forest vegetation obscure the airport and access road alternative locations from most of the designated high priority VPRs and use areas, which were then eliminated from consideration as representative viewpoints for analysis in the EIS.

Upon completion of fieldwork, all of the potential viewpoints were subjected to additional screening to select a subset of representative viewpoints that include both USFS designated VPRs and use areas and equivalent VPRs and use areas for non-USFS lands. One factor in screening potential viewpoints was the frequency or volume of use of the area in question. Very low volume routes or use areas were eliminated from consideration as representative viewpoints in favor of viewpoints that experience a higher volume of use and from which the viewing experience of a larger number of individuals could be affected.

Based on USFS criteria for selecting scenic analysis viewpoints, seven representative locations (see Figure 1 and Figures 2–8) were selected as the viewpoints for determining the existing viewsheds that will be characterized and for which impacts will be analyzed in the EIS. As noted previously, the FAA EIS Team

discussed the process by which these viewpoints would be selected with USFS staff members prior to field data collection.

The locations of the landscape characterization and analysis viewpoints are as follows:

- Viewpoint 1: Favorite Bay Creek (Figure 2)
- Viewpoint 2: Favorite Bay (Figure 3)
- Viewpoint 3: Favorite Bay North (Figure 4)
- Viewpoint 4: Angoon (Figure 5)
- Viewpoint 5: Whalers' Cove Lodge (Figure 6)
- Viewpoint 6: Angoon Ferry Road (Figure 7)
- Viewpoint 7: Reservoir Road (Figure 8)

The scenic (visual) character as viewed from each of these locations is described below.

3.4 Scenic Character within the Visual Study Area

3.4.1 VIEWPOINT 1: FAVORITE BAY CREEK

The view from this perspective is from offshore in Favorite Bay Creek and the estuary at the southern end of the Favorite Bay, looking east-northeast and along and down the length of the runway for Airport Alternative 4. This point of view would provide unobstructed, short-distance views of surface disturbances along much of the length of the alternative area. That is, from this viewpoint the viewer would see the greatest disturbance caused by clear-cutting for the runway.

The foreground view is of a topographically flat intertidal estuary; brackish water flowing through Favorite Creek and the estuary; a narrow vegetated shoreline; and a very dense, uniform, and solid-appearing spruce-hemlock forest beyond the shoreline. Landscape forms appear definite and distinct: the shoreline-estuary boundary is clearly defined by changes in vegetation; the forest-shoreline boundary is abrupt and obvious, with a clear transition from low-growing vegetation to tall trees. The rapid transition from flat, horizontal estuary to rising shoreline to vertical dense forest creates strong, bold landscape contrasts. Foreground linear contrasts are strong and simple—the horizontal, straight, and narrow band of shoreline appears distinct between water and forest, and the sharp, horizontal edge of the forest along the shoreline is clear and regular. Tree top lines undulate. Foreground colors are distinct and scenic: dark water intermixes with bright orange-yellow intertidal vegetation near the shoreline; vivid intertidal vegetation colors rapidly change to soft light green; and light green rapidly changes to variegated dark green forest colors. Textures are distinct and contrasting, and internal texture contrasts are created among the trees along the forest edge by changes in lighting and shade. Textures range from smooth water and uneven or stippled gradations of shoreline textures to dense, coarse-textured trees. Middleground views are obscured by the height of the dense forest cover adjacent to the shoreline.

Background views are dominated by high, rugged mountain ranges east of the general Airport project area. It should be noted that the background landscape character is affected by atmospheric conditions, appearing bold and distinct when clear but softened and obscured by mist, rain, and low clouds when overcast. The mountains in the background are diverse and complex in form: vertical and angular slopes are composed of rocky outcrops and peaks, forested lower slopes, and snow fields at middle and upper elevations. Line contrasts are strong because the mountain skyline creates a silhouette with the background sky. Diffuse and scenic edge effects are created by the gradation and intermixing of snowfields with the dark rocky or dark green forested slopes. Background textures appear rough and coarse on the jagged upper slopes, but medium on the smoother lower slopes.

Figure 2. Viewpoint 1: Favorite Bay Creek, in the estuary, facing northeast toward the runway area for Airport Alternative 4.

3.4.2 VIEWPOINT 2: FAVORITE BAY

This northeastern-facing view is from an offshore point near the center of the bay that would provide unobstructed views along the entire length of Airport Alternative 3a. This viewpoint, which is transited primarily by watercraft operated by local residents engaged in subsistence activities, represents the location from which the viewer would see the greatest degree of disturbance caused by clear-cutting for the runway. The foreground view is similar to that described for Favorite Bay Creek (Viewpoint 1) above but without estuary line and color contrasts. The result is a topographically flat landscape with distinct and definite shoreline and forest boundaries. The view is dominated by the dense and unbroken wall of mature spruce-hemlock forest, and this landscape characteristic is typical of the shoreline and foreground around Favorite Bay.

The shoreline appears distinctly narrow from this viewpoint, and its features are obscured by the viewing distance. Landscape linear features are predominantly and distinctly horizontal, composed of edge boundaries between water and shoreline, and shoreline and forest. As described for Viewpoint 1 above, the forest creates a continuous but undulating and irregular silhouette line along the treetops that contrasts with the background sky. Color contrasts are strong between the dark green spruce-hemlock forest and sky, and between the dark water and forest. A moderate color contrast exists between the light green shoreline vegetation, water, and forest, but this contrast is reduced because of the narrowness of the shoreline when viewed from water level. Foreground textures are similar to those described for Viewpoint 1: coarse-textured forest trees contrast strongly with fine-textured water and shoreline. Middleground and background features are entirely obscured by the dense growth of forest in the foreground.

Figure 3. Viewpoint 2: Favorite Bay, near center of bay, facing northeast toward Airport Alternative 3a.

3.4.3 VIEWPOINT 3: FAVORITE BAY NORTH

Located offshore and within the Favorite Bay narrows, the purpose of this viewpoint is to document existing conditions and short-distance views southeast of the potential road and bridge access to Airport Alternative 3a. A south-facing view was chosen because it is assumed that there would be a greater number of viewers in this direction than looking northward (e.g., viewers traveling from Angoon into the straits toward Mitchell Bay as well as those traveling south into Favorite Bay).

From this perspective, the view shows a diversity and contrast of natural landforms and water that is highly scenic. The foreground view is of an open waterway bounded on both sides by tall, dense growths of spruce-hemlock, with water and forest separated by a narrow band of low-growing shoreline vegetation and exposed rock. Strong foreground form contrasts are created by the differences between flat, relatively featureless water and the tall, vertical, highly varied forms of trees along the shoreline. Partially exposed rock outcrops in the center of the foreground water add to the diversity of forms and to scenic quality. Landscape colors range from dark green forest vegetation and lighter green vegetation and tan-colored shoreline rock to dark gray water. It should be noted that cloud cover likely has a direct impact on Favorite Bay water color, and that blue sky and direct sunlight on water would create stronger color contrasts with the surrounding landscape. Moderately strong horizontal linear edge-effect contrasts exist between shoreline and water, between shoreline and treeline, and as a rough and undulating silhouette line along the forest treetops. Textures range from smooth water to coarse trees. Internal texture contrasts are created among the trees visible along the edge of the forest by changes in lighting and shade.

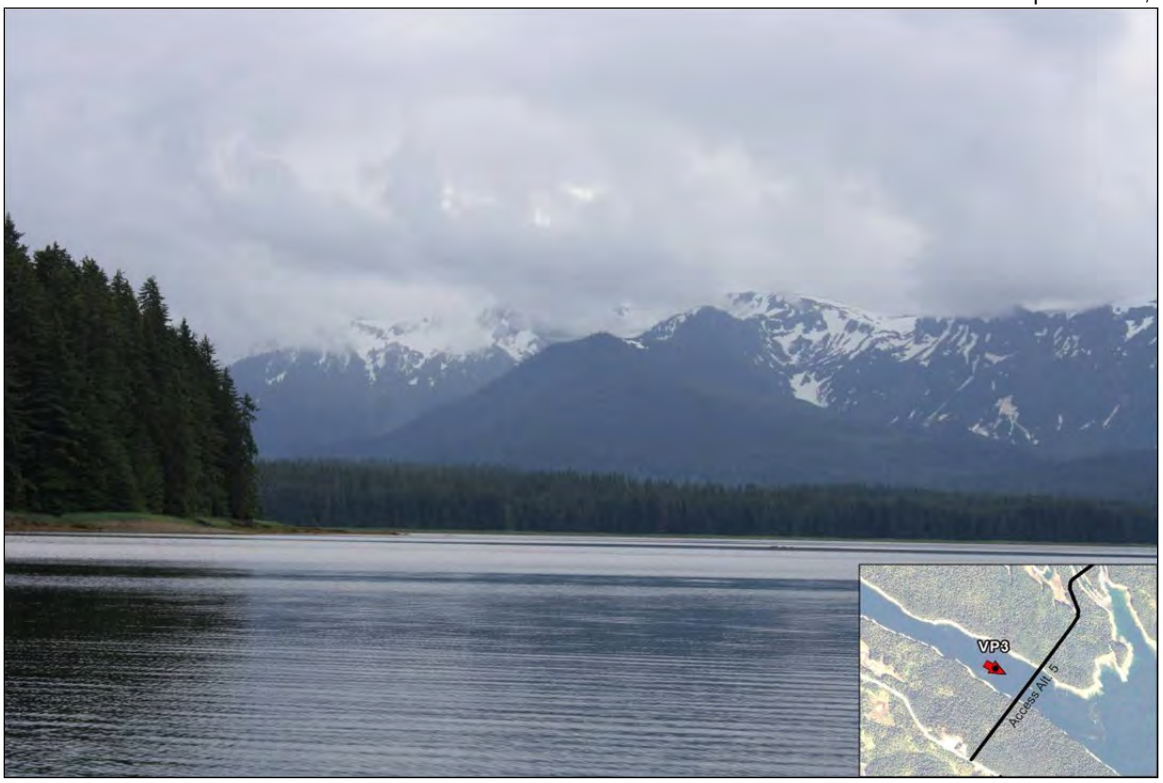

Figure 4. Viewpoint 3: Favorite Bay North, facing southeast toward the potential access road and bridge to Airport Alternative 3a.

Middleground views are of the open water of Favorite Bay, the bay estuary in the far middleground, and the dense and topographically flat forest growing along the bay's shoreline and inland. Middleground scenic characteristics are similar to those described for the Viewpoint 2 foreground above. The uniformly dense, uniformly dark green, and uniformly fine-textured relatively horizontal line of trees along the middleground bay shoreline creates a moderate scenic contrast with the foreground forest and water.

Background views are similar to the background views described for the Viewpoint 1. The rugged peaks, steep rock and snow-covered upper slopes, and forested lower slopes create a strong and highly scenic contrast with the foreground and middleground views. As noted for Viewpoint 1, the atmospheric effects of cloud cover, mist, rain, and fog tend to mute the background contrasts with foreground and middleground. Full sunshine and unobscured sky would likely heighten the background contrasts because of the increased color, line, texture, and form contrasts that would be visible.

3.4.4 VIEWPOINT 4: ANGOON

This point of view is located offshore from Angoon and near the northern end of Favorite Bay. The view is to the southeast, and the viewpoint was chosen to determine if there would be any observable impacts of Airport Alternative 12a construction when viewed from an unobstructed location near the town. The viewpoint was also chosen to determine the impacts to scenic quality from construction of the proposed bridge and access road (Access Alternative 5) across the lake narrows to Airport Alternative 3a. Because of terrain, Airport Alternatives 3a and 4 would not be visible from this location.

The foreground view is of the nearshore waterway leading to Favorite Bay and Mitchell Bay. Dwellings, docks, and other structures lie along the partially developed, rocky shoreline. Tree-covered, gently rising slopes frame

the shoreline and lead up toward the east side of Angoon. Natural landscape forms are typical of the shoreline surrounding Favorite Bay (as described above under Viewpoint 2) except where the shoreline has been widened (near and adjacent to buildings and structures) to accommodate development. Development has increased landscape form contrasts and complexity: numerous vertical and horizontal, rectangular and regular shapes and angles are intermixed with the relatively uniform, regular shapes of trees and shoreline. Foreground line contrasts are strong due to the distinct structural edges seen against a softened and diffuse forest background. A strong line contrast is created by the silhouette edge effect of forest treetops against the background sky. Color contrasts are created by the gray, white, tan, and brown colors of the structures against the muted dark green trees and dark gray water. Foreground textures are fine (within offshore water and along the shoreline), moderate (due to shoreline buildings and structures), and coarse (where tall spruce-hemlock forest trees are visible along the shoreline). Middleground views are obscured by the shoreline trees when the view is toward the Airport Alternative 12a.

Figure 5. Viewpoint 4: Angoon, facing south from offshore near Angoon at the northern end of Favorite Bay toward Airport Alternative 12a.

The background view is of the mountain range described in Viewpoints 1 and 3, and the scenic characteristics would be similar to the description provided for those viewpoints. When fully visible, the background landscape would produce a similarly scenic view as is described under Viewpoint 3. Also, as previously mentioned, it should be noted that atmospheric and weather conditions strongly influence and affect the scenic quality and visual contrasts of the landscape: during periods of low-hanging clouds and/or mist, the scenic background view would not be visible (as shown in the survey photograph below); however, in full sunlight with an unobstructed sky, the scenic contrasts would likely be greater, and scenic quality would be enhanced.

3.4.5 VIEWPOINT 5: WHALERS' COVE LODGE

From this perspective, facing northeast from the lodge toward Airport Alternative 12a would provide short-distance views of potential impacts to scenic quality when viewed by tourists, recreational and commercial fishermen, and Alaska Marine Highway ferry passengers. This viewpoint was chosen based on the relatively large number of people that would have potentially continuous and elevated views of Airport Alternative 12a, most notably from the upper deck of the ferry.

Figure 6. Viewpoint 5: Whalers' Cove Lodge, facing northeast toward Airport Alternative 12a.

The foreground view is dominated by the lodge dock, the ferry terminal, the Chatham Strait inlet, and the dense stand of spruce-hemlock that covers the low ridge and slopes beyond the inlet. Landscape forms are highly varied from this perspective because of shoreline development. The near shoreline is dominated by regular, horizontal, long, and low metal and wooden ramps, docks, piers, and moorings. Tall, vertical pilings, sheds, buildings, and dock support structures are visible. The far shoreline and landscape appear undeveloped (with the exception of minor structures along the shoreline) and present strong form contrasts to the near shore. The undeveloped slope and low ridge are typical of the undeveloped landscape in the visual study area (and as describe above for Viewpoint 2): a low, narrow shoreline bounded by flat water, behind which lies a dense, tall, vertical, and unbroken spruce-hemlock forest. Linear, color, and texture character is also similar to that described under Viewpoint 2: strong horizontal edge-effect line contrasts between water and shoreline, and between shoreline and forest boundary; moderate color contrasts between dark green forest, light green and tan shoreline vegetation and exposed rock/soil, and varying sky and water color contrasts with forest and shoreline. Again, as noted above, atmospheric conditions of cloud cover, mist, and rain tend to mute these color contrasts, but contrasts would likely be enhanced during periods of full sunlight and low cloud cover. Foreground landscape textures are fine at water level and along the far shoreline; fine to medium and uneven variable in areas of shoreline development; and coarse, dense, and uniform in the forest.

The middleground and background are obscured by trees and topography.

3.4.6 VIEWPOINT 6: ANGOON FERRY ROAD

This viewpoint is located along the Angoon ferry access road at a point where Airport Alternative 12a would potentially be visible to the southeast for those driving to and from the ferry docks. This viewpoint was chosen because of the relatively heavy traffic along the road while the ferry is docked, traffic to and from the village and Whalers' Cove Lodge, local traffic to and from the Angoon cemetery, and occasional foot traffic between Angoon and the ferry docks.

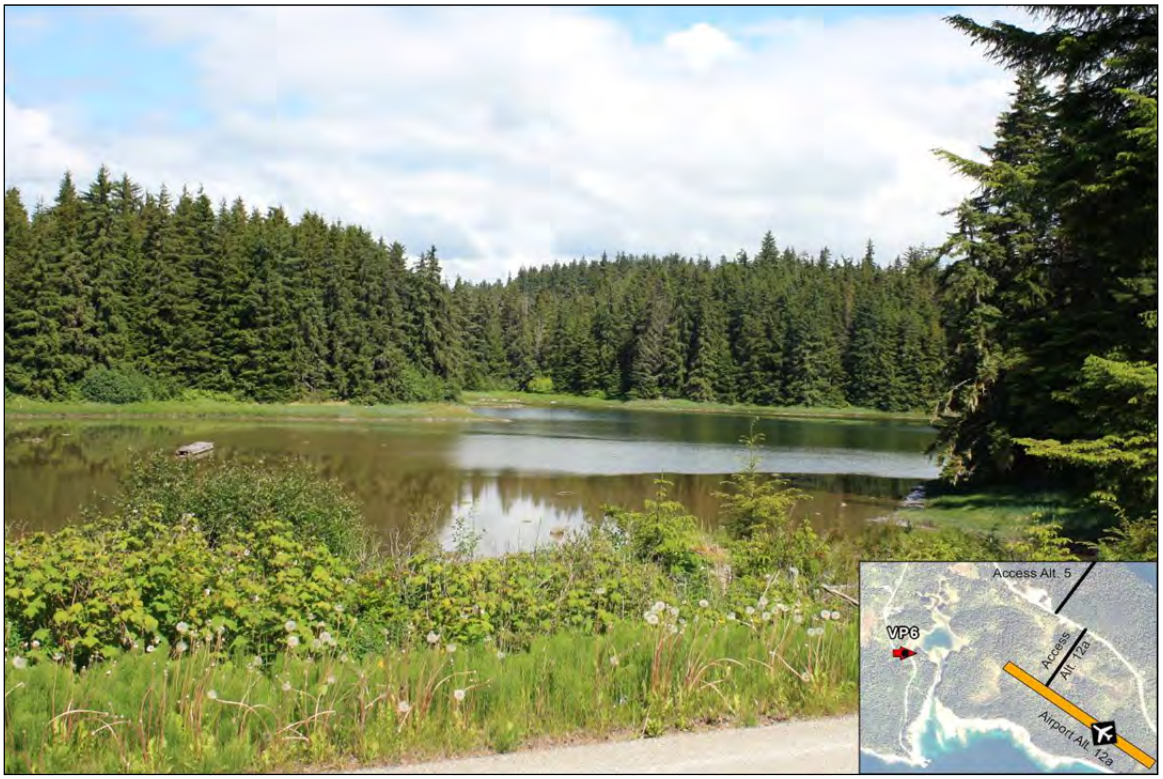

Figure 7. Viewpoint 6: Angoon Ferry Road, facing east toward the northern end of Airport Alternative 12a.

The foreground view is of a topographically flat landscape. A curving lagoon shoreline is clearly visible from the road, bounded by low-growing vegetation along the road and by tall conifers on the far shore and on most of the near shore. The narrow strip of curving shoreline creates a minor transitional contrast between tall vertical trees and flat lagoon water. The prominent wall-like edge of the forest and flat, open water are the dominant form characteristics in this view. Prominent line contrasts are visible, creating edge effects between the forest boundary and the shoreline, and between the shoreline and lagoon. Line contrasts are also created between the undulating tree tops and background sky, producing a silhouette-edge effect. Colors include green-brown lake water, light green shoreline vegetation, and variegated or mottled dark green along the forest edge. A mild contrast exists between the shades of green along the shoreline and forest. The reflection of the trees off the lake with the background blue sky produces a scenic effect. Textures range from simple in the lagoon and along the shoreline to a more complex, dense, and coarse texture along and within the surrounding forest. Internal texture contrasts are created among the trees visible along the forest edge by changes in lighting and shade.

The middleground and background are obscured by the foreground trees and by the low angle of view from this location.

3.4.7 VIEWPOINT 7: RESERVOIR ROAD

This viewpoint is located at a high point along the water reservoir maintenance access road where a wetland clearing would potentially allow views of the southern end of Airport Alternative 12a. A viewpoint was chosen along this road because of its relatively heavy use for reservoir and pump station maintenance, and because it is a popular driving route for Angoon citizens. Due to dense evergreen forest along the road, the locations of Airport Alternatives 3a and 4 would not be visible from this or other locations along the road.

Figure 8. Viewpoint 7: Reservoir Road, facing northwest through a clearing from the road edge toward the southern end of Airport Alternative 12a.

From this perspective, the foreground view is dominated by the flat wetland meadow and tall trees that lie along the meadow boundary. Landscape forms consist of a slightly undulated ridgeline and slope, short vegetation within the flat meadow, vertical trees along the edge of a spruce-hemlock forest, and a single downed tree that partially (and temporarily) obscures the foreground view. A linear edge effect is created along the boundary between short meadow vegetation and the forest boundary. Landscape foreground colors range from light-green meadow vegetation to dark-green conifers along meadow edge. Textures are fine within the meadow and coarse within the forest. Middleground views are obscured by tall trees and topography.

The background view is partially obscured by the foreground trees, but a smooth to rough and jagged ridgeline and steep upper-elevation slopes are visible. A strong linear edge-silhouette is visible along the background ridgeline and sky, creating a scenic contrast and scenery-enhancing effect with the foreground view. Background colors are indistinct because of the viewing distance, but appear as muted green and brown on the mountain slopes. Background textures are medium to coarse.

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Literature Cited

DOT&PF. 2007. Angoon Airport Master Plan. Alaska: Alaska Department of Transportation and Public Facilities.

FAA. 2007. Environmental Desk Reference for Airport Actions. Federal Aviation Administration.

Southeast Strategies. 2010. Land Use Technical Report for Angoon Airport Environmental Impact Statement. Douglas, Alaska: Southeast Strategies.

USFS. 1974. National Forest Landscape Management. Washington, D.C.: U.S. Forest Service.

————. 1995. Landscape Aesthetics: A Handbook for Scenery Management. U.S. Forest Service.

————. 2002. Mitchell Bay Watershed Landscape Assessment. R10-MB-471, Alaska: U.S. Forest Service.

————. 2008a. Tongass Land and Resource Management Plan Final Environmental Impact Statement Plan Amendment Record of Decision. R10-MB-603a, Alaska: U.S. Forest Service.

————. 2008b. Tongass National Forest Land and Resource Management Plan. R10-MB-603c, Juneau, Alaska: U.S. Forest Service.

————. 2009. Angoon Hydroelectric Project Final Environmental Impact Statement. R10-MB-628, Juneau, Alaska: U.S. Forest Service.

Acronyms

ANILCA	Alaska National Interest Lands Conservation Act
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	environmental impact statement
FAA	Federal Aviation Administration
GIS	geographic information system
GPS	global positioning system
LUD	land use designation
NEPA	National Environmental Policy Act
SIO	scenic integrity objectives
SMS	Scenery Management System
VAC	visual absorption capability
VPR	visual priority route
USFS	U.S. Forest Service

APPENDIX M
SOCIOECONOMICS TECHNICAL REPORT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

SOCIOECONOMIC EXISTING CONDITIONS TECHNICAL REPORT FOR ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ANGOON, ALASKA

Prepared for

Federal Aviation Administration
and
Alaska Department of Transportation and Public Facilities

Prepared by

Southeast Strategies
and
SWCA Environmental Consultants

August 8, 2013

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska. The Angoon Airport project involves the construction and operation of a land-based airport to serve the community of Angoon, a small village located approximately 60 miles south of Juneau and 40 miles northeast of Sitka. Angoon is the only permanent settlement on Admiralty Island and is located on a small peninsula on the western coast of the island (Figure 1). At present, there is no land-based airport runway in or near Angoon.

The land-based airport would be a small, commercial airport typical of other rural airports in the region, such as the airport at Kake. The initial construction would include a 3,300-foot-long paved runway, with the ability to extend the runway length to 4,000 feet in the future if air traffic warrants it. The airport would have a short, perpendicular taxiway leading from the runway to a small apron area, which may eventually contain a small shelter for passengers. The airport layout is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The access road would have a gravel surface and would be two lanes wide (one lane in each direction), with 9-foot-wide lanes and minimal shoulders.

The EIS is evaluating two alternative airport locations in addition to the DOT&PF's proposed location and multiple access road alternatives associated with those airport locations (Figure 2). In all, the EIS considers three potential airport locations and three potential access roads. Two of the three airport alternatives (Airport Alternatives 3a and 4) and two of the access road alternatives (Access Alternatives 2 and 3) are largely located on lands within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area), which is managed by the U.S. Forest Service (USFS). For this reason, the USFS is a cooperating agency for the EIS.

2.0 SOCIOECONOMIC STUDY CONTEXT

The purpose of this report is to compile existing social and economic data to provide a detailed description of the conditions and trends that could be affected by implementation of the proposed airport project. The report considers both conditions in the community of Angoon and, in some circumstances, in the surrounding region. Regional data for Southeast Alaska are also provided in some cases, to provide greater context regarding certain general trends for the area. Although it is not possible to separate most socioeconomic data relative to specific airport or access road alternatives, available data that are related to or would be affected by specific airport and access alternatives (see Figure 2) are used in discussions about subsistence activities and children's environmental health and safety issues in specific geographic locations in the Angoon area.

2.1 Regulatory Setting

Beyond the overarching requirements of the National Environmental Policy Act (NEPA) and its implementing regulations issued by the Council on Environmental Quality (CEQ) at 40 Code of Federal Regulations (CFR) 1500 et seq., the evaluation of socioeconomics and children's environmental health issues related to the Angoon Airport project is guided by Appendix A of FAA Orders 1050.1E, *Environmental Impacts: Policies and Procedures* (FAA 2004), and 5050.4B*, NEPA Implementing Instructions for Airport Actions* (FAA 2006).

In the FAA orders, environmental justice is included with socioeconomics and children's environmental health and safety. Due to the complexity of the environmental justice issue relative to the population that could be affected—both positively and negatively—by the proposed airport project, the FAA is addressing environmental justice under separate cover (that is, in the EIS) rather than in this technical report. For this reason, Table 1 summarizes only those statutes and regulations specific to socioeconomics and children's health and safety as outlined in the aforementioned FAA documents.

Table 1. Statutes and Regulations Pertaining to Analysis of Socioeconomics and Children's Environmental Health Issues as Identified in FAA Orders 1050.1E and 5050.4B

Statute	Regulation	Oversight Agency
Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (62 CFR 19883, April 23, 1997)	40 CFR 1508.27	All federal agencies
Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. 4601, et seq.) (Public Law [PL] 91-646 amended by Surface Transportation and Uniform Relocation Act Amendments of 1987, Title IV of PL 100-117, and PL 105-117)	FAA Advisory Circular 150/5100-17 49 CFR Part 24 FAA Order 5100.37A, *Land Acquisition and Relocation Assistance for Airport Projects*	FAA

2.1.1 U.S. Forest Service Considerations

The USFS does not have agency-specific policies related to considerations of socioeconomics or children's health and safety beyond those called for by the general (non-FAA and non-DOT) federal regulations outlined in Table 1, above. The USFS *National Environmental Policy Act Handbook* (Forest Service Handbook [FSH] 1909.15) (USFS 2012a) and the USFS *Forest Service Manual 1900, Planning* (USFS 2012b) acknowledge the need to comply with CEQ regulations regarding the implementation of NEPA, with FSH 1909.15 establishing USFS-specific procedures for implementing NEPA; neither, however, provides additional guidance or policies regarding issues related to socioeconomics, environmental justice, or children's health and safety. However, the USFS *Tongass Land Management Plan* (TLMP) (USFS 2008) provides management objectives for issues broadly subsumed under the topics of socioeconomics and environmental justice.

The TLMP includes Forest-wide standards and guidelines for management of the Tongass National Forest, including those related to rural community assistance and subsistence. The rural community assistance guidelines call for the consideration of "social, cultural, and economic issues in resource management," including "considering local communities' needs in project plans" (USFS 2008). TLMP guidelines include such actions as

- maintaining reasonable access to subsistence resources as required by the Alaska National Interest Lands Conservation Act (ANILCA), discussed in section 2.1.2 below;
- generally managing Forest lands to maintain the health of subsistence resources; and
- locating and managing "…Forest management activities considering impacts upon rural residents who depend upon subsistence uses of the resources of [National Forest System] lands."

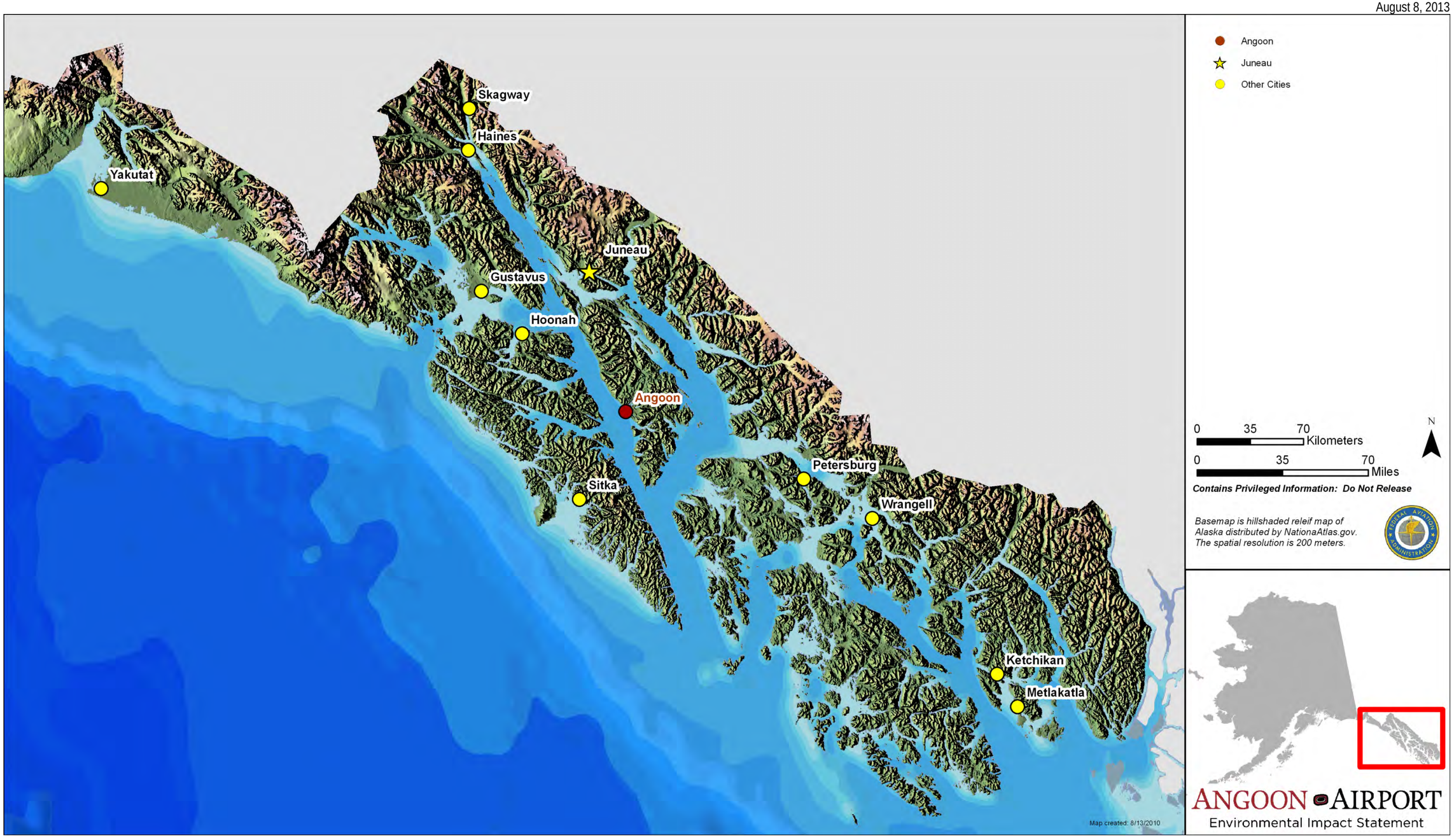

Figure 1. Southeast Alaska regional overview map showing the location of Angoon.

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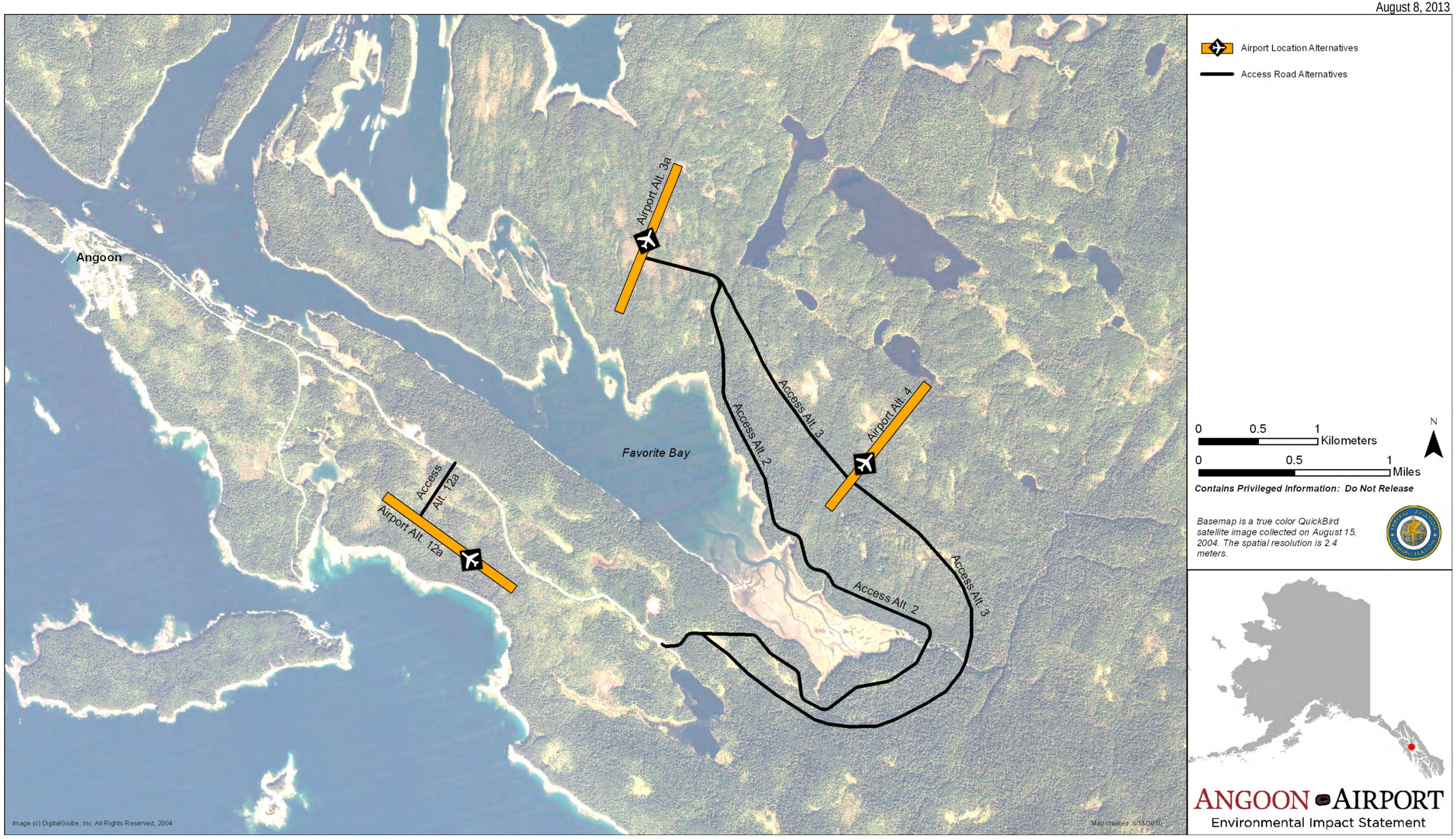

Figure 2. Locations of airport and access alternatives. NOTE: Airport alternatives illustrated on this figure represent locations only and do not depict final areas of disturbance.

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2.1.2 OTHER REGULATORY CONSIDERATIONS

Because two of the potential airport locations and two potential access road locations under consideration in the EIS are located wholly or partially on federal public lands in Alaska, ANILCA (Public Law [PL] 96-487) applies to the Angoon Airport project and must be considered along with the FAA- and USFS-specific regulations and policies. ANILCA (Title VIII) requires consideration of socioeconomic issues specifically as they relate to subsistence. It also requires consideration of compatible land use relative to the development of transportation and utility systems on federal public lands located in specially designated areas known as conservation system units (CSUs) (see Title XI of ANILCA). The two airport and access road alternatives located wholly or partially on federal public lands are located in the Monument–Wilderness Area, a designated CSU. The requirements of Title XI of ANILCA will be addressed in the EIS and are discussed in detail in the *Land Use Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement, Angoon, Alaska* (Southeast Strategies 2012).

Title VIII of ANILCA directs federal agencies to assess the effects of their undertakings on the subsistence uses of public lands. ANILCA is germane only to Alaska and applies to rural Alaskans regardless of ethnicity. Title VIII requires evaluation of an undertaking's effects on several components of subsistence use, including availability and quality of subsistence resources, the availability of other public lands for project or subsistence use, and access to and competition for subsistence resources. It also requires consideration of the availability of project alternatives that would avoid or minimize effects on subsistence uses of public lands.

2.2 Methods and Data Sources

This report is based on data available in the *Angoon Airport Master Plan* (DOT&PF 2007), verified and updated as appropriate. Other data sources (reports, plans, databases, and agency web pages) are listed in Table 2.

Table 2. Data Sources

Socioeconomic Data	Source
Employment and income	Alaska Department of Labor and Workforce Development (DOL&WD)
Population and demographics (e.g., age, race)	DOL&WD and U.S. Census Bureau
Top employers	DOL&WD
Census block race data near alternatives	DOL&WD
Income data	U.S. Bureau of Economic Analysis
Commercial fisheries harvest by residence	Alaska Department of Fish and Game (ADF&G)
Commercial fisheries permits by residence	ADF&G
Commercial fisheries harvest by catch location	ADF&G and International Pacific Halibut Commission
Sport fish harvest by catch location	ADF&G
Charter vessels by home port	ADF&G
Subsistence harvest by residence and location	ADF&G
Ferry traffic and future plans	DOT&PF
Air traffic	DOT&PF and U.S. Department of Transportation
Development plans	Southeast Conference[1] and Alaska Department of Commerce, Community, and Economic Development (ADCCED)
Web-based community databases	DOL&WD

Note: Originally compiled by Southeast Strategies in 2009. Data updated by SWCA in 2013.

[1] Southeast Conference is a regional association of municipalities, businesses, agencies, civic organizations, Native corporations and village councils, and individuals interested in economic, transportation, infrastructure, and social issues of Southeast Alaska.

Because the community is small and few community-specific socioeconomic studies have been conducted, some socioeconomic data are not available at the community level. In those cases, data at the larger census-area level are presented. Regional data for Southeast Alaska are also provided in some cases to provide greater context regarding certain general trends for the area. Where data from documented official sources were not available, information was obtained through personal communication or first-hand observation, extrapolated from existing data, or discussed only in general terms. Sources of personal communications, use of best professional judgment, and methods of extrapolation are noted where applicable.

Known data gaps are summarized as follows:

- Lack of annual community-level socioeconomic data. State-reported employment and unemployment data, and U.S. Bureau of Economic Analysis income data are not published below the census-area level. The U.S. Census Bureau does report income and employment data for individual communities, but a thorough count is only available through the decennial census every 10 years. The U.S. Census Bureau does some interim sampling of communities between decennial census years through the American Communities Survey program; however, in 2008, sample sizes for these surveys were significantly reduced, resulting in reduced reliability of estimates produced through that program.
- Census-area composition and boundary changes. Angoon is currently located within the Hoonah-Angoon Census Area. Prior to 2007, the City of Skagway was also included within this area. Because communities such as Skagway and Hoonah differ fairly significantly from Angoon in their demographic and economic makeup, census area–level socioeconomic data and trends may not be wholly applicable to Angoon. Moreover, because the boundary of the Census Area has changed significantly in recent years, comparisons over time are difficult. Broader census-area data are only used where no other data are available or to supplement the general discussion.
- Angoon employment data set overlap. State employment data and self-employment data are collected separately, and there may be overlap in data. For example, commercial fishing is counted as a self-employment activity and is not included in Department of Labor and Workforce Development (DOL&WD) employment data. However, because commercial fishing is a seasonal activity, residents holding commercial fishing permits or commercial fishing crew permits could also be employed in other reported industries part of the year and may be counted in state employment data. Small businesses with only one owner-employee are also not included in DOL&WD data. As a result, a person who has a business license could also be employed by other companies on a part-time basis and be included in DOL&WD employment data. Alaska business license counts are available by industry and by zip code, but do not include information on length of time in business, number of employees, earnings, and other data. As a result, state employment data and self-employment data cannot be combined into one data set, but need to be considered separately, with the possibility of some overlap.
- Lack of local government data. Because Angoon has a small population and is located in a rural, isolated area, the local government does not have as many public resources available as do larger, more accessible communities in the region. As a result, archives, mapping, and record-keeping at the local level are limited in scope, detail, and accessibility.
- Transportation data limitations. Data differentiating traveler status between resident and visitor are not collected through government agency programs. Although some special studies are performed to determine that breakdown, those studies generally do not include small rural communities. Consequently, it is not possible to determine how many travelers to and from Angoon are visitors.
- Confidentiality issues. Kootznoowoo, Inc. and some individual businesses that provided financial and otherwise sensitive data for this report requested that this information be kept confidential. For this reason, this information was used only as a general guide toward understanding the current socioeconomic condition of the community.

It is also important to note that the Tlingit culture's emphasis on subsistence activities and connection to the land are social forces that may not be fully measureable through conventional socioeconomic metrics. For this reason, the breadth of the socioeconomic condition of the Angoon community may not be fully represented in available government data.

3.0 BASELINE CONDITIONS IN THE ANGOON AREA

3.1 Population

Angoon was incorporated as a fourth-class city in 1963 and upgraded to a second-class city in 1972. The 2010 city population was 459. Figure 3 presents historical population counts for Angoon between 1990 and 2012. Angoon's population has shown an average decline of about 1.4% per year since 1990, resulting in a total loss of 182 residents (−29%) over the last 22 years.

3.1.1 REGIONAL CONTEXT

The Southeast Alaska region lost population during much of the past decade, mainly due to declines in several of its major industries: timber harvest and processing, commercial fish harvest and processing, and mining. While commercial fisheries and mining industries have rebounded recently, the population loss in many small rural communities has continued. Federal laws requiring welfare program recipients to obtain work have spurred rural residents to move to larger communities where more work is available. High costs of living, especially in power and transportation costs, have also made rural living less feasible. Table 3 presents annual population changes in the state, in the Southeast Alaska region, and in selected rural communities with economic and demographic characteristics similar to those of Angoon between 2000 and 2012. While the Southeast Alaska region, in general, had a slight population gain over that time, rural communities experienced slight to moderate population losses.

Table 3. Change in Annual Population in Alaska, Southeast Alaska, and Selected Regional Communities, 2000–2012

	Alaska	SE Alaska	Angoon	Hoonah	Hydaburg	Kake
2000 population	626,932	73,082	572	860	382	710
Percent change in 2001	0.92%	−1.68%	−6.99%	−3.26%	−7.07%	−1.27%
Percent change in 2002	1.42%	0.50%	−2.26%	0.36%	4.23%	−3.00%
Percent change in 2003	1.21%	0.05%	−7.69%	−4.07%	2.70%	−2.94%
Percent change in 2004	1.57%	−0.97%	−3.33%	0.12%	−2.89%	−0.15%
Percent change in 2005	1.14%	0.23%	3.02%	2.0%	7.32%	−2.28%
Percent change in 2006	1.11%	−0.44%	−2.30%	−3.18%	−3.54%	−2.80%
Percent change in 2007	0.83%	−1.65%	0.21%	2.65%	1.83%	−2.72%
Percent change in 2008	0.98%	0.41%	−7.91%	−0.62%	−2.57%	−2.79%
Percent change in 2009	1.60%	0.90%	4.41%	−5.69%	1.85%	−2.36%
Percent change in 2010	1.78%	0.74%	2.00%	−0.26%	−2.59%	−3.63%
Percent change in 2011	1.82%	2.86%	3.27%	0.26%	8.78%	3.59%
Percent change in 2012	1.27%	0.96%	−3.80%	1.97%	−10.27%	3.64%
Average annual change, 2000–2012	1.30%	0.16%	−1.78%	−0.81%	−0.19%	−1.39%

Source: (DOL&WD 2013a)

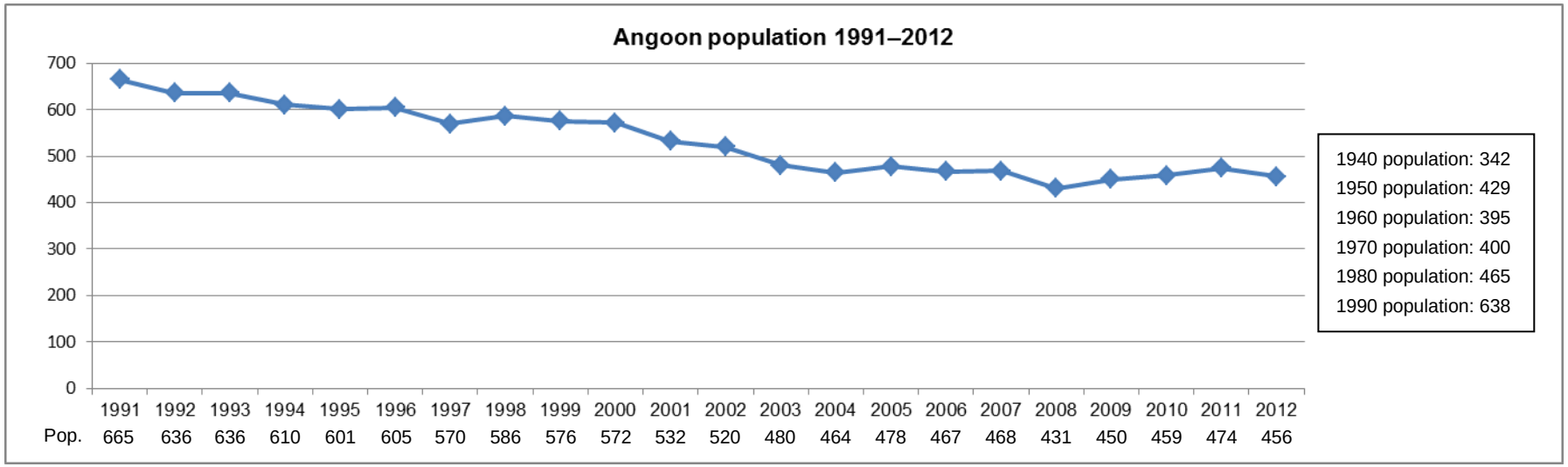

Figure 3. Angoon population counts from 1991 to 2012 (DOL&WD 2013a) and decennial census data from 1940 to 1990 (ADCCED 2012a).

3.1.2 Population Forecasts

The DOL&WD periodically prepares population projections for Alaska and its component areas. In 2012 DOL&WD completed census-area population forecasts through the out-year of 2035. Angoon is a part of the Hoonah-Angoon Census Area. Estimates of average annual population growth for the Hoonah-Angoon Census Area are presented in Table 4.

Table 4. Population Forecast for the Hoonah-Angoon Census Area, 2010–2035

Time Period	Average Annual Percent Change
2010–2015	−1.57%
2015–2020	−1.68%
2020–2025	−1.82%
2025–2030	−1.89%
2030–2035	−1.83%

Source: (DOL&WD 2012)

Applying this negative growth rate of the census-area population to Angoon shows that future population counts for the community would be 423 in 2015, 387 in 2020, 352 in 2025, 310 in 2030, and 290 in 2035. In conjunction with existing low levels of economic opportunity, as discussed below, it is clear that Angoon is more economically distressed than some communities in the Hoonah-Angoon Census Area. As such, the community is likely to continue to lose residents at a slightly higher average annual rate than the Census Area as a whole.

3.2 Demographics

Figure 4 presents demographic characteristics of Angoon from the U.S. Census Bureau. From 2007 to 2011, the median age of Angoon residents was approximately 34 years, and 115 residents (approximately 29%) were younger than 18 years old, the demographic group to which special consideration must be given under regulations regarding children's health and safety. Slightly more than half of the population was male, and more than three-quarters were of Alaska Native or other Native American heritage. The average household size was relatively small, and just under half of Angoon residents occupied homes they owned, as opposed to renting or living in the home of relatives (U.S. Census Bureau 2013).

3.3 Economic Activity

This section focuses on employment and industries located in or otherwise affecting the community of Angoon, as well as the cash income to the community's residents from employment and other sources. Although this section presents standard socioeconomic benchmarks, it is important to note that a substantial portion of the community's socioeconomic base extends beyond this conventional economic view into aspects of cultural tradition and practice. The harvest and sharing of local resources for food, clothing, tools, heating, and other uses, which serve as the cornerstone of the local economy and culture, are much harder to measure than nontraditional practices that involve the exchange of money and that are the typical subjects of agency data gathering. Because of the high prices of commercial products in remote Alaska communities, the economic role of subsistence takes on added importance. Angoon's local subsistence economy is discussed later in section 3.3.5 and in greater detail in the *Subsistence Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement* (SWCA Environmental Consultants 2011).

Angoon population distribution…

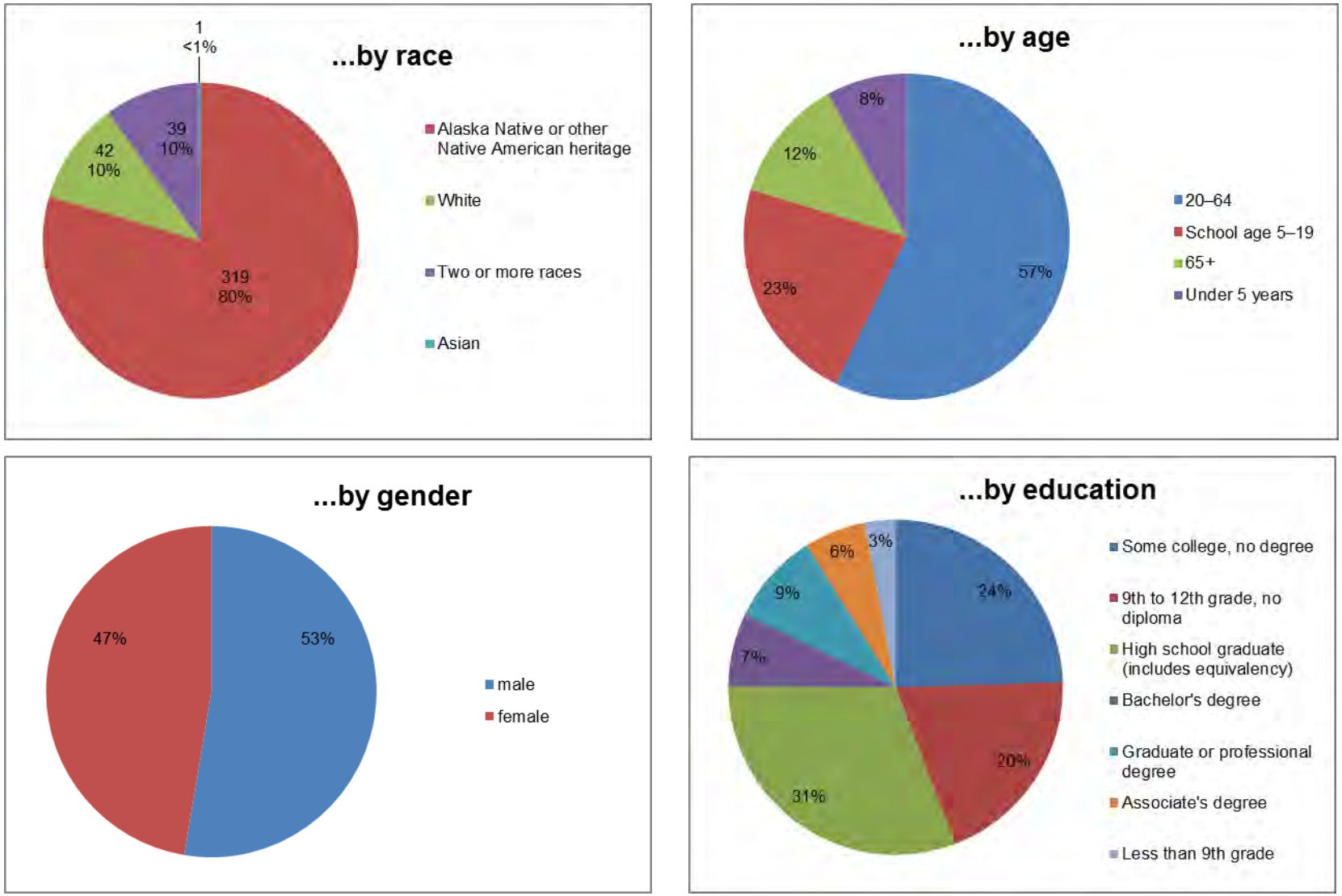

Figure 4. Angoon demographics by race, age, gender, and education (U.S. Census Bureau 2013).

3.3.1 EMPLOYMENT BY INDUSTRY

In terms of the cash economy, the strongest sectors for the Angoon community in the past few decades have been commercial fishing and tourism. However, many jobs related to these sectors are not counted under the U.S. Department of Labor's standard classification of employment by industries. Other possible data limitations include the following:

- Under the U.S. Department of Labor's criteria, commercial fishermen are not counted as "employed" by any industry, but are considered "self-employed." The department does not gather data regarding numbers of individuals self-employed in the fishing industry.
- Small businesses with no employees beyond the owner are also not documented by the U.S. Department of Labor. Tourism-related businesses such as bed-and-breakfasts and charter boat operations in the Angoon area are often small enough in terms of numbers of employees that they, too, are not included in employment data gathered by the department or other agencies. Yet, these types of businesses may contribute significantly to the overall employment rates in Angoon because of the small size of the community.
- The U.S. Department of Labor's data are reported as full-time equivalents (FTE) and, as such, do not capture the seasonal fluctuation in employment that is common in Angoon due to the nature of industries such as commercial fishing and tourism.

As a result, available statistical data for Angoon regarding actual employment must be considered taking into account the roles that part-time, seasonal, and one-person business employment may play in the community.

Table 5 presents DOL&WD data for average annual employment of Angoon residents for 2011. As discussed above, this information excludes self-employment categories and represents *average* annual employment (FTE). The data also represent Angoon residents only and do not account for nonresidents, many of whom work seasonal jobs at area fishing lodges.

Table 5. 2011 Average Employment by Industry Sector for Angoon Residents

Industry	Number of People Employed
Natural resources and mining	16
Construction	1
Manufacturing	NA
Trade, transportation, and utilities	19
Information	NA
Financial activities	7
Professional and business services	1
Education and health services	30
Leisure and hospitality	24
State government	2
Local government	109
Other	2
Total employment	**211**

Source: (DOL&WD 2013a)

Note: "NA" indicates that the number is confidential due to the small number of local businesses in that industry sector and nondisclosure laws.

Under this DOL&WD count, the largest industry sector in Angoon is local government, which includes tribal government and public school employment. In 2011, approximately 109 average annual FTE jobs in local government were held by Angoon residents. An additional 30 FTE jobs in nongovernment educational and health services and 24 FTE jobs in the leisure and hospitality industries were held by Angoon residents in 2011. Often, nonresidents will work seasonal jobs in visitor-related industries at Angoon. Anecdotal evidence suggests that as many as half the seasonal jobs at local lodges may be held by non-Angoon residents (personal communication, Powers 2012).

Table 6 presents employment by occupation for Angoon residents in 2011. Self-employed workers such as commercial fishers and other small-business owners are not represented in this table. Non-Angoon residents working in Angoon are also not counted in this table.

Table 6. Annual Average Employment by Occupation for Angoon Residents, 2011

Occupation	Average Annual Employment
Grounds maintenance workers, all other	13
Construction laborers	36
Extraction workers, all other	11
Teachers and instructors, all other	9
Teacher assistants	7
Home health aides	6
Maids and housekeeping cleaners	6
Office and administrative support workers, all other	6
Cashiers	6
Stock clerks and order fillers	5

Source: (DOL&WD 2013a)

According to the DOL&WD online database (DOL&WD 2013b), top employers of Angoon residents in 2011 included:

- Chatham School District (local government sector)
- Whaler's Cove Lodge (leisure and hospitality sector)
- City of Angoon (local government sector)
- Angoon Community Association (local government sector)
- Angoon Trading Company (trade, transportation, and utilities sector)

3.3.2 Other Employment

In 2010, 18 Angoon residents held commercial fishing permits (Alaska Commercial Fisheries Entry Commission [ACFEC] 2013). In 2013, 20 Angoon residents held business licenses (Alaska Department of Commerce, Community, and Economic Development [ADCCED] 2013). Alaska business license counts are available by industry and zip code, but do not include information on length of time in business, number of employees, earnings, and other data. Based on the professional knowledge of the author of this report, it is believed that several of those businesses were large enough to have employees, and their employment is represented in Table 5. However, some licenses are held by self-employed Angoon residents and are not counted as employment in existing employment data. Angoon residents with business licenses or commercial fishing permits or crew licenses could also be employed in another capacity during part of the year, and so would be counted in DOL&WD employment data. Because these different

types of data are collected by different agencies with different criteria, it is not possible to combine employment and self-employment data for a total count of working residents.

3.3.3 EARNINGS AND INCOME

In 2011, Angoon residents earned $3,772,209 from the jobs outlined in Tables 5 and 6, for an average annual wage of $17,878 (DOL&WD 2013a). During 2008 (the latest data available), state and local government jobs earned an average of $18,000 per year; trade, transportation, and utilities jobs earned an average of $19,100 per year; education and health services jobs earned an average of $16,069 per year; and all other industries earned an average of $20,787 per year (personal communication, Biller 2010). These low average annual earnings indicate that many of these jobs may be seasonal or part-time. In 2010, commercial fishermen reported a value-per-permit of $16,201. In 2009, the average value-per-permit was $9,495 (ACFEC 2013). Additional information is available on commercial fishing income trends over the last two decades in section 3.6.1. No information is available regarding income of other self-employment activities.

Kootznoowoo, Inc. is the corporation for the community of Angoon created through the Alaska Native Claims Settlement Act (ANCSA). Kootznoowoo, Inc. is charged with managing its land holdings for the benefit of its shareholders. Of the corporation's approximately 1,000 shareholders, roughly 333 lived in Angoon in 2013 (Kootznoowoo, Inc. 2013). In addition to employing a few Angoon residents, Kootznoowoo, Inc. contributes to the local economy through annual cash dividends distributed to its shareholders. Each shareholder received $2,494 in cash dividends in 2009, for a total of nearly $631,000 in dividends to Angoon residents. Cash dividends distributed per shareholder in 2007 and 2008 were $1,853 and $1,923, respectively (personal communication, Naoroz and Nease 2010).

Per capita income[1] in 2011 for the Hoonah-Angoon Census Area[2] was $39,307 (U.S. Bureau of Economic Analysis 2013). From 2007 to 2011, average per capita income for Angoon was $17,366, and median household income was $23,971 (U.S. Census Bureau 2013). Angoon's average per capita income was 44% below the same measures for the entire Hoonah-Angoon Census Area in the same year. From 2007 to 2011, approximately 31% of the population was living below the poverty level (U.S. Census Bureau 2013).

The average unemployment rate from 2007 to 2011 for the City of Angoon was 28% (U.S. Census Bureau 2013); however, when one considers that this unemployment rate does not take into account those potential workers who are no longer seeking work because jobs are not available, the rate is likely much higher. Unemployment data from 2011 indicate that of those Angoon residents who are working, only about 55% work year-round (DOL&WD 2013a).

3.3.4 REGIONAL CONTEXT

The U.S. Bureau of Economic Analysis publishes household and per capita income data annually to the census-area level, but not to the community level. The U.S. Census Bureau provides detailed income data to the community level for its decennial census. However, interim-year community-level income data are available only through the American Community Survey, conducted by the U.S. Census Bureau. Table 7 presents comparative annual income data, averaged between the years 2007 to 2011, for Southeast Alaska communities of similar size and racial makeup as Angoon. However, the small sample sizes used to obtain these data result in large margins of error, so these data should be used cautiously.

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[1] In addition to wages and salaries, measures of income also include dividend income, such as that received from Kootznoowoo, Inc., as well as rental income, investment income, and transfer payments such as social security income.

[2] From 2007 to 2008, Skagway was included in the census area.

Table 7. Comparative Demographic Data for Southeast Alaska Communities of Similar Size and Racial Characteristics, Annual Average, 2007–2011

	Angoon	Margin of Error	Hydaburg	Margin of Error	Kake	Margin of Error
Total population	399	±86	420	±74	470	±139
Alaska Native or other Native American	319	±84	357	±77	253	±86
Percent Alaska Native or other Native American	80%		85%		54%	
Per capita income (annual)	$17,366	±$5,582	$20,520	±$5,242	$24,413	±$8,392
Percent of individuals earning income below poverty level	31%		18%		19%	

Source: (U.S. Census Bureau 2013)

Note: Dollar values are reported in 2011 dollar equivalents. These data are from very small samples and should be used with caution.

3.3.5 Economic Role of Subsistence

The subsistence lifestyle and the strong cultural beliefs with which it is intertwined set Angoon apart from many other communities in the region. As cultural activities constitute the backbone of Angoon's society, so subsistence harvest and sharing constitute the backbone of its economy. Much of the residents' physical, spiritual, and cultural sustenance comes from subsistence harvest and not from mainstream cash economies. However, the cash economy both supplements and is closely tied with subsistence activity because it provides money for goods and services not available from the surrounding lands and waters and for equipment necessary to engage in subsistence harvest, such as guns, ammunition, and boat engines and fuel.

Subsistence activities are considered in depth in the *Subsistence Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement* (SWCA Environmental Consultants 2011). However, because the subsistence harvest is of such importance to the local economy, it is discussed in this report as well. For the purposes of this report, the value of the subsistence harvest by Angoon residents is not translated into dollar equivalents, but an attempt is made to show the volume of that harvest.

Items acquired in the subsistence harvest include things used as food or heating fuel or to make tools, clothing, and other items. A subsistence harvest often includes far more than the harvester, or even his or her household, can use. The excess is distributed to other families and individuals within the community, most often to those without the ability to harvest these goods for themselves.

Data on estimated subsistence harvest by Angoon residents in 1996 are presented in Table 8. These data are the most current, comprehensive, and reliable harvest data for the area. Showing per capita harvest of nearly 225 pounds of subsistence goods per year, these sample data reveal that subsistence harvest is economically important to families in the area. Table 8 also illustrates the role of sharing of subsistence resources among residents. Additional information about deer hunting and noncommercial fishing trends is included in section 3.6.6.

Table 8. Subsistence Harvest by Angoon Residents in 1996

Resource	% Using	% Attempting to Harvest	% Harvesting	% Receiving	% Giving	Per Capita Harvest (lbs)
All resources combined	97.3	93.2	93.2	94.6	67.6	224.5
Fish	89.2	70.3	70.3	83.8	50.0	129.5
Salmon	79.7	64.9	64.9	62.2	41.9	81.9
Non-salmon	82.4	60.8	60.8	70.3	29.7	47.6
Land mammals	74.3	51.4	51.4	50.0	27.0	51.3
Large	74.3	51.4	51.4	50.0	27.0	51.3
Small	2.7	2.7	2.7	1.4	0.0	0.0
Marine mammals	32.4	14.9	14.9	28.4	8.1	9.0
Birds and eggs[1]	5.4	5.4	5.4	2.7	1.4	0.2
Marine invertebrates	89.2	78.4	78.4	73.0	41.9	30.1
Vegetation[2]	66.2	62.2	56.8	50.0	17.6	4.4

Source: (ADF&G Subsistence Division 2009)

Note: Information is for the most representative reporting year for Angoon: 1996.

[1] Includes upland birds and waterfowl.

[2] Includes terrestrial and marine vegetation.

3.4 Community Infrastructure

Angoon is a small, isolated, lightly developed community. The City of Angoon operates a diesel generator for electric power, a water treatment plant for potable water, and a piped sewer system. Plans to develop hydroelectric and possibly other types of renewable power generation are being considered; the EIS for the hydroelectric facility, which would be located northeast of Angoon at Thayer Lake, was completed in 2009. However, the City has applied for a Federal Energy Regulatory Commission permit for a potential hydroelectric project in another part of the region. This has resulted in the Thayer Lake project being placed on hold until the funding agencies' concerns about the community's need for two hydroelectric projects are addressed. In addition, there is great potential for tidal power production in the Angoon area, but that technology is still experimental, and development of a tidal power facility is uncertain and likely many years in the future.

The City of Angoon also manages the local landfill, trash collection services, and cable television service. In addition to the roads in town, access roads lead to the landfill, the ferry terminal, and the water treatment plant. The community receives floatplane and ferry service via state-owned docks. The City owns the local boat harbor with approximately 80 boat slips.

The community of Angoon has two schools, an elementary school and a junior/senior high school, that accommodate kindergarten through twelfth grades. The community also has a health clinic staffed by a full-time health practitioner (generally a nurse practitioner or a physician's assistant) and suitable for the treatment of minor illnesses and injuries. Residents must travel to larger regional communities such as Juneau and Sitka for more substantial treatment, including surgery and treatment of severe illness.

Angoon is a dry community, and it is illegal to own or consume alcohol within city limits. Public safety is addressed by a single public safety officer housed at Angoon, and the community supports a volunteer fire department and emergency medical services. The city government is the strong-mayor form of government, in

which the mayor also acts as the city administrator or manager. The Tribal Council of the Angoon Community Association, the federally recognized Alaska Native Tribe for Angoon, also has considerable influence in the community, though the municipal government is the recognized governing body for the City.

The community has an Alaska Native Brotherhood hall, a community center, a senior center, a post office, and three churches; there are no banks or restaurants. Private commercial enterprise is limited to four hotels and fishing and hunting lodges, a grocery store, and a gas station. Angoon's store provides groceries and some general hardware and dry goods; other goods may be mail-ordered.

High fuel prices affect communities such as Angoon more than they do larger Southeast Alaska communities such as Juneau. The increased cost of locally available goods is due to fuel-related transportation costs, and also because these communities obtain electric energy through diesel generation. Table 9 presents retail heating fuel and gasoline prices in Southeast Alaska communities in January 2012.

Table 9. Retail Fuel Prices across Southeast Alaska, January 2012

Community	Heating Fuel #1	Difference from Statewide Average	Gasoline	Difference from Statewide Average
Statewide average	$5.71		$5.93	
Angoon	**$5.20**	**−9%**	**$5.09**	**−14%**
Craig	$4.03	−29%	$4.36	−26%
Gustavus	$4.85	−15%	$4.91	−17%
Hoonah	$4.50	−21%	$4.39	−26%
Juneau	$4.31	−25%	$4.00	−33%
Kake	$5.48	−4%	$5.96	1%
Pelican	$4.95	−13%	$4.92	−17%
Petersburg	$4.03	−29%	$4.36	−26%
Point Baker	$5.30	−7%	$4.95	−17%
Thorne Bay	$4.13	−28%	$4.53	−24%
Wrangell	$4.47	−22%	$4.26	−28%

Source: (ADCCED 2012b)

Note: Statewide average is weighted by number of communities, not by number of residents.

3.5 Transportation Options

Angoon's relative isolation compounds the importance of transportation access to the community. Residents must travel by air or sea; there are no road connections between Angoon and other communities.

Angoon residents travel to shop, visit family and friends, or attend important cultural, social, or regional athletic events. Lack of many services in Angoon, such as financial, legal, and many medical services, also necessitates travel to other communities. Table 10 presents the results of a survey of Angoon residents 18 years and older performed in 2001 for the 2004 *Angoon Airport Site Reconnaissance Study* (DOT&PF 2004). The table shows the number of individual respondents indicating travel for a particular purpose as well as the percent of total respondents they represent.

More recent information on purpose of travel and travel destinations of Angoon residents is not available. Current travel options are discussed below.

Table 10. Travel Purposes and Destinations for Angoon Residents

Travel Purpose	Juneau	Sitka	Other Southeast Alaska Locales	Other Destinations
Shopping	92 (89.3%)	36 (35.0%)	4 (3.9%)	14 (13.6%)
Visiting friends and family	76 (73.8%)	33 (32.0%)	18 (17.5%)	12 (11.7%)
Recreation or events (Gold Medal, etc.)	56 (54.4%)	6 (5.8%)	3 (2.9%)	3 (2.9%)
Medical reasons	55 (53.4%)	75 (72.8%)	4 (3.9%)	11 (10.7%)
Work or business	43 (41.7%)	26 (25.2%)	10 (9.7%)	7 (6.8%)
Vacation	36 (35.0%)	12 (11.7%)	9 (8.7%)	13 (12.6%)
School	9 (8.7%)	3 (2.9%)	3 (2.9%)	5 (4.9%)
Other	8 (7.8%)	5 (4.9%)	5 (4.9%)	1 (1.0%)

Source: (DOT&PF 2004)
Note: The survey was sent to all Angoon residents 18 years and older. Of 430 surveys, 103 were completed and returned, for a 24% response rate.

3.5.1 AIR TRAVEL

One regional air carrier, Alaska Seaplane Service, currently provides scheduled air service to Angoon. This provider is subsidized to provide service to the community through the FAA's Essential Air Service Subsidy through January 31, 2015 (U.S. Department of Transportation 2010). This carrier has expressed concerns that even with the subsidy, the operations associated with the route cost more than the revenue generated by passenger fares. Scheduled service connects directly to Juneau with an occasional stop at Tenakee Springs and is available, on average, four times daily in summer (May–mid-September) and twice daily in winter (November–April), weather permitting. Table 11 presents the number of passengers departing Angoon on scheduled air carriers from 1998 through 2008. Although the data shown in Table 11 indicate a decline in enplaned passengers, air travel demand forecasts completed for the EIS indicate a latent demand not being met by current air transportation options (Barnard Dunkelberg & Company 2008). Additionally, preliminary data from the 2010 Census show that the population of Angoon has grown slightly for the second year in a row, potentially signaling a reversal of the previous population decline (see Table 3 and Figure 3).

On-demand charter service to Angoon is provided by air taxi services with float-equipped planes. Consolidation and attrition have reduced the number of small air carriers in the region (those that operate under the FAA's Part 135 regulations), and increased fuel, insurance, security, and other costs have driven up fares.

Table 11. Enplaned Passengers at Angoon, Scheduled Service, 1998–2008

Year	Enplaned Passengers
1998	3,321
1999	2,865
2000	3,009
2001	3,274
2002	2,059
2003	2,379
2004	2,408
2005	2,307
2006	2,080
2007	1,896
2008	1,770

Sources: (DOT&PF 2007, 2008; FAA 2009)

3.5.2 MARINE TRAVEL

Angoon is a year-round port of call for the Alaska Marine Highway System (AMHS). This state-operated ferry service is available approximately twice a week for passengers, vehicles, and freight between Juneau and Angoon and approximately once a week between Sitka and Angoon during the summer. During the winter, ferry service is only provided between Juneau and Angoon. Table 12 shows ferry traffic (both passengers and vehicles) into and out of Angoon from 1990 through 2012. The data illustrate the fluctuation in ferry service demand and ferry service frequency available to Angoon residents as well as the increasing travel demand. Although fewer passengers embarked or disembarked in Angoon in 2012 compared with 1990, the relative demand increased. That is, approximately 51% fewer ferry departures were available to Angoon residents in 2012 than in 1990. As a result, the relative passenger traffic per departure increased from 26.6 embarking passengers per departure and 29.2 disembarking passengers per departure in 1990 to 36.0 embarking passengers per departure and 39.9 disembarking passengers per departure in 2012. Additionally, these data, combined with those shown in Table 11, show the overall high travel demand of the relatively small population of Angoon in a given year.

Table 12. State Ferry Traffic to and from Angoon, 1990–2012

Year	Passengers Embarking	Vehicles Embarking	Passengers Disembarking	Vehicles Disembarking	Departures
1990	5,847	760	6,424	797	220
1991	5,735	828	6,260	828	202
1992	5,234	771	6,137	771	244
1993	4,278	661	4,921	678	246
1994	4,107	686	4,706	736	215
1995	3,726	683	4,753	752	235
1996	4,183	817	4,576	851	256
1997	3,647	788	4,307	813	277
1998	3,497	644	3,940	652	265
1999	4,012	716	4,419	769	273
2000	3,754	642	4,273	666	252
2001	3,328	647	3,962	696	227
2002	3,988	774	4,398	833	252
2003	3,564	624	3,949	661	246
2004	3,296	479	3,554	532	187
2005	3,077	567	3,720	595	281
2006	3,410	539	3,775	583	239
2007	3,297	742	3,664	761	105
2008	4,160	893	4,584	948	109
2009	4,287	829	4,655	852	138
2010	4,360	960	4,849	994	118
2011	4,172	1,040	4,519	1,070	108
2012	4,028	1,023	4,472	1,061	112

Sources: (AMHS 2000, 2008, 2012)

Catamaran service for charter passengers only is provided to and from Juneau by Allen Marine. One of the local lodges routinely charters catamaran service to transport about half of its clients between Angoon and Juneau in

the summer (personal communication, Powers 2009). Barge service is available in the summer, although most of the goods shipped to Angoon travel via ferry.

For large parties, passenger-only service is available via charter ferry by Allen Marine fast catamarans. These boats hold 120 passengers and charter for about $1,000 per hour. Round-trip travel (Angoon-Juneau-Angoon) takes six hours, but is effectively only a one-way trip, as the boats are based in Juneau. If the boat were full both ways, a round-trip (which would entail two trips) would cost each passenger $100 (Gorsuch 2011). Charter ferry service has been used in the past to transport Angoon residents to and from special events and to transport visitors to and from Angoon area lodges. In past years, an Angoon lodge chartered a ferry every Saturday for seven weeks in summer, but that traffic has dropped off recently (Gorsuch 2011).

3.5.3 Travel Costs

High fuel prices have resulted in fare increases, and both disproportionately affect residents of isolated communities such as Angoon because of the need to travel to obtain goods and services not present locally. Table 13 provides the comparative costs of round-trip travel to Juneau by various modes of travel. Once in Juneau, travelers can make travel connections to anywhere in the world. This table compares costs for one adult as well as a family of four made up of two adults and two children between the ages of six and 12 years. It does not include transportation of a vehicle. Round-trip costs (Angoon-Juneau-Angoon) for a small vehicle (up to 15 feet long) would be $140.00 (AMHS 2013).

Table 13. Comparative Costs for Round-trip Travel Angoon-Juneau-Angoon

Mode of Travel	Per Adult	Per Family of Four[1]	Travel Time[2]
State ferry service, slow ferry[3]	$74	$222	11.5 hours
Scheduled air service	$270	$1,080	2.6 hours
Charter air service	$237 to 371	$1,123 to $2,226	2.6 hours

Sources: (AMHS 2013; Alaska Seaplane Services 2013a, 2013b)

[1] Round-trip Angoon-Juneau-Angoon for two adults and two children between six and 12 years of age, no vehicle.

[2] Travel time is figured as twice the one-way travel time plus one hour waiting time.

[3] Fast ferry, when available, is estimated to be about $10 more per person and would reduce travel time to less than 3 hours one way.

3.6 Social and Economic Trends and Forecasts

The regional economy of Southeast Alaska was in decline long before the worldwide economic recession began in 2008. A steep decline in the timber harvest and processing industries, a slower decline (amid ups and downs) in the commercial fishing harvest and processing industries, and a lack of new development in the mining industry have been major components of this decline. Overall, the region saw a 5.1% decline in population between 2000 and 2009. The visitor industry in the region was robust and growing until recent fuel price spikes and the worldwide recession reversed this trend.

The commercial fishing, tourism, and local government sectors are major contributors to jobs and income in Angoon. Commercial fishing and tourism are defined as basic industries (industries that obtain most of their revenue from outside the community), whereas local government is mostly a support industry (an industry that obtains revenue from within the community). Of these major industries, government is the only one not completely seasonal in nature. However, many Alaska communities are struggling with decreases in state revenue–sharing grants due to past declining state revenues. Consequently, many municipal and village governments in Southeast Alaska are decreasing services and, in some cases, reducing staff sizes.

It has been many years since Angoon has had a strong basic industry within its economy. Although the commercial fishing sector contributed to a healthy economy in past years, Angoon residents' participation in that industry has dwindled. The recent decline in the visitor industry in response to the weak economy and an apparent lack of active economic development plans within the community creates a somewhat bleak outlook for the future economic condition of Angoon. Without growth in basic industries to bring in outside money and create job opportunities, the local economy will continue to stagnate, and even support sector businesses will slow. One local support business owner has put development plans on hold because of the discouraging outlook for Angoon's economy (personal communication, Thompson 2010). Discussions with community and business leaders indicate that local children often leave for education elsewhere, including high school and higher education, and do not return.

Because of the poor economic trends of Angoon in recent years, much attention is being focused on future economic opportunity provided by the City of Angoon, Kootznoowoo, Inc., and others. Specifically, these parties have been exploring options for the development of lower-cost and renewable energy as a key to future growth; reductions in energy costs would not only reduce the cost of living for individual residents but would allow business owners to invest more money in expanding their operations and hiring more employees. The viability and breadth of economic impact such affordable energy developments would have on the community remain to be seen; while planning is underway for new hydroelectric facilities to serve the community, no construction has begun, and completion of any such projects is many years away.

Additional economic opportunity for residents of Angoon may come from private-sector businesses located outside the community. For example, Coeur Alaska, Inc. opened the Kensington Gold Mine north of Juneau for production on July 3, 2010 and employed 250 full time employees during its first full year of operations in 2011 (Coeur Alaska 2012; Coeur Mining 2013). It is not uncommon for Alaska residents to work shifts of several days or weeks at mines and in the oil and gas industry at locations that are some distance from their homes. Between shifts they may return home, and their earnings also support family members at home. Remote employment is one way that Angoon residents support themselves and their families, and so private-sector opportunities throughout Alaska can be seen as beneficial for Angoon residents.

3.6.1 Role of Commercial Fishing

Historically, commercial fishing has been one of Angoon's economic mainstays. Prior to the mid-1990s, the community hosted a fleet of 15 to 20 seine boats, and residents held more than 100 limited-entry fishing permits (ACFEC 2013). A fish-buying station was located in Angoon from the mid-1970s to the mid-1990s. With changes in fishing patterns and harvest seasons; loss of locally owned, limited-entry fishing permits; and fluctuating fish prices, commercial fishery in Angoon has become less of an economic factor in the community (personal communication, McDowell 2010). The number of Angoon residents engaging in commercial fishery work and the earnings of that work have declined steadily since 1990 (Table 14). The decline for Angoon residents has been faster and more substantial than for other commercial fishers using the broader Chatham Strait area by Angoon (Tables 15 and 16). Although participation and total earnings have decreased, the value per permit has increased, likely because of rising fish prices and possibly due to a shift in catch toward higher value fish.

Table 14. Commercial Fishing Effort and Earnings by Angoon Residents, All State-managed Species in All State-managed Fishing Regions in Alaska, 1990–2010

Year	Permits Fished[1]	Lbs Harvested	Gross Value	Lbs per Permit	Value per Permit
1990	119	1,409,059	$1,115,853	11,841	$9,377
1991	118	2,161,298	$1,144,210	18,316	$9,697
1992	130	1,523,696	$1,006,888	11,721	$7,745
1993	109	2,199,887	$974,377	20,182	$8,939
1994	94	2,055,056	$1,370,909	21,862	$14,584
1995	77	1,416,152	$1,026,090	18,392	$13,326
1996	75	1,690,699	$926,522	22,543	$12,354
1997	59	470,150	$383,458	7,969	$6,499
1998	36	NA	NA	NA	NA
1999	48	589,662	$340,632	12,285	$7,097
2000	46	307,359	$290,900	6,682	$6,324
2001	41	489,125	$270,106	11,930	$6,588
2002	28	144,422	$200,228	5,158	$7,151
2003	25	118,237	$223,452	4,729	$8,938
2004	21	136,532	$285,428	6,502	$13,592
2005	22	124,560	$256,017	5,662	$11,637
2006	25	146,726	$370,833	5,869	$14,833
2007	20	85,436	$286,546	4,272	$14,327
2008	15	66,227	$222,904	4,415	$14,860
2009	8	37,007	$75,957	4,626	$9,495
2010	6	37,578	$97,208	6,263	$16,201

Source: (ACFEC 2013)

Note: NA = data not available to preserve confidentiality per Alaska Statute 16.05.815.

[1] In general, more permits are held than are actually fished. For example, 26 permits were held by Angoon residents in 2010 but only 6 were fished.

Table 15. Commercial Fish Catch in Chatham Strait near Angoon under State Management by All Fishers, 1999–2008

Year	Salmon (lbs)	Groundfish (lbs)	Shellfish (lbs)	Total (lbs)
1999	1,650,797	1,164,657	0	2,815,454
2000	2,418,140	1,068,862	0	3,487,002
2001	1,946	820,103	38,139	860,188
2002	363,725	782,433	36,029	1,182,187
2003	1,446,656	701,720	53,015	2,201,391
2004	1,882,017	714,506	21,277	2,617,800
2005	2,233,555	752,014	6,393	2,991,962
2006	282,992	835,657	22,279	1,140,928
2007	1,258,875	705,297	0[1]	1,964,172
2008	0[2]	878,644	0[1]	878,644

Source: (Plotnick 2009)

Note: This shows catch by all commercial fishers with permits to harvest fish in the area, regardless of where they reside. Some of these fish may have been harvested by Angoon residents.

[1]Data were not reported by ADF&G.

[2]The salmon fishery in Chatham Strait was closed in 2008 due to a poor run of pink salmon.

Table 16. Commercial Halibut Catch under Federal Management in Chatham Strait by All Fishers, 1999–2008 (in lbs)

1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
579,918	397,966	285,879	259,640	269,611	385,104	402,435	419,612	364,307	260,700

Source: (International Pacific Halibut Commission 2009)

Note: Some of this catch may have occurred in Kootznahoo Inlet, but no smaller catch areas were available from the source.

The decline in fishing effort by Angoon residents occurred for several reasons, including loss of fishing permits and the inability of local fishers to fund their commercial fishing operations. The early part of this decline resulted in the closure of the local fish-buying station, and that closure, in turn, contributed to the further decline in fishing efforts by Angoon residents, because the cost of getting the fish to willing buyers increased due to the high transportation costs. Additional factors in the closure of the buying station included increased operating costs and consolidation of the processing industry (personal communication, McDowell 2010). Attempts to attract another fish-buying station have occurred over the years. Angoon is far from the major commercial fishing activity in Chatham Strait, and it may be difficult to attract fishers to travel that far to land their fish. With less local commercial fishing participation, it becomes less cost-effective for a processor to have a station so far away from the primary commercial centers of the region.

There is currently no fish-processing operation in Angoon; however, the city government is working to upgrade local dock and float facilities and to provide ice and fish totes for use by local fishers at Killisnoo Harbor. Electricity has recently been extended to the dock, and waterlines for the facilities are planned for the near future.

Angoon is one of the communities eligible for the Community Quota Entity program, a new federal program that allows local nonprofit entities to purchase halibut and sablefish quota shares and lease those shares to local resident fishers. Similar programs (Community Development Quota programs) in southwest and western Alaska

have proven to be economically beneficial to the communities involved and may contribute to future growth in the Angoon commercial fishing industry.

3.6.2 Role of Tourism

Prior to the spikes in oil prices and the global economic recession, tourism in Southeast Alaska was thriving. The 2009 tourism season saw a slight decline in visitors to the region, and a slightly larger decline in spending by those visitors. The tourism industry in Southeast Alaska is heavily influenced by charter fishing regulations, and a recent regulatory reduction in catch limits of charter-caught halibut to one fish per day served to decrease activity in the charter fishing sector. Additional regulation of charter fishers is being considered by the National Marine Fisheries Service and will likely reduce the number of charter fishing licenses available in the region. Anecdotal information indicates that many of the sport-fishing lodges and charter fishing boats in the region had a disappointing 2010 season, but that bookings for the 2011 and 2012 season were encouraging[3] (personal communication, Powers 2009; personal communication, Powers 2012).

The cruise industry is another significant component of the broader Southeast Alaska economy. Cruise ships do not stop at Angoon, and because of the limited transportation options to reach the area, independent travelers rarely visit. Annually, an indeterminate number of visitors travel to Angoon to access the Monument–Wilderness Area for canoeing, kayaking, camping, and other recreational activities. No agency or other party tracks data relative to these visitors. As such, the number of tourists of this nature is unclear; tourists of this type are estimated to be fewer than 350 per year (Neary 2009).

Angoon supported four sport-fishing operations in 2008, and most of the tourist activity centers around these businesses. These operations provide charter fishing excursions as well as kayaking and other sorts of tours. In 2009, 18 boats were licensed to operate fishing charters from Angoon, down from 35 charter fishing vessels operating in 1999. Many of the charter fishing boats are associated with lodges. Because of the recent business climate, bookings at lodges in Angoon were down approximately 20% in 2009, and several of the lodges closed earlier than in previous years. The owner of the largest lodge in Angoon had considered ceasing operations after the 2010 season; however, bookings for the 2011 and 2012 seasons picked up, and they will continue operations (personal communication, Powers 2009; personal communication, Powers 2012).

For data tracking purposes, charter fishing is categorized as sport fishing. Table 17 presents data on sport-fishing activity by boat in the Angoon area. This count includes sport fishing from both private and charter fishing boats. This table shows that both sport-fishing effort and total catch generally decreased through 2009, except for minor increases since 2006 in harvest of specific fish species (for example, halibut and rockfish).

[3] Accommodation tax data is often used as an indicator of hotel occupancy and changes in visitor activity. The City of Angoon is required by state agencies to assess accommodation (or bed) taxes on local lodging establishments; however, the City has not reported the revenue from that tax to the state since 2005 and was unable to produce that data for this report.

Table 17. Sport-fish Catch in the Angoon Area by Boat, 2001–2011

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Anglers	1,598	1,271	1,500	1,100	1,719	1,123	895	1,019	946	825	771
Days fished	6,109	4,606	5,863	3,550	8,789	3,100	3,582	3,810	4,517	2,558	2,103
Species caught (# of fish):											
Chinook salmon	1,367	707	977	546	1,178	613	244	205	520	354	233
Coho salmon	7,669	8,720	10,247	5,549	7,894	2,424	3,482	2,802	2,071	3,275	2,103
Sockeye salmon	449	151	251	11	36	0	32	252	347	0	110
Pink salmon	1,758	652	3,447	832	2,102	99	728	956	1,127	732	1,041
Chum salmon	1,057	194	466	374	274	114	114	141	338	132	87
Dolly Varden	108	104	169	128	258	0	94	45	22	0	0
Cutthroat trout	0	8	68	0	0	0	9	0	0	67	0
Smelt/capelin	0	0	1,593	0	0	0	757	337	167	0	381
Pacific halibut	3,299	3,645	5,099	2,649	4,070	1,478	2,926	3,385	2,624	1,217	641
Rockfish	1,908	1,333	1,388	1,544	1,169	340	1,054	1,426	2,514	956	447
Lingcod	120	216	198	114	11	157	33	13	102	25	0
Sablefish/black cod	NA	NA	NA	NA	NA	NA	NA	NA	NA	83	57
Other	0	8	148	81	0	0	0	0	0	0	0

Source: (ADF&G Sport Fish Division 2013)
NA = Data not available.

In addition to sport fishing, sport hunting, mostly for Sitka black-tailed deer, also contributes modestly to the Angoon economy through bookings at lodges in Angoon. Because the ADF&G requires only one type of deer hunting license, the data in Table 20 include both sport and subsistence hunting activities. As shown in Table 20 (in section 3.6.6, below), deer hunting appears to have decreased over the 10-year period depicted.

3.6.3 GOVERNMENT

The local government industry category in Angoon includes the City of Angoon, the Chatham School District, and tribal governments such as the Angoon Community Association and the Central Council of the Tlingit and Haida Indian Tribes of Alaska. This industry category is the largest employer of all industries in Angoon, and it provided 109 FTE local jobs in 2011 (DOL&WD 2013a). A large component of local government is support of the local population; however, the Chatham School District offices are located in Angoon and represent a basic industry business because they support schools outside of Angoon. Recent state budget cuts and reductions in municipal assistance resulted in a reduction in local government jobs in Angoon. This trend will likely continue over the next few years as the broader regional and state economy recovers from the national economic downturn.

3.6.4 KOOTZNOOWOO, INC. DEVELOPMENT

Kootznoowoo, Inc. is considering tourism-related development in the Angoon area, but such efforts are only conceptual at this point, and no details are available from which to make projections of future effects on the local economy. The corporation has been in discussions with Natural Currents Energy Services (the company that holds a Federal Energy Regulatory Commission permit for tidal power in the Angoon area) about creating a tidal research institute in the Angoon area to study tidal energy resources and associated technology. In addition, the corporation has considered natural resource development in the Angoon area, including timber harvest and development of a mine for coal and methane gas (personal communication, Naoroz and Nease 2010).

Kootznoowoo, Inc. has distributed 629 private lots in 10 subdivisions through a corporation shareholder homesite program authorized under ANILCA, and titles to these lots were conveyed to the private owners from the corporation in early 2010 (personal communication, Naoroz 2012). Although these lands have some economic value, their use is governed by restrictive covenants that state that the lands may be used only for single-family residential development for 10 years after the deeds are issued. In addition, no residential structures may be built or occupied until a legal wastewater disposal system has been installed on the lot. The covenants also give timber development rights of these homesite lots to the City of Angoon (Kootznoowoo, Inc. 2009).

3.6.5 Cost of Living

Rising fuel and other prices have strongly impacted communities in Southeast Alaska, raising the cost of living while employment rates continue to decline. High fuel prices will continue to disproportionately affect rural Alaska communities such as Angoon because of their diesel-fueled electricity generation and because of increased fuel costs associated with transportation. While many rural communities are seeking to develop lower-cost renewable energy sources, the actual construction of facilities would be years into the future. As discussed previously, there are several potential developments being studied in the Angoon area, including a tidal energy facility and two hydroelectric facilities.

3.6.6 Subsistence Activity

As discussed in section 3.3.5, Angoon households participate heavily in subsistence activities, with an average per capita harvest of nearly 225 pounds of subsistence goods per year. Subsistence harvest will likely continue to provide necessities for many Angoon families for the foreseeable future. However, subsistence harvest alone does not fulfill every physical need, and some cash income, whether earned income or government subsidy, is needed for residents to outfit themselves to perform subsistence activities.

Among subsistence resources harvested by Angoon residents, fish are the most abundant, and among fish, salmon is the cornerstone of the subsistence harvest. Table 18 presents numbers of salmon caught by Angoon residents under subsistence fishing permits from 1999 to 2008, regardless of where the fish were caught. Sockeye salmon is the most prevalent catch, followed by coho salmon.

Halibut is also an important component of the subsistence economy. Table 19 presents the halibut catch by Angoon residents for subsistence use from 2003 to 2007. As of November 2009, 36 Angoon residents had been issued a subsistence halibut registration certificate (SHARC) by the National Marine Fisheries Service, and 13 of those certificates were current (National Oceanic and Atmospheric Administration Fisheries Service 2009).

Table 18. Subsistence Salmon Catch by Angoon Residents, Numbers of Fish Caught, 1999–2008

Year	Permits Issued	Permits Fished	Chinook	Sockeye	Coho	Pink	Chum
1999	110	54	0	1,620	291	32	3
2000	115	46	0	1,344	147	19	50
2001	117	38	1	1,147	213	133	83
2002	91	34	0	751	40	67	21
2003	102	39	0	1,496	36	6	2
2004	106	42	0	1,479	107	107	58
2005	90	14	0	261	12	25	0
2006	96	20	0	658	20	9	0
2007	86	14	1	56	47	62	0
2008	87	38	0	637	120	0	15

Source: (ADF&G Commercial Fisheries Division 2009)

Table 19. Estimated Subsistence Halibut Catch by Angoon Residents, SHARC Holders in Area 2C Using All Gear, 2003–2007

Year	Number of Fish	Lbs of Fish
2003	1,142	20,283
2004	1,435	32,009
2005	1,231	25,166
2006	954	16,875
2007	836	16,429

Sources: (Fall and Koster 2008; Fall et al. 2004, 2005, 2006, 2007).

Note: Area 2C encompasses all of Southeast Alaska south of Glacier Bay.

Deer, abundant on Admiralty Island, is another widely used subsistence resource. Table 20 summarizes deer harvest in the Angoon area from 2004 to 2010. Because the ADF&G does not differentiate between sport and subsistence deer harvest, some of this harvest could represent guided hunting, which is part of the tourism industry. However, based on general discussions with local residents and land managers, the vast majority of the activity illustrated by Table 20 is estimated to be related to subsistence hunting. As shown below, the deer hunting effort has fluctuated over time. Some of the yearly fluctuations are likely the result of changes in environmental conditions.

It should be remembered that data regarding subsistence harvest by Angoon residents are limited and noncomprehensive. For example, harvest data tracked by the ADF&G and other agencies typically do not focus on individual local water bodies but on larger geographic areas. Additionally, harvest data gathered by such agencies focus on specific, common resources, such as certain types of fish; the agencies only nominally track harvest of less common resources, such as shellfish. No statistics for subsistence or personal-use shellfish caught in Favorite Bay, adjacent to Angoon, are available; however, anecdotal evidence suggests that Favorite Bay is an important location for the harvest of a number of types of marine invertebrates by Angoon residents.

Table 20. Subsistence Deer Harvest in Angoon Area, 2004–2010

	2004	2005	2006	2007	2008	2009	2010
Total hunters	37	23	38	51	59	59	53
Total days hunted	330	79	203	294	448	252	179
Total deer harvested	132	45	89	111	186	193	168

Source: (Mooney 2013)

3.7 Children's Environmental Health and Safety Risks

Executive Order 13045, the Protection of Children from Environmental Health Risks, directs federal agencies to prioritize the identification and assessment of environmental health risks and safety risks that may disproportionately affect children. Risks can include such things as effects from increased noise on children's learning or sleep, or increased pollutants or reductions in air quality in areas frequented by children (for instance, playgrounds). Agencies are encouraged, but not required, to participate in implementation of the order by ensuring that their policies, programs, activities, and standards address disproportionate risks to children resulting from environmental health risks or safety risks.

There are two schools and one Head Start building within the Angoon area, both near the city center. None of the airport alternatives are closer than 1.5 miles to the schools; however, the approach and departure path for one of the airport alternatives would likely pass directly over the community. Noise and air quality analyses are being conducted as part of studies for the airport project and will be reported in the EIS.

Literature Cited

ACFEC. 2013. Permit and fishing activity, Skagway-Hoonah-Angoon Census Area, 1990–2010. Available at: http://www.cfec.state.ak.us/fishery_statistics/earnings.htm. Accessed April 10, 2013.

ADCCED. 2012a. Community database online: Angoon. Available at: http://commerce.alaska.gov/cra/DCRAExternal/community/Details/72294383-ddd6-4441-8c63-eb92786a82a1. Accessed October 8, 2012.

———. 2012b. *Current Community Conditions, Alaska Fuel Price Report, January 2012.* Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs Research and Analysis Section.

———. 2013. Business license database search, city = Angoon. Available at: http://commerce.alaska.gov/CBP/Main/CBPLSearch.aspx?mode=BL. Accessed April 25, 2013.

ADF&G Commercial Fisheries Division. 2009. Historic subsistence salmon catch reported under permits issued to Angoon residents. Data search performed by David Harris, assistant area management biologist, in December 2009.

ADF&G Sport Fish Division. 2013. Juneau sport fish harvest and effort estimates by fisheries and species, 2001–2011. Alaska sport fishing survey, Survey Area E estimates. Available at: http://www.adfg.alaska.gov/sf/sportfishingsurvey/index.cfm?ADFG=main.home. Accessed March 1, 2013.

ADF&G Subsistence Division. 2009. 1996 community subsistence information system. Available at: http://www.subsistence.adfg.state.ak.us/CSIS/. Accessed December 15, 2009.

AMHS. 2000. *Annual Traffic Volume Report 2000.* Prepared for the Alaska Department of Transportation and Public Facilities.

———. 2008*. Annual Traffic Volume Report 2008.* Prepared for the Alaska Department of Transportation and Public Facilities.

———. 2012*. Annual Traffic Volume Report 2012.* Prepared for the Alaska Department of Transportation and Public Facilities.

———. 2013. Southeast Alaska/inside passage passenger and vehicle fares, summer 2013 thru [sic] September 2013. Available at: http://www.dot.state.ak.us/amhs/doc/fares/W12S13_SETariffs.pdf. Accessed April 2, 2013.

Alaska Seaplane Services. 2013a. Alaska Seaplane Services home page. Available at: http://www.flyalaskaseaplanes.com/index.html. Accessed April 2, 2013.

Alaska Seaplane Services. 2013b. Alaska Seaplane Charter costs. Telephone conversation between John, Alaska Seaplane Services, and Sue Wilmot, SWCA Environmental Consultants, April 2, 2013.

Barnard Dunkelberg & Company. 2008. *Angoon Airport Environmental Impact Statement, Supplemental Airport Planning Memorandum, Working Paper One*. Available at: www.angoonairporteis.com. Accessed July 2011.

Biller, J. 2010. Breakout of wages earned by Angoon residents by industry group for 2008. E-mail communication between J. Biller, research analyst at Alaska Department of Labor and Workforce Development, Research and Analysis Section, and Linda J. Snow, economist, Southeast Strategies.

Coeur Alaska. 2012. Kensington – Alaska. Leading Coeur's growth in gold. Available at: http://www.kensingtongold.com/. Accessed October 8, 2013.

Coeur Mining. 2013. Kensington, Alaska 100% gold operation. Available at: http://www.coeur.com/operations/kensington-alaska. Accessed July 23, 2013.

DOL&WD. 2012. *Alaska Population Projections, 2010–2035.* Juneau: Alaska Department of Labor and Workforce Development, Research and Analysis Section.

———. 2013a. Alaska Local and Regional Information (ALARI) employment data: Alaska (all boroughs/census areas), Southeast region, the Hoonah-Angoon Census Area, and Juneau (city and borough). Available at: http://live.laborstats.alaska.gov/alari/. Accessed March 27, 2013.

———. 2013b. Alaska Local and Regional Information (ALARI): Hoonah-Angoon Census Area employers by category. Available at: http://live.laborstats.alaska.gov/employers/index.cfm. Accessed April 15 and 23, 2013.

DOT&PF. 2004. *Angoon Airport Reconnaissance Study*. Prepared by R&M Engineering, Inc. with Sheinberg Associates, Southeast Strategies, URS Corporation, and IHH Electrical for the Alaska Department of Transportation and Public Facilities, Southeast Region. Available at: www.angoonairporteis.com.

———. 2007. *Angoon Airport Master Plan*. Available at: www.angoonairporteis.com.

———. 2008. *Southeast Region Aviation System Plan Final Report*. Prepared by DOWL Engineers and Southeast Strategies for State of Alaska, Department of Transportation and Public Facilities, Southeast Region.

FAA. 2004. *Environmental Impacts: Policies and Procedures*. Federal Aviation Administration. Available at: http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/13975. Accessed December 2011.

———. 2006. *NEPA Implementing Instructions for Airport Actions*. Federal Aviation Administration. Available at: http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/14836. Accessed December 2011.

———. 2009. Air Carrier Activity Information System: Passenger enplanements for calendar years 2007 and 2008 by airport. Available at: http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/cy08_primary_np_comm.pdf. Accessed November 2009.

Fall, J.A., M. George, and B. Easley. 2005. *Subsistence Harvests of Pacific Halibut in Alaska, 2004.* Technical Paper No. 304: Alaska Department of Fish and Game.

Fall, J.A., M. Kerlin, B. Easley, and R.J. Walker. 2004. *Subsistence Harvests of Pacific Halibut in Alaska, 2003.* Technical Paper No. 288: Alaska Department of Fish and Game.

Fall, J.A., and D. Koster. 2008. *Subsistence Harvests of Pacific Halibut in Alaska, 2007.* Technical Paper No. 342: Alaska Department of Fish and Game.

Fall, J.A., D. Koster, and B. Davis. 2006. *Subsistence Harvests of Pacific Halibut in Alaska, 2005.* Technical Paper No. 320: Alaska Department of Fish and Game.

Fall, J.A., D. Koster, and M. Turek. 2007. *Subsistence Harvests of Pacific Halibut in Alaska, 2006.* Technical Paper No. 333: Alaska Department of Fish and Game.

Gorsuch, L. 2011. Allen Marine Services costs for chartering catamaran trips between Angoon and Juneau and the frequency of charters by lodges in Angoon. Telephone conversation between Lonnie Gorsuch, Allen Marine Services, and Linda J. Snow, Economist, Southeast Strategies, on January 5, 2011.

International Pacific Halibut Commission. 2009. Federally managed commercial halibut catch in Statistical Area 171 (Chatham Strait Area), 1999–2008. Data search performed by Tom Kong, biologist, in December 2009.

Kootznoowoo, Inc. 2009. *Summary of Declaration of Restrictive Covenants for Kootznoowoo Shareholder Homesite Subdivisions.* Juneau, Alaska: Kootznoowoo, Inc.

———. 2013. Governance. Available at: http://www.kootznoowoo.com/?page_id=7. Accessed March 26, 2013.

McDowell, M. 2010. Discussion about fish processing at Angoon and historical commercial fishing effort by Angoon residents. Telephone communication between M. McDowell, vice president of Pacific Seafood Processors Association, Juneau, and Linda J. Snow, economist, Southeast Strategies on January 4, 2010.

Mooney. P. 2013. Angoon deer harvest, 2004–2010. Data obtained from Philip W. Mooney, Alaska Department of Fish and Game on May 14, 2013, as requested by George Weekley, SWCA Environmental Consultants.

Naoroz, P. 2012. Discussion of land reconveyance via ANCSA 14(c). Telephone communication on January 17, 2012, with Jamie Young, SWCA Environmental Consultants.

Naoroz, P., and R. Nease. 2010. Discussion about the corporation's future development plans at Angoon, and the cash dividends distributed to shareholders over the past few years, between P. Naoroz, chief executive officer; R. Nease, human resources manager for Kootznoowoo, Inc.; and Linda J. Snow, economist, Southeast Strategies. Telephone communication on January 7, 2010.

National Oceanic and Atmospheric Administration Fisheries Service. 2009. Web page regarding subsistence halibut registration certificates (SHARC) issued, by community. Available at: http: //www.fakr.noaa.gov/ram/daily/sharc_summary.pdf. Accessed November 2009.

Neary, J. 2009. Discussion about recreation use in the Proposed Angoon Airport Project Area. Telephone conversation between John Neary, Wilderness Field Manager, Admiralty Island National

Monument and Kootznoowoo Wilderness Area, U.S. Forest Service, and Linda J. Snow, Southeast Strategies, on November 20, 2009.

Plotnick, M. 2009. Total annual commercial harvest information, statistical areas 112-18 and 112-67, 1999–2008. Search results Alaska Department of Fish and Game Division of Commercial Fisheries Fish Ticket Databases, December 10, 2009. Obtained from Mike Plotnick, Alaska Department of Fish and Game, as requested by Linda Snow, Economist, Southeast Strategies.

Powers, D. 2009. Discussion about tourism business in Angoon between Dick Powers, owner, Whaler's Cove Lodge, Angoon, and Linda J. Snow, economist, Southeast Strategies. Telephone communication on December 30, 2009.

Powers, K. 2012. Number of travelers in and out of Whaler's Cove Lodge, summer 2011. E-mail exchange between Kristine Powers, Whaler's Cove Lodge, and Jamie Young, SWCA Environmental Consultants, May 30, 2012.

Southeast Strategies. 2012. *Land Use Resources Existing Conditions Technical Report for Angoon Airport Environmental Impact Statement*. Prepared for Federal Aviation Administration and Alaska Department of Transportation and Public Facilities. Douglas, Alaska: Southeast Strategies.

SWCA Environmental Consultants. 2011. *Subsistence Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement*. Prepared for Federal Aviation Administration and Alaska Department of Transportation and Public Facilities. Salt Lake City, Utah: SWCA.

Thompson, M. 2010. Discussion about the economy of Angoon and future trends between Maxine Thompson, owner of Angoon Trading, Angoon Oil, and Thompson Management, and Linda J. Snow, economist, Southeast Strategies. Telephone communication on January 8, 2010.

U.S. Bureau of Economic Analysis. 2013. Regional economic accounts, BEARFACTS for Hoonah-Angoon Census Area, Alaska. Available at: http: //www.bea.gov/regional/bearfacts/action.cfm. Accessed July 23, 2013.

U.S. Census Bureau. 2013. 2007-2011 American Community Survey 5-Year estimates for Angoon, Hydaburg, and Kake, Alaska. Available at: http://factfinder2.census.gov/. Accessed April 2, 2013.

U.S. Department of Transportation. 2010. Order 2010-12-7, Essential Air Service at Angoon, Alaska, and Tenakee, Alaska. Order reselecting carrier. Available at: http://www.regulations.gov/#!documentDetail;D=DOT-OST-2006-25542-0019. Accessed January 5, 2012.

USFS. 2008. *Tongass Land Management Plan*. R10-MB-603b, Juneau, Alaska: U.S. Forest Service. Available at: www.fs.fed.us/r10/tongass/projects/tlmp/index.shtml. Accessed November 2009.

———. 2012a. *National Environmental Policy Act Handbook*, Forest Service Handbook 1909.15. U.S. Forest Service. Available at: http://www.fs.fed.us/emc/nepa/nepa_procedures/. Accessed May 6, 2013.

————. 2012b. *Forest Service Manual 1900, Planning Chapter 1950 – Environmental Policy and Procedures.* U.S. Forest Service. Available at: http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsm?1900!.. Accessed May 6, 2013.

Acronyms

ACFEC	Alaska Commercial Fisheries Entry Commission
ADCCED	Alaska Department of Commerce, Community, and Economic Development
ADF&G	Alaska Department of Fish and Game
AMHS	Alaska Marine Highway System
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CSU	conservation system unit
DOL&WD	Alaska Department of Labor and Workforce Development
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	environmental impact statement
FAA	Federal Aviation Administration
FSH	Forest Service Handbook
FTE	full-time equivalent
Monument–Wilderness Area	Admiralty Island National Monument and Kootznoowoo Wilderness Area
NEPA	National Environmental Policy Act
PL	Public Law
SHARC	subsistence halibut registration certificate
TLMP	*Tongass Land and Resource Management Plan*
U.S.C.	United States Code
USFS	United States Forest Service

APPENDIX N

ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT (ANILCA) SECTION 810 EVALUATION

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

ANGOON AIRPORT
Environmental Impact Statement

ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT SECTION 810 EVALUATION OF EFFECTS TO SUBSISTENCE RESOURCES AND USES

Prepared for

Federal Aviation Administration
and
Alaska Department of Transportation and Public Facilities

Prepared by

SWCA Environmental Consultants

April 29, 2014

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska. At present, there is no land-based airport runway in or near Angoon. The DOT&PF prepared the *Angoon Airport Master Plan* (DOT&PF 2007) for their proposed airport location. The FAA is evaluating five alternatives, including the proposed action, in the draft environmental impact statement (draft EIS). These alternatives consist of three airport locations and their associated access roads. As shown in Figure 1, two of the airport alternatives (Airport 3a and Airport 4) and portions of their associated access roads are located on lands administered by the U.S. Forest Service (USFS) within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area). Airport 12a is the FAA's preferred alternative, and it is located on lands owned or managed by private landowners, Kootznoowoo Inc., or the City of Angoon. See Figure 1 for the location of each alternative relative to landownership.

The proposed land-based airport would be a small, commercial airport typical of other rural airports in the region. The initial construction would include a 3,300-foot-long, 75-foot-wide paved runway, and the runway length could be extended to 4,000 feet in the future if air traffic warrants it. The airport would have a short perpendicular taxiway leading from the runway to a small apron area. The proposed airport is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The proposed access road for the two alternatives in the Monument–Wilderness Area would include two paved 9-foot-wide lanes with 1-foot shoulders, and the right-of-way would be sized for future expansion to two 10-foot-wide lanes with 5-foot shoulders. The access road for Airport 12a would immediately be built to two 10-foot lanes with 5-foot shoulders.

In the draft EIS, section 4.13 Subsistence Resources and Uses provides a detailed description of the existing conditions of subsistence resources and uses in the area of the alternatives, and the potential effects to those resources and uses from the alternatives. For the purposes of the EIS, a study area was established based on the extent of a map shown during interviews with Angoon-based subsistence users. The areas of subsistence use identified during these interviews are hereafter referred to as "subsistence use areas" or simply "use areas." Combined, these use areas and the study area (Figure 2) form the area analyzed for effects in this evaluation. Angoon residents occasionally use a broader area for harvest of certain species, and this is described where applicable. This appendix uses the detailed information presented in the EIS to evaluate the potential effects to subsistence pursuant to Section 810(a) of the Alaska National Interest Land Conservation Act (ANILCA) (Public Law [PL] 96-487).

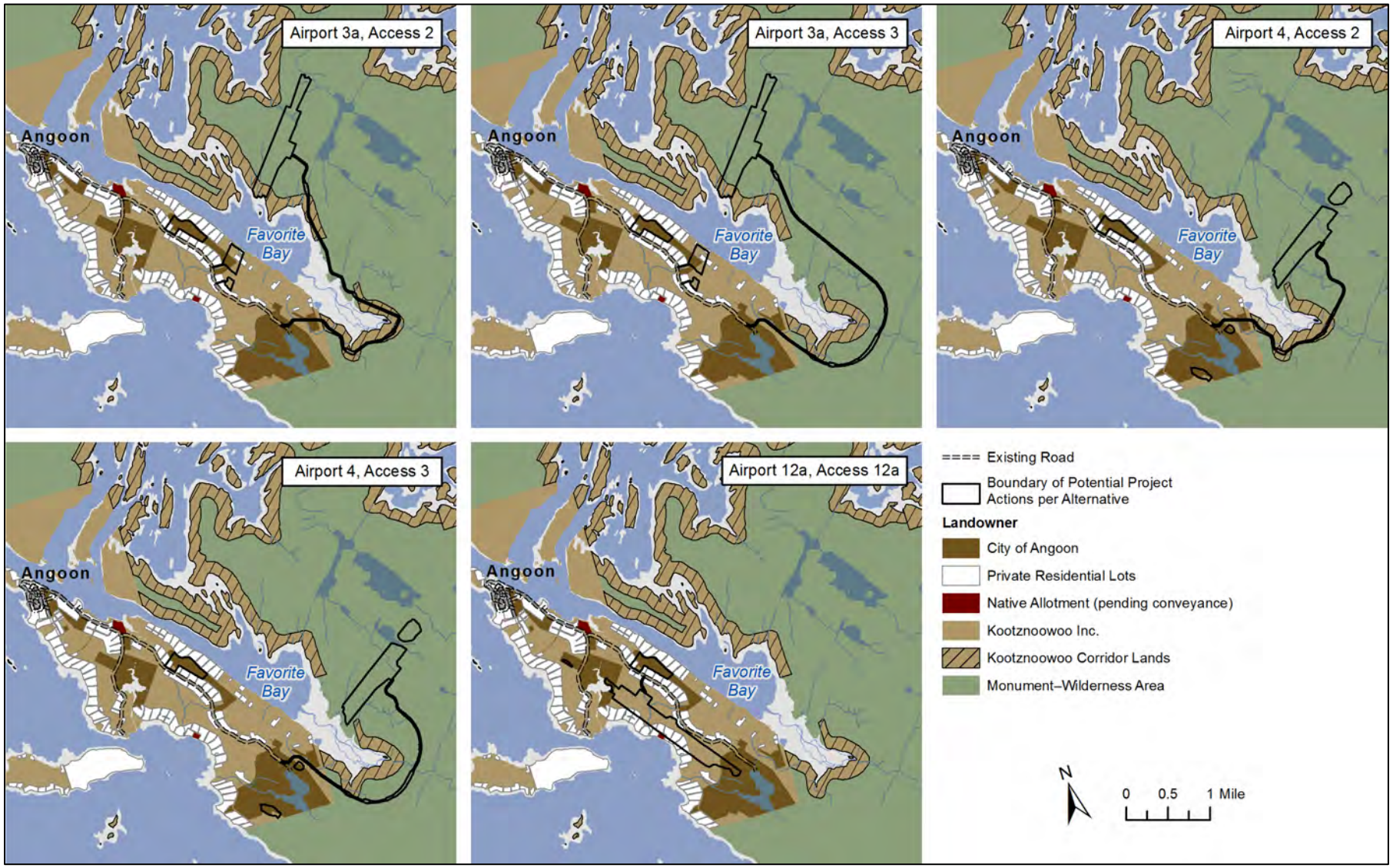

Figure 1. Location of action alternatives relative to landownership.

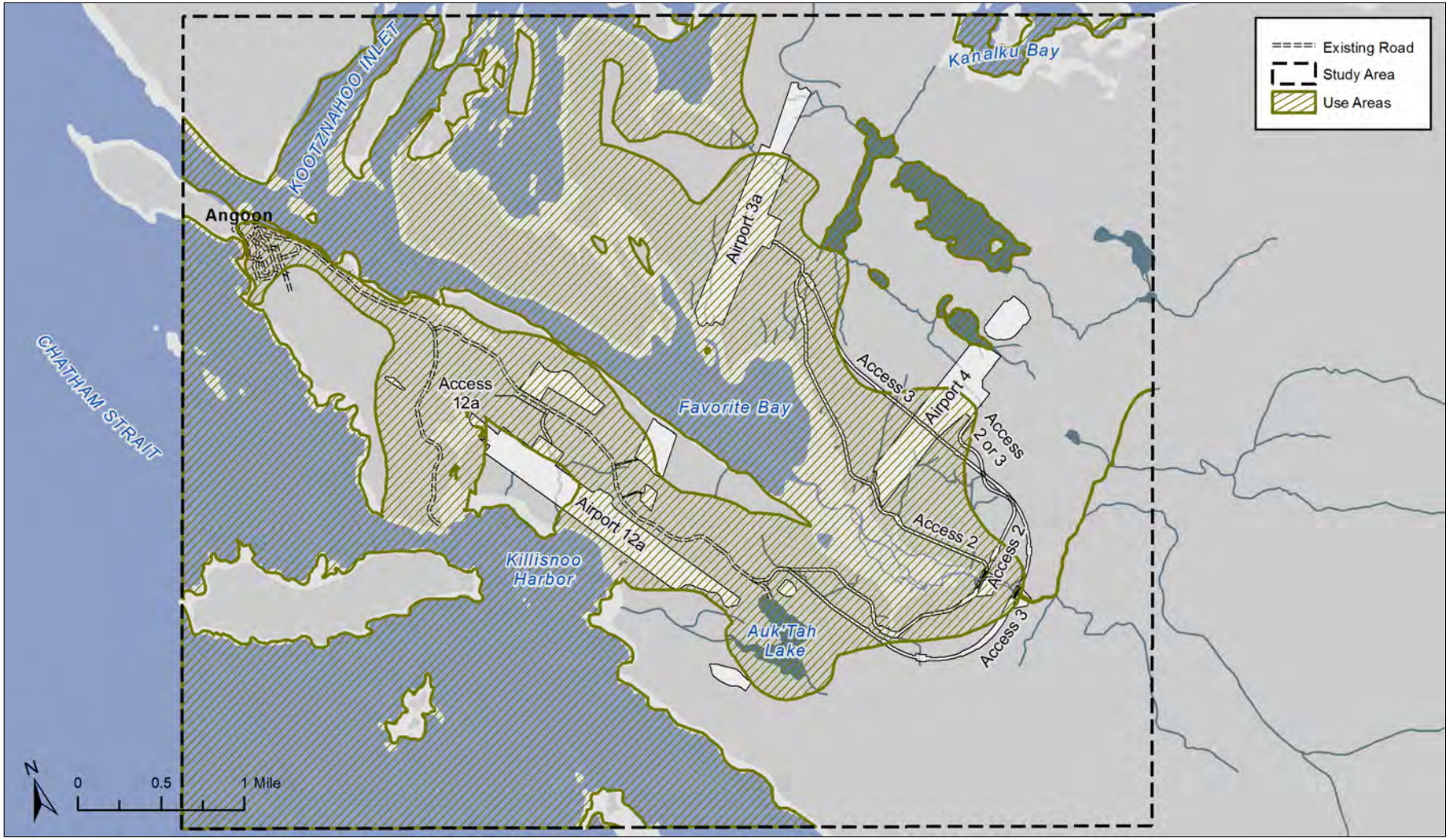

Figure 2. Study area initially assessed for subsistence resources and uses, and the combined use areas that Angoon residents use.

2.0 SECTION 810 EVALUATION PROCESS

Section 810(a) of ANILCA states the following:

> In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands…the head of the Federal agency…over such lands…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. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency -- (1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to §805; (2) gives notice of, and holds, a hearing in the vicinity of the area involved; and (3) determines that -- (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions.

3.0 DEFINITIONS AND LEGAL CONTEXT

Although there are many popular cultural and sociological definitions and interpretations of subsistence, in 1980 Congress provided a legal description of subsistence in Title VIII of ANILCA (PL 96-487). Section 803 of ANILCA defines "subsistence use" as

> the customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal, or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade.

Under Alaska state law, "subsistence uses" are defined as

> the noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption, such as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; and for customary trade, barter, or sharing for personal or family consumption. (Alaska Statute [AS] 16.05.940[32])

ANILCA does not distinguish between native and non-native populations. In ANILCA, Section 801 provides for

> (1) the continuation of the opportunity for subsistence uses by rural residents of Alaska, including both Natives and non-Natives, on the public lands and by Alaska Natives on Native lands is essential to Native physical, economic, traditional, and cultural existence and to non-Native physical, economic, traditional, and social existence…
>
> (4) in order to fulfill the policies and purposes of the Alaska Native Claims Settlement Act and as a matter of equity, it is necessary for the Congress to invoke its constitutional authority over Native affairs and its constitutional authority under the property clause and the commerce clause to protect and provide the <u>opportunity</u> for continued subsistence uses on the public lands by Native and non-Native rural residents;

ANILCA Section 802 states that

> (1) consistent with sound management principles, and the conservation of healthy populations of fish and wildlife, the utilization of the public lands in Alaska is to cause the least adverse impact possible on rural residents who depend upon subsistence uses of the resources of such lands; consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for each unit established, designated, or expanded by or pursuant to Titles II through VII of this Act, the purpose of this title is to provide the opportunity for rural residents engaged in a subsistence way of life to do so;
>
> (2) nonwasteful subsistence uses of fish and wildlife and other renewable resources shall be the priority consumptive uses of all such resources on the public lands of Alaska when it is necessary to restrict taking in order to assure the continued viability of a fish and wildlife population or the continuation of subsistence uses of such population, the taking of such population for nonwasteful subsistence uses shall be given preference on the public lands over other consumptive uses….

ANILCA Section 102 defines public lands as

> land situated in Alaska which, after the date of enactment of this Act, are Federal lands except--
>
> (A) land selections of the State of Alaska which have been tentatively approved or validly selected under the Alaska Statehood Act and lands which have been confirmed to, validly selected by, or granted to the Territory of Alaska or the State under any other provision of Federal law;
>
> (B) land selections of a Native Corporation made under the Alaska Native Claims Settlement Act which have not been conveyed to a Native Corporation, unless any such selection is determined to be invalid or is relinquished; and
>
> (C) lands referred to in §19(b) of the Alaska Native Claims Settlement Act.

In regard to consumptive uses, provisions in ANILCA state

> [t]he taking on public lands of fish and wildlife for nonwasteful subsistence uses shall be accorded priority over the taking on such lands of fish and wildlife for other purposes. Whenever it is necessary to restrict the taking of populations of fish and wildlife on such lands for subsistence uses in order to protect the continued viability of such populations, or to continue such uses, such priority shall be implemented through appropriate limitations based on the application of the following criteria:
>
> 1. customary and direct dependence upon the populations as a mainstay of livelihood;
> 2. local residency; and
> 3. the availability of alternative resources." (ANILCA Section 804)

Finally, ANILCA Section 811(a) states that

> (a) the Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands.

3.1 Additional Applicable Requirements

Executive Order 13175: *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000). This executive order establishes principles and standards for government-to-government consultation with tribal governments on "policies that have tribal implications." Consultation with tribal governments on subsistence, along with other issues, is an integral part of the public involvement process for an EIS. Although Section 810 does not establish separate or additional requirements concerning consultation with tribal governments, the Section 810 review benefits from outreach to the tribal governments through the EIS. FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures, contains the FAA's policy on consultation with tribal governments. The USFS has additional guidance on government-to-government relations with Alaska Native tribes in Section 1563 of the USFS *Manual on American Indian and Alaska Native Relations*.

Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* (February 11, 1994) calls for an analysis of the effects of federal actions on environmental justice, specifically on minority populations with regard to subsistence. As defined by the Environmental Protection Agency, environmental justice is

> the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.
>
> Fair treatment means that no group of people, including any racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.
>
> Meaningful involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected. (EPA 2012)

Executive Order 12898 Section 4-4 Subsistence Consumption of Fish and Wildlife requires federal agencies to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence, and to communicate to the public any risks associated with the consumption patterns.

The subsistence analyses for all alternatives evaluated in the draft EIS were prepared to comply with Executive Order 12898.

The FAA's *Order 1050.1E, Chg 1. Policies and Procedures for Considering Environmental Impacts* (FAA 2006a). Appendix A, Section 16, Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks, requires "disclosure of the effects on subsistence patterns and consumption of fish, vegetation, or wildlife, and effective public participation and access to this information" as part of the evaluations related to environmental justice.

The FAA's *Order 5050.4B,National Environmental Policy Act Implementing Instructions for Airport Actions* (FAA 2006b). Although FAA Order 5050.4B does not specifically address subsistence practices or resources, it reiterates the FAA's policies contained in Order 1050.1E.

3.2 Subsistence Evaluation Factors

Section 810(a) of ANILCA requires that the federal land management agency complete an evaluation of subsistence resources and uses for any federal determination to "withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands." Therefore, an evaluation of potential effects to subsistence under ANILCA Section 810(a) must be completed for the actions proposed in the EIS. ANILCA requires that this evaluation include findings on three specific issues:

- The effects of use, occupancy, or disposition on subsistence resources and uses
- The availability of other lands for the purpose sought to be achieved
- Other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes (16 United States Code [USC] 3120)

The evaluation and findings required by ANILCA Section 810(a) are set out for each of the action alternatives considered in the EIS. If it is determined that there are alternatives that may significantly restrict subsistence uses, additional requirements would be imposed, including provisions for notices to the State of Alaska and

appropriate regional and local subsistence committees, a hearing in the vicinity of the area involved, and the making of the findings listed below, as required by Section 810(a)(3).

- Such a significant restriction of subsistence uses is necessary, and consistent with sound management principles for the utilization of the public lands;
- The proposed activity would involve the minimal amount of public lands necessary to accomplish the purposes of use, occupancy, or other disposition; and
- Reasonable steps would be taken to minimize adverse effects upon subsistence uses and resources resulting from such actions.

The Alaska Land Use Council clarified the definition of a "significant restriction of subsistence use" as follows:

> A proposed action shall be considered to significantly restrict subsistence uses, if after any modification warranted by consideration of alternatives, conditions, or stipulations, it can be expected to result in a substantial reduction in the opportunity to continue subsistence uses of renewable resources.

(Note: The Alaska Land Use Council was originally established by federal law (16 USC 3181) to study land and resource uses in Alaska and to advise federal and state decision-makers on those uses. It has been terminated because Congress declined to reauthorize it.)

The Bureau of Land Management provided additional clarification, which was affirmed in the U.S. District Court decision of record in *Kunaknana v. Clark*, 742 F.2d 1145 (9th Cir. 1984). In part, it states that

> …restrictions for subsistence uses would be significant if there were large reductions in abundance or major redistribution of these resources, substantial interference with harvestable access to active subsistence sites, or major increases in non-rural resident hunting.

This description of significant restrictions is used as the baseline for establishing effects evaluation criteria for the EIS. To determine if a significant restriction of subsistence resources and uses may result from any one of the alternatives discussed in the EIS, including their cumulative effects, the following four factors are considered:

- Reductions in the abundance of subsistence resources caused by a decline in the population or amount of harvestable resources
- Reductions in the availability of subsistence resources caused by redistributions of the resources (i.e., alteration of normal locations and distribution patterns)
- Limitations on access to subsistence resources, including both physical access and legal access
- Increases in competition for subsistence resources from non-rural users

The *Kunaknana v. Clark* opinion does not provide a definition or interpretation of what constitutes a "large reduction," "major redistribution," "substantial interference," or "major increase." For the purpose of this EIS, and taking into consideration the nature of subsistence use and local environmental conditions in the Angoon area, the FAA is using these terms as follows:

- Large reductions in abundance or a major redistribution of the resources: Noticeable and recognizable declines in subsistence resource populations or distributions (in other words, the "availability" of the resource) and, subsequently, reductions in subsistence resource harvests caused by project actions. A reduction of more than 16% in the total harvest of a resource would be considered large, because it would be greater than the average annual variability in total harvest for a representative terrestrial species—deer—that has fluctuated annually by an average of 16% in total harvest from 2004 to 2010

(Alaska Department of Fish and Game 2013). This threshold conservatively assumes that project-related terrestrial wildlife subsistence use area changes will directly correlate to changes in total subsistence harvest.

- Substantial interference with access to subsistence use areas.
- Major increases in use by non-rural persons: Increases in non-rural use beyond existing levels that would cause local subsistence users to either quit using certain subsistence use areas or find alternate locations.

This evaluation focuses on subsistence resources most likely to be affected by habitat degradation associated with construction and operation activities at the proposed Angoon Airport. The definition provided above specifically identifies four potential effects for determinations of significance related to subsistence uses: 1) resource abundance, 2) resource availability, 3) access to resources, and 4) competition for the use of resources.

Section 4.13 of the EIS, Subsistence Resources and Uses, provides information on resources important for subsistence use within the study area, and provides data on the levels of reduction and limitation under each alternative that were used to determine whether the action would cause a significant restriction to subsistence. The information contained in the EIS is the primary data used in this analysis.

A subsistence evaluation and findings under ANILCA Section 810 must also include a cumulative effects analysis. This appendix evaluates the FAA's preferred alternative as part of the cumulative case (see section 8.7). This approach helps the reader separate the subsistence restrictions caused by activities proposed under the preferred alternative from those caused by past, present, and future activities that could occur, or have already occurred, in the surrounding area.

3.3 Subsistence Resource Management

Different legal frameworks regulate subsistence on lands of different status. The State of Alaska administers the harvest of fish and wildlife on all lands in Alaska, including for subsistence purposes, except as specifically superseded by federal law. When it is necessary to implement a federal subsistence priority under the terms of Title VIII of ANILCA, the Federal Subsistence Board regulates subsistence hunting on federally administered uplands and fishing on waters where there is a federal reserved water right. State, private, and Native-selected or -owned lands are generally not within the jurisdiction of the federal subsistence management program and are regulated by the State of Alaska.

The land in and around the study area is owned or managed by the USFS, State of Alaska, private landowners, Kootznoowoo Inc., and the City of Angoon. The federal lands in the study area are within the Monument–Wilderness Area. Favorite Bay and most other submerged lands and tidelands below mean high water (approximately 15 feet above mean sea level) are owned and managed by the State of Alaska.

Kootznoowoo, Inc. is the local village Alaska Native Corporation established under the Alaska Native Claims Settlement Act (ANCSA). Kootznoowoo, Inc. holds title to lands in and around Angoon under ANCSA. Portions of the lands on the peninsula south of Angoon disbursed to Kootznoowoo, Inc. under ANCSA have been divested to Kootznoowoo, Inc. shareholders. These lands are considered private lands.

In addition, under Section 506 of ANILCA, Kootznoowoo, Inc. holds title to any rocks, pinnacles, islands, islets, and lands from the mean high tide mark to a point 660 feet inland; in and adjacent to the inland waters from Kootznahoo Inlet to the rangeline separating Range 68 East and Range 69 East, Copper River Base and Meridian, and those parts of Mitchell, Kanalku, and Favorite bays west of that line. These lands are called the Kootznoowoo Corridor Lands (see Figure 1). The U.S. government reserves the following rights to these lands:

- All timber rights are reserved subject to subsistence uses consistent with Title VIII of ANILCA.
- The right of public access and use within such area, subject to regulation by the Secretary of Agriculture to insure protection of the resources, and to protect the rights of quiet enjoyment of Kootznoowoo, Inc., granted by law, including subsistence uses consistent with Title VIII of ANILCA.
- The subsurface estate.
- The development rights, except that the Secretary of Agriculture is authorized to permit construction, maintenance, and use of structures and facilities on said land which he [or she] determines to be consistent with the management of the Admiralty Island National Monument: *Provided* that all structures and facilities so permitted shall be constructed of materials which blend and are compatible with the immediate and surrounding landscape.

The City of Angoon also owns land on the Angoon peninsula within the study area (see Figure 1).

Subsistence activities occurring in offshore federal waters (more than 3 miles from the coast) are not subject to ANILCA. However, offshore waters and all lands in Alaska are subject to the Marine Mammal Protection Act (16 USC 1361–1407), the Endangered Species Act (16 USC 1531 et seq.), the Migratory Bird Treaty Act (16 USC 703–712), and the Migratory Waterfowl Hunting and Conservation Stamp Act (16 USC 718–718h). The Marine Mammal Protection Act and the Endangered Species Act forbid the harvest of marine mammals and endangered species except by Native Americans for non-wasteful subsistence purposes.

4.0 STUDY AREA DESCRIPTION AND HISTORY

The study area is located around the community of Angoon, a second-class city in Southeast Alaska with a population of around 450 residents. Angoon is the only permanent settlement on Admiralty Island, and is located approximately 55 miles south of Juneau and 41 miles northeast of Sitka. Angoon has no road links to any other developed areas, and its residents are completely dependent upon seaplane or boat transportation throughout the year (ADCCED 2013).

The major habitats found in the study area include the spruce-hemlock forest, freshwater streams and wetlands, coastal marshes and estuarine tidal flats, alpine tundra, muskeg, coastal shorelines, and open ocean.

The spruce-hemlock forest is habitat for Sitka black-tailed deer, brown bear, smaller furbearing mammals such as marten, several species of songbirds, and many edible plants. Freshwater streams are habitat for many species of fish, including all five species of Pacific salmon found in Alaska, Dolly Varden, steelhead/rainbow trout, and cutthroat trout. Freshwater wetlands support minks, river otters, and waterbirds. Coastal marshes and estuarine tidal flats are among the richest ecosystems in the study area. The marshes and estuarine areas provide habitat for waterbirds, shorebirds, juvenile fishes, invertebrates such as clams and mussels, minks, edible plants and seaweed, and other wildlife such as brown bears at certain times of the year. The alpine tundra ecosystem is habitat for primarily Sitka black-tailed deer and brown bears. Muskeg habitats are home to many edible plants and berries, deer, brown bears, and many birds. Finally, coastal shorelines and open ocean habitat support several species of edible seaweed, invertebrates (such as scallops, shrimp, crabs, and abalone), many species of fish, and marine mammals such as seals, porpoises, sea otters, and whales.

Archaeological sites at Groundhog Bay, Hidden Falls, Thorne River, and Chuck Lake indicate that Southeast Alaska has been inhabited by Alaska Natives for at least the last 11,000 years (Ackerman 1968; Ackerman et al. 1985; Davis 1989, 1990; Holmes 1987). The study area is located within the traditional territory of the Kootznoowoo Tlingit tribe (ADCCED 2013; de Laguna 1960:204; Goldschmidt and Haas 1998:67–72). Direct and indirect contact with European explorers and fur traders after the mid- to late-1700s had a devastating effect on the Native population throughout Alaska—the spread of Western diseases; adoption of a cash economy; and introduction of foreign languages, religions, and social customs dramatically affected Native populations and cultures. By the mid-1800s, the Tlingit population in the Angoon area was estimated at between approximately 300 and 700 individuals (Emmons 1991:Tables 4-6). Systematic collection of ethnographic data began in the early 1880s when a German geographer named Aurel Krause spent the winter of 1881–1882 with the Tlingit at the village of Chilkat, and continued with the work of military officers George Thornton Emmons and Albert Parker Niblack. Emmons was stationed in Tlingit territory in 1882 when he began documenting Tlingit culture. Niblack was a naval officer sent to study the Tlingit in the summers from 1885 through 1887. Although their ethnographic accounts document aspects of Tlingit culture at the time, considerable change had already occurred in Tlingit communities during the 100 years following indirect and direct contact with European and American explorers and fur traders. Tlingit communities decimated by disease and conflict with other groups consolidated their settlements and altered their seasonal movements to take advantage of jobs and trade opportunities that allowed them access to Russian and later American goods.

When the Russians sold Alaska to the United States in 1867, sea otter fur harvesting was in decline as a major commercial enterprise. The territory was placed under the control of U.S. military garrisons, and other resource extraction industries were encouraged to establish trading posts and resource extraction and processing stations throughout the state. In 1878 the Northwest Trading Company established a trading post on Killisnoo Island. Over the next two years they expanded, adding a herring reduction factory and a whaling station. At this time, some of the inhabitants of Angoon were employed to hunt whales. Following an accident where a Tlingit crewmember was killed, the family of the deceased and other villagers demanded that payment be made to the man's family and took two white men hostage; fearing a threat from the community, the Northwest Trading

Company sought assistance from the U.S. Navy. The revenue steamer *Corwin* and the tugboat *Favorite* responded by firing on the village at Angoon and raiding the village at Neltushkin, destroying community houses and canoes, and killing as many as six children. The loss of the canoes severely restricted the mobility of the Angoon community and their ability to provision themselves for the winter. Ultimately, this conflict was one of the events leading to the establishment of a civil government in Alaska in 1884 (de Laguna 1960:162), and it undoubtedly played a role in the self-organization of local government institutions in Angoon.

The town of Angoon was organized in 1917 under the Territorial laws of 1915, and an Alaska Native Service school was established in 1920. The Alaska Native Brotherhood (ANB), originally founded in Sitka in 1912 to boycott discrimination of Native peoples, established Camp No. 7 in Angoon in the early 1920s. At the time of its founding, more than half the population of Angoon joined the organization, and by the 1960s many community members had held leadership positions in the ANB or its sister organization, the Alaska Native Sisterhood (ANS) (de Laguna 1960:195). The ANB and ANS were influential in electing Alaska Native members to the Territorial Legislature, in coordination with the American Federation of Labor, for negotiating fair pay for fishers and cannery workers. By 1925, the community had acquired a diesel electric plant to provide power to many houses and to light the boardwalk; the maintenance of this plant was funded by an annual tax that the local government collected from each household. In 1936, the Angoon Community Association incorporated under the provisions of the Indian Reorganization Act of 1934. The bylaws and constitution of the Angoon Community Association—which enabled the organization to buy, own, and manage community property and borrow money from the federal government for community business development and investments—was ratified in 1939. In 1948, the community association established a law and order code, the Angoon Native Village Court, and the Village Police Force (de Laguna 1960).

Prior to its incorporation, the Angoon cash economy was dominated by outside interests such as the National Fish and Salting Company, which operated a herring processing plant on Killisnoo Island and employed many community members until the facility and settlement burned in 1928. The ability to procure federal loans allowed the community to acquire commercial fishing vessels and purchase the salmon cannery at Hood Bay in 1947. The community took over direct management of the cannery in 1949, and for many years community members worked on fishing vessels, occupied management positions, or worked on the cannery line. The cannery burned in 1961.

A city government was adopted in 1963.

The current Angoon economy is largely based on natural resource extraction, transportation and trade, educational and health services, leisure and hospitality, and local government (Alaska Department of Labor and Workforce Development 2013). Fewer than 18 individuals hold commercial fishing permits (Alaska Commercial Fisheries Entry Commission 2013). The Southeast Alaska Health Consortium clinic and city government also rank among the top employers.

5.0 IMPORTANCE OF SUBSISTENCE

For many Alaskans, subsistence is more than the harvesting, processing, sharing, and trading of natural resources; subsistence embodies cultural, social, and spiritual values at the core of Alaska Native and rural Alaskan culture. Subsistence in Alaska comprises a diverse set of localized systems of food production and distribution, representing unique combinations of ecology, community, culture, and economics (Wolfe 2004).

Nearly all rural Alaska communities depend on subsistence resources to meet at least part of their nutritional needs. The reasons for participating in subsistence are many and varied. Some individuals participate in subsistence activities to supplement personal income and provide needed food. Others pursue subsistence activities to continue cultural customs and traditions. Many others participate in subsistence activities for personal reasons related to deeply held attitudes, values, and beliefs about where their food comes from, as well as the ability to supply their family directly through their own work.

Subsistence resources are highly valued and central to the customs and traditions of many cultural groups in Alaska. These customs and traditions encompass sharing and distribution networks as well as cooperative hunting, fishing, gathering, and ceremonial activities. Sharing of subsistence foods is common in rural Alaska. Subsistence fishing, hunting, and gathering are important sources of nutrition in most rural communities. In general, statewide Alaskan subsistence harvests by rural residents consist primarily of fish (60%), followed by land mammals (20%), marine mammals (14%), birds (2%), shellfish (2%), and plants (2%) (Wolfe 2000).

In the context of the community of Angoon's seasonal and cyclical employment, subsistence harvest of fish and wildlife resources takes on special importance. Subsistence in Alaska is part of a rural economic system referred to as a mixed subsistence-market economy. Under this market system, families invest money in small-scale, efficient technologies to harvest wild foods. Fishing, hunting, and gathering subsistence resources provides a reliable economic base for many rural communities. Families and in some cases communities have invested in gill nets, motorized skiffs, and other equipment to harvest important resources. Subsistence is not oriented toward sales, profits, or commercial production; it is focused on meeting the needs of families and the community. Participants in this mixed economy in rural Alaska often augment their subsistence production with cash employment. Cash from employment provides the means to purchase equipment, supplies, and fuel used in subsistence activities. The combination of subsistence and commercial-wage activities provides the economic basis for the way of life in Alaska's rural communities (Wolfe and Walker 1987). Because of the high prices of commercial products in remote Alaska communities, the economic role of locally available fish and game takes on added importance.

Generally, subsistence harvest levels vary widely from one community to another and from year to year. Rural communities have high subsistence participation rates and rely heavily on wild foods, with approximately 86% of rural Alaska households using wild game and 95% using fish (Wolfe 2000). Wolfe's 2000 study estimated that the annual wild food harvest in Southeast Alaska was approximately 5,064,509 pounds, or 178 pounds per person per year. Participation in subsistence activities supports a variety of cultural and related values in rural communities. For example, the distribution of harvested fish and wildlife contributes to community stability through the sharing of resources. Subsistence resources also provide the foundation for native culture in Angoon and are deeply connected to traditional respect for the earth and its resources.

6.0 ANGOON HARVEST DATA

Much of the information in this analysis comes from the Alaska Department of Fish and Game (ADF&G) Community Subsistence Information System (ADF&G 2013) regarding a study of Angoon subsistence harvest in 1996, and from ADF&G Division of Subsistence technical reports (George and Kookesh 1983; George and Bosworth 1988), which highlight subsistence resources used by Angoon residents and methods of use in the community.

The 1996 harvest study is the most representative data on broad scale subsistence use for the community of Angoon to date. For it, data were collected on subsistence harvest from some households in the population so that statistical inferences could be made for the entire population. Since that study, data gathered by the ADF&G, the USFS, and the FAA's EIS team show that there have been no major changes in subsistence effort, harvest of most species, and use. More recent harvest information beyond the 1996 study was also used to characterize existing subsistence uses when those data were gathered in such a way as to constitute a representative sample of the community. Information from non-representative sampling, such as with an extremely small sample size, was reviewed and used as general subsistence resource information, but could not be applied to the entire Angoon population regarding their subsistence practices.

In addition, information was gathered from local residents to ground-truth recent subsistence harvest efforts in and near the study area. The FAA's EIS team conducted site visits and interviews with Angoon subsistence users to supplement existing information on subsistence use areas that might be affected by the project. Interviews included the use of subsistence mapping, wherein the interviewer asked Angoon residents to identify locations they or others in their household use as sources of subsistence resources. Eighteen formal interviews were conducted. These were supplemented by informal conversations with residents about their subsistence practices. Interviewees represented a cross-section of the Angoon community, and included individuals ranging from 18 to 75 years old. The methods used to prepare this report and to assess effects on subsistence resources were developed in consultation with the FAA, USFS, ADF&G, and State of Alaska ANILCA program.

Resource collection for fishes, land and marine mammals, birds, marine invertebrates, and plants occurs throughout the year in the study area, with summer being the most intense collection period. The resources harvested are shown in Table 1. Springtime harvest often involves collecting shoots of edible plants, herring, herring eggs, seaweed, clams, and other intertidal resources. Residents primarily harvest fish resources in the summer and early fall, either under subsistence, commercial, or sport-fishing regulations. Fish harvest involves mostly salmon and halibut, with the greatest amount of harvest reserved for halibut, coho salmon, and sockeye salmon. Fall harvest is primarily hunting, with many residents hunting for Sitka black-tailed deer. Some fishing also occurs in the fall, primarily for coho salmon. Winter is usually the lowest harvest period. Winter harvest often includes trolling for king salmon, trapping, and some collecting of intertidal resources. Residents harvest some resources year-round including halibut, Chinook salmon, herring, chitons, rockfish, devil's club, and harbor seals (George and Bosworth 1988).

Angoon residents harvested an estimated 224 pounds of subsistence resources per capita in 1996 (ADF&G 2013). Subsistence resources used by residents consist of fish, land mammals, marine mammals, birds and eggs, marine invertebrates, and vegetation (Table 2). In general, the pattern of use is similar to that of rural residents statewide, as discussed above: most harvested resources are fish, followed by land mammals, marine invertebrates, plants, birds, and eggs.

Angoon households participate in subsistence use in many ways: direct use, harvest attempts, actual harvest, and giving and receiving subsistence resources (see Table 2). The ADF&G Community Profile Database indicates that 97% of Angoon households use subsistence resources (ADF&G 2013). There is a strong emphasis on sharing subsistence resources, as indicated by the number of households that have given and/or

received resources from another household. Residents of communities throughout Southeast Alaska and in other parts of Alaska give and receive resources to and from residents of Angoon. Some resources harvested outside the study area may be reported as being used locally, although the resource may not be harvested in or around the study area.

Table 1. Angoon Subsistence Resources Harvested in 1996

Resource category	Common name	Scientific name
Fish	Chinook salmon	*Oncorhynchus tshawytscha*
	Chum salmon	*Oncorhynchus keta*
	Coho salmon	*Oncorhynchus kisutch*
	Pink salmon	*Oncorhynchus gorbuscha*
	Sockeye salmon	*Oncorhynchus nerka*
	Herring	*Clupea* spp.
	Pacific cod (gray)	*Gadus macrocephalus*
	Flounder	Various spp.
	Lingcod	*Ophiodon elongatus*
	Halibut	*Hippoglossus stenolepis*
	Black rockfish	*Sebastes melanops*
	Yelloweye rockfish (red snapper)	*Sebastes ruberrimus*
	Sablefish (black cod)	*Anoplopoma fimbria*
	Dolly Varden	*Salvelinus malma Walbaum*
	Rainbow trout	*Oncorhynchus mykiss*
	Steelhead	*Oncorhynchus mykiss*
Terrestrial mammals	Brown bear	*Ursus arctos*
	Sitka black-tailed deer	*Odocoileus hemionus sitkensis*
	Land (river) otter	*Lutra canadensis*
	Marten	*Martes martes*
	Mink	*Neovision vision*
Marine mammals	Harbor seal	*Phoca vitulina*
Birds and bird eggs	Bufflehead	*Bucephala albeola*
	Harlequin	*Histrionicus histrionicus*
	Mallard	*Anas platyrhynchos*
	Northern pintail	*Anas acuta*
	Long-tailed duck (old squaw)	*Clangula hyemalis*
	Green-winged teal	*Anas carolinensis*
	American widgeon	*Anas americana*
	Vancouver Canada geese	*Branta canadensis*
	Blue grouse	*Dendragapus obscurus*
	Bird eggs	Various spp.
Marine invertebrates	Black (small) chitons	*Katharina tunicata*

Table 1. Angoon Subsistence Resources Harvested in 1996

Resource category	Common name	Scientific name
	Gumboot chiton	*Cryptochiton stelleri*
	Butter clams	*Saxidomus giganteus*
	Pacific littleneck clams (steamers)	*Protothaca staminea*
	Basket cockles	*Clinocardium nutta*
	Heart cockles	*Clinocardium nuttallii*
	Dungeness crab	*Cancer magister*
	Red king crab	*Paralithodes platypus*
	King crab sub-species	*Paralithodes camtschaticus*
	Tanner crab sub-species	*Chionoecetes* spp.
	Limpets	Various spp.
	Octopus	*Octopus dolfeini*
	Sea cucumber	*Parastichopus californicus*
	Green sea urchin	*Strongylocentrotus droebachiensis*
	Coonstripe shrimp	*Pandalus danae*
	Humpback shrimp	*Pandalus hypsinotus*
	Pacific prawn	*Pandalus platyceros*
Vegetation	Plants/greens/mushrooms	Various spp.
	Berries	Various spp.
	Seaweed/kelp	Various spp.
	Wood	Various spp.

Source: ADF&G (2013)

Table 2. Angoon Resource Harvest by Major Resource Category

Resource	Percentage of households (%)					Per capita harvest (pounds)
	Using	Attempting to harvest	Harvesting	Receiving	Giving	
All resources combined	97.3	93.2	93.2	94.6	67.6	224.45
Fish	89.2	70.3	70.3	83.8	50.0	129.51
Salmon	79.7	64.9	64.9	62.2	41.9	81.92
Non-salmon	82.4	60.8	60.8	70.3	29.7	47.58
Land mammals	74.3	51.4	51.4	50.0	27.0	51.32
Large	74.3	51.4	51.4	50.0	27.0	51.32
Small	2.7	2.7	2.7	1.4	0.0	0.00*
Marine mammals	32.4	14.9	14.9	28.4	8.1	9.02
Birds and eggs	5.4	5.4	5.4	2.7	1.4	0.17
Marine invertebrates	89.2	78.4	78.4	73.0	41.9	30.09
Vegetation	66.2	62.2	56.8	50.0	17.6	4.35

Source: ADF&G (2013)

* Per capita harvest does not assess pounds of harvest for fur-bearing animals

7.0 SUBSISTENCE RESOURCES AND USES

7.1 Fisheries

Fish are an extremely important subsistence resource for Angoon residents. Centrally located in the Alexander Archipelago, Angoon residents have access to many saltwater and freshwater fishing grounds throughout Southeast Alaska.

In Alaska, state and federal regulations define three types of fishing: 1) fishing for profit (commercial fishing), 2) fishing for sport by hook and line (sport fishing), and 3) taking fish resources for personal use (subsistence) with prescribed gear (usually by permit). However, in many cases, the lines between commercial, sport, and personal use fishing are not quite clear. For example, commercial fishers may keep a portion of their catch for personal consumption, and sport anglers often consider filling the freezer just as important as the pleasure they derive from catching fish (Gmelch et al. 1985).

In the 1996 ADF&G study (ADF&G 2013), approximately 70% of all households in Angoon attempted to fish during that year, with approximately 70% harvesting fish (see Table 2). However, the importance of fishing is shown by the statistic that 89% of all households used fish resources in 1996. Based on interviews with Angoon residents conducted in 2008 and 2009, the 1996 use rate is still considered an accurate representation of subsistence fish use in Angoon. The importance of subsistence in the community's culture also is shown by the following statistic: 84% of residents receive fish from others, and 50% give fish to others (ADF&G 2013).

7.1.1 SALMON

In Angoon, as in most of coastal Alaska, salmon is the foundation of the subsistence way of life. In addition to sustenance for individuals and families in Angoon throughout the year, salmon provide job opportunities through commercial fishing, fish processing, sport-fish guiding, and other ancillary activities associated with fishing, such as the service industry. The salt and fresh waters around Angoon are home to all five species of Pacific salmon found in Alaska: Chinook (or king) salmon, sockeye (or red) salmon, pink (or humpy) salmon, coho (or silver) salmon, and chum (or dog) salmon.

According to interviews in 2008, Angoon residents fish for salmon in many locations. Many people fish locally along most of Chatham Strait and the Mitchell Bay area for all species of salmon found in Alaska. In Favorite Bay and its freshwater tributaries (including Favorite Creek), coho, chum, and pink salmon are all harvested by Angoon residents. Angoon residents also harvest sockeye and Chinook salmon in the marine waters of Favorite Bay, although those species do not spawn in the freshwater sources of Favorite Bay. Angoon residents indicate that chum and pink salmon are harvested in the greatest quantities in this area, followed by coho, Chinook, and sockeye salmon. Figure 3 shows the study area locations used by Angoon residents for fish.

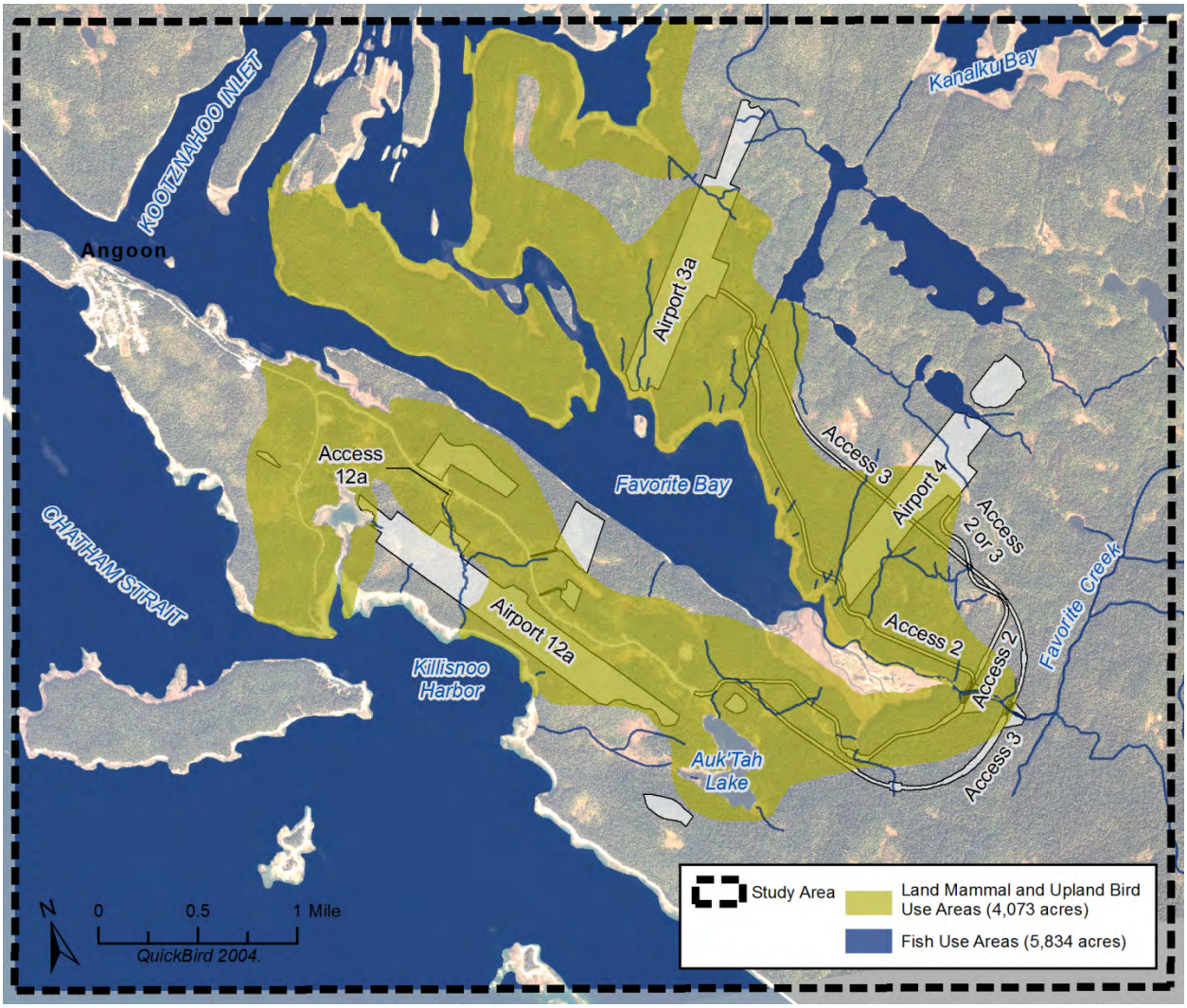

Figure 3. Land mammal, upland bird, and fish use areas commonly used by Angoon residents.

According to the ADF&G Community Subsistence Information System, the most common salmon species harvested by Angoon residents is coho (30 pounds per capita), followed by sockeye salmon (21 pounds per capita). Chinook salmon are third in harvest (20 pounds per capita), with chum salmon (9 pounds per capita) and pink salmon (2 pounds per capita) being fourth and fifth, respectively (ADF&G 2013).

Under sport-fishing licenses using rod and reel, Angoon residents often catch coho, Chinook, and pink salmon; most sockeye and chum salmon are primarily caught with nets under a subsistence harvest permit administered by the ADF&G. Table 3 shows the harvest of Pacific salmon under the ADF&G subsistence harvest permits from 2003 to 2012.

Table 3. Saltwater and Freshwater Salmon Subsistence Harvest by Angoon Residents under ADF&G Permits

Year	Permits issued	Permits fished	Number of Chinook	Number of sockeye	Number of coho	Number of pink	Number of chum
2003	102	55	0	1,496	36	6	2
2004	106	86	0	1,479	107	107	58
2005	90	35	0	261	12	25	0
2006	96	44	0	658	20	9	0
2007	86	73	1	56	47	62	0
2008	86	83	0	637	120	0	15
2009	115	96	0	942	70	55	5
2010	109	102	0	1,332	155	112	29
2011	102	60	8	997	186	10	11
2012*	98	34	0	728	40	40	0

*2012 data are preliminary data
Source: Harris 2013

Once harvested, salmon are either eaten fresh or preserved so the meat can be eaten throughout the year. Angoon residents use several different methods to preserve caught fish. Some are traditional, having been passed down through the generations; others are recent and coincide with improved technology. One of the most traditional methods of preserving fish is by smoking. In this method, residents filet the fish and either cut it into strips or chunks. The meat is usually hung in a small building called a smokehouse. A fire is built inside the smokehouse using a slow-burning wood, usually alderwood, and the fish is left to smoke for a period of time. The process can take between one and six days, depending on the level of dryness preferred.

Another method of preserving is canning. Many residents of Angoon will can salmon using a pressure cooker and glass jars. The use of canning to preserve salmon probably stems from the salmon canneries that were in operation around Angoon between the late 1800s and early 1900s. Today, residents often can both fresh salmon and smoked salmon to have different flavors throughout the year. Another method of preserving, which is only used by a few residents, involves fermentation. Some Angoon residents preserve salmon parts, usually the heads, by placing them in a burlap sack and burying them in wet sand for several months. The heads are then dug up and eaten. In many places in rural Alaska, this method is used to create what are known as "stinkheads."

The most common method of preserving fish is freezing. Many households in Angoon have a large freezer where they can preserve salmon, halibut, deer, and berries for a long period of time. Salmon are usually filleted and either wrapped in freezer paper or vacuum sealed to protect the meat. Freezing meat is common because it is the least time- and labor-intensive method of preserving and because it retains the original flavor of the meat better than any other method.

7.1.2 NON-SALMON FISHERIES

Of equal importance to Angoon residents are non-salmon fish, primarily species such as halibut, lingcod, rockfish, herring, rainbow trout, cutthroat trout, Dolly Varden, and eulachon. The vast majority of non-salmon fish harvest is halibut, followed by herring roe, rockfish, herring, Dolly Varden, Pacific cod (gray cod), and sablefish (black cod) respectively. Commercial fishing involves species such as halibut, rockfish, and black cod. Fish such as halibut, rockfish, and Dolly Varden are also sport fished by community. In terms of economic importance, non-salmon fishes are just as important as salmon to the economic well-being of the community. Locations for fishing non-salmon fish are similar to salmon fishing areas and shown as fish use areas in Figure 3 above. In most cases, Angoon residents fish for multiple species in a single outing, particularly for deepwater fishes such as halibut, rockfish, and cod.

Halibut is an especially important non-salmon fish resource for Angoon residents. The ADF&G 1996 study (ADF&G 2013) documented approximately 40.5 pounds of per capita harvest by Angoon residents. Most halibut harvested by Angoon residents is filleted and frozen, although some residents may smoke or can the meat.

Subsistence fishers are required to obtain a subsistence halibut registration certificate (SHARC) from the National Marine Fisheries Service prior to fishing. A SHARC permit allows the use of rod and reel or one longline with up to 30 hooks and a bag limit of 20 fish per day. In 2010, approximately 180 Angoon residents were SHARC permit holders. The estimates provided in Table 4 reflect only fishing by SHARC fishers in the community of Angoon. All subsistence gear types (setline and hand-operated gear) are included in the harvest estimates.

In addition to the SHARC permits, some Angoon residents harvest halibut under their sport-fishing license. In 2007, SHARC permit holders reported harvesting 36 halibut (approximately 653 pounds) under the sport-fishing license. ADF&G Statewide Harvest Surveys for 2011 show 641 halibut harvested, although much of the harvest is from non-residents and non-local residents from other Alaskan communities (Harris 2013). In addition, the reported harvest represents a harvest area larger than the study area. Angoon residents interviewed for this project have indicated that all halibut harvest occurs outside the study area, but there are several identified locations for halibut harvest outside of this area.

Table 4. Estimated Halibut Subsistence Harvest by Angoon SHARC Holders Using All Gear Types within Regulatory Area 2c, 2003–2010

Year	Estimated number harvested	Estimated pounds harvested
2003	1,142	20,283
2004	1,435	32,009
2005	1,231	25,166
2006	954	16,875
2007	836	16,429
2008	715	13,148
2009	716	16,148
2010	894	14,688

Sources: Fall et al. (2004, 2005, 2006, and 2007); Fall and Koster (2008, 2010, 2011, and 2012).
Note: Estimated pounds given as net (dressed) weight, which is equal to 75% of round weight.

Herring and herring eggs are an important resource in Angoon, for both subsistence and commercial uses. In mid to late winter, herring begin to congregate in saltwater bays in preparation for spawning. During this time, some Angoon residents travel to the bays to fish for herring, usually by jigging. The 1996 ADF&G survey

(ADF&G 2013) shows that Angoon residents harvest approximately 1.4 pounds of herring per capita. Residents often freeze the herring and use it for salmon or non-salmon fish bait. Angoon residents identified several locations in the study area as places where herring harvest occurs.

In early spring, usually in late March and April, herring begin to spawn in the waters around Southeast Alaska. The male fish emit their milt (semen) into the water. The females then deposit their roe in the milt, completing the fertilization process. The developing eggs fasten to kelp, seaweed, rocks, or any object placed in the water.

Angoon residents harvest herring eggs for personal use in two ways: 1) by placing hemlock branches into the intertidal zone and 2) by collecting the eggs that have formed naturally on seaweed or kelp. Hemlock branches or entire trees are cut, attached to a buoy or line from the beach, and lowered into the water. Collectors leave the branches or trees in the water to collect eggs, then recover eggs from the branches. Residents also harvest herring eggs from kelp and seaweed. Most people travel by boat to kelp beds and pull up the egg-laden kelp with hooks. A few people dive into kelp or seaweed and pull it up by hand. Still others bring kelp or seaweed into an area prior to the spawn, and then collect it as they would hemlock branches. Residents collect the seaweed at low tide where the eggs show up as a large white ball or spot in the water.

Historically, Angoon residents often harvested herring eggs in Favorite Bay. However, in the early 1980s, the local herring population decreased significantly, and the community placed a voluntary moratorium on herring egg collection until the population rebounded. As of 2009, the population had not rebounded enough for any herring egg harvest to occur. To offset the loss of herring egg harvest close to the community, Angoon residents rely on the subsistence herring fishery in Sitka for their supply. Some Angoon residents either boat to Sitka in the spring to harvest herring eggs, trade goods and/or services for herring eggs collected by Sitka residents, or receive herring eggs from relatives living in Sitka. In 1996, Angoon residents harvested approximately 2.0 pounds of herring roe per capita, with half of the harvest occurring on kelp and the other half coming from hemlock branches placed in the water (ADF&G 2013). Because of the voluntary moratorium on herring egg harvest, it is assumed that all herring egg harvest by Angoon residents occurred in Sitka.

Rockfish are another important non-salmon fish harvested by Angoon residents. Rockfish typically prefer steep rocky habitats, such as those found in the marine waters around Chatham Strait. Because rockfish have a swim bladder to maintain buoyancy in various depths, rapid changes in depth can cause mortality among many rockfish species. Rapid changes in depth can be caused by being caught by sport or commercial anglers. This factor, along with late sexual maturity and slow reproductive rates, can cause rapid population declines in many rockfish species. The 1996 ADF&G study (ADF&G 2013) found that red rockfish is the most common rockfish species caught by Angoon residents at approximately 1.4 pounds per capita, followed by the black rockfish at less than 1 pound per capita. Interviews with local residents indicate that no rockfish are harvested in Favorite Bay, but the fish are commonly found in the waters of Chatham Strait.

Pacific cod (gray cod) and sablefish (black cod) are typically harvested in deeper waters in the Gulf of Alaska. Most Pacific cod and sablefish harvest comes from commercial fishing, but occasionally Angoon residents will catch Pacific cod and sablefish while targeting other marine fish species. In addition, a few commercial fishers based in Angoon keep some of their catch for personal consumption. Some Pacific cod are harvested in Chatham Strait and lower Favorite and Mitchell bays, but both species typically are not found in the shallower waters in upper Favorite Bay. Less than 1 pound per capita of both Pacific cod and sablefish are harvested by Angoon residents (ADF&G 2013).

Dolly Varden are found in the study area and are used by Angoon residents. The 1996 ADF&G study (ADF&G 2013) found that approximately 1.0 pound of Dolly Varden was harvested per capita by Angoon residents in that representative year. Most Dolly Varden in this region are anadromous, meaning that they migrate between freshwater and saltwater, although there may be a few resident Dolly Varden in isolated watersheds. Angoon residents harvest Dolly Varden year-round and often catch Dolly Varden when targeting salmon in marine and

freshwater environments. However, historically, Dolly Varden were primarily harvested in the spring, where they would congregate at the mouths of streams to eat out-migrating pink and chum salmon. The ADF&G Statewide Harvest Survey found that 96 Dolly Varden were harvested in 2011, although some of that harvest is from non-residents and non-local residents of other Alaskan communities, and the reported harvest represents a harvest area larger than the study area (Harris 2013). Within the study area, Dolly Varden are located in marine waters all around Favorite Bay, and outside the study area in Mitchell Bay. In freshwater, Favorite Creek and many of the freshwater lakes between Favorite and Kanalku bays contain Dolly Varden.

Angoon residents also harvested cutthroat trout in the study area, albeit in very small numbers. The 1996 ADF&G study found that less than 1 pound of cutthroat trout was harvested during that representative year (ADF&G 2013). Like Dolly Varden, cutthroat trout in the area are anadromous. Angoon residents harvest cutthroat trout year-round and often catch them when targeting salmon in both marine and freshwater environments. The ADF&G Statewide Harvest Survey found that no cutthroat trout were harvested in the Angoon area in 2011. Within the study area, cutthroat trout are located in marine waters all around Favorite Bay, and outside the study area in Mitchell Bay. In freshwater, Favorite Creek and many of the freshwater lakes between Favorite and Kanalku bays contain cutthroat trout.

7.2 Land Mammals

Hunting is an important activity to the residents of Angoon. For many people, hunting is an important source of nutritious food, and a highly valued outdoor pursuit. It is also a significant part of the community's social network, as many hunters bond over experiences and share the products of their success. Figure 3 above shows areas commonly used for terrestrial mammal subsistence harvest in the study area. Sitka black-tailed deer represent the vast majority of terrestrial mammals harvested by Angoon residents. Approximately 74% of households used deer for subsistence, and 50% of all households attempted to harvest deer in 1996. Every Angoon resident who went hunting for deer that year also harvested at least one deer. Approximately 51 pounds of deer were harvested by Angoon residents in 1996 (ADF&G 2013). Table 5 shows the number of hunters, the amount of effort, and the amount of deer harvest from data collected by ADF&G surveys from 2004 to 2010.

The ADF&G conducted a study of Angoon residents' deer hunting methods and activities in 1982 (George and Kookesh 1983). The study documented three main methods for hunting deer in the Angoon area. The first method is referred to as the alpine hunt. In that method, Angoon residents go to higher ground where deer often occupy open alpine areas to feed on succulent vegetation before it dies with the first frost. Usually, these hunts are overnight trips where the hunters boat to an area with relatively easy access to higher alpine areas. Because of the travel, this method typically involves camping, and often entire families will head up to hunt. The hunters glass or scope for deer in the open areas, and once one is spotted, they stalk within range for an open shot. Outside the study area, the upper portions of Hood Bay Mountain are popular locations for this type of hunting.

The second method is called the muskeg and forest hunt. This hunt usually occurs after the first frost and continues until the end of the hunting season. In this method, hunters set up in small clearings or muskegs at the edge of densely forested areas. The hunters will either wait for the deer to enter the clearings or use a deer call to lure the deer into the open areas. The study area has many locations where residents employ this method of hunting, especially when the weather makes travel to other locations around Chatham Strait difficult or impossible. Most hunters access locations for the muskeg and forest deer hunt by a combination of boat travel and walking.

The third method is the beach hunt. The beach hunt can occur throughout the season, but many Angoon hunters intensify their efforts in November and December, when deer use the beach fringe to get away from deep and heavy snow. Angoon residents will often travel up and down the coastline in boats looking for deer.

When a deer is spotted, the boat is driven to shore and the hunter then stalks the deer to get within range. A similar form of this type of hunting also occurs at muskeg areas along the Angoon road system. Residents who do not have access to boats often use a motor vehicle and travel the Angoon road system, glassing open areas for deer.

Very few residents hunt for small game, with land (river) otters being the only known harvest of small game documented in 1996. Only 3% of Angoon residents either used or harvested land otters in 1996 (ADF&G 2013). No per capita pounds of meat were documented from that harvest, meaning that the residents likely sold the fur or used it for ceremonial items. Several residents indicated in interviews that although they have trapped in the past, they have stopped the practice because of declining fur prices.

Table 5. Deer Harvest, 2004–2010

Year	Number of hunters	Total number of days hunted	Total number of deer harvested
2004	23	64	14
2005	36	74	55
2006	20	44	32
2007	19	20	15
2008	38	203	89
2009	23	79	45
2010	37	330	132

Source: Mooney 2013c

7.3 Birds and Eggs

Angoon residents harvest a number of upland birds and waterbirds, including grouse and migratory waterbirds. In 1996, approximately 5% of Angoon residents harvested birds (less than 1 pound per capita), mostly migratory waterbirds (ADF&G 2013). The most frequently harvested type are migratory waterbirds at less than 1 pound per capita, with mallards being the most common species harvested. Other migratory waterbird species harvested by Angoon residents include Vancouver Canada geese, buffleheads, Harlequin ducks, long-tailed ducks (old squaw), northern pintails, Green-winged Teal, and American Widgeon. Migratory waterbirds are typically harvested in the fall and spring, as birds are migrating to and from warmer climates. Under the Migratory Bird Treaty Act, migratory birds must be harvested using shotguns and nontoxic shot. The freshwater, marine, and near-shore tidal environments in the study area were identified by Angoon residents as common harvesting locations for waterbirds (see Figure 3 above).

The only non-migratory bird harvested by Angoon residents is blue grouse, with less than 1 pound per capita of annual harvest (ADF&G 2013). As with migratory birds, blue grouse (also known as “hooters”) are typically harvested in the fall or spring, particularly the spring, when they can be heard “hooting” from the forest. Blue grouse are harvested in many locations in the study area.

In the 1996 study, none of the households surveyed had harvested eggs from migratory birds (ADF&G 2013). Harvest of gull eggs is allowed in some communities in Alaska under federal migratory bird subsistence harvest regulations (50 CFR 92.5). In Southeast Alaska specifically, regulations allow only the harvest of glaucous-winged gull eggs and only by residents of Hoonah, Craig, Hydaburg, and Yakutat. In those communities, gull eggs have been historically harvested by residents. Gull eggs are large, about twice the size of chicken eggs,

and residents used them in the same ways as chicken eggs. During interviews, no Angoon residents provided any documentation of egg collection in the study area.

7.4 Marine Mammals

Under the Marine Mammal Protection Act of 1972, only Alaska Natives are permitted to harvest marine mammals. In the 1996 ADF&G study, approximately 15% of all Angoon households had harvested marine mammals, with 32% of the community using marine mammals and 28% receiving marine mammal products from others in the community (ADF&G 2013).

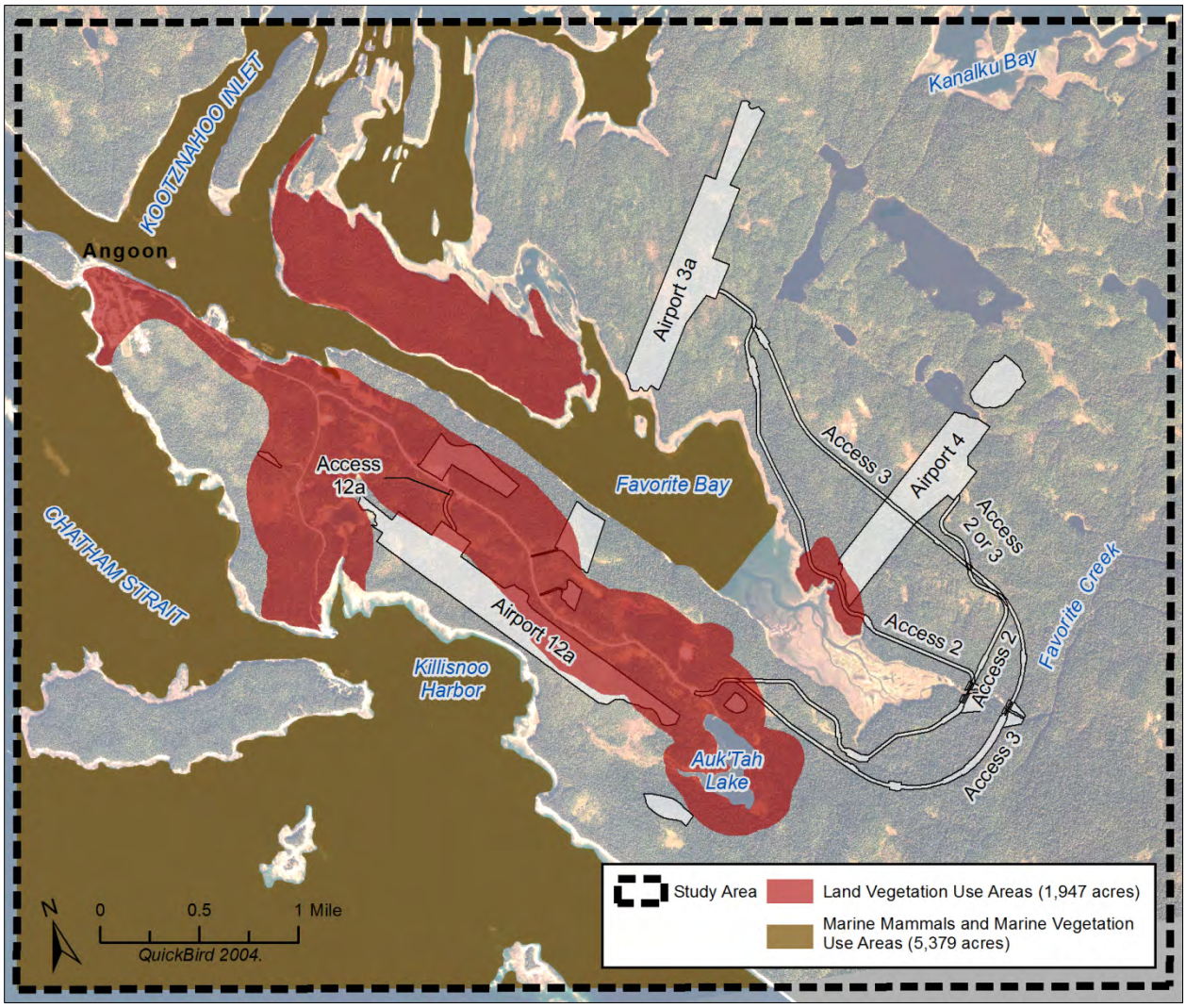

Figure 4. Land vegetation, marine mammal, and marine vegetation use areas commonly used by Angoon.

All marine mammals harvested in the study area are harbor seals. The average weight of an adult harbor seal is about 180 pounds, and average length is 5 to 6 feet (ADF&G 1994). There is no bag limit, harvest is expected to be limited to what can be reasonably used and not be wasted. Seals are generally hunted from late fall through

early spring. During the cold weather season, the seals are fatter, so fewer seals will sink when shot. In addition, many Alaska Natives believe the hide is better quality during this period than in summer. Within the study area, upper Favorite Bay is the favored location for seal harvest. Outside the study area, portions of Mitchell, Kanalku, and Pea Hen bays are all favored locations for seal harvest. Figure 4 above shows the marine mammal use areas in the study area.

7.5 Marine Invertebrates

Living in a coastal community, residents of Angoon heavily utilize marine invertebrates. Angoon residents harvest many types of marine invertebrates, including crabs, clams, cockles, abalone, gumboots (chitons), sea cucumbers, sea urchins, scallops, mussels, and octopus. Some of these resources, such as cockles and gumboots, are traditional Alaska Native foods that remain popular among Native people (Gmelch et al. 1985). Others, such as crabs and shrimp, are popular among all residents. Based on the marine invertebrate species targeted for harvest by Angoon residents and the percentage of Angoon households that harvested them in 1996, clams, chitons, cockles, crab, and shrimp are the favored resources for harvest (Table 6).

Table 6. Angoon Marine Invertebrates Resource Harvest by Angoon Households, 1996

Resource	% Using	% Attempting to harvest	% Harvesting	% Receiving	% Giving	Per capita harvest (pounds)
All marine invertebrates	89.20	78.40	78.40	73.00	41.90	30.0
Chitons	58.10	47.30	47.30	39.20	21.60	9.4
Clams	64.90	51.40	51.40	36.50	17.60	10.0
Cockles	68.90	54.10	54.10	45.90	16.20	6.32
Crab	48.60	32.40	31.10	35.10	20.30	2.77
Shrimp	8.10	5.40	5.40	2.70	1.40	1.05
Sea urchins	2.70	2.70	2.70	0.00	0.00	0.01
Octopus	6.80	6.80	6.80	0.00	2.70	0.41
Sea cucumbers	1.40	1.40	1.40	0.00	0.00	0.15
Limpets	1.40	1.40	1.40	0.00	0.00	0.01

Source: (ADF&G 2013)

Clams are the most commonly harvested intertidal resource and the second-most-common marine invertebrate used in Angoon: 51% of survey households had harvested them in 1996 (ADF&G 2013). Several species are found in Angoon, but only two species are harvested. These include the butter (or hardshell) clam and steamers (or the Pacific littleneck clam).

Residents can find clams throughout the year, but only collect them during certain months due to the threat of paralytic shellfish poisoning (PSP), which happens during the warm summer months and early autumn, when phytoplankton inundates the waters of many coastal areas. Some of the phytoplankton produces neurotoxins that mollusks ingest during feeding and concentrate in their tissues. The principal neurotoxin is saxitoxin, which is a strong natural poison. Of all marine invertebrates, clams and mussels are the most dangerous to consumers.

The butter or hardshell clam, also known as the northern quahog, is the most abundant species in the Angoon region in terms of its both availability and actual harvest levels. Adults average about 4 inches in diameter. Residents can easily find butter clams at low tide in the numerous gravel and rock beaches in the study area. Many people, especially those without a boat, dig clams close to town. Those with boats travel to locations in Favorite Bay, and outside of the study area in Mitchell, and Pea Hen bays. Some individuals gather clams along the salt lagoon, directly adjacent to the ferry terminal. Within the study area, several locations in Favorite Bay and on beaches along the Angoon peninsula are known locations for harvesting butter clams.

The steamer or Pacific littleneck clam is smaller than the butter clam, averaging 2 inches in diameter, but it occupies the same habitat. Residents harvest Pacific littleneck clams in the same locations as butter clams. The per capita harvest of butter and littleneck clams in 1996 was approximately 10 pounds and less than 1 pound respectively (ADF&G 2013).

Angoon residents harvest two species of chitons: the giant Pacific chiton and the lined chiton. All chitons are edible, and people often use the term “gumboot” to describe both species. Chitons are not susceptible to PSP like clams and mussels. Approximately 9% of Angoon households collect gumboots, according to the 1996 study (ADF&G 2013). Per capita harvest is over 1.0 pound. Gumboots occupy boulder-strewn, wave-beaten, or intertidal beaches, not gravel, sand, or mud habitats like most other mollusks. Residents harvest gumboots using a knife or some other thin, sharp object to pry them from the rocks. In the study area, the predominant location for harvest of gumboots is a series of rocky channels between Favorite and Pea Hen bays, where there is a massive tidal exchange of water.

Cockles are hard-shelled bivalves that are slightly larger than butter clams. Like clams, cockles are also susceptible to PSP. Therefore, most Angoon residents wait until fall or spring to harvest them. Cockles are typically found in finer sand or mud beaches than clam species. Most residents either smoke and dry the meat for later use or use them immediately by pounding the flesh to tenderize them and then fry the meat. Within the study area, much of Favorite Bay is a preferred location for harvest of cockles.

Crab is another important subsistence species, with approximately 31% of Angoon residents harvesting crabs in 1996 (ADF&G 2013). Angoon residents harvest crab by primarily using crab pots. Crab pots are typically baited with fish parts, attached to a line and buoy, and set in protected bays and coves. Crabs then enter the pot to get the bait and cannot escape because of the pot’s one-way entrance. Once caught, crabs are kept alive until they are ready for consumption. Then the crabs are placed into a pot of boiling water until cooked. Once cooked, the shell is cracked and the white meat inside is consumed.

Dungeness crab accounts for the highest amount of crab harvest by Angoon residents. In 1996, approximately 2.1 pounds per capita of Dungeness crab were harvested by Angoon residents (ADF&G 2013). The most popular location for harvesting Dungeness crab in the study area is upper Favorite Bay. In the summertime, it is common to see multiple crab and shrimp pot buoys floating in the bay.

Other crab species harvested by Angoon residents include red king crab and tanner crab. In 1996, less than 1.0 pound per capita of each species was harvested by Angoon residents (ADF&G 2013). These species are typically harvested in deeper waters than Dungeness crab, although occasionally both king and tanner crabs are caught in the study area.

Like crab, shrimp are an important subsistence species for Angoon residents, with approximately 5% of households harvesting shrimp in 1996 (ADF&G 2013). Most Angoon residents harvest shrimp using shrimp pots, which work in a similar fashion as crab pots by capturing shrimp as they enter the pot to feed on bait. In the study area, there are several different species of shrimp, but only three species are actively sought after by Angoon residents for subsistence harvest: the Pacific prawn (or spot shrimp), the humpback (or humpy) shrimp, and the coonstripe shrimp. Angoon residents harvested approximately 1.0 pound per capita of shrimp in 1996.

As with Dungeness crab, one of the most important harvest locations for shrimp is upper Favorite Bay in the study area.

7.6 Vegetation

Plant gathering is a very popular resource use activity in Angoon when measured by the number of households that engage in it. Approximately 62% of Angoon households had gathered berries, greens, roots, wood, or mushrooms in 1996 (ADF&G 2013). Edible plants are abundant in the study area. The main habitats where residents find edible plants in the region include bogs (muskeg), the upper beach rocks and meadows, old growth forest edges, open areas, sub-alpine areas, and disturbed areas (Figure 4 above). Typically, Angoon residents do not have to travel far to collect vegetation resources, as many can gather plants along the roadside or in the forests surrounding the community. Substantial travel is only necessary to find resources like cranberries, strawberries, and certain mushrooms, which may be unavailable or scarce near Angoon. When this is the case, residents often gather plants and berries coincidentally to other activities such as boating, beachcombing, fishing, camping, or exploring.

Plant gathering is the easiest of the harvest activities, especially for the majority of gatherers, who only harvest berries. As mentioned above, it can be done close to home, equipment is minimal, and little experience is required. Other types of plant collection, however, often demand substantial knowledge. Making full use of the plants requires a familiarity with edible plant identification, productive locales, harvest times, preparation and preservation methods, and non-food uses (such as medicine or dyes).

In traditional times, native Tlingits used a wide assortment of plants. Modern residents of Angoon do not use as many plants as historical residents did for subsistence. However, some residents still use an impressive range of plants, including a wide variety of berries, greens, roots, mushrooms, and wood.

Approximately 35% of Angoon households harvest berries during the summer and early fall, with the prime months being July and August (ADF&G 2013). Residents use berries in a variety of ways. The most common use of berries is to eat them raw. Many people, however, bring back large quantities to freeze, make into pies, sauces, or preserve as jams and jellies.

The berries most commonly picked in the study area are blueberries, huckleberries, cloudberries, nagoonberries, salmonberries, and thimbleberries. Other berries collected in the study area include currants, cranberries, red elderberries, and strawberries. Residents collect blueberries, huckleberries, cloudberries, and salmonberries in the study area. Blueberries and huckleberries are located in dense, woody thickets in mixed-open forest areas through the study area. Cloudberries and nagoonberries are small yellow or red berries that grow in muskeg areas. Salmonberries and thimbleberries are orange and red berries that ripen in late June through July on large shrubs that form dense thickets in open areas such as roadsides, shorelines, and forest clearings.

The study area contains many edible wild greens. Interviews with local residents indicate that around 15 different species of greens can be harvested in the study area. However, the percentage of households harvesting the various greens is substantially less than the number harvesting berries; only 18% of households harvest greens (ADF&G 2013). The most commonly harvested greens in the study area are goosetongue, devil's club, beach asparagus, and Labrador tea.

Goosetongue is abundant in the study area, growing in the cracks of rocks just above the high-tide line. It is popular because of its good taste and long edible season. Angoon residents harvest goosetongue from spring until August, although some residents claim that June is the best month for harvest.

Labrador tea is a commonly used "green" in the study area. It grows abundantly in muskegs and wetland alpine meadows that are found through the study area. Residents can harvest the leaves year round. Once picked, they are dried and then boiled to make a tea.

Devil's club is a member of the ginseng family. It grows abundantly in the moist, well-drained soils of forests around Angoon. The stalks are covered with sharp spines and grow up to 1.5 inches in diameter. Angoon residents collect both stalks and roots, primarily for medicinal use. The most common use is as an all-purpose elixir, usually made by heating the dried roots or bark in water just below the boiling point for several hours. It is also commonly used as a wound sealant and protectant by pulverizing the bark into a poultice and heating it up in a small pot with spruce pitch. The sticky substance is then spread over the wound and left to dry and harden, both sealing and protecting the wound.

Angoon residents also harvest beach asparagus, which grows in thick bunches or mats on tidal flats in the study area. This delicious vegetable tastes like asparagus, and residents commonly eat it raw as a salad green.

7.6.1 SEAWEED

Many Angoon households harvest marine vegetation, especially seaweeds (see Figure 4 above). The most popular species collected by the survey households in the 1996 study were black seaweed (30% of households), sea ribbons (4%), and alaria (1%). The per capita harvest of black seaweed collected was 6.8 quarts; sea ribbons less than 0.1 quart; and alaria was less than 0.1 quart (ADF&G 2013). All three types are found and harvested in rocky near-shore marine habitats in both the study area.

Residents harvest black seaweed at two times of the year: spring and winter. Households harvest the spring growth during a two-week period beginning in late April or early May. A second spring growth is ready a month later, and residents harvest that growth for a two- or three-week period only. Seaweeds come into season at slightly different times in different locations around Angoon, apparently depending on water temperature. Many residents consider May the best time to gather black seaweed. Winter seaweed, the third growth, is available in February. It is more tedious to harvest because it is shorter and harder to pull off the rocks.

Black seaweed acquires a washed-out look when it is old and no longer growing and edible. Residents often pick black seaweed on a minus tide by pulling it off the rocks. There is access to black seaweed from several locations in Favorite Bay within the study area. Many Alaska Natives consider seaweed a delicacy or prestige food. Black seaweed is very expensive to buy if a household cannot collect its own supply. Sea ribbons (or ribbon seaweed or dulse) are another alga harvested by Angoon residents. Sea ribbons are thin, elastic purple or red fronds varying in length from a few inches to 1 foot. They are typically found attached to rocks. Like black seaweed, sea ribbons are often harvested in the spring, when the growth is fresh.

Alaria is a brown alga also known as wing kelp. It is found in rocky, intertidal zones and is a rich source of protein, iodine, and vitamin A. Alaria can grow to considerable length, but, like other seaweeds, it is mostly harvested when it is younger and less tough. Most alaria is dried and then later reconstituted with fresh water for use in soups or as a salad.

7.6.2 WOOD

Approximately 26% of Angoon households collect wood for use in handicrafts, home heating, or smoking fish or venison (ADF&G 2013). The use of wood for handicrafts ranged from gathering small pieces of driftwood for use in dried flower arrangements and natural sculptures to special woods cut for crafts and carvings, such as totems. A small number of residents harvest spruce roots to make the traditional, finely woven Tlingit baskets. Many Angoon residents collect alder for smoking meat and fish.

Wood used for handicrafts or smoking meat and fish is often gathered along beaches or along the Angoon road system. Spruce roots are gathered throughout the region. For home heating, most Angoon residents gather logs from locations along the Angoon road system, with a common spot being near the community water supply.

8.0 ANILCA SECTION 810(A) EVALUATIONS AND FINDINGS FOR ALL ALTERNATIVES AND THE CUMULATIVE CASE

The following evaluations are based on information relating to the environmental and subsistence consequences of all alternatives as presented in Chapter 4: Existing Conditions and Project Effects and the cumulative case as presented in Chapter 8: Cumulative Effects of the EIS. This evaluation focuses on subsistence uses only on federal public lands, as defined by ANILCA Section 102. As discussed in section 3.0 above, federal public lands are defined as follows:

> "land situated in Alaska which, after the date of enactment of this Act, are Federal lands except--
>
> (A) land selections of the State of Alaska which have been tentatively approved or validly selected under the Alaska Statehood Act and lands which have been confirmed to, validly selected by, or granted to the Territory of Alaska or the State under any other provision of Federal law;
>
> (B) land selections of a Native Corporation made under the Alaska Native Claims Settlement Act which have not been conveyed to a Native Corporation, unless any such selection is determined to be invalid or is relinquished; and
>
> (C) lands referred to in §19(b) of the Alaska Native Claims Settlement Act."

Based on this definition, federal public lands in the study area are the Monument–Wilderness Area lands managed by the USFS. Although the EIS evaluates effects to subsistence resources and uses on all lands, not just federal lands, this evaluation focuses on effects to the subsistence resources and uses on just federal lands, namely the Monument–Wilderness Area.

The assessment of effects on subsistence resources and uses includes two factors:

- Assessment of effects to biological resources identified as being subsistence resources
- Assessment of whether effects to biological resources would cause a subsequent effect on the ability of Angoon residents to gather those resources

The FAA does not have its own significance threshold criteria for subsistence and will not establish one for this evaluation. However, the U.S. Forest Service commonly uses the thresholds of significance established for ANILCA Section 810 evaluations in the *Kunaknana v. Clark* case, as described in section 3.2, above, specifically the following four factors:

- Large reductions in abundance: Noticeable and recognizable declines in subsistence resource populations in a given area and reduced subsistence resource harvests as a result of project actions. This includes reduced per capita harvest of subsistence resources.
- Major redistribution resulting in reduction in availability: Noticeable and recognizable declines in subsistence resource distributions across the landscape, and reduced subsistence resource harvests as a result of project actions. This includes reduced per capita harvest of subsistence resources.
- Substantial interference with harvestable access: Local subsistence user access to active subsistence harvesting locations becomes so inconvenient that a substantial portion of those users shift to alternate locations.
- Major increases in non-rural use: Increases in non-rural use that would cause local subsistence users to either forgo or find alternate subsistence harvesting locations

The level of effect was developed using acres of available habitat for all subsistence resources affected by the action alternatives.

8.1 No Action Alternative: Evaluation and Findings

The no action alternative would make no changes in Angoon's existing air transportation options. There would be no new construction of a land-based airport or access road. The existing air transportation options would remain as they exist today, and the Angoon Seaplane Base would continue to operate as it currently does. Under this alternative, there would be no effects to subsistence on federal public lands and waters, and existing conditions would remain as they are.

8.1.1 No Action Alternative: Evaluation of Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses

The no action alternative would make no changes in Angoon's existing air transportation system, and no federal public lands used for subsistence would be affected. Therefore, this alternative would not affect the abundance or availability of, access to, and competition for subsistence resources.

8.1.2 No Action Alternative: Evaluation of the Availability of Other Lands for Airport Construction

Under the no action alternative, no airport would be built and therefore no federal public lands would be used.

8.1.3 No Action Alternative: Evaluation of Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The no action alternative would not remove federal public lands used for subsistence purposes because it would not change the existing Angoon air transportation system. Of all the alternatives, only the no action alternative and Airport 12a with Access 12a would use no federal public lands used for subsistence purposes.

8.1.4 No Action Alternative: Findings

The no action alternative would not significantly affect the abundance or availability of, access to, or competition for subsistence resources on federal public lands because no action would be taken.

8.2 Airport 3a with Access 2 (Proposed Action): Evaluation and Findings

Airport 3a with Access 2 (Figure 5) is the proposed action. This alternative would be located on lands owned or managed by the U.S. Forest Service; Kootznoowoo, Inc. (the local village Alaska Native corporation); and the City of Angoon. The airport would be located on the north side of Favorite Bay within the boundaries of the Monument–Wilderness Area. Access 2 would begin at the existing Bureau of Indian Affairs (BIA) Road, and travel around the southeastern end of Favorite Bay within 1,000 feet of the shoreline. This access road would be 20 feet wide and consist of two 9-foot lanes with 1-foot shoulders. It would require the construction of a bridge across Favorite Creek.

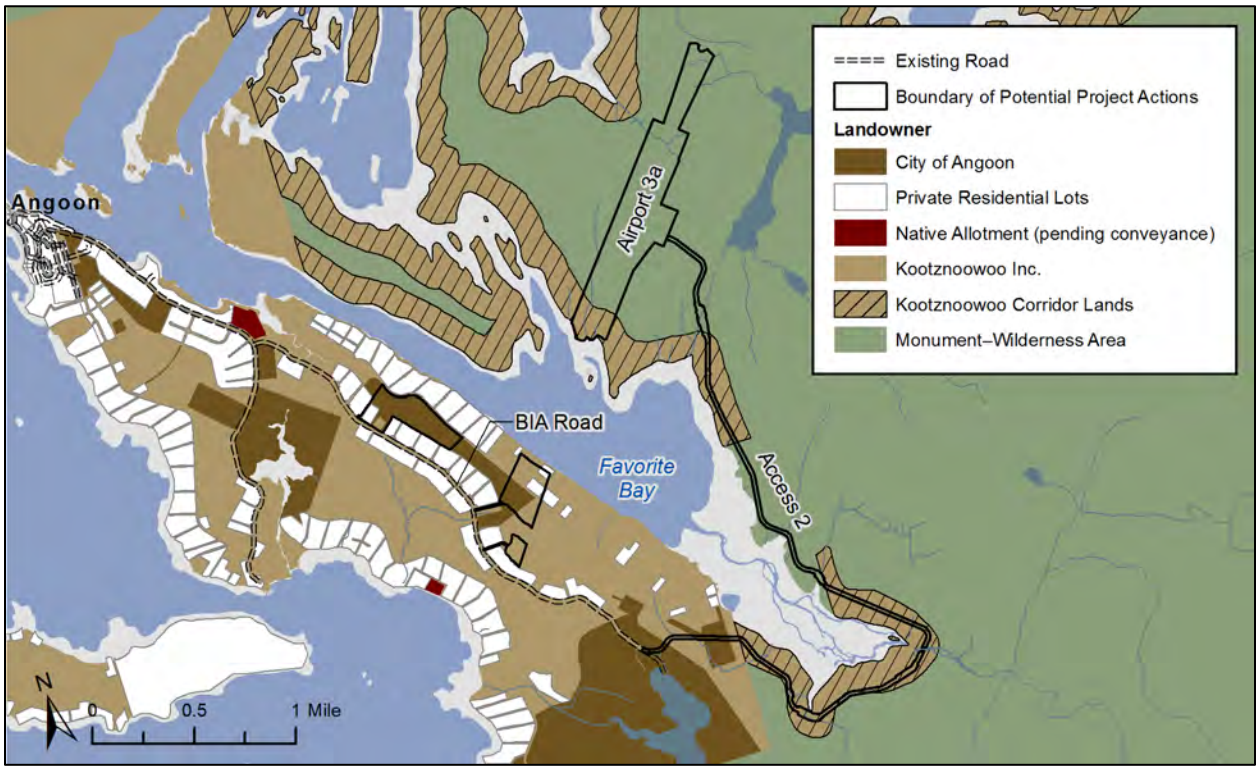

Figure 5. Location of Airport 3a with Access 2 relative to landownership.

8.2.1 Airport 3a with Access 2: Evaluation of Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses

Resource Abundance and Availability

Vegetation clearing would result in long-term direct effects to abundance and availability in land-based use areas. Animals would also likely avoid the 321-acre construction zone during vegetation clearing and while vehicles and workers were present. Construction is estimated to last for up to three seasons. See Table 7 for acreages and percentages of each type of use area affected.

Table 7. Effects to Abundance and Availability from Airport 3a with Access 2

Acres of land affected by construction	Acres of use areas lost through vegetation clearing			Acres of fish use areas affected by bridge construction
	Land mammals and upland birds	Land vegetation	Marine mammals, vegetation and invertebrates, and fish	
321	262 acres (7% of the land mammal and upland bird use areas)	68 acres (4% of the land vegetation use areas)	0 acres	0.6 acres (<0.01% of the fish use areas)

In addition, the distribution of local wildlife populations may change in response to long-term increases in human activity and habitat changes. For instance, deer populations may exhibit short-term increases in abundance and local availability following construction because deer prefer cleared margins along dense forest habitats (Turek et al. 1998). For upland bird species and other land mammals, this habitat loss could slightly reduce long-term abundance and availability as some animals move to more suitable habitat for breeding, forage, and cover. The combined affected acreage would be relatively small when compared to total use areas in the study area.

Other than barging, no actions related to airport and access road construction and operation for the Airport 3a with Access 2 alternative would affect marine resources. Therefore, the Airport 3a with Access 2 alternative would not directly affect abundance and availability of marine invertebrates, marine vegetation, or waterbirds. Although unlikely, marine mammal collisions with barges hauling materials could occur during the construction period. The potential for ship strikes on marine mammals would be minimized or avoided by adhering to a general marine mammal "code of conduct" such as vigilantly scanning the water's surface and remaining at least 100 yards from marine mammals (Neilson et al. 2012). Therefore, the effects of ship strikes to marine mammals as a result of the airport project would be very low, and are not expected to affect marine mammal abundance and availability.

Less than 0.01% of fish use areas would be affected by bridge construction along Favorite Creek (see Table 7). Fish passage would be maintained along Favorite Creek throughout construction, and best management practices would be implemented to protect water quality. Consequently, bridge construction direct effects to fish abundance and availability would be negligible.

Indirect effects to subsistence resources would come from changes in harvest as a result of reductions in or displacement of subsistence resources by improved access for subsistence users. Improved access afforded by the Airport 3a with Access 2 alternative could affect the abundance and availability of some land-based subsistence resources in areas such as the northern and eastern sides of Favorite Bay where local-resident access had previously been limited. Increased harvest pressure could contribute to long-term declines in some subsistence resource populations as well as changes in their distribution patterns. Based on the estimated 7% loss of land mammal and upland bird use areas, as compared to current conditions, this EIS assumes that total annual harvest of terrestrial resources could also decrease by as much as 7%. This change would be within the annual harvest variability for a representative terrestrial species—deer—that has fluctuated by an average of 16% in total harvest from 2004 to 2010 (Alaska Department of Fish and Game 2013).

Improved and new human access to areas along the Access 2 route and construction of a bridge across Favorite Creek could result in long-term increases in fish harvests from Favorite Creek, particularly in pink and coho salmon, as well as increases in waterbird, marine invertebrate, and marine vegetation (seaweed and kelp) harvests from parts of Favorite Bay. Assuming that irregular terrain and thick vegetation would restrict

subsistence users from traveling more than 0.5 mile from improved access corridors, it is anticipated that the increase in harvest pressure would minimally affect abundance and availability of these subsistence resources.

Access to Resources

The Airport 3a with Access 2 alternative would restrict subsistence users' access to 321 acres of land for up to three construction seasons. Following construction, the airport perimeter fence would exclude 98 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). As a result of road and bridge construction, however, this alternative would improve access to 2,021 acres (11%) of current use areas, and would create new access to 726 acres of potential subsistence use areas north of Favorite Bay, around the north end of the proposed airport. Compared to the no action alternative, this alternative would result in a net access increase of 628 acres (4%) during airport and access road operation, based on the assumed 0.5-mile travel limitations due to irregular terrain and thick vegetation. Access to the waterbird use area as well as land mammal / upland bird use area would be increased by 46% and 32%, respectively, whereas marine vegetation and fish use areas would see improvements in access of 1% and 3%, respectively. There would be no indirect effects to access from this alternative.

Competition for the Use of Resources

Competition would not be directly affected by the Airport 3a with Access 2 alternative; however, implementation of this alternative could indirectly affect competition among local subsistence users by improving access to previously inaccessible or remote use areas. Improved access to the east and north sides of Favorite Bay could reduce competition for subsistence harvest areas around Angoon as existing subsistence users spread out into more remote areas. However, competition could increase in some areas, such as the eastern side of Favorite Bay, where highly desirable resources are located.

The Airport 3a with Access 2 alternative would not increase competition between locals and non-locals for collection of land and marine vegetation or hunted wildlife, but could increase competition for fish and marine invertebrates. Visiting hunters are rare, and access to subsistence lands for hunting by locals and non-locals is currently sufficient to meet demand. It is unlikely that a land-based airport would encourage more non-local deer hunting in known subsistence use areas immediately surrounding Angoon. Local interviews indicate that no other land-based resources or marine vegetation would likely be collected or harvested by non-locals following construction of a land-based airport. However, increased air service could expand the existing sports fishing industry in Angoon, bringing in more recreational fishers and thereby increasing competition for fish—in particular for non-sockeye salmonids, halibut, and marine invertebrates—throughout the area. Although reported visitor levels have been relatively low over the past several years, assuming visitor projections increase at the 10.5% rate of anticipated growth for enplanement by 2029 (see discussion in Chapter 2: Purpose and Need for a Land-Based Airport at Angoon), this would represent an increase of approximately 50 non-local recreational fishers in total over current levels by 2029. To minimize conflicts with local subsistence users, charter fishing operators already avoid taking recreational fishers to Kanalku Bay, an important subsistence fishing area (Powers 2013). The growth of self-guided sport fishing operations in other parts of Southeast Alaska suggests that additional efforts by lodge owners or other businesses may be necessary to steer self-guided, non-local recreational fishers away from areas frequented by local subsistence users.

For all use areas in the study area, analysis of the Airport 3a with Access 2 alternative indicates that this alternative would result in few short- and long-term effects on the abundance or availability of, access to, and competition for subsistence resources.

8.2.2 Airport 3a with Access 2: Evaluation of the Availability of Other Lands for Airport Construction

This alternative would be located in the Monument–Wilderness Area (i.e., federal public lands). Of the action alternatives, only Airport 12a with Access 12a would be located on lands other than federal public lands. Airport 12a with Access 12a would be located entirely on lands owned or managed by private landowners, Kootznoowoo Inc., or the City of Angoon.

8.2.3 Airport 3a with Access 2: Evaluation of Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The Airport 3a and Airport 4 alternatives would use federal public lands owned or managed by the USFS. If implemented, the Airport 3a with Access 2 alternative would remove 98 acres of federal public lands from subsistence use. This is less than Airport 4 with either access, which would use the largest amount of federal public lands needed for subsistence purposes. Of all alternatives, only the no action alternative and Airport 12a with Access 12a would use no federal public lands used for subsistence purposes.

8.2.4 Airport 3a with Access 2: Findings

The Airport 3a with Access 2 alternative would not significantly affect the abundance or availability of, access to, or competition for subsistence resources on federal public lands, and therefore it would not significantly restrict subsistence use. Approximately 4% of land vegetation use areas would be cleared during airport, road and bridge construction, and the airport perimeter fence would exclude 98 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). This alternative, however, would improve access to 2,021 acres (11%) of current use areas, and would improve access to 726 acres of new potential subsistence use areas north of Favorite Bay, resulting in a potential net increase of 628 acres (4%) accessible for subsistence use during airport and access road operations.

Although proposed vegetation clearing, road and bridge construction, and other activities that would permanently disrupt subsistence harvesting locations would require some individuals to use new harvesting locations, this alternative would not result in substantial interference in harvestable access or major increases in competition. Rather, implementation of this alternative would likely increase accessibility and expand areas available for Angoon subsistence users.

8.3 Airport 3a with Access 3: Evaluation and Findings

The Airport 3a with Access 3 alternative (Figure 6) would involve new airport construction on the north side of Favorite Bay and development of an access road. As with Access 2, Access 3 would begin at the existing BIA Road; however, the route would extend farther inland from the Favorite Bay shoreline and would require the construction of a shorter bridge across Favorite Creek at a site upstream from the potential location of the Access 2 bridge site. The airport and most of the access road would be located in the Monument–Wilderness Area; a small portion of the access road would be located on lands owned or managed by the USFS, Kootznoowoo, Inc., and the City of Angoon.

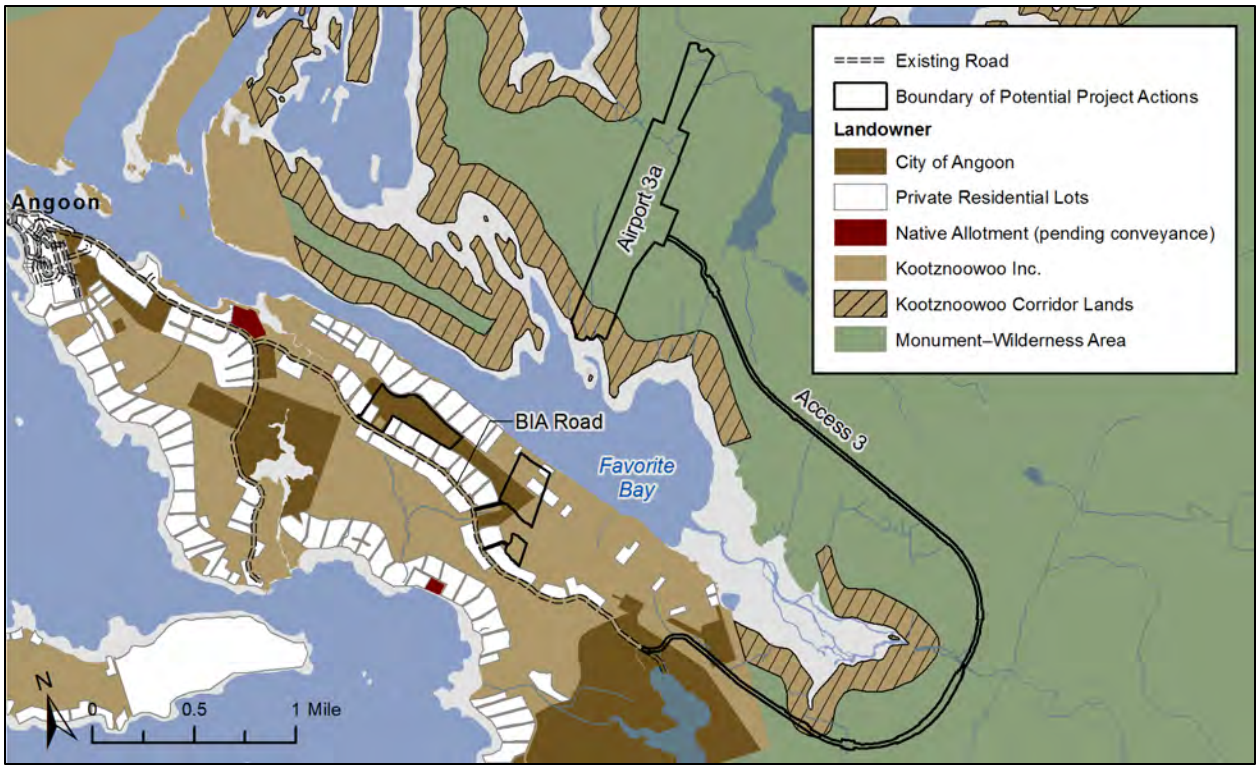

Figure 6. Location of Airport 3a with Access 3 relative to landownership.

8.3.1 Airport 3a with Access 3: Evaluation of Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses

Resource Abundance and Availability

Vegetation clearing would result in long-term direct effects to abundance and availability in land-based use areas. Animals would also likely avoid the 349-acre construction zone during vegetation clearing and while vehicles and workers were present. Construction is estimated to last for up to three seasons. See Table 8 for acreages and percentages of each type of use area affected.

Table 8. Effects to Abundance and Availability from Airport 3a with Access 3

Acres of land affected by construction	Acres of use areas lost through vegetation clearing			Acres of fish use areas affected by bridge construction
	Land mammals and upland birds	Land vegetation	Marine mammals, vegetation and invertebrates, and fish	
349 acres	246 acres (6% of the land mammal and upland bird use areas)	64 acres (4% of the land vegetation use areas)	0 acres	0.3 acres (<0.01% of the fish use areas))

In addition, the distribution of local wildlife populations could change in response to long-term increases in human activity and habitat changes. For instance, deer populations could exhibit short-term increases in abundance and local availability following construction because deer prefer cleared margins along dense forest habitats (Turek et al. 1998). For upland bird species and other land mammals, this habitat loss could slightly reduce long-term abundance and availability as some animals move to more suitable habitat for breeding, forage, and cover. The combined affected acreage would be relatively small when compared to total use areas in the study area.

As with the Airport 3a with Access 2 alternative, the Airport 3a with Access 3 alternative would not directly affect abundance and availability of marine invertebrates, marine mammals, marine vegetation, or waterbirds. Less than 0.01% of fish use areas would be affected by bridge construction along Favorite Creek (see Table 8). Fish passage would be maintained along Favorite Creek throughout construction, and best management practices would be implemented to protect water quality. Consequently, bridge construction effects to fish abundance and availability would be negligible.

Improved access afforded by the Airport 3a with Access 3 alternative could indirectly affect the abundance and availability of some land-based subsistence resources in areas such as the northern and eastern sides of Favorite Bay where local-resident access had previously been limited. Increased harvest pressure could contribute to long-term declines in some subsistence resource populations, and changes in their distribution patterns. Based on the estimated 6% loss of land mammal and upland bird use areas, total annual harvest of terrestrial resources could also decrease by as much as 6%. This change would be within the annual harvest variability for a representative terrestrial species—deer.

Improved and new human access to areas along the Access 3 route, and construction of a bridge across Favorite Creek could also result in long-term increases in fish harvests from Favorite Creek, particularly in pink and coho salmon, as well as increases in waterbird, marine invertebrate, and marine vegetation (seaweed and kelp) harvests from parts of Favorite Bay. Assuming that irregular terrain and thick vegetation would restrict subsistence users from traveling more than 0.5 mile from improved access corridors, it is anticipated that the increase in harvest pressure would minimally affect the abundance and availability of these subsistence resources.

Access to Resources

The Airport 3a with Access 3 alternative would restrict subsistence users' access to 349 acres of land for up to three construction seasons. Following construction, the airport perimeter fence would exclude 98 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). As a result of road and bridge construction, however, Access 3 would improve access to 2,116 acres (12%) of current use areas, and would create new access to 1,416 acres of potential

subsistence use areas north of Favorite Bay, around the north end of the proposed airport. Compared to the no action alternative, this alternative would result in a net access increase of 1,318 acres (7%) during airport and access road operation, based on the assumed 0.5-mile travel limitations due to irregular terrain and thick vegetation. Access to waterbird, land mammal, and upland bird use areas would be increased by 46% and 34%, respectively, whereas marine vegetation and fish use areas would see improvements in access of 1% and 3%, respectively. There would be no indirect effects to access from this alternative.

Competition for the Use of Resources

Competition would not be directly affected by the Airport 3a with Access 3 alternative; however, implementation of this alternative could indirectly affect competition among local subsistence users by improving access to previously inaccessible or remote use areas. Improved access to the east and north sides of Favorite Bay could reduce competition for subsistence harvest areas around Angoon as existing subsistence users spread out into more remote areas. However, competition could increase in some areas, such as the eastern side of Favorite Bay, where highly desirable resources are located.

The Airport 3a with Access 3 alternative would not increase competition between locals and non-locals for collection of land and marine vegetation or hunted wildlife, but could increase competition for fish and marine invertebrates. Visiting hunters are rare, and access to subsistence lands for hunting by locals and non-locals is currently sufficient to meet demand. It is unlikely that a land-based airport would encourage more non-local deer hunting in known subsistence use areas immediately surrounding Angoon. Local interviews indicate that no other land-based resources or marine vegetation would likely be collected or harvested by non-locals following construction of a land-based airport. However, increased air service could expand the existing sports fishing industry in Angoon, bringing in more recreational fishers and thereby increasing competition for fish—in particular for non-sockeye salmonids, halibut, and marine invertebrates—throughout the area. Although reported visitor levels have been relatively low over the past several years, assuming visitor projections increase at the 10.5% rate of anticipated growth for enplanement by 2029 (see discussion in Chapter 2: Purpose and Need for a Land-Based Airport at Angoon), this would represent an increase of approximately 50 non-local recreational fishers in total over current levels by 2029. To minimize conflicts with local subsistence users, charter fishing operators already avoid taking recreational fishers to Kanalku Bay, an important subsistence fishing area (Powers 2013). The growth of self-guided sport fishing operations in other parts of Southeast Alaska suggests that additional efforts by lodge owners or other businesses may be necessary to steer visiting self-guided, non-local recreational fishers away from areas frequented by local subsistence users.

For all lands in the study area, analysis of the Airport 3a with Access 3 alternative indicates that this alternative would have few short- and long-term effects on the abundance or availability of, access to, and competition for subsistence resources.

8.3.2 Airport 3a with Access 3: Evaluation of the Availability of Other Lands for Airport Construction

This alternative would be located in the Monument–Wilderness Area (i.e., federal public lands). Of the action alternatives, only Airport 12a with Access 12a would be located on lands other than federal public lands. Airport 12a with Access 12a would be located entirely on lands owned or managed by private landowners, Kootznoowoo Inc., or the City of Angoon.

8.3.3 Airport 3a with Access 3: Evaluation of Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The Airport 3a and Airport 4 alternatives would use federal public lands owned or managed by the USFS. If implemented, the Airport 3a with Access 3 alternative would remove 98 acres of federal public lands from subsistence use. This is less than Airport 4 with either access, which would use the largest amount of federal public lands needed for subsistence purposes. Of all alternatives, only the no action alternative and Airport 12a with Access 12a would use no federal public lands used for subsistence purposes.

8.3.4 Airport 3a with Access 3: Findings

The Airport 3a with Access 3 alternative would not significantly affect the abundance or availability of, access to, or competition for subsistence resources on federal public lands, and therefore would not significantly restrict subsistence use. Approximately 4% of land vegetation use areas would be cleared during airport, road, and bridge construction, and the airport perimeter fence would exclude 98 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). This alternative, however, would improve access to 2,116 acres (12%) of current use areas and would improve access to 11,416 acres of new potential subsistence use areas north of Favorite Bay, resulting in a potential net increase of 1,318 acres (7%) accessible for subsistence use during airport and access road operations.

Although proposed vegetation clearing, road and bridge construction, and other activities that would permanently disrupt subsistence harvesting locations would require some individuals to use new harvesting locations, this alternative would not result in substantial interference in harvestable access or major increases in competition. Rather, implementation of this alternative would likely increase accessibility and expand areas available for Angoon subsistence users.

8.4 Airport 4 with Access 2: Evaluation and Findings

The Airport 4 with Access 2 alternative would involve new airport construction on the east side of Favorite Bay and development of an access road. Access 2 would begin at the existing BIA Road, would continue around the southeastern end of Favorite Bay within 1,000 feet of the shoreline, and would require the construction of a bridge across Favorite Creek (at the same location as for the Airport 3a with Access 2 alternative). The airport and most of the access road would be located in the Monument–Wilderness Area; a small portion of the access road would be located on lands owned or managed by the USFS, Kootznoowoo, Inc , and the City of Angoon.

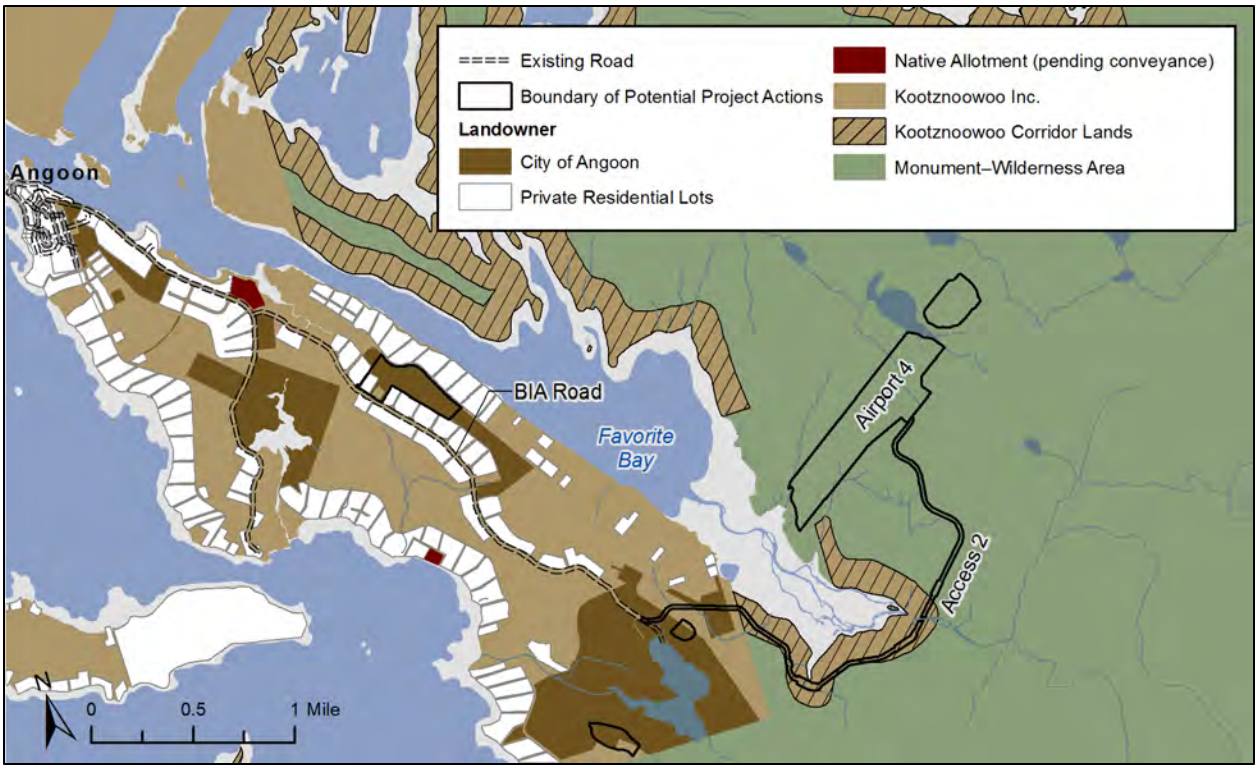

Figure 7. Location of Airport 4 with Access 2 relative to landownership.

8.4.1 Airport 4 with Access 2: Evaluation of Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses

Resource Abundance and Availability

Vegetation clearing would result in long-term direct effects to abundance and availability in land-based use areas. Animals would also likely avoid the 290-acre construction zone during vegetation clearing and while vehicles and workers were present. Construction is estimated to last for up to three seasons. See Table 9 for acreages and percentages of each type of use area affected.

Table 9. Effects to Abundance and Availability from Airport 4 with Access 2

Acres of land affected by construction	Acres of use areas lost through vegetation clearing			Acres of fish use areas affected by bridge construction
	Land mammals and upland birds	Land vegetation	Marine mammals, vegetation and invertebrates, and fish	
290 acres	189 acres (5% of the land mammal and upland bird use areas)	58 acres (3% of the land vegetation use areas)	0 acres	0.6 acres (<0.01% of the fish use areas)

In addition, the distribution of local wildlife populations could change in response to long-term increases in human activity and habitat changes. For instance, deer populations could exhibit short-term increases in abundance and local availability following construction because deer prefer cleared margins along dense forest habitats (Turek et al. 1998). For upland bird species and other land mammals, this habitat loss could slightly reduce long-term abundance and availability as some animals move to more suitable habitat for breeding, forage, and cover. The combined affected acreage would be relatively small when compared to total use areas in the study area.

The Airport 4 with Access 2 alternative would not directly affect abundance and availability of marine invertebrates, marine mammals, marine vegetation, or waterbirds. Less than 0.01% of fish use areas would be affected by bridge construction along Favorite Creek (see Table 9). Fish passage would be maintained along Favorite Creek throughout construction, and best management practices would be implemented to protect water quality. Consequently, bridge construction effects to fish abundance and availability would be negligible.

Improved access afforded by the Airport 4 with Access 2 alternative could indirectly affect the abundance and availability of some land-based subsistence resources in the area around the east side of Favorite Bay where local-resident access had previously been limited. Increased harvest pressure could contribute to long-term declines in some subsistence resource populations and changes in their distribution patterns. Based on the estimated 5% loss of land mammal and upland bird use areas, total annual harvest of terrestrial resources could also decrease by as much as 5%. This change would be within the annual harvest variability for a representative terrestrial species—deer.

Improved and new human access to areas along the Access 2 route and construction of a bridge across Favorite Creek could result in long-term increases in fish harvests from Favorite Creek, particularly in pink and coho salmon, as well as increases in waterbird, marine invertebrate, and marine vegetation (seaweed and kelp) harvests from parts of Favorite Bay. Assuming that irregular terrain and thick vegetation would restrict subsistence users from traveling more than 0.5 mile from improved access corridors, it is anticipated that the increase in harvest pressure would minimally affect abundance and availability of these subsistence resources.

Access to Resources

The Airport 4 with Access 2 alternative would restrict subsistence users' access to 290 acres of land for up to three construction seasons. Following construction, the airport perimeter fence would exclude 100 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). As a result of road and bridge construction, however, this alternative would improve access to 1,425 acres (8%) of current use areas, and would improve access to 896 acres of new potential subsistence use areas east of Favorite Bay. Compared to the no action alternative, this alternative would result in a net access increase of 796 acres (5%) during airport and access road operation, based on the assumed 0.5-mile travel

limitations due to irregular terrain and thick vegetation. Although access to waterbird, land mammal, and upland bird use areas would be increased, the land mammal and upland bird increase would be roughly half (18%) that estimated under the Airport 3a with Access 2 alternative. There would be no indirect effects to access from this alternative.

Competition for the Use of Resources

Competition would not be directly affected by the Airport 4 with Access 2 alternative; however, implementation of this alternative could indirectly affect competition among local subsistence users by improving access to previously inaccessible or remote use areas. Implementation of this alternative would likely reduce local competition for subsistence harvest areas around Angoon; however, competition for highly desirable resources among local subsistence users could increase in areas, such as along the Favorite Creek drainage.

Although the Airport 4 with Access 2 alternative would not directly increase competition among locals and non-locals for collection of land and marine vegetation or hunted wildlife, this alternative could ultimately lead to increased competition for fish and marine invertebrates. Visiting hunters are rare, and access to subsistence lands for hunting by locals and non-locals is currently sufficient to meet demand. It is unlikely that a land-based airport would encourage more non-local deer hunting in known subsistence use areas immediately surrounding Angoon. Local interviews indicate that no other land-based resources or marine vegetation would likely be collected or harvested by non-locals following construction of a land-based airport. Increased air service, however, could allow for expansion of the existing sports fishing industry in Angoon, bringing in more recreational fishers and thereby increasing competition for fish—in particular for non-sockeye salmonids, halibut, and marine invertebrates—throughout the area. Although reported visitor levels have been relatively low over the past several years, assuming visitor projections increase at the 10.5% rate of anticipated growth for enplanement by 2029 (see discussion in Chapter 2: Purpose and Need for a Land-Based Airport at Angoon), this would represent an increase of approximately 50 non-local recreational fishers in total over current levels by 2029. To minimize conflicts with local subsistence users, charter fishing operators already avoid taking recreational fishers to Kanalku Bay, an important subsistence fishing area (Powers 2013). The growth of self-guided sport fishing operations in other parts of Southeast Alaska suggests that additional efforts by lodge owners or other businesses may be necessary to steer visiting self-guided, non-local recreational fishers away from areas frequented by local subsistence users.

For all lands in the study area, analysis of the Airport 4 with Access 2 alternative indicates that this alternative would result in few short- and long-term effects on the abundance or availability of, access to, and competition for subsistence resources.

8.4.2 Airport 4 with Access 2: Evaluation of the Availability of Other Lands for Airport Construction

This alternative would be located in the Monument–Wilderness Area (i.e., on federal public lands). Of the action alternatives, only Airport 12a with Access 12a would be located on lands other than federal public lands. Airport 12a with Access 12a would be located entirely on lands owned or managed by private landowners, Kootznoowoo Inc., or the City of Angoon.

8.4.3 Airport 4 with Access 2: Evaluation of Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The Airport 3a and Airport 4 alternatives would use federal public lands owned or managed by the USFS. If implemented, Airport 4 with either access would remove 100 acres of federal public lands from subsistence use, the largest amount of federal public lands needed for subsistence purposes. Of all alternatives, only the no action alternative and Airport 12a with Access 12a would use no federal public lands used for subsistence purposes.

8.4.4 Airport 4 with Access 2: Findings

The Airport 4 with Access 2 alternative would not significantly affect the abundance or availability of, access to, or competition for subsistence resources on federal public lands, and therefore not significantly restrict subsistence use. Approximately 3% of land vegetation use areas would be cleared during airport, road and bridge construction, and the airport perimeter fence would exclude 100 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). This alternative, however, would improve access to 1,425 acres (8%) of current use areas and access to 896 acres of new potential subsistence use areas east of Favorite Bay, resulting in a potential net increase of 796 acres (5%) accessible for subsistence use during airport and access road operations.

Although proposed vegetation clearing, road and bridge construction, and other activities that would permanently disrupt subsistence harvesting locations would require some individuals to use new harvesting locations, this alternative would not result in substantial interference in harvestable access or major increases in competition. Rather, implementation of this alternative would likely increase accessibility and expand areas available for Angoon subsistence users.

8.5 Airport 4 with Access 3: Evaluation and Findings

The Airport 4 with Access 3 alternative would involve new airport construction on the east side of Favorite Bay and development of an access road. As with Access 2, Access 3 would begin at the existing BIA Road; however, the route would extend farther inland from the Favorite Bay shoreline and would require the construction of a shorter bridge across Favorite Creek at a site upstream from the potential location of the Access 2 bridge site. From the bridge, the road would continue northwest to the proposed Airport 4 location. The airport and most of the access road would be located in the Monument–Wilderness Area; a small portion of the access road would be located on lands owned or managed by the USFS;Kootznoowoo, Inc.; and the City of Angoon.

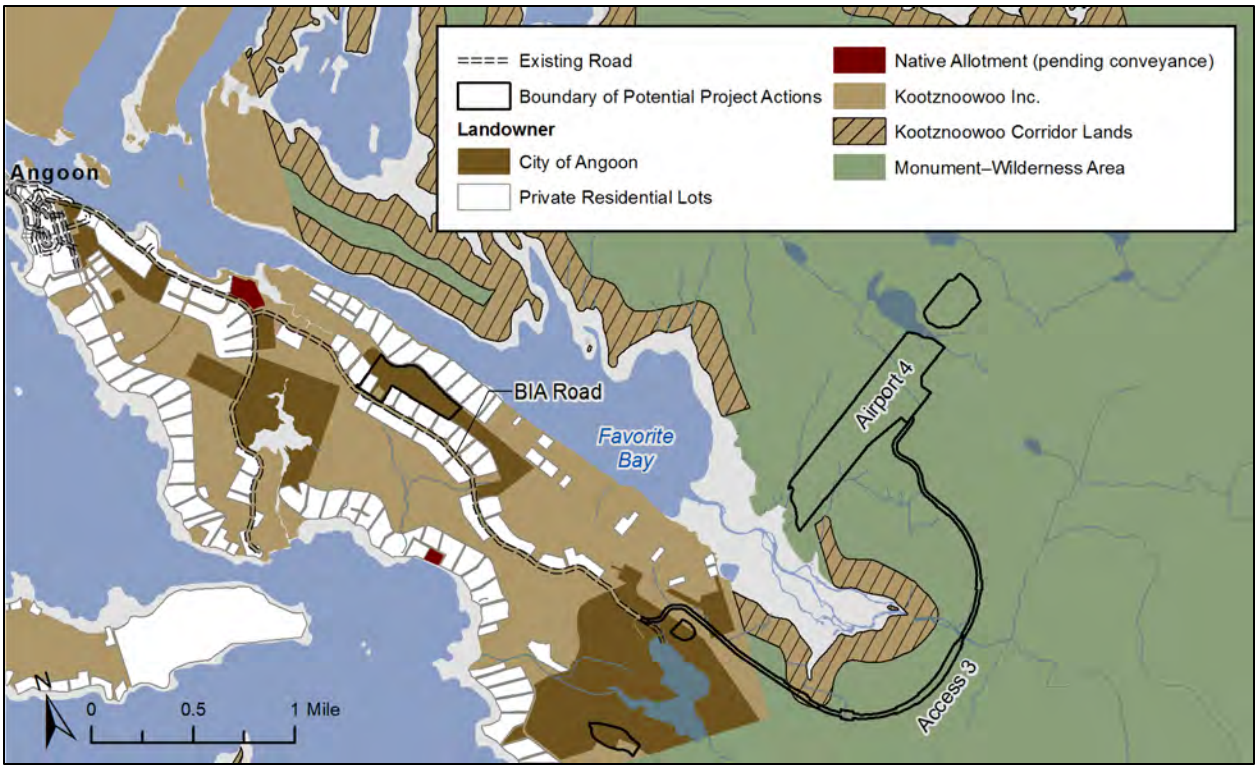

Figure 8. Location of Airport 4 with Access 3 relative to landownership.

8.5.1 Airport 4 with Access 3: Evaluation of Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses

Resource Abundance and Availability

Vegetation clearing would result in long-term direct effects to abundance and availability in land-based use areas. Animals would also likely avoid the 295-acre construction zone during vegetation clearing and while vehicles and workers were present. Construction is estimated to last for up to three seasons. See Table 10 for acreages and percentages of each type of use area affected.

Table 10. Effects to Abundance and Availability from Airport 4 with Access 3

Acres of land affected by construction	Acres of use areas lost through vegetation clearing			Acres of fish use areas affected by bridge construction
	Land mammals and upland birds	Land vegetation	Marine mammals, vegetation and invertebrates, and fish	
295 acres	170 acres (5% of the land mammal and upland bird use areas)	59 acres (3% of the land vegetation use areas)	0 acres	0.3 acres (<0.01% of the fish use areas)

In addition, the distribution of local wildlife populations could change in response to long-term increases in human activity and habitat changes. For instance, deer populations could exhibit short-term increases in abundance and local availability following construction because deer prefer cleared margins along dense forest habitats (Turek et al. 1998). For upland bird species and other land mammals, this habitat loss could slightly reduce long-term abundance and availability as some animals move to more suitable habitat for breeding, forage, and cover. The combined affected acreage would be relatively small when compared to total use areas in the study area.

As with the Airport 3a with Access 2 or 3 alternatives, the Airport 4 with Access 3 alternative would not directly affect abundance and availability of marine invertebrates, marine mammals, marine vegetation, or waterbirds. Less than 0.01% of fish use areas would be affected by bridge construction along Favorite Creek (see Table 10). Fish passage would be maintained along Favorite Creek throughout construction, and best management practices would be implemented to protect water quality. Consequently, bridge construction effects to fish abundance and availability would be negligible.

Improved access afforded by the Airport 4 with Access 3 alternative could indirectly affect the abundance and availability of some land-based subsistence resources in the area around the east side of Favorite Bay where local resident access had previously been limited. Increased harvest pressure could contribute to long-term declines in some subsistence resource populations and changes in their distribution patterns. Based on the estimated 5% loss of land mammal and upland bird use areas, total annual harvest of terrestrial resources could also decrease by as much as 5%. This change would be within the annual harvest variability for a representative terrestrial species—deer.

Improved and new human access to areas along the Access 3 route, and construction of a bridge across Favorite Creek could also result in long-term increases in fish harvests from Favorite Creek, particularly in pink and coho salmon, as well as increases in waterbird, marine invertebrate, and marine vegetation (seaweed and kelp) harvests from parts of Favorite Bay. Assuming that irregular terrain and thick vegetation would restrict subsistence users from traveling more than 0.5 mile from improved access corridors, it is anticipated that the increase in harvest pressure would minimally affect abundance and availability of these subsistence resources.

Access to Resources

The Airport 4 with Access 3 alternative would restrict subsistence users' access to 295 acres of land for up to three construction seasons. Following construction, the airport perimeter fence would exclude 100 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). As a result of road and bridge construction, however, this alternative would improve access to 1,442 acres (8%) of current use areas, and would create new access to 1,182 acres of potential subsistence use areas east of Favorite Bay. Compared to the no action alternative, this alternative would result

in a net access increase of 1,082 acres (6%) during airport and access road operation, based on the assumed 0.5-mile travel limitations due to irregular terrain and thick vegetation. Although access to waterbird, land mammal, and upland bird use areas would be increased, the land mammal and upland bird increase would be roughly half (18%) that estimated under the Airport 3a with Access 2 alternative. There would be no indirect effects to access from this alternative.

Competition for the Use of Resources

Competition would not be directly affected by the Airport 4 with Access 3 alternative; however, implementation of this alternative could indirectly affect competition among local subsistence users by improving access to previously inaccessible or remote locations. Implementation of this alternative would likely reduce local competition for subsistence harvest areas around Angoon; however, competition for highly desirable resources among local subsistence users could increase in areas such as along the Favorite Creek drainage.

Although the Airport 4 with Access 3 alternative would not directly increase competition between locals and non-locals for collection of land and marine vegetation or hunted wildlife, this alternative could ultimately lead to increased competition for fish and marine invertebrates. Visiting hunters are rare, and access to subsistence lands for hunting by locals and non-locals is currently sufficient to meet demand. It is unlikely that a land-based airport would encourage more non-local deer hunting in known subsistence use areas immediately surrounding Angoon. Local interviews indicate that no other land-based resources or marine vegetation would likely be collected or harvested by non-locals following construction of a land-based airport. Increased air service, however, could allow for expansion of the existing sports fishing industry in Angoon, bringing in more recreational fishers and thereby increasing competition for fish—in particular for non-sockeye salmonids, halibut, and marine invertebrates—throughout the area. Although reported visitor levels have been relatively low over the past several years, assuming visitor projections increase at the 10.5% rate of anticipated growth for enplanement by 2029 (see discussion in Chapter 2: Purpose and Need for a Land-Based Airport at Angoon), this would represent an increase of approximately 50 non-local recreational fishers in total over current levels by 2029. To minimize conflicts with local subsistence users, charter fishing operators already avoid taking recreational fishers to Kanalku Bay, an important subsistence fishing area (Powers 2013). The growth of self-guided sport fishing operations in other parts of Southeast Alaska suggests that additional efforts by lodge owners or other businesses may be necessary to steer visiting self-guided, non-local recreational fishers away from areas frequented by local subsistence users.

For all lands in the study area, analysis of the Airport 4 with Access 3 alternative indicates that this alternative would result in few short- and long-term effects on the abundance or availability of, access to, and competition for subsistence resources.

8.5.2 Airport 4 with Access 3: Evaluation of the Availability of Other Lands for Airport Construction

This alternative would be located in the Monument–Wilderness Area (i.e., on federal public lands). Of the three airport alternatives, only Airport 12a with Access 12a would be located on lands other than federal public lands. Airport 12a with Access 12a would be located entirely on lands owned or managed by private landowners, Kootznoowoo Inc., or the City of Angoon.

8.5.3 Airport 4 with Access 3: Evaluation of Other Alternatives That Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The Airport 3a and Airport 4 alternatives would use federal public lands owned or managed by the USFS. If implemented, Airport 4 with either access would remove 100 acres of federal public lands from subsistence use, the largest amount of federal public lands needed for subsistence purposes. Of all alternatives, only the no action alternative and Airport 12a with Access 12a would use no federal public lands used for subsistence purposes.

8.5.4 Airport 4 with Access 3: Findings

The Airport 4 with Access 3 alternative would not significantly affect the abundance or availability of, access to, or competition for subsistence resources on federal public lands, and therefore would not significantly restrict subsistence use. Approximately 3% of land vegetation use areas would be cleared during airport, road and bridge construction, and the airport perimeter fence would exclude 100 acres from public access for the duration of airport operation (considered permanent removal of federal public lands used for subsistence purposes). This alternative, however, would improve access to 1,442 acres (8%) of current use areas and access to 1,182 acres of new potential subsistence use areas east of Favorite Bay, resulting in a potential net increase of 1,082 acres (6%) accessible for subsistence use during airport and access road operations.

Although proposed vegetation clearing, road and bridge construction, and other activities that would permanently disrupt subsistence harvesting locations would require some individuals to use new harvesting locations, this alternative would not result in substantial interference in harvestable access or major increases in competition. Rather, implementation of this alternative would likely increase accessibility and expand areas available for Angoon subsistence users.

8.6 Airport 12a with Access 12a (Preferred Alternative): Evaluation and Findings

The Airport 12a with Access 12a alternative would be located on the Angoon peninsula southeast of the community of Angoon on lands owned and managed by private landowners, Kootznoowoo Inc., or the City of Angoon. Access 12a would begin at the existing BIA Road and travel south to the proposed airport location. No part of this alternative would be located on Monument–Wilderness Area lands.

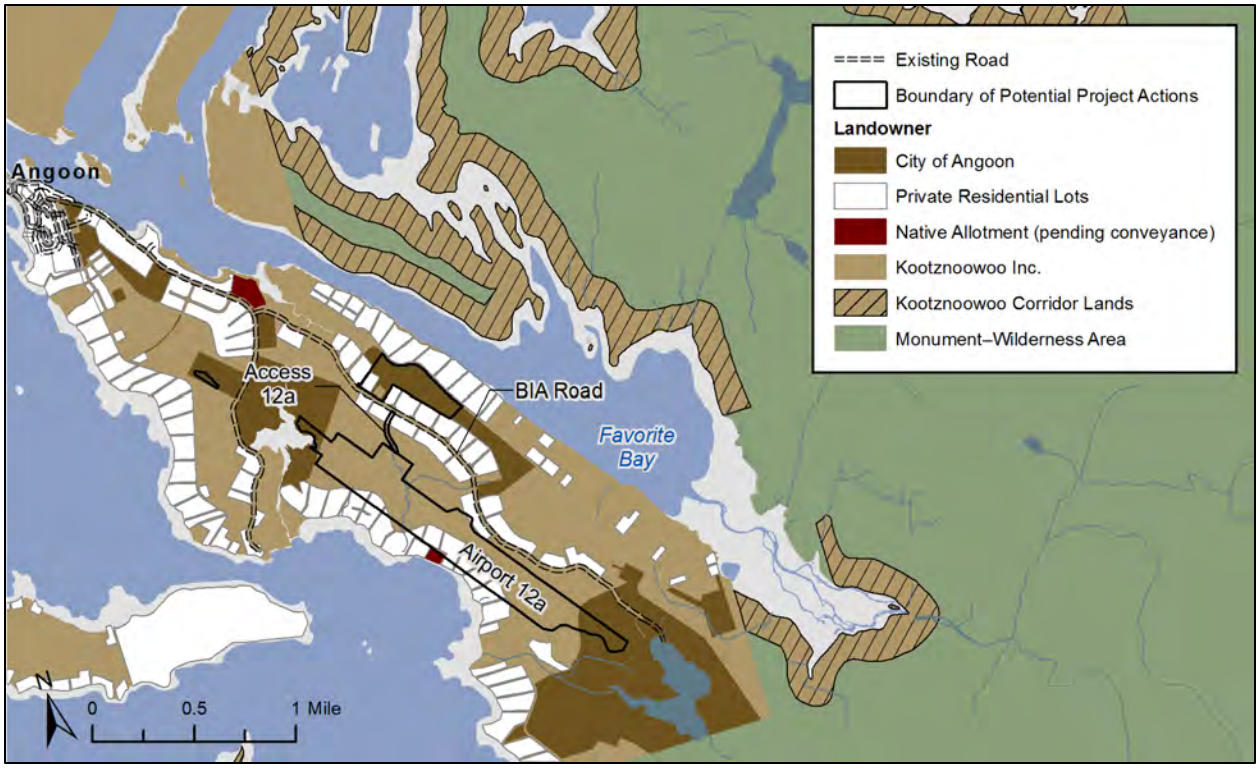

Figure 9. Location of Airport 12a with Access 12a relative to landownership.

8.6.1 *Airport 12a with Access 12a: Evaluation of Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses*

Although this alternative would affect subsistence resources and uses, those effects would not be on federal public lands. Information on effects to subsistence resources and uses can be found section 4.13.3.4 of Subsistence Resources and Uses in the EIS.

8.6.2 *Airport 12a with Access 12a: Evaluation of the Availability of Other Lands for Airport Construction*

The Airport 12a with Access 12a alternative would wholly occupy non-federal lands and affect no Monument–Wilderness Area lands. Because this alternative does not affect federal public lands, there is no need to evaluate the availability of other lands for airport construction.

8.6.3 Airport 12a with Access 12a: Evaluation of Other Alternatives that Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

The Airport 12a with Access 12a alternative would not remove federal public lands used for subsistence purposes. Of all alternatives, only the no action alternative and the Airport 12a with Access 12a alternative would use no federal public lands used for subsistence purposes. As shown in Table 11, Airport 3a and Airport 4 with either access would result in the permanent removal of between 98 and 100 acres of federal public lands from subsistence use.

Table 11. Acres of Federal Public Lands Permanently Removed from Subsistence Use Compared to the Airport 12a with Access 12a Alternative

No Action Alternative	Airport 3a with Access 2	Airport 3a with Access 3	Airport 4 with Access 2	Airport 4 with Access 3	Airport 12a with Access 12a
No use of federal public lands	98 acres	98 acres	100 acres	100 acres	No use of federal public lands

8.6.4 Airport 12a with Access 12a: Findings

Because the Airport 12a with Access 12a alternative would be located wholly on non-federal lands, it would not significantly restrict subsistence resources and uses on federal public lands.

8.7 Cumulative Case: Evaluation and Findings

The goal of the cumulative effects analysis is to evaluate the incremental effect of the preferred alternative, Airport 12a with Access 12a, in conjunction with all past, present, and reasonably foreseeable future actions in or near the study area.

Various projects have been completed or are planned in the study area that may affect subsistence resources and uses. Only projects with potential direct effects are listed in Table 12 and shown in Figure 10.

Table 12. Current and Reasonably Foreseeable Projects

Project	Description
Angoon barge landing improvements	Development of an upland staging area and installation of a trestle or causeway leading to a heavy loadout dock with mooring dolphins on each side.
Angoon Hydroelectric Project	Transmission line to deliver power to Angoon from a hydroelectric dam to be constructed on Thayer Creek.
Angoon helipad	Helicopter landing pad for health and safety emergencies when seaplanes are not available.
Angoon ferry terminal passenger facility	Replacement of the existing passenger terminal facility for Alaska Marine Highway System passengers at Angoon. Design to include the new building and parking area.

Source: (City of Angoon 2012; CRW and Golder 2010; DOT&PF 2013; USFS 2002, 2009, 2012).

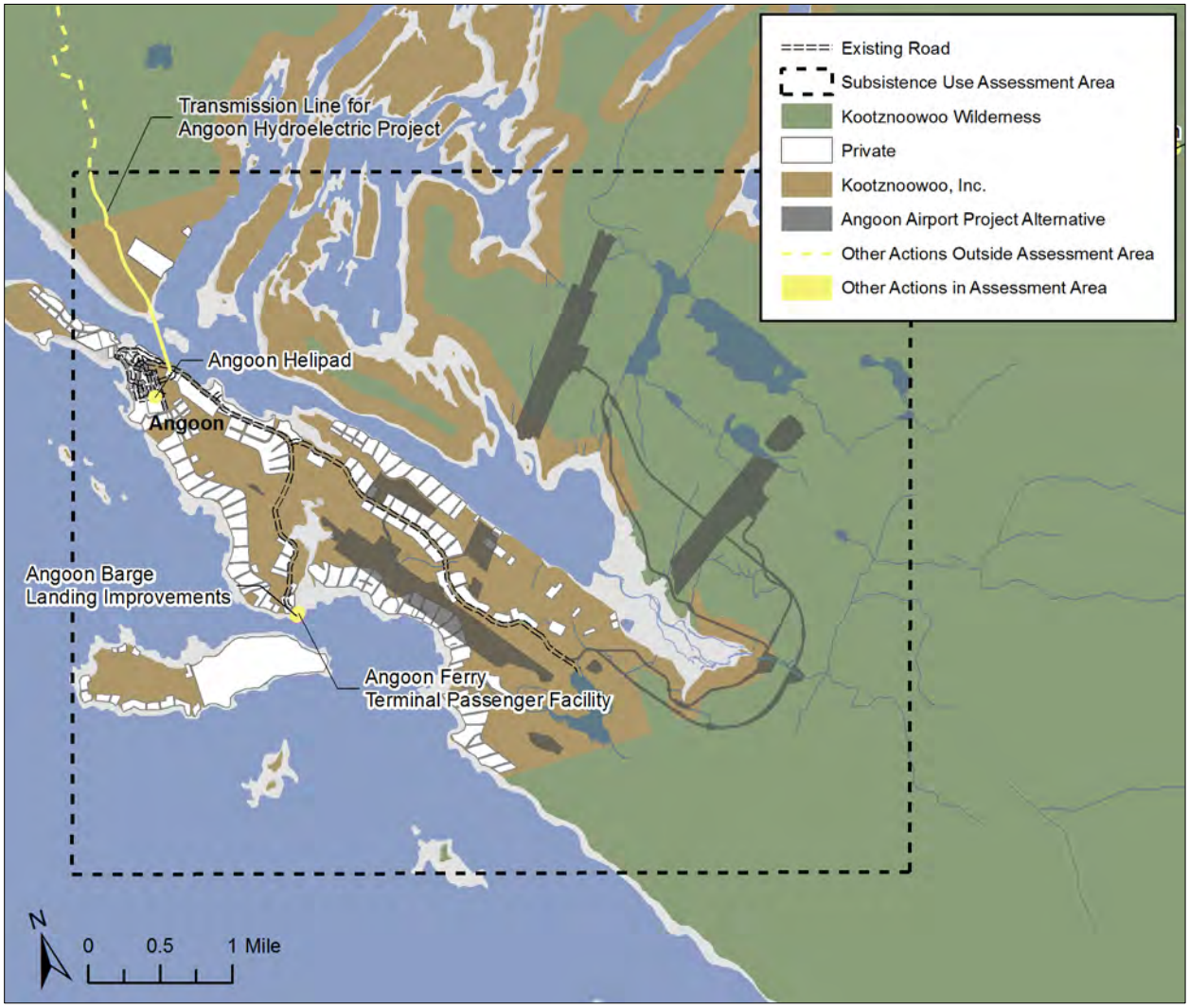

Figure 10. Current and reasonably foreseeable projects within the subsistence study area.

8.7.1 *Cumulative Case: Evaluation of the Effect of Use, Occupancy, or Disposition on Subsistence Resources and Uses*

Past actions in the Angoon area that may have affected subsistence resources through reduction in habitat for subsistence resources include timber harvest, landfill improvements, seaplane base improvements, and ferry terminal improvements.

Future actions could affect subsistence resources and uses in several ways. The installation of the underwater cable for the hydroelectric project would result in a short-term reduction of abundance and availability in the immediate vicinity of the cable in Favorite Bay. The construction of the barge landing area and ferry terminal passenger facility would result in a short-term reduction of abundance and availability in a high-use area for clamming by the Angoon community. There would be no cumulative effects to access or competition in the long term. Short-term displacement of subsistence users would occur during construction of any of the reasonably foreseeable future actions, but access would be restored after construction. This displacement could have

minimal effects on competition as users move to other areas, but users would be able to return to these areas once construction was complete. In summary, because the effects from future actions are anticipated to be short-term and minimal, these future actions combined with the preferred alternative would not result in significant cumulative effects.

8.7.2 Cumulative Case: Evaluation of the Availability of Other Lands for Airport Construction

Four of the five action alternatives would use federal public lands. Only the preferred alternative, Airport 12a with Access 12a, would use no federal public lands.

8.7.3 Cumulative Case: Evaluation of Other Alternatives that Would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

Four of the five action alternatives would use federal public lands. Of all the alternatives, only the no action alternative and the preferred alternative (Airport 12a with Access 12a) would use no federal public lands needed for subsistence purposes. Airport 4 with either access would permanently remove the greatest amount of federal public land needed for subsistence purposes.

8.7.4 Cumulative Case: Findings

When considered in combination with past, present, and reasonably foreseeable future actions, implementation of the preferred alternative would have minor short-term and long-term effects on abundance and availability of subsistence resources; however, the preferred alternative would not be constructed on federal public lands. Further, there would be no known significant change in access to subsistence resources, nor would there be increases in competition from non-rural use. Implementation of the preferred alternative, in combination with past, present, and reasonably foreseeable future actions, would not result in a significant effect as measured against the established significance criteria of large reductions in abundance, major redistribution resulting in reduced availability, substantial interference with harvestable access, or major increases in non-rural use. Therefore, implementation of the preferred alternative would not significantly restrict subsistence resources and uses.

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9.0 REFERENCES

Ackerman, R.E. 1968. *The Archaeology of the Glacier Bay Region, Southeastern Alaska*. Laboratory of Archaeology Report of Investigation 44. Washington State University, Pullman.

Ackerman, R.E., K.C. Reid, J.D. Gallison, and M.E. Roe. 1985. *Archaeology of Heceta Island: A Survey of 16 Timber Harvest Units in the Tongass National Forest, Southeastern Alaska*. Center for Northwest Anthropology Project Report 3. Washington State University.

Alaska Commercial Fisheries Entry Commission (ACFED). 2013. Permit and fishing activity, Skagway-Hoonah-Angoon Census Area, 1990–2010. Available at: http://www.cfec.state.ak.us/fishery_statistics/earnings.htm. Accessed April 10, 2013.

Alaska Department of Commerce, Community, and Economic Development (ADCCED). 2013. Angoon community profile. Available at: http://commerce.alaska.gov/cra/DCRAExternal/community/Details/72294383-ddd6-4441-8c63-eb92786a82a1. Accessed April 2013.

Alaska Department of Fish and Game (ADF&G). 1994. Wildlife notebook series. Available at: http://www.adfg.state.ak.us/pubs/notebook/notehome.php. Accessed November 10, 2008.

——————. 2013. Community Subsistence Information System. Available at: http://www.subsistence.adfg.state.ak.us/CSIS/. Accessed March 15, 2013.

Alaska Department of Labor and Workforce Development. 2013. Alaska Local and Regional Information (ALARI) employment data: Alaska (all boroughs/census areas), Southeast region, the Hoonah-Angoon Census Area, and Juneau (city and borough). Available at: http://live.laborstats.alaska.gov/alari/. Accessed March 27, 2013.

Alaska Department of Transportation and Public Facilities (DOT&PF). 2007. *Angoon Airport Master Plan.* Available at: www.angoonairporteis.com. Accessed October 17, 2012.

———. 2013. *2012–2015 State of Alaska Statewide Transportation Improvement Program (STIP).* Amendment 5 incorporated. April 24, 2013. Juneau: Alaska Department of Transportation and Public Facilities, Division of Program Development.

City of Angoon. 2012. City of Angoon Resolution No. 12-5, Setting Forth Angoon Capital Improvement Projects. Adopted February 6, 2012. Certified by Mayor Albert Howard.

CRW Engineering Group, LLC, and Golder Associates. 2010. *City of Angoon Favorite Creek Hydrology Study*. Prepared for the City of Angoon and the Alaska Native Tribal Health Consortium. Anchorage: CRW Engineering Group, LLC, and Golder Associates.

Davis, S.D. (ed.). 1989. *The Hidden Falls Site, Baranof Island, Alaska.* Aurora: Alaska Anthropological Association Monograph Series.

Davis, S.D. 1990. Prehistory of Southeast Alaska. In *Northwest Coast*, edited by W.P. Suttles, pp. 197–202. Handbook of North American Indians, Vol. 7, W.C. Sturtevant, general editor. Washington, D.C.: Smithsonian Institution Press.

de Laguna, F. 1960. *The Story of a Tlingit Community*. Washington, D.C.: United States Government Printing Office.

Emmons, G.T. 1991. *The Tlingit Indians.* Edited with additions by Frederica de Laguna and a biography by Jean Low. Seattle and London: University of Washington Press and New York: American Museum of Natural History.

Environmental Protection Agency (EPA). 2012. Environmental justice: basic information. Available at: http://www.epa.gov/compliance/ej/basics/. Accessed May 30, 2013.

Fall, J.A., M. George, and B. Easley. 2005. *Subsistence Harvests of Pacific Halibut in Alaska, 2004.* Technical Paper No. 304. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., M. Kerlin, B. Easley, and R.J. Walker. 2004. *Subsistence Harvests of Pacific Halibut in Alaska, 2003.* Technical Paper No. 288. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., and D. Koster. 2008. *Subsistence Harvests of Pacific Halibut in Alaska, 2007.* Technical Paper No. 342. Anchorage: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., and D. Koster. 2010. *Subsistence Harvests of Pacific Halibut in Alaska, 2008.* Technical Paper No. 348. Anchorage: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., and D. Koster. 2011. *Subsistence Harvests of Pacific Halibut in Alaska, 2009.* Technical Paper No. 357. Anchorage: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., and D. Koster. 2012. *Subsistence Harvests of Pacific Halibut in Alaska, 2010.* Technical Paper No. 367. Anchorage: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., D. Koster, and B. Davis. 2006. *Subsistence Harvests of Pacific Halibut in Alaska, 2005.* Technical Paper No. 320. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Fall, J.A., D. Koster, and M. Turek. 2007. *Subsistence Harvests of Pacific Halibut in Alaska, 2006.* Technical Paper No. 333. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

FAA. 2006a. *Order 1050.1E, Chg 1. Policies and Procedures for Considering Environmental Impacts.* Effective date March 20, 2006. U.S. Department of Transportation, Federal Aviation Administration. Available at: http://www.faa.gov/documentLibrary/media/order/energy_orders/1050-1E.pdf. Accessed March 15, 2013.

FAA. 2006b. *Order 5050.4B. National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions.* Effective date April 28, 2006. U.S. Department of Transportation, Federal Aviation Administration. Available at: http://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/. Accessed October 17, 2012.

George, G.D., and R.G. Bosworth. 1988. *Use of Fish and Wildlife by Residents of Angoon, Admiralty Island, Alaska.* Technical Paper No. 159. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

George, G.D., and M.A. Kookesh. 1983. *Angoon Deer Hunting, 1982.* Technical Paper No. 71. Angoon: Alaska Department of Fish and Game, Division of Subsistence.

Gmelch, G., S.B. Gmelch, and R.K. Nelson. 1985. *Resource Use in a Small Alaskan City—Sitka.* Technical Paper No. 90. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Goldschmidt, W.R., and T.H. Haas. 1946 (republished 1998). Haa Aani *Our Land: Tlingit and Haida Land Rights and Use*. Seattle and London: University of Washington Press.

Harris, D. 2013. Updated salmon harvest information. Personal communication via e-mail from Dave Harris, Area Management Biologist, Juneau, Alaska Department of Fish and Game, Division of Commercial Fisheries, to George Weekley, SWCA Environmental Consultants, May 20, 2013.

Holmes, C.E. 1987. *Excavations at Thorne River (CRG-177) Prince of Wales Island, Alaska.* Paper prepared for a symposium on "Man and Land in Southeast Alaska, Current Research Perspectives," March 13–14, 1987, Anchorage, Alaska.

Mooney, P. 2013. Updated deer harvest information. Personal communication via e-mail from Phil Mooney, Area Management Biologist, Alaska Department of Fish and Game, to George Weekley, SWCA Environmental Consultants, May 14, 2013.

Powers, M. 2013. Fishing location limitations for Whaler's Cove Lodge guests. Personal communication via e-mail from Mark Powers, Whaler's Cove Lodge, and George Weekley, SWCA Environmental Consultants, April 4, 2013.

SWCA Environmental Consultants. 2011. *Subsistence Resources Existing Conditions Technical Report for Angoon Airport Environmental Impact Statement, Angoon, Alaska.* Salt Lake City, Utah: SWCA Environmental Consultants.

Turek, M.F., R.F. Schroeder, and R.J. Wolfe. 1998. *Deer Hunting Patterns, Resource Populations, and Management Issues on Prince of Wales Island.* U.S. Forest Service.

U.S. Forest Service (USFS). 2002. *Mitchell Bay Watershed Landscape Assessment.* Tongass National Forest. R10-MB-471. Ketchikan, Alaska: U.S. Forest Service.

———. 2009. *Angoon Hydroelectric Project Final Environmental Impact Statement.* R10-MB-628. February 2009. Juneau, Alaska: Tongass National Forest, Admiralty Island National Monument.

———. 2012. *Greens Creek Mine Tailings Disposal Facility Expansion Draft Expansion Environmental Impact Statement.* Volume 1. R10-MB-74a. April 2012. Juneau, Alaska: Tongass National Forest.

Wolfe, R.J. 2000. *Subsistence in Alaska: A Year 2000 Update*. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

———. 2004. *Local Traditions and Subsistence: A Synopsis from Twenty-Five Years of Research by the State of Alaska.* Technical Paper No. 284. Juneau: Alaska Department of Fish and Game, Division of Subsistence.

Wolfe, R.J., and R.J. Walker. 1987. Subsistence economies in Alaska: productivity, geography, and development impacts. *Arctic Anthropology* 24:56–81.

Acronyms

ADF&G	Alaska Department of Fish and Game
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Conservation Lands Act
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	environmental impact statement
FAA	Federal Aviation Administration
PSP	paralytic shellfish poisoning
SHARC	subsistence halibut registration certificate
USC	U.S. Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

APPENDIX O
SUBSISTENCE RESOURCES TECHNICAL REPORT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

SUBSISTENCE RESOURCES EXISTING CONDITIONS TECHNICAL REPORT FOR ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ANGOON, ALASKA

Prepared for

Federal Aviation Administration

and

Alaska Department of Transportation and Public Facilities

Prepared by

SWCA Environmental Consultants

September 16, 2011

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Appendix A. Angoon Subsistence Resources Harvested in 1996 A-1

1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska. At present, there is no land-based airport runway in or near Angoon. The DOT&PF prepared the Angoon Airport Master Plan (DOT&PF 2007) or their proposed airport location. The EIS is evaluating two alternative airport locations in addition to the DOT&PF's proposed location and multiple access road alternatives associated with those airport locations. (Note: Access Alternative 5 was studied and is shown on maps throughout this report, but it was subsequently dropped from consideration in the EIS.) Two of the airport alternatives and portions of their associated access roads are located on lands administered by the U.S. Forest Service (USFS) within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (hereafter referred to as the Monument–Wilderness Area).

The proposed land-based airport would be a small, commercial airport typical of other rural airports in the region. The initial construction would include a 3,300-foot-long paved runway, with the ability to extend the runway length to 4,000 feet in the future if air traffic warrants it. The airport would have a short, perpendicular taxiway leading from the runway to a small apron area, which may eventually contain a passenger shelter building. The proposed airport is being designed to accommodate a future full-parallel taxiway, but this taxiway would not be constructed initially and would only be built if air traffic demands are sufficient to warrant this additional safety and efficiency feature. The runway, perpendicular taxiway, and apron would be surrounded by clear areas required for safety. Regardless of the airport location under consideration, an access road would need to be constructed to connect the new airport to the existing Angoon road system. The proposed access road would have a gravel surface and would be two lanes wide (one lane in each direction) with 9-foot-wide lanes and minimal shoulders.

This report provides a detailed description of the subsistence resources and uses potentially affected by implementation of the proposed airport. It includes information on subsistence resources and uses known to occur or with potential to occur in the vicinity of the airport location alternatives and access alternatives under consideration at the time subsistence studies were conducted. Data collected during the various field studies described below are available for agency review. Information in this report will be used to prepare the Affected Environment section of the EIS and the Alaska National Interest Conservation Lands Act (ANILCA) Section 810 evaluation, as well as to facilitate coordination between the FAA, USFS, and other agencies during the preparation of the EIS and to verify information about existing subsistence uses with the public.

2.0 ANALYSIS AREAS

The analysis areas for this Angoon Airport EIS technical report consist of a local study area and a landscape study area. The local study area is that area analyzed as the existing affected environment within and surrounding the airport and access road alternatives; it encompasses the existing resources in areas of direct disturbance and the immediately adjacent area. The landscape study area is a larger area that establishes the context of the project impacts on the landscape scale. This scale is determined by the extent of the habitat that could be impacted by both the proposed airport project as well as other unrelated projects that are affecting the same resource. The landscape study area represents a broader area of similar resources and uses within which the relative scale of impacts from construction of an airport and its associated access road at any given alternative location can be understood.

2.1 Subsistence Local Study Area

The local study area is located near Angoon, a community of approximately 430 residents (2008 data Department of Labor and Workforce Statistics [DOL&WD] 2009) in Southeast Alaska. Angoon is located on Admiralty Island in the Alexander Archipelago approximately 60 miles southwest of Juneau and 45 miles east of Sitka, the closest major communities. It has no road links to any other developed areas and is completely dependent upon plane and boat transportation for access throughout the year.

For the purpose of analyzing subsistence resources, the local study area consists of all of upper Favorite Bay, the lower Favorite Creek watershed, uplands between Favorite Bay and Kanalku Bay, and uplands along the Angoon peninsula south of the community of Angoon (Figure 1). These areas include Airport Alternatives 3a, 4, and 12a. The local study area also includes all of the access alternatives. Approximately 11,078 acres of uplands and 7,091 acres of water are located within the local study area.

2.2 Subsistence Landscape Study Area

The landscape study area for subsistence resources consists of the area identified in the *Mitchell Bay Watershed Landscape Assessment* (USFS 2002). This area is identified as encompassing the entire watershed that drains into Kootznahoo Inlet, including Mitchell, Pea Hen, Kanalku, and Favorite bays. The landscape study area comprises the entire local study area, all of the community of Angoon, and a large portion of southern Admiralty Island (Figure 2). The landscape study area was chosen because it represents a large portion of the subsistence use area used by Angoon residents on Admiralty Island. Approximately 68,989 acres of uplands and 27,085 acres of water are located within the landscape study area.

3.0 SUBSISTENCE RESOURCES

This section of the technical report describes the subsistence resources in and around the local study area (Figure 1). Within the local study area, the most likely subsistence resources to be present are terrestrial, intertidal, and riverine species, including anadromous fish.

3.1 Regulatory Setting

3.1.1 ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT

Although there are many popular cultural and sociological definitions and interpretations of subsistence, in 1980, the U.S. Congress provided a legal description of subsistence in Title VIII of ANILCA (Public Law 96-487). Section 803 of ANILCA defines *subsistence use* as:

> the customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal, or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade.

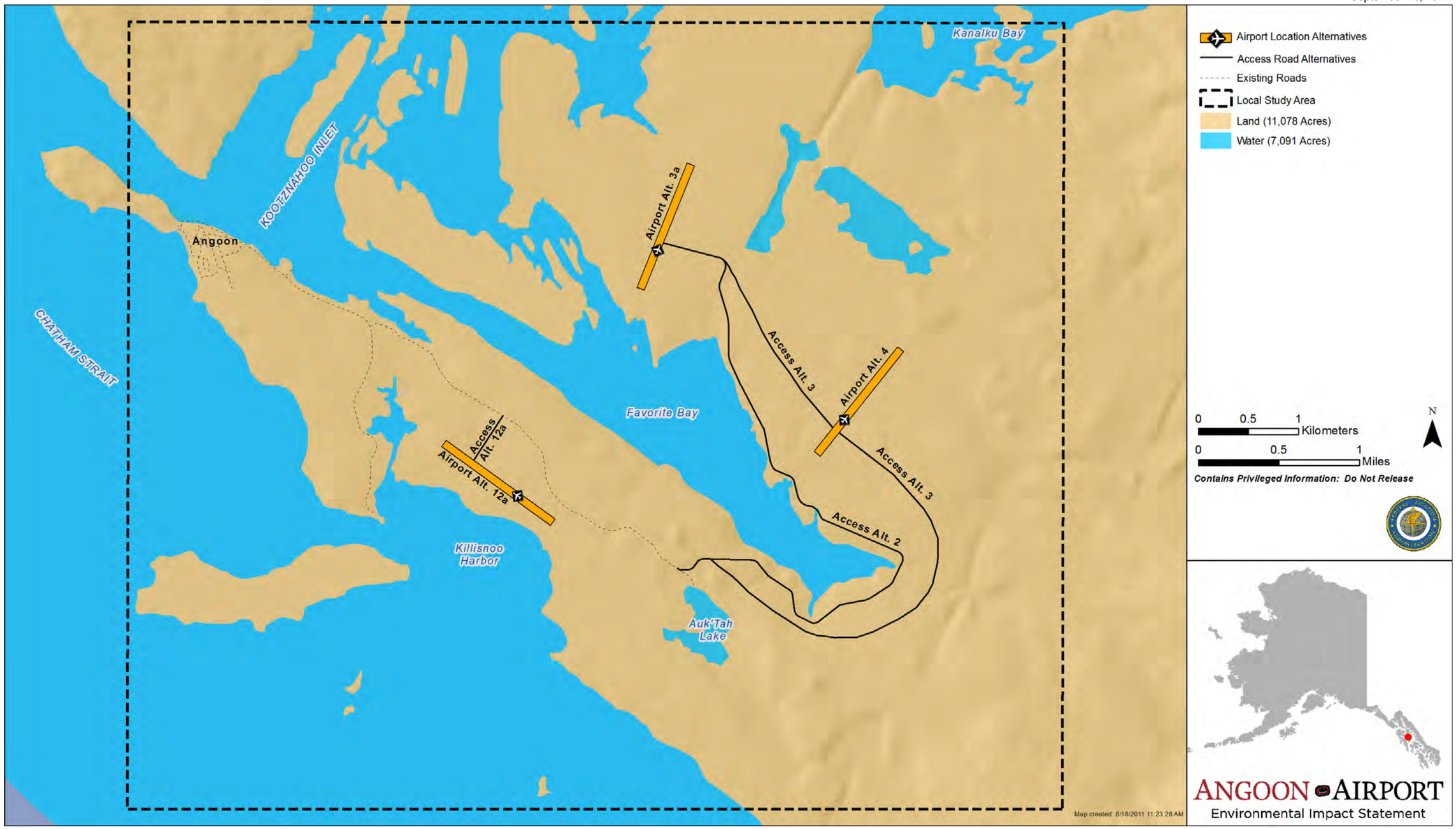

Figure 1. Subsistence local study area. *Note*: Airport alternatives illustrated on figures in this report represent locations only and do not depict final areas of disturbance.

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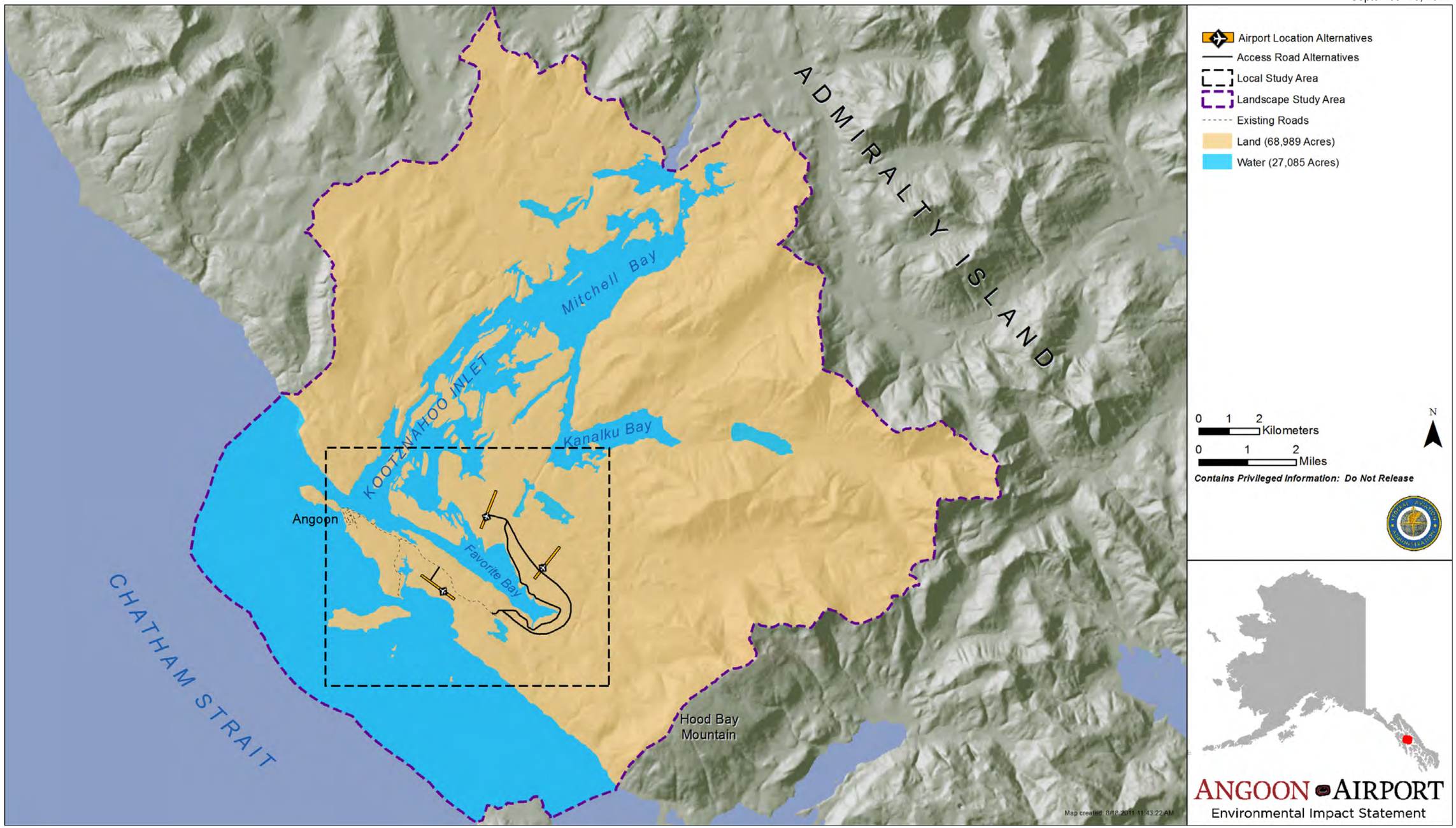

Figure 2. Subsistence landscape study area.

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Under Alaska state law, *subsistence uses* are defined as:

> the noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption, such as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; and for customary trade, barter, or sharing for personal or family consumption. (Alaska Statute 16.05.940[33])

ANILCA provides for "the continuation of the opportunity for subsistence uses by rural residents of Alaska, including both Natives and non-Natives, on the public lands." ANILCA defines public lands as:

> land situated in Alaska which, after the date of enactment of this Act, are Federal lands except—
>
> (A) land selections of the State of Alaska which have been tentatively approved or validly selected under the Alaska Statehood Act and lands which have been confirmed to be validly selected by, or granted to the Territory of Alaska or the State under any other provision of Federal law;
>
> (B) land selections of a Native Corporation made under the Alaska Native Claims Settlement Act [ANCSA] which have not been conveyed to a Native Corporation, unless any such selection is determined to be invalid or is relinquished; and
>
> (C) lands referred to in §19(b) of [ANCSA].

In regard to consumptive uses, the provisions in ANILCA state:

> [t]he taking on public lands of fish and wildlife for non-wasteful subsistence uses shall be accorded priority over the taking on such lands of fish and wildlife for other purposes. Whenever it is necessary to restrict the taking of populations of fish and wildlife on such lands for subsistence uses in order to protect the continued viability of such populations, or to continue such uses, such priority shall be implemented through appropriate limitations based on the application of the following criteria:
>
> 1. customary and direct dependence upon the populations as the mainstay of livelihood;
> 2. local residency; and
> 3. the availability of alternative resources (ANILCA Section 804)

Different legal frameworks regulate subsistence on lands of different status. The State of Alaska administers the harvest of fish and wildlife on all lands in Alaska, including for subsistence purposes, except as specifically superseded by federal law. When it is necessary to implement a federal subsistence priority under the terms of Title VIII of ANILCA, the Federal Subsistence Board regulates subsistence hunting on federally administered uplands and fishing on waters where there is a federal reserved water right. State, private, and Native-selected or -owned lands are generally not within the jurisdiction of the federal subsistence management program and are regulated by the State of Alaska.

The land in and around the local study area and landscape study area consists of federal, state, local government, and private lands. The study area includes federal land within the Admiralty Island National Monument and Kootznoowoo Wilderness Area. These lands are managed by the USFS. Favorite Bay and other marine submerged lands and waters within the local study area are owned and managed by the State of Alaska.

Kootznoowoo, Inc. is the Angoon village corporation established under ANCSA. Kootznoowoo, Inc. holds title to lands in and around Angoon under Kootznoowoo's village entitlement under ANCSA. Portions of the lands on the peninsula south of Angoon disbursed to Kootznoowoo, Inc. under ANCSA have been divested to Kootznoowoo, Inc. shareholders. These lands are considered private lands. In addition, under Section 506 of ANILCA, Kootznoowoo, Inc. holds title to any rocks, pinnacles, islands, islets, and lands from the mean high tide mark to a point 660 feet inland; in and adjacent to the inland waters from Kootznahoo Inlet to the rangeline separating Range 68 east and Range 69 east, Copper River Base and Meridian, and including those parts of Mitchell, Kanalku, and Favorite bays west of that line. However, the U.S. government reserves the following rights to these lands:

- All timber rights are reserved subject to subsistence uses consistent with Title VIII of this Act.
- The right of public access and use within such area, subject to regulation by the Secretary of Agriculture to insure protection of the resources, and to protect the rights of quiet enjoyment of Kootznoowoo, Incorporated, granted by law, including subsistence uses consistent with Title VIII of this Act.
- The subsurface estate.
- The development rights, except that the Secretary of Agriculture is authorized to permit construction, maintenance, and use of structures and facilities on said land which he determines to be consistent with the management of the Admiralty Island National Monument: *Provided* that all structures and facilities so permitted shall be constructed of materials which blend and are compatible with the immediate and surrounding landscape.

The City of Angoon also owns land within and adjacent to the community of Angoon. City lands are located on the Angoon peninsula within the local study area.

Subsistence activities occurring in offshore federal waters (greater than 3 miles from the coast) are not subject to ANILCA. However, offshore waters and all lands in Alaska are subject to the Marine Mammal Protection Act (16 U.S. Code [U.S.C.] 1361–1407), the Endangered Species Act (16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (16 U.S.C. 703–712), and the Migratory Waterfowl Hunting and Conservation Stamp Act (16 U.S.C. 718–718h). The Marine Mammal Protection Act and the Endangered Species Act forbid the harvest of marine mammals and endangered species except by Native Americans for non-wasteful subsistence purposes.

3.1.2 Other Applicable Laws, Regulations, and Policies

Executive Order 13175: *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000). Executive Order 13175 establishes principles and standards for government-to-government consultation with tribal governments on "policies that have tribal implications." Consultation with tribal governments on subsistence, along with other issues, is an integral part of the public involvement process for an EIS. Although Section 810 of ANILCA does not establish separate or additional requirements concerning consultation with tribal governments, the Section 810 review benefits from outreach to the tribal governments through the EIS. FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation Policy and Procedures, contains the FAA's policy on consultation with tribal governments. In addition, the *Forest Service Handbook* Section 1509.13, American Indian and Alaska Native Relations, and the *Forest Service Manual* Section 1563, American Indian and Alaska Native Relations, contain USFS policies and procedures for consultation with tribal governments, including subsistence rights and uses in Alaska.

Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations.* In addition to ANILCA, environmental justice, as defined in Executive Order 12898,

also calls for an analysis of the effects of federal actions on minority populations with regard to subsistence. Specifically, environmental justice is:

> The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

Section 4-4 of Executive Order 12898, regarding the subsistence consumption of fish and wildlife, requires federal agencies to collect, maintain, and analyze information on the consumption patterns of populations that principally rely on fish and/or wildlife for subsistence, and to communicate to the public any risks associated with the consumption patterns.

FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, does not specifically address subsistence practices or subsistence resources as a stand-alone topic. However, Appendix A, Section 16, *Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks*, specifically requires "disclosure of the effects on subsistence patterns and consumption of fish, vegetation, or wildlife, and effective public participation and access to this information" as part of the evaluations related to Environmental Justice.

FAA Order 5050.4B NEPA [National Environmental Policy Act] Implementing Instructions for Airport Actions. While FAA Order 5050.4B does not specifically address subsistence practices or resources, it reiterates the FAA's policies contained in Order 1050.1E, Appendix A. Chapter 10, *Environmental Justice,* of FAA's Environmental Desk Reference supplement to FAA Order 5050.4B provides guidance regarding FAA's consideration of subsistence practices and resources during the NEPA process. The Desk Reference outlines FAA's policy for determining impacts, determining significance of impacts, and considering mitigation measures.

3.2 Methods

The following pages discuss subsistence resources and use in the local study area. Much of the information was derived from the Alaska Department of Fish and Game (ADF&G) Community Subsistence Information System (ADF&G 2009a) regarding a study of Angoon subsistence harvest in 1996 and from ADF&G Division of Subsistence technical reports (George and Kookesh 1983, George and Bosworth 1988), which highlight subsistence resources used by Angoon residents and methods of utilization within the community.

The 1996 harvest study is the most representative data on broad scale subsistence use for the community of Angoon to date. Appendix A of this technical report contains a list of all species harvested as subsistence resources in 1996. For the 1996 study, data were collected on subsistence harvest from some households in the population so that statistical inferences can be made on the entire population. Since that study, data gathered by the ADF&G, the USFS, and the FAA's EIS Team show that there have been no major changes in subsistence effort, harvest of most species, and use. More recent harvest information beyond the 1996 study was also used to characterize existing subsistence uses when that data was gathered in such a way as to constitute a representative sample of the community. Information from non-representative sampling, such as with an extremely small sample size, was reviewed and used as general subsistence resource information but could not be used to extrapolate to the entire Angoon population regarding their subsistence practices.

In addition, information was gathered from local residents to ground-truth recent subsistence harvest efforts within the local study area and landscape study area. The FAA's EIS Team conducted site visits and qualitative interviews with Angoon subsistence users to supplement existing information on subsistence use areas that might be affected by the project. Qualitative interviews included the use of subsistence mapping wherein the interviewer asked Angoon

residents to identify locations they or others in their household use as sources of subsistence resources. Identification of those areas was focused on locations within the local study area and helped provide localized information on subsistence resources and uses within the community. A total of 18 formal interviews were conducted. These were supplemented by informal conversations with residents about their subsistence practices. Interviewees represented a cross-section of the Angoon community and included individuals ranging in age from 18 to 75 years old. The methods used to prepare this report and that will be used to assess impacts on subsistence resources were developed in consultation with the FAA, USFS, ADF&G, and State of Alaska ANILCA program.

3.3 Subsistence Resources and Uses in Local and Landscape Study Areas

For Alaskans, subsistence is more than the harvesting, processing, sharing, and trading of natural resources. For many, subsistence embodies cultural, social, and spiritual values at the core of Alaska Native and rural Alaskan culture. Subsistence in Alaska comprises a diverse set of localized systems of food production and distribution representing unique combinations of ecology, community, culture, and economics (Wolfe 2004).

Nearly all rural Alaska communities depend on subsistence resources to meet at least part of their nutritional needs. The reasons for participating in subsistence are many and varied. Some individuals participate in subsistence activities to supplement personal income and provide needed food. Others pursue subsistence activities to continue cultural customs and traditions. Many others participate in subsistence activities for personal reasons related to deeply held attitudes, values, and beliefs about where their food comes from, as well as the ability to supply their family directly through their own work.

Subsistence resources are highly valued and central to the customs and traditions of many cultural groups in Alaska. These customs and traditions encompass sharing and distribution networks, as well as cooperative hunting, fishing, gathering, and ceremonial activities. Sharing of subsistence foods is common in rural Alaska. Subsistence fishing, hunting, and gathering are important sources of nutrition in most rural communities. In general, statewide Alaskan subsistence harvests by rural residents consist primarily of fish (60%), followed by land mammals (20%), marine mammals (14%), birds (2%), shellfish (2%), and plants (2%) (Wolfe 2000).

Within the context of Admiralty Island's and specifically the community of Angoon's seasonal and cyclical employment, subsistence harvest of fish and wildlife resources takes on special importance. Subsistence in Alaska is part of a rural economic system referred to as a mixed subsistence-market economy. Under this market system, families invest money in small-scale, efficient technologies to harvest wild foods. Fishing, hunting, and gathering subsistence resources provide a reliable economic base for many rural communities. Families and, in some cases, communities have invested in gill nets, motorized skiffs, and other equipment to harvest important resources. Subsistence is not oriented toward sales, profits, or commercial production; it is focused toward meeting the needs of families and the community. Participants in this mixed economy in rural Alaska often augment their subsistence production with cash employment. Cash from employment provides the means to purchase equipment, supplies, and fuel used in subsistence activities. The combination of subsistence and commercial-wage activities provides the economic basis for the way of life in Alaska's rural communities (Wolfe and Walker 1987). Because of the high prices of commercial products in remote Alaska communities, the economic role of locally available fish and game takes on added importance.

Resource collection for fish, land and marine mammals, birds, marine invertebrates, and plants occurs throughout the year in the Angoon area, with summer harvest being the most intense collection period. Springtime harvest in the Angoon area often involves collecting shoots of edible plants, herring harvest, and collection of herring eggs, seaweed, clams, and other intertidal resources. Residents primarily harvest fish resources in the summer and early fall, either under subsistence, commercial, or sport-fishing regulations. Fish harvest involves salmon and halibut, with the greatest amount of harvest reserved for halibut, coho salmon, and sockeye salmon. Fall harvest is primarily hunting, with many residents hunting for Sitka black-tailed deer. Some fishing also occurs in the fall, primarily for coho

salmon. Winter is usually the lowest harvest period during the year. Winter harvest often includes trolling for king salmon, trapping, and some collecting of intertidal resources. Residents harvest some resources year-round including halibut, Chinook salmon, herring, chitons, rockfish, devil's club, and harbor seals (George and Bosworth 1988).

Generally, subsistence harvest levels vary widely from one community to another and from year to year. Rural communities have high subsistence participation rates and rely heavily on wild foods, with approximately 86% of rural Alaska households using wild game and 95% using fish (Wolfe 2000). Wolfe's 2000 study estimated that the annual wild food harvest in Southeast Alaska was approximately 5,064,509 pounds, or 178 pounds per person per year. The opportunity to participate in subsistence activities supports a variety of cultural and related values in rural communities. For example, the distribution of harvested fish and wildlife contributes to community stability through the sharing of resources. Subsistence resources also provide the foundation for native culture in Angoon and are deeply connected to traditional respect for the earth and its resources.

Angoon residents harvested an estimated 224 pounds of subsistence resources per capita in 1996 (ADF&G 2009a). Subsistence resources used by residents consist of fish, land mammals, marine mammals, birds and eggs, marine invertebrates, and vegetation (Table 1). In general, the pattern of use is similar to that of the subsistence harvests by rural residents statewide, as discussed above: the majority of harvested resources are fish, followed by land mammals, marine invertebrates, plants, and birds/eggs.

Households in Angoon use, attempt to harvest, harvest, receive, and give subsistence resources (see Table 1). The ADF&G Community Profile Database indicates that 97% of Angoon households use subsistence resources (ADF&G 2009a). There is a strong relationship of sharing subsistence resources indicated by the number of households who have either given and/or received resources from another household. Residents of communities throughout Southeast Alaska and in other parts of Alaska give and receive resources to and from residents of Angoon. Some resources harvested outside the local study area or landscape study area may be reported as being used locally though the resource may not be harvested within the local study area or landscape study area.

Table 1. Subsistence Resource Categories and Pounds of Harvest by Angoon Households in 1996

Resource	% Using	% Attempting to Harvest	% Harvesting	% Receiving	% Giving	Per Capita Harvest (lbs.)
All resources combined	97.3	93.2	93.2	94.6	67.6	224.5
Fish	89.2	70.3	70.3	83.8	50.0	129.5
Salmon	79.7	64.9	64.9	62.2	41.9	81.9
Non-salmon	82.4	60.8	60.8	70.3	29.7	47.6
Land mammals	74.3	51.4	51.4	50.0	27.0	51.3
Large	74.3	51.4	51.4	50.0	27.0	51.3
Small	2.7	2.7	2.7	1.4	0.0	0.0
Marine mammals	32.4	14.9	14.9	28.4	8.1	9.0
Birds and eggs[1]	5.4	5.4	5.4	2.7	1.4	0.2
Marine invertebrates	89.2	78.4	78.4	73.0	41.9	30.1
Vegetation[2]	66.2	62.2	56.8	50.0	17.6	4.4

Source: (ADF&G 2009a)

Note: Information is for the most representative reporting year for Angoon (1996).

[1] Includes upland birds and waterfowl.

[2] Includes terrestrial and marine vegetation.

3.3.1 FISHERIES

Fish are an extremely important subsistence resource for Angoon residents. Centrally located in the Alexander Archipelago, Angoon residents have access to many salt and freshwater fishing grounds throughout Southeast Alaska.

In Alaska, state and federal regulations define three distinct types of fishing: 1) fishing for profit (commercial fishing), 2) fishing for sport by hook and line (sport fishing), and 3) taking fish resources for personal use (subsistence) with prescribed gear (usually by permit). However, in many cases, the lines between commercial, sport, and personal use fishing are not quite as clearly defined. For example, commercial fishermen may keep a portion of their catch for personal consumption, and sport anglers often consider filling the freezer just as important as the pleasure of catching fish (Gmelch et al. 1985).

In the 1996 ADF&G study (ADF&G 2009a), approximately 70% of all households in Angoon attempted to fish during that year, with approximately 70% harvesting fish (see Table 1). However, the importance of fishing is shown by the statistic that 89% of all households utilized fish resources in 1996. Based on interviews with Angoon residents conducted in 2008 and 2009, this use rate appears to have changed little since 1996 and is still considered an accurate representation of subsistence fish use in Angoon. The importance of subsistence in the community's culture also is shown by the following statistic: 84% of residents receive fish from others and 50% give fish to others (ADF&G 2009a).

Salmon

In Angoon, as in most of coastal Alaska, salmon is the foundation of the subsistence lifeway. In addition to sustenance for individuals and families in Angoon throughout the year, salmon provide job opportunities through commercial fishing, fish processing, sport-fish guiding, and other ancillary jobs associated with fishing, such as the service industry. The salt and fresh waters around Angoon are home to all five species of Pacific salmon found in Alaska: Chinook (or king) salmon, sockeye (or red) salmon, pink (or humpy) salmon, coho (or silver) salmon, and chum (or dog) salmon.

According to interviews in 2008, Angoon residents fish for salmon in many locations. Many people fish locally along most of Chatham Strait and the Mitchell Bay area for all species of salmon found in Alaska. Within Favorite Bay and its freshwater tributaries (including Favorite Creek), coho, chum, and pink salmon are all harvested by Angoon residents. Angoon residents also harvest sockeye and Chinook salmon in the marine waters of Favorite Bay, although those species do not spawn in the freshwater sources of Favorite Bay. Angoon residents indicate that chum and pink salmon are harvested in the greatest quantities in this area, followed by coho, Chinook, and sockeye salmon (Figure 3).

According to the ADF&G Community Subsistence Information System, the most common salmon species harvested by Angoon residents are coho salmon (30 pounds per capita), followed by sockeye salmon (21 pounds per capita). Chinook salmon are third in harvest (20 pounds per capita), with chum salmon (9 pounds per capita) and pink salmon (2 pounds per capita) being fourth and fifth, respectively (ADF&G 2009a).

Under sport-fishing licenses using rod and reel, Angoon residents often catch coho, Chinook, and pink salmon; whereas most sockeye and chum salmon are primarily caught using nets under a subsistence harvest permit administered by the ADF&G. Table 2 shows the harvest of Pacific salmon under the ADF&G subsistence harvest permits from 2003 to 2008.

Table 2. Salt and Freshwater Salmon Subsistence Harvest by Angoon Residents under ADF&G Permits

Year	Permits Issued	Permits Fished	Number of Chinook	Number of Sockeye	Number of Coho	Number of Pink	Number of Chum
2003	102	39	0	1,496	36	6	2
2004	106	42	0	1,479	107	107	58
2005	90	14	0	261	12	25	0
2006	96	20	0	658	20	9	0
2007	86	14	1	56	47	62	0
2008	87	38	0	637	120	0	15

Once harvested, salmon are either eaten fresh or preserved so the meat can be eaten throughout the year. Angoon residents use several different methods to preserve caught fish. Some of these methods are traditional, having been passed down through the generations, while others are recent methods to coincide with improved technology. One of the most traditional methods of preserving fish is by smoking. In this method, residents will filet the fish and either cut them into strips or chunks of meat. The meat is usually hung in a small building called a smokehouse. A fire is built inside the smokehouse using a slow-burning wood, usually alderwood, and left to smoke for a period of time. Smoking fish can be completed anywhere between one and six days, depending on the level of dryness preferred.

Another method of preserving is canning. Many residents of Angoon will can salmon using a pressure cooker and glass jars. The use of canning to preserve salmon probably stems from the salmon canneries that were in operation around Angoon between the late 1800s and early 1900s. Residents often can both fresh salmon and smoked salmon to have different flavors throughout the year. Another method of preserving that is only used by a few residents is fermenting. Some Angoon residents will preserve salmon parts, usually the heads, by placing them in a burlap sack and burying them in wet sand for several months. The heads are then dug up and eaten. In many places in rural Alaska, this method is used to create what are known as *stinkheads*.

Finally, the most common method of preserving fish is freezing. Many households in Angoon have a large freezer where they can preserve salmon, halibut, deer, and berries for a long period of time. Salmon are usually filleted and either wrapped in freezer paper or vacuum sealed to protect the meat. Freezing meat is common because it is the least time and labor intensive method of preserving and because it retains the original flavor of the meat better than any other method.

Non-salmon Fish

Of equal importance to Angoon residents are non-salmon fish, primarily species such as halibut, lingcod, rockfish, herring, rainbow trout, cutthroat trout, Dolly Varden, and eulachon. The vast majority of non-salmon fish harvest is halibut, followed by herring roe, rockfish, herring, Dolly Varden, Pacific cod (gray cod), and sablefish (black cod) respectively. Commercial fishing includes species such as halibut, rockfish, and black cod in the Angoon area. Fish such as halibut, rockfish, and Dolly Varden are also sport fished in the community. In terms of economic importance, non-salmon fishes are just as important as salmon to the economic well-being of the community. Locations for fishing non-salmon fish are similar to salmon fishing areas. In most cases, Angoon residents fish for multiple species in a single outing, particularly for deepwater fishes such as halibut, rockfish, and cod.

Halibut is an especially important non-salmon fish resource for Angoon residents. The ADF&G 1996 study (ADF&G 2009a) documented approximately 40.5 pounds of per capita harvest by Angoon residents. Most halibut harvested by Angoon residents are filleted and frozen, although some residents may smoke or can the meat.

Subsistence fishers are required to obtain a subsistence halibut registration certificate (SHARC) from the National Marine Fisheries Service prior to fishing. A SHARC permit allows the use of rod and reel or one longline with up to 30 hooks and a bag limit of 20 fish per day. In 2007, approximately 180 residents of Angoon were SHARC permit holders. These estimates provided in Table 3 reflect only fishing by SHARC fishers in the community of Angoon. All subsistence gear types (setline and hand-operated gear) are included in the harvest estimates.

In addition to the SHARC permits, some Angoon residents harvest halibut under their sport-fishing license. In 2007, SHARC permit holders reported harvesting 36 halibut (approximately 653 pounds) under the sport-fishing license. ADF&G Statewide Harvest Surveys for 2007 showed 2,926 halibut harvested in the Angoon area, although much of the harvest is from nonresidents and non-local residents from other Alaskan communities (ADF&G 2009b). In addition, the reported harvest represents a harvest area larger than the local study area or landscape study area. Angoon residents interviewed for this project have indicated that all halibut harvest occurs outside the local study area, but there are several identified locations for halibut harvest within the landscape study area.

Table 3. Estimated Halibut Subsistence Harvest by Angoon SHARC Holders Using All Gear Types within Regulatory Area 2C, 2003–2007

Year	Estimated Number Harvested	Estimated Pounds Harvested
2003	1,142	20,283
2004	1,435	32,009
2005	1,231	25,166
2006	954	16,875
2007	836	16,429

Sources: (Fall et al. 2004); (Fall et al. 2005); (Fall et al. 2006); (Fall et al. 2007); (Fall and Koster 2008)

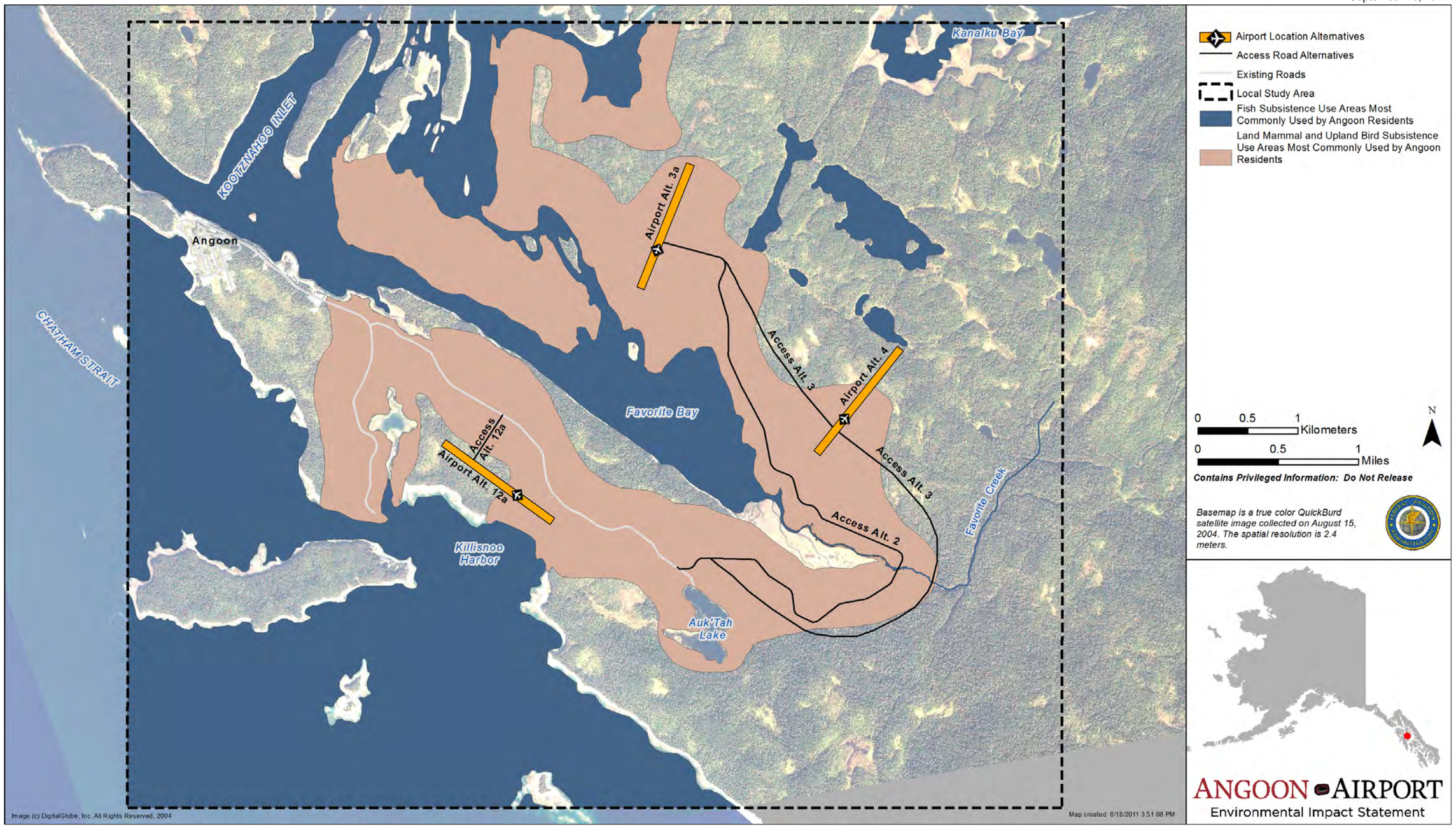

Figure 3. Fish, land mammal, and upland bird subsistence harvest areas.

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Herring and herring eggs are an important resource in Angoon, both for subsistence and commercial uses. In mid to late winter, herring begin to congregate in saltwater bays in preparation for spawning. During this time, Angoon residents will often head into the bays and fish for herring, usually by jigging. The 1996 ADF&G survey (ADF&G 2009a) showed that Angoon residents harvest approximately 1.4 pounds of herring per capita. Residents will often freeze the herring and use them for salmon or non-salmon fish bait. Within the local study area, there are several locations that Angoon residents identified in interviews as being places where herring harvest occurs.

In early spring, usually in late March and April, herring begin to spawn in the waters around Southeast Alaska. The male fish emit their milt (semen) into the water. The females then deposit their roe in the milt, completing the fertilization process. The developing eggs fasten to kelp, seaweed, rocks, or any object placed in the water.

Angoon residents harvest herring eggs for personal use in two ways: 1) by placing hemlock branches into the intertidal zone and 2) by collecting the eggs that have formed naturally on seaweed or kelp. Hemlock branches or entire trees are cut, attached to a buoy or line from the beach, and lowered into the water. Collectors leave the branches or trees in the water to collect eggs and then recover eggs from the branches. Residents also harvest herring eggs from kelp and seaweed. Most people go by boat to kelp beds and pull up the egg-laden kelp with hooks. A few people dive into kelp or seaweed and pull it up by hand. Still others bring kelp or seaweed into an area prior to the spawn and then collect it as they would hemlock branches. Residents collect the seaweed at low tide where the eggs show up as a large white ball or spot in the water.

Historically, Angoon residents often harvested herring eggs in Favorite Bay. However, in the early 1980s, the local herring population decreased significantly and the community placed a voluntary moratorium on herring egg collection until the population rebounded. As of 2009, the population has not rebounded enough for any herring egg harvest to occur. To offset the loss of herring egg harvest close to the community, Angoon residents rely on the subsistence herring fishery in Sitka for their supply. Some Angoon residents will either take a boat to Sitka in the spring to harvest herring eggs, trade goods and/or services for herring eggs collected by Sitka residents, or receive herring eggs from relatives living in Sitka. In 1996, Angoon residents harvested approximately 2.0 pounds of herring roe per capita, with half of the harvest occurring on kelp and the other half coming from hemlock branches placed in the water (ADF&G 2009a). Because of the voluntary moratorium on herring egg harvest, it is assumed that all herring egg harvest by Angoon residents occurred in Sitka.

Rockfish are another important non-salmon fish found in the Angoon area. Rockfish typically prefer steep rocky habitats, such as those found in the marine waters around Chatham Strait. Because rockfish have a swim bladder to maintain buoyancy in various depths, rapid changes in depth can cause mortality among many rockfish species. Rapid changes in depth can be caused by being caught by sport or commercial anglers. This factor, along with late sexual maturity and slow reproductive rates, can quickly cause rapid population declines with many rockfish species. The 1996 ADF&G study (ADF&G 2009a) found that red rockfish is the most common rockfish species caught by Angoon residents at approximately 1.4 pounds per capita, followed by the black rockfish at less than 1 pound per capita. Interviews with local residents indicate that no rockfish are harvested within the local study area or landscape study area.

Pacific cod (gray cod) and sablefish (black cod) are typically harvested in deeper waters in the Gulf of Alaska. Most Pacific cod and sablefish harvest is from commercial fishing, but occasionally residents will catch Pacific cod and sablefish while targeting other marine fish species. In addition, a few commercial fishermen based in Angoon keep some of their catch for personal consumption. Some Pacific cod are harvested in Chatham Strait and lower Favorite and Mitchell bays, but both species typically are not found in the shallower waters in upper Favorite Bay. Less than 1 pound per capita of both Pacific cod and sablefish are harvested by Angoon residents (ADF&G 2009a).

Dolly Varden are another subsistence resource found in the local study area and landscape study area that are used by Angoon residents. A study completed by ADF&G in 1996 (ADF&G 2009a) found that approximately 1 pound of Dolly Varden was harvested per capita by Angoon residents in that representative year. Most Dolly Varden in the Angoon area are anadromous, meaning they migrate between fresh and salt water, although there may be a few resident Dolly Varden in isolated watersheds. Angoon residents harvest Dolly Varden year-round and often catch Dolly Varden when targeting salmon in both marine and freshwater environments. However, historically, Dolly Varden were primarily harvested in the spring, where they would congregate at the mouths of streams to eat out-migrating pink and chum salmon. The ADF&G Statewide Harvest Survey found that 94 Dolly Varden were harvested in the Angoon area in 2007, although some of that harvest is from nonresidents and non-local residents of other Alaskan communities and the reported harvest represents a harvest area larger than the local study area or landscape study area (ADF&G 2009b). Within the local study area and landscape study area, Dolly Varden are located in marine waters all around Mitchell and Favorite bays. In fresh water, Favorite Creek and many of the freshwater lakes between Favorite and Kanalku bays contain Dolly Varden.

Angoon residents also harvested cutthroat trout in the Angoon area, albeit in very small numbers. The 1996 ADF&G study found less than 1 pound of cutthroat trout was harvested during that representative year (ADF&G 2009a). Like Dolly Varden, cutthroat trout in the area are anadromous, meaning they migrate between fresh and salt water. Angoon residents harvest cutthroat trout year-round and often catch cutthroat trout when targeting salmon in both marine and freshwater environments. The ADF&G Statewide Harvest Survey found that nine cutthroat trout were harvested in the Angoon area in 2007, although some of that harvest is from nonresidents and non-local residents of other Alaskan communities and the reported harvest represents a harvest area larger than the local study area or landscape study area (ADF&G 2009b). Within the local study area and landscape study area, cutthroat trout are located in marine waters all around Mitchell and Favorite bays. In fresh water, Favorite Creek and many of the freshwater lakes between Favorite and Kanalku bays contain cutthroat trout.

3.3.2 Terrestrial Mammals

Hunting is an important activity to the residents of Angoon. For many people, hunting is an important source of nutritious food and a highly valued outdoor pursuit. It is also a significant part of the community's social network, as many hunters bond over experiences and share the products of their success. Figure 3 above shows areas commonly used for terrestrial mammal subsistence harvest. The Sitka black-tailed deer represents the vast majority of terrestrial mammal harvest by Angoon residents. Approximately 74% of households used deer for subsistence, and 50% of all households attempted to harvest deer in 1996. Every Angoon resident who went hunting for deer that year also harvested at least one deer. Approximately 51 pounds per capita of deer were harvested by Angoon residents in 1996 (ADF&G 2009a). Table 4 shows the number of hunters, the amount of effort, and the amount of deer harvest in the Angoon area collected by ADF&G surveys from 1997 to 2007.

The ADF&G conducted a study of Angoon residents' deer hunting methods and activities in 1982 (George and Kookesh 1983). The study documented three main methods for hunting deer in the Angoon area. The first method is referred to as the alpine hunt. In that method, Angoon residents go to higher ground where deer often occupy open alpine areas to feed on succulent vegetation before the vegetation dies with the first frost. Usually, these hunts are overnight trips where the hunters take a boat to an area with relatively easy access to higher alpine areas. Because of the travel, this method typically involves camping and often entire families will head up to hunt. The hunters will glass or scope for deer in the open areas and once one is spotted, they stalk within range for an open shot. Within the local study area and landscape study area, the upper portions of Hood Bay Mountain are popular locations for this type of hunting (see Figure 2 for location of Hood Bay Mountain).

The second method is called the muskeg and forest hunt. This hunt usually occurs after the first frost and continues until the end of the hunting season. In this method, hunters will set up in small clearings or muskegs

at the edge of densely forested areas. The hunters will either wait for the deer to enter the clearings or use a deer call to lure the deer into the open areas. The local study area and landscape study area have many locations where residents employ this method of hunting, especially when the weather makes travel to other locations around Chatham Strait difficult or impossible. Most hunters access locations for the muskeg and forest deer hunt by a combination of boat travel and walking.

The third method is the beach hunt. The beach hunt can occur throughout the season, but many Angoon hunters intensify their efforts in November and December, when the deer use the beach fringe to get away from deep and heavy snow. Angoon residents will often travel up and down the coastline in boats looking for deer. When a deer is spotted, the boat is driven to shore and the hunter then stalks the deer to get within range. A similar form of this type of hunting also occurs at muskeg areas along the Angoon road system. Residents who do not have access to boats will often use a motor vehicle and travel the Angoon road system, glassing open areas for deer.

Very few residents hunt for small game, with land (river) otters as the only known harvest of small game documented in 1996. Only 3% of Angoon residents either used or harvested land otters in 1996 (ADF&G 2009a). No per capita pounds of meat were documented from that harvest, meaning that the residents likely sold the fur or used it for ceremonial items. Several residents have indicated in interviews that they have trapped in the past, but because of declining fur prices, they no longer do any trapping.

Table 4. Deer Harvest in the Angoon Area, 1997–2007

Year	Number of Hunters	Total Number of Days Hunted	Total Number of Deer Harvested
1997	54	246	63
1998	10	83	62
1999	66	195	63
2000	19	54	59
2001	23	67	56
2002	31	144	44
2003	16	35	16
2004	23	64	14
2005	36	74	55
2006	20	44	32
2007	19	20	15

3.3.3 Birds and Bird Eggs

Angoon residents harvest a number of upland birds (see Figure 3) and waterfowl (Figure 5), including grouse and migratory waterfowl. In 1996, approximately 5% of Angoon residents harvested birds (less than 1 pound per

capita), mostly migratory waterfowl (ADF&G 2009a). The most frequently harvested type of birds is migratory waterfowl at less than 1 pound per capita, with Mallards being the most common species harvested. Other migratory waterfowl species harvested by Angoon residents include Vancouver Canada Geese, Buffleheads, Harlequin Ducks, Long-tailed Ducks (Old Squaw), Northern Pintails, Green-winged Teal, and American Widgeon. Migratory waterfowl are typically harvested in the fall and spring, as birds are migrating to and from warmer climates. Under the Migratory Bird Treaty Act, migratory birds must be harvested using shotguns and nontoxic shot. The freshwater, marine, and nearshore tidal environments in the local study area were identified by Angoon residents as common harvesting locations for waterfowl (Figure 5).

The only nonmigratory bird harvested by Angoon residents is Blue Grouse, with less than 1 pound per capita of annual harvest (ADF&G 2009a). As with migratory birds, Blue Grouse (also known as Hooters) are typically harvested in the fall or spring, particularly the spring, when they can be heard "hooting" from the forest. Blue Grouse are harvested in many locations within the local study area.

In the 1996 study, none of the households surveyed had harvested eggs from migratory birds (ADF&G 2009a). Harvest of gull eggs is allowed in some communities in Alaska under federal migratory bird subsistence harvest regulations (50 CFR 92.5). In Southeast Alaska specifically, regulations allow only the harvest of glaucous-winged gull eggs and only by residents of Hoonah, Craig, Hydaburg, and Yakutat. In those communities, gull eggs have been historically harvested by residents. Gull eggs are large, about twice the size of chicken eggs, and residents used them in the same ways as chicken eggs. During interviews, no Angoon residents provided any documentation of egg collection in the local study area.

3.3.4 Marine Mammals

Under the Marine Mammal Protection Act of 1972, only Alaska Natives are permitted to harvest marine mammals. In the 1996 ADF&G community study, approximately 15% of all Angoon households had harvested marine mammals, with 32% of the community using marine mammals and 28% receiving marine mammal products from others in the community (ADF&G 2009a).

All marine mammals harvested in the Angoon area are harbor seals. The average weight of an adult harbor seal is about 180 pounds, and average length is 5 to 6 feet (ADF&G 1994). There is no bag limit, harvest is expected to be limited to what can be reasonably used and not be wasted. Seals are generally hunted from late fall through early spring. During the cold weather season, the seals are fatter, so fewer seals will sink when shot. In addition, many Alaska Natives believe the hide is better quality during this period than in summer. Within the local study area and landscape study area, upper Favorite Bay, and portions of Mitchell, Kanalku, and Pea Hen bays are all favored locations for seal harvest (Figure 4).

3.3.5 Land Vegetation and Marine Vegetation

Plant gathering is a very popular resource use activity in Angoon when measured by the number of households that engage in it. Approximately 62% of Angoon households had gathered berries, greens, roots, wood, or mushrooms in 1996 (ADF&G 2009a). Edible plants are abundant in the Angoon area. The main habitats where residents find edible plants in the region include bogs (muskeg), the upper beach rocks and meadows, old growth forest edges, open areas, sub-alpine areas, and disturbed areas (Figure 4). Typically, Angoon residents do not have to travel far to collect vegetation resources, as many can gather plants along the roadside or in the forests surrounding the community. Substantial travel is only necessary to find resources like cranberries, strawberries, and certain mushrooms, which may be unavailable or scarce near Angoon. When this is the case, residents often gather plants and berries coincidentally to other activities such as boating, beachcombing, fishing, camping, or exploring.

Plant gathering is the easiest of the harvest activities, especially for the majority of gatherers, who only harvest berries. As mentioned above, it can be done close to home, equipment is minimal, and little experience is required. Other types of plant collection, however, often demand substantial knowledge. Making full use of the plants requires a familiarity with edible plant identification, productive locales, harvest times, preparation and preservation methods, and non-food uses (such as medicine or dyes).

In traditional times, Native Tlingits used a wide assortment of plants. Modern residents of Angoon do not use as many plants as historical residents did for subsistence. However, some residents still use an impressive range of plants, including a wide variety of berries, greens, roots, mushrooms, and wood.

Approximately 35% of Angoon households harvest berries during the summer and early fall, with the prime months being July and August (ADF&G 2009a). Residents use berries in a variety of ways. The most common use of berries is to eat them raw. Many people, however, bring back large quantities to freeze, make into pies, sauces, or preserve as jams and jellies.

The berries most commonly picked in the Angoon area are blueberries, huckleberries, cloudberries, nagoonberries, salmonberries, and thimbleberries. Other berries collected in the Angoon area include currants, cranberries, red elderberries, and strawberries. Residents collect blueberries, huckleberries, cloudberries, and salmonberries within the local study area. Blueberries and huckleberries are located in dense, woody thickets in mixed-open forest areas through the region. Cloudberries and nagoonberries are small yellow or red berries that grow in muskeg areas. Salmonberries and thimbleberries are orange and red berries that ripen in late June through July on large shrubs that form dense thickets in open areas such as roadsides, shorelines, and forest clearings.

The Angoon area contains many edible wild greens. Interviews with local residents indicate that around 15 different species of greens can be harvested in the Angoon area. However, the percentage of households harvesting the various greens is substantially less than the number harvesting berries; only 18% of households harvest greens (ADF&G 2009a). The most commonly harvested greens in the local study area are goosetongue, devil's club, beach asparagus, and Labrador tea.

Goosetongue is a plantain that is abundant around Angoon, growing in the cracks of rocks just above the high tide line. It is popular because of its good taste and long edible season. Angoon residents harvest goosetongue from spring until August, although some residents claim that June is the best month for harvest.

Labrador tea is a commonly used "green" in the Angoon area. It grows abundantly in muskegs and wetland alpine meadows that are found through the local study area and landscape study area. Residents can harvest the leaves year round. Once picked, they are dried and then boiled to make a tea.

Devil's club is a member of the ginseng family. It grows abundantly in the moist, well-drained soils of forests around Angoon. The stalks are covered with sharp spines and grow up to 1.5 inches in diameter. Angoon residents collect both stalks and roots, primarily for medicinal use. The most common use is as an all-purpose elixir, usually made by heating the dried roots or bark in water just below the boiling point for several hours. It is also commonly used as a wound sealant and protectant by pulverizing the bark into a poultice and heating it up in a small pot with spruce pitch. The sticky substance is then spread over the wound and left to dry and harden, both sealing and protecting the wound.

Angoon residents also harvest beach asparagus, which grows in thick bunches or mats on tidal flats in the local study area and landscape study area. This delicious vegetable tastes like asparagus, and residents commonly eat it raw as a salad green.

Wood

Approximately 26% of Angoon households had collected wood for use in handicrafts, home heating, or smoking fish or venison (ADF&G 2009a). The use of wood for handicrafts ranged from gathering small pieces of driftwood for use in dried flower arrangements and natural sculptures to special woods cut for crafts and carvings, such as totems. A small number of residents harvest spruce roots to make the traditional, finely woven Tlingit baskets. Many Angoon residents collect alder for smoking meat and fish.

Wood used for handicrafts or smoking meat and fish is often gathered along beaches or along the Angoon road system. Spruce roots are gathered throughout the region. For home heating, most Angoon residents gather logs from locations along the Angoon road system, with a common spot being near the community water supply.

Seaweed

Many Angoon households harvest marine vegetation, especially seaweeds (Figure 4). The most popular species collected by the survey households in the 1996 study were black seaweed (30% of households); sea ribbons (4%); and alaria (1%). The per capita harvest of black seaweed collected was 6.8 quarts; sea ribbons less than 0.1 quart; and alaria was less than 0.1 quart (ADF&G 2009a). All three types are found and harvested in rocky nearshore marine habitats in both the local study area and landscape study area.

Residents harvest black seaweed at two times of the year: spring and winter. Households harvest the spring growth during a two-week period beginning in late April or early May. A second spring growth is ready a month later and residents harvest that growth for a two- or three-week period only. Seaweeds come into season at slightly different times in different locations around Angoon, apparently depending on water temperature. Many residents consider May the best time to gather black seaweed. Winter seaweed, the third growth, is available in February. It is more tedious to harvest because it is shorter and harder to pull off the rocks.

Black seaweed acquires a washed-out look when it is old and no longer growing and edible. Residents often pick black seaweed on a minus tide by pulling it off the rocks. There is access to black seaweed from several locations in Favorite Bay within the local study area. Many Alaska Natives consider seaweed a delicacy or prestige food. Black seaweed is very expensive to buy if a household cannot collect its own supply.

Sea ribbons (or ribbon seaweed or dulse) are another alga harvested by Angoon residents. Sea ribbons are thin, elastic purple or red fronds varying in length from a few inches to one foot. They are typically found attached to rocks. Like black seaweed, sea ribbons are often harvested in the spring, when the growth is fresh.

Alaria is a brown alga also known as wing kelp. It is found in rocky, intertidal zones and is a rich source of protein, iodine, and vitamin A. Alaria can grow to considerable length, but, like other seaweeds, it is mostly harvested when it is younger and less tough. Most alaria is dried and then later reconstituted with fresh water for use in soups or as a salad.

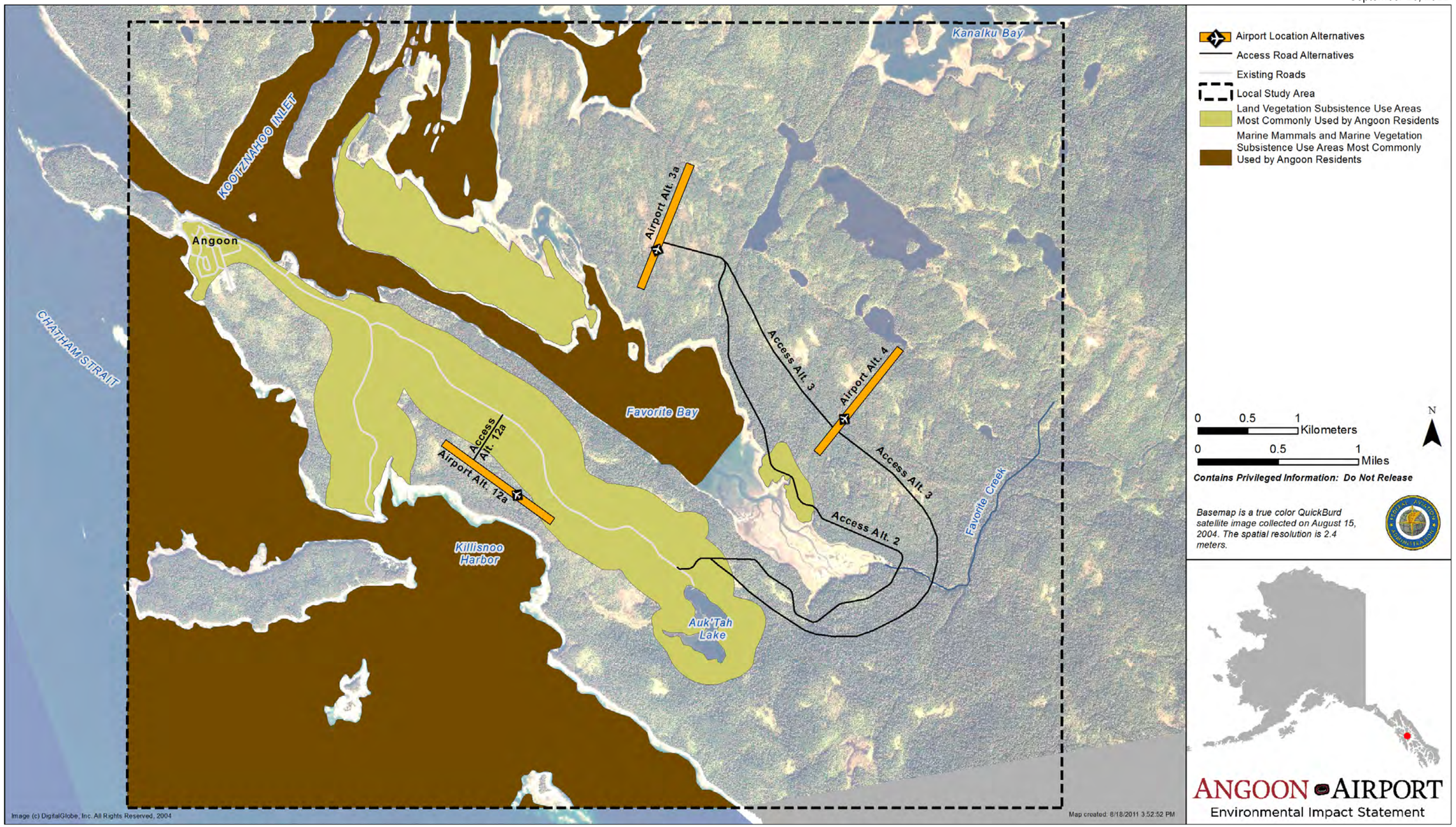

Figure 4. Marine mammal, marine vegetation, and land vegetation subsistence harvest areas.

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3.3.6 MARINE INVERTEBRATES

Living in a coastal community, residents of Angoon heavily utilize marine invertebrates. Angoon residents harvest many types of marine invertebrates, including crabs, clams, cockles, abalone, gumboots (chitons), sea cucumbers, sea urchins, scallops, mussels, and octopus. Some of these resources, such as cockles and gumboots, are traditional Alaska Native foods that remain popular among Native people (Gmelch et al. 1985). Others, such as crabs and shrimp, are popular among all residents. Based on the marine invertebrate species targeted for harvest by Angoon residents and the percentage of Angoon households that harvested them in 1996, clams, chitons, cockles, crab, and shrimp are the favored resources for harvest (Table 5).

Table 5. Angoon Marine Invertebrates Resource Harvest by Angoon Households

Resource	%Using	% Attempting to Harvest	% Harvesting	% Receiving	% Giving	Per Capita Harvest (lbs.)
All marine invertebrates	89.20	78.40	78.40	73.00	41.90	30.0
Chitons	58.10	47.30	47.30	39.20	21.60	9.4
Clams	64.90	51.40	51.40	36.50	17.60	10.0
Cockles	68.90	54.10	54.10	45.90	16.20	6.32
Crab	48.60	32.40	31.10	35.10	20.30	2.77
Shrimp	8.10	5.40	5.40	2.70	1.40	1.05
Sea urchins	2.70	2.70	2.70	0.00	0.00	0.01
Octopus	6.80	6.80	6.80	0.00	2.70	0.41
Sea cucumbers	1.40	1.40	1.40	0.00	0.00	0.15
Limpets	1.40	1.40	1.40	0.00	0.00	0.01

Source: (ADF&G 2009a)

Clams are the most commonly harvested intertidal resource and the second most common marine invertebrate in Angoon: 51% of survey households had harvested them in 1996 (ADF&G 2009a). Several species are found in Angoon, but only two species are harvested. These include the butter (or hardshell) clam and steamers (or the Pacific littleneck clam).

Residents can find clams throughout the year, but only collect them during certain months due to the threat of paralytic shellfish poisoning (PSP). PSP happens during the warm summer months and early autumn, when phytoplankton inundates the waters of many coastal areas. Some of the phytoplankton produces neurotoxins that mollusks ingest during feeding and concentrate in their tissues. The principal neurotoxin is saxitoxin, which is a strong natural poison. Of all marine invertebrates, clams and mussels are the most dangerous to consumers.

The butter or hardshell clam, also known as the northern quahog, is the most abundant species in the Angoon region in terms of its both availability and actual harvest levels. Adults average about 4 inches in diameter. Residents can easily find butter clams at low tide in the numerous gravel and rock beaches around Angoon. Many people, especially those without a boat, dig clams close to town. Those with boats travel to locations in Favorite, Mitchell, and Pea Hen bays. Some individuals gather clams along the salt lagoon, directly adjacent to the ferry terminal. Within the local study area, several locations in Favorite Bay and on beaches along the Angoon peninsula are known locations for harvesting butter clams (Figure 5).

The steamer or Pacific littleneck clam is smaller than the butter clam, averaging 2 inches in diameter, but it occupies the same habitat. Residents harvest Pacific littleneck clams in the same locations as butter clams. The per capita harvest of butter and littleneck clams in 1996 was approximately 10 pounds and less than 1 pound respectively (ADF&G 2009a).

Residents also find chitons or gumboots in the Angoon area. Angoon residents harvest two species of chitons; the giant Pacific chiton or gumboot, and the lined chiton. All are edible, and people often use the term *gumboot* to describe both species. Chitons are not susceptible to PSP like clams and mussels. Approximately 9% of Angoon households collect gumboots, according to the 1996 study (ADF&G 2009a). Per capita harvest is over 1 pound. Gumboots occupy boulder-strewn, wave-beaten, or intertidal beaches, not gravel, sand, or mud habitats like most other mollusks. Residents harvest gumboots by using a knife or some other thin, sharp object to pry the chiton from the rocks. Within the local study area, the predominant location for harvest of gumboots is a series of rocky channels between Favorite and Pea Hen bays, where there is a massive tidal exchange of water.

Cockles are hardshelled bivalves that are slightly larger than butter clams. Like clams, cockles are also susceptible to PSP. Therefore, most Angoon residents will wait until fall or spring to harvest them. Cockles are typically found in finer sand or mud beaches than clam species. Most residents either smoke and dry the meat for later use or use them immediately by pounding the flesh to tenderize them and then fry the meat. Within the local study area, much of Favorite Bay is a preferred location for harvest of cockles.

Crab is another important subsistence species in the Angoon area, with approximately 31% of Angoon residents harvesting crabs in 1996 (ADF&G 2009a). Angoon residents harvest crab by primarily using crab pots. Crab pots are typically baited with fish parts, attached to a line and buoy, and set in protected bays and coves. Crabs then enter the pot to get the bait and cannot escape because of the pot's one-way entrance. Once caught, crabs are kept alive until they are ready for consumption. Then the crabs are placed into a pot of boiling water until cooked. Once cooked, the shell is cracked and the white meat inside is consumed.

Dungeness crab accounts for the highest amount of crab harvest by Angoon residents. In 1996, approximately 2.1 pounds per capita of Dungeness crab were harvested by Angoon residents (ADF&G 2009a). The most popular location for harvesting Dungeness crab in the Angoon area is upper Favorite Bay, which is located in the local study area. In the summertime, it is common to see multiple crab and shrimp pot buoys floating in the bay.

Other crab species harvested by Angoon residents include red king crab and tanner crab. In 1996, less than 1 pound per capita of each species was harvested by Angoon residents (ADF&G 2009a). These species are typically harvested in deeper waters than Dungeness crab, although occasionally both king and tanner crabs are caught in the local study area.

Like crab, shrimp are an important subsistence species for Angoon residents with approximately 5% of households harvesting shrimp in 1996 (ADF&G 2009a). Most Angoon residents harvest shrimp using shrimp pots, which work in a similar fashion as crab pots by capturing shrimp as they enter the pot to feed on bait. In the Angoon area, there are several different species of shrimp, but only three species are actively sought after by Angoon residents for subsistence harvest: the Pacific prawn (or spot shrimp), the humpback (or humpy) shrimp, and the coonstripe shrimp. Angoon residents harvested approximately 1 pound per capita of shrimp in 1996. As with Dungeness crab, one of the most important harvest locations for shrimp is upper Favorite Bay in the local study area.

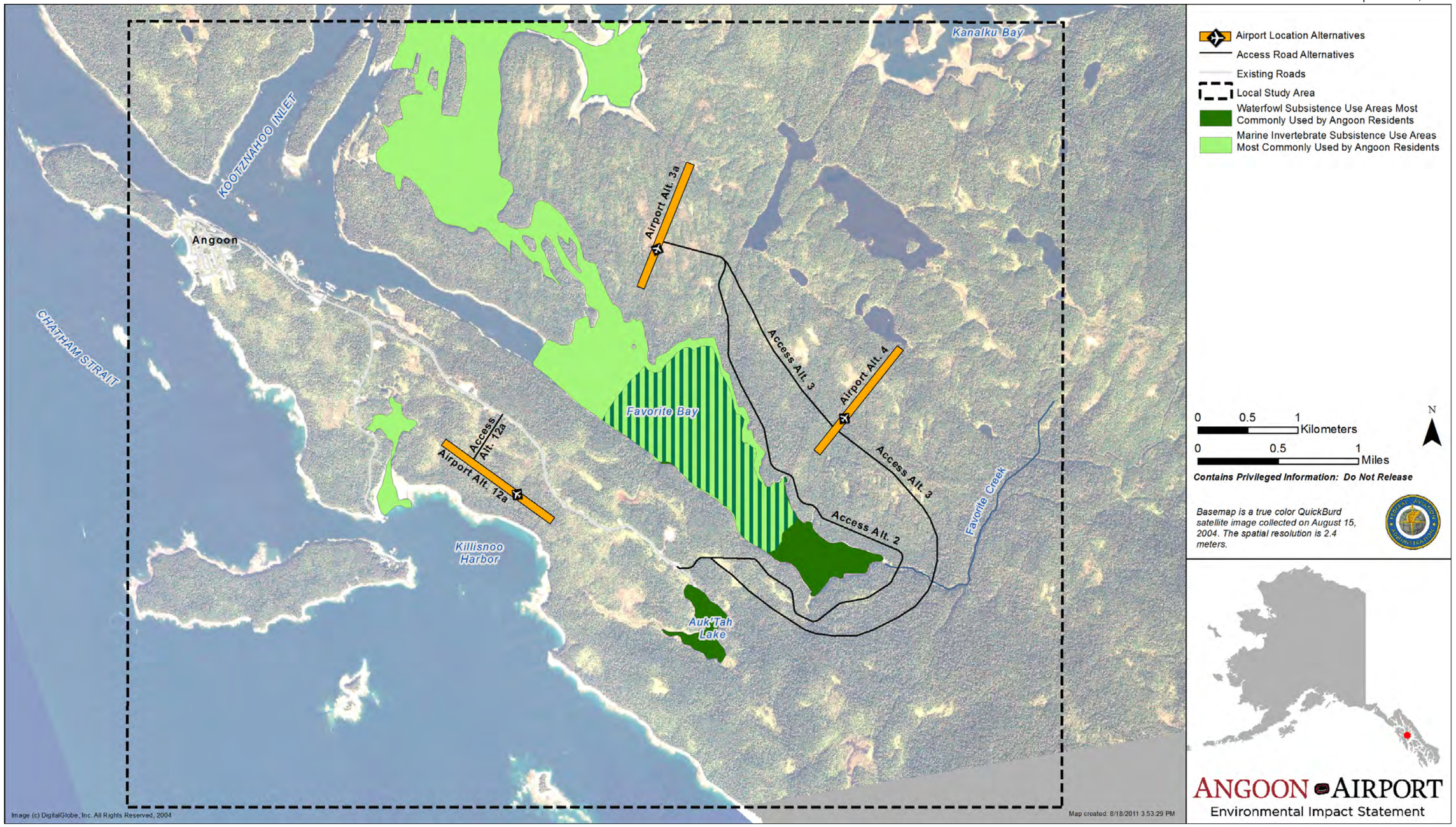

Figure 5. Marine invertebrate and waterfowl subsistence harvest areas

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Approximately 3% of Angoon households harvested sea urchins in the 1996 study (ADF&G 2009a). Several species occur in the local study area, including the purple urchin, red urchin, and green urchin, but only green sea urchin is harvested by Angoon residents. Sea urchins require considerable effort to obtain and process for a small amount of food, and they are highly perishable. Furthermore, the prime season for eating urchins, when the gonads mature, is approximately one month in duration. However, because the resource is abundant in rocky intertidal pools around the local study area and landscape study area, it is commonly used by local residents.

Octopuses are also gathered by Angoon residents. In 1996, approximately 7% of households harvested octopus (ADF&G 2009a). Octopuses are usually harvested either by hook or by placing a stick in front of the octopus to get the animal to grab it. Octopuses are primarily used in several ways. One use is as food. Octopuses are typically fried or boiled. A large octopus may require pounding to tenderize the meat before cooking. The other way octopus is used is as bait, primarily for halibut. Octopuses are highly prized because they are a major food source for halibut and they can stay on the hook without falling off. Angoon residents did not identify any harvesting locations within the local study area, but there are several locations within the landscape study area.

Residents can find several species of sea cucumbers in the Angoon area, but only eat one, the Yein sea cucumber. Like sea urchins, sea cucumbers present challenges for subsistence use as they require considerable effort to obtain and process for a small amount of food, and they are highly perishable. The sea cucumber is an echinoderm that resembles a bumpy cucumber. Those in the Angoon area average about 4 inches in length and residents can collect them in the intertidal zone. Approximately 1% of Angoon households harvested sea cucumbers in 1996 (ADF&G 2009a). Sea cucumbers can be found throughout marine waters in the local study and landscape study areas, but most harvest occurs closer to the community.

While collecting other intertidal marine invertebrates, some Angoon residents will also harvest limpets. Limpets are small, cone-shaped invertebrates that lives in rocky, intertidal terrain and feed on algae that collect on rock surfaces. There are many species of limpets that are found in the Angoon area, all of which are edible. Like gumboots, limpets also are not susceptible to PSP. Within the local study area, Angoon residents harvest limpets in a series of rocky channels between Favorite and Pea Hen bays, where there is a massive tidal exchange of water. The rocky channels between Favorite and Pea Hen bays are also popular locations for Angoon residents to harvest marine invertebrates.

4.0 Summary

As demonstrated in this technical report, Angoon residents use many subsistence resources within the local study area. Fish, Sitka black-tailed deer, marine invertebrates, and plants are the most harvested resources in both the local study area and landscape study area. However, other resources, such as migratory birds and marine mammals, are also harvested by Angoon residents in the local study area and landscape study area. Subsistence is an important part of Angoon's economy and culture.

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Literature Cited

ADF&G. 1994. Wildlife Notebook Series http://www.adfg.state.ak.us/pubs/notebook/notehome.php. November 10, 2008.

————. 2009a. Community Subsistence Information System http://www.subsistence.adfg.state.ak.us/CSIS/. December 15, 2009.

————. 2009b. Statewide Harvest Survey http://www.sf.adfg.state.ak.us/statewide/participationandharvest/index.cfm December 20, 2009.

DOL&WD. 2009. Online databases on population estimates and projections. http: //laborstats.alaska.gov/?PAGEID=67&SUBID=115. Accessed July 2009.

DOT&PF. 2007. *Angoon Airport Master Plan*. Alaska: Alaska Department of Transportation and Public Facilities.

Fall, J. A., M. George, and B. Easley. 2005. *Subsistence Harvests of Pacific Halibut in Alaska, 2004*. Technical Paper No. 304, Alaska: Alaska Department of Fish and Game.

Fall, J. A., M. Kerlin, B. Easley, and R. J. Walker. 2004. *Subsistence Harvests of Pacific Halibut in Alaska, 2003*. Technical Paper No. 288, Alaska: Alaska Department of Fish and Game.

Fall, J. A. and D. Koster. 2008. *Subsistence Harvests of Pacific Halibut in Alaska, 2007*. Technical Paper No. 342, Alaska: Alaska Department of Fish and Game.

Fall, J. A., D. Koster, and B. Davis. 2006. *Subsistence Harvests of Pacific Halibut in Alaska, 2005*. Technical Paper No. 320, Alaska: ADF&G Division of Subsistence.

Fall, J. A., D. Koster, and M. Turek. 2007. *Subsistence Harvests of Pacific Halibut in Alaska, 2006*. Technical Paper No. 333, Alaska: Alaska Department of Fish and Game.

George, G. D. and R. G. Bosworth. 1988. *Use of Fish and Wildlife by Residents of Angoon, Admiralty Island, Alaska*. Technical Paper No. 159, Alaska: Alaska Department of Fish and Game.

George, G. D. and M. A. Kookesh. 1983. *Angoon Deer Hunting, 1982*. Technical Paper No. 71, Alaska: Alaska Department of Fish and Game.

Gmelch, G., S. B. Gmelch, and R. K. Nelson. 1985. *Resource Use in a Small Alaskan City - Sitka*. Technical Paper No. 90, Juneau, Alaska: Alaska Department of Fish and Game.

USFS. 2002. *Mitchell Bay Watershed Landscape Assessment*. R10-MB-471, Alaska: U.S. Forest Service.

Wolfe, R. J. 2000. *Subsistence in Alaska: A Year 2000 Update*. Alaska: Alaska Department of Fish and Game.

————. 2004. *Local Traditions and Subsistence: A Synopsis from Twenty-Five Years of Research by the State of Alaska*. Technical Paper No. 284, Alaska: Alaska Department of Fish and Game.

Wolfe, R. J. and R. J. Walker. 1987. Subsistence economies in Alaska: productivity, geography, and development impacts. *Arctic Anthropology* 24:56–81.

Acronyms

ADF&G	Alaska Department of Fish and Game
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Conservation Lands Act
DOT&PF	Alaska Department of Transportation and Public Facilities
EIS	environmental impact statement
FAA	Federal Aviation Administration
NEPA	National Environmental Policy Act
PSP	paralytic shellfish poisoning
SHARC	subsistence halibut registration certificate
U.S.C.	U.S. Code
USFS	U.S. Forest Service

APPENDIX A. ANGOON SUBSISTENCE RESOURCES HARVESTED IN 1996

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Table A-1. Subsistence Resources Harvested by Angoon Residents in 1996

Resource Category	Common Name	Scientific Name
Fish	Chinook salmon	*Oncorhynchus tshawytscha*
	Chum salmon	*Oncorhynchus keta*
	Coho salmon	*Oncorhynchus kisutch*
	Pink salmon	*Oncorhynchus gorbuscha*
	Sockeye salmon	*Oncorhynchus nerka*
	Herring	*Clupea* spp.
	Pacific cod (gray)	*Gadus macrocephalus*
	Flounder	Various spp.
	Lingcod	*Ophiodon elongatus*
	Halibut	*Hippoglossus stenolepis*
	Black rockfish	*Sebastes melanops*
	Red snapper (yelloweye rockfish)	*Sebastes ruberrimus*
	Sablefish (black cod)	*Anoplopoma fimbria*
	Dolly Varden	*Salvelinus malma Walbaum*
	Rainbow trout	*Oncorhynchus mykiss*
	Steelhead	*Oncorhynchus mykiss*
Terrestrial mammals	Brown bear	*Ursus arctos*
	Sitka black-tailed deer	*Odocoileus hemionus sitkensis*
	Land (river) otter	*Lutra canadensis*
Marine mammals	Harbor seal	*Phoca vitulina*
Birds and bird eggs	Bufflehead	*Bucephala albeola*
	Harlequin	*Histrionicus histrionicus*
	Mallard	*Anas platyrhynchos*
	Northern Pintail	*Anas acuta*

Table A-1. Subsistence Resources Harvested by Angoon Residents in 1996

Resource Category	Common Name	Scientific Name
	Long-tailed Duck (Old Squaw)	*Clangula hyemalis*
	Green-winged Teal	*Anas carolinensis*
	American Widgeon	*Anas americana*
	Vancouver Canada Geese	*Branta canadensis*
	Blue Grouse	*Dendragapus obscurus*
	Bird eggs	Various spp.
Marine invertebrates	Black (small) chitons	*Katharina tunicata*
	Gumboot chiton	*Cryptochiton stelleri*
	Butter clams	*Saxidomus giganteus*
	Pacific littleneck clams (steamers)	*Protothaca staminea*
	Basket cockles	*Clinocardium nutta*
	Heart cockles	*Clinocardium nuttallii*
	Dungeness crab	*Cancer magister*
	Red king crab	*Paralithodes platypus*
	King crab sub-species	*Paralithodes camtschaticus*
	Tanner crab sub-species	*Chionoecetes* spp.
	Limpets	Various spp.
	Octopus	*Octopus dolfeini*
	Sea cucumber	*Parastichopus californicus*
	Green sea urchin	*Strongylocentrotus droebachiensis*
	Coonstripe shrimp	*Pandalus danae*
	Humpback shrimp	*Pandalus hypsinotus*
	Pacific prawn	*Pandalus platyceros*

Table A-1. Subsistence Resources Harvested by Angoon Residents in 1996

Resource Category	Common Name	Scientific Name
Vegetation	Plants/greens/mushrooms	Various spp.
	Berries	Various spp.
	Seaweed/kelp	Various spp.
	Wood	Various spp.

Source: (ADF&G 2009a)

APPENDIX P
PUBLIC INVOLVEMENT PLAN

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

ANGOON AIRPORT
Environmental Impact Statement

PUBLIC INVOLVEMENT PLAN

SUBMITTED TO:

FEDERAL AVIATION ADMINISTRATION
ALASKAN REGION, AIRPORTS DIVISION

SUBMITTED BY:

SWCA ENVIRONMENTAL CONSULTANTS

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APRIL 25, 2008

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ANGOON AIRPORT EIS PROJECT
PUBLIC INVOLVEMENT PLAN

1.0 INTRODUCTION

Client:	Federal Aviation Administration (FAA)
Project Sponsor:	Alaska Department of Transportation and Public Facilities (ADOT&PF)
Project Type:	Environmental Impact Statement (EIS)
Project ID & Title:	Angoon Airport EIS Project

An EIS is being prepared to analyze the potential effects of constructing a land-based airport near the City of Angoon located on Admiralty Island in the southeast portion of Alaska. The proposed airport is of considerable interest to citizens (local, regional, statewide, and nationwide); organizations; local, state, and regional government entities; businesses; and other bodies with a stake in the outcome of the EIS process and other decisions related to the proposed airport. These groups, collectively, make up the Angoon Airport EIS Project stakeholders (hereafter referred to simply as stakeholders). Due to the high level of public interest in this project it is important to construct a thorough, well-reasoned, and well-crafted plan to facilitate public involvement throughout the process. This Public Involvement Plan (PIP) outlines a detailed approach designed to:

- reach a diverse group of stakeholders with different communication abilities and interests;
- address key public concerns;
- strengthen relationships with stakeholders;
- provide ongoing project information; and
- minimize potential conflicts surrounding project development and implementation.

The PIP addresses the need to communicate with and gain input from a variety of audiences, each of which may communicate differently. In the spirit of the National Environmental Policy Act (NEPA) the public involvement approach detailed in this PIP uses innovative and creative concepts within the framework of collaboration to meet the needs of the various project stakeholders to have a voice in the process. This PIP would also meet the compliance and regulatory requirements for public involvement set forth by the Council on Environmental Quality (CEQ) Regulations (40 CFR 1500-1508) for implementing NEPA, the Alaska National Interest Lands Conservation Act (ANILCA), and the FAA NEPA Implementing Procedures for Airport Actions (FAA Order 50504b).

2.0 GOALS AND OBJECTIVES

The Contractor, SWCA Environmental Consultants (SWCA), formed a Public Involvement Team (PI Team) to assist the FAA in all aspects of the public involvement process. This team has identified four main goals for successful public outreach and the actions necessary to accomplish

these goals. SWCA sees value in incorporating the following strategies as discussed further in the Public Involvement Approach Section below. The four public involvement goals are:

Goal 1: Ensure that the public is well informed about the process and project.

Actions:

- Inform and educate community citizens with clear, easily understood, factual and timely information regarding NEPA, the Angoon Airport project and its impacts, the opportunities for public input, and any related regulatory processes;
- Develop an effective process for project updates throughout the EIS process;
- Develop a unified theme (via consistent graphics and other elements) that will be carried throughout the EIS process; and
- Clearly communicate milestones and decision dates to the public and inform the public at each stage.

Goal 2: Facilitate effective communication and cooperation between Lead Agency (FAA) and project Sponsor (ADOT &PF) throughout the life of the project.

Actions:

- Inform and educate Sponsor through regular project status updates;
- Encourage Sponsor participation at public meetings;
- Develop opportunities for Sponsor involvement though invitations to interagency project meetings and review of project materials, as appropriate within the confines of a neutral NEPA process;
- Communicate regularly with the Sponsor including: 1) invitations to meetings, 2) consistent project updates, 3) meaningful and timely responses to comments and questions, and 4) demonstrated consideration of input throughout the entire NEPA process; and
- Provide opportunities to review materials, as appropriate within the confines of a neutral NEPA process.

Goal 3: Convey the importance and value of public, agency, and stakeholder input throughout the NEPA process and ensure stakeholders have opportunities to contribute to identifying issues, alternatives, and potential impacts.

Actions:

- Develop a process that generates interest in and provides equal opportunities for input into the analysis and decision-making process and
- Involve and obtain substantive input from all stakeholder groups via meetings, mailings and other correspondence.

Goal 4: Create a comfortable communication environment where stakeholders can freely discuss issues and ideas.

Actions:

- Appropriately address/interface with all the different stakeholders and interested members of the public in a culturally appropriate manner;
- Help give stakeholders project "ownership" by providing a range of opportunities for participation throughout the life of the project. This includes obtaining stakeholder "buy in" by 1) consistent project updates, 2) meaningful and timely responses to comments and questions, 3) consideration of input throughout the entire NEPA process; and 4) modifying PI outreach techniques or meeting formats as needed based upon public feedback;
- Provide reasonable opportunity for public review of information and for commenting.

3.0 TARGET AUDIENCES

To accomplish the goals described above, the PI Team will take a proactive approach to involve potentially interested parties directly throughout the Angoon Airport EIS Project. In the spirit of NEPA, the PI Team will use both traditional and non-traditional means to involve all target audiences in the process. The following sections outline the general target audiences that need to be included:

1. Local Angoon tribal and non-tribal community members;
2. Southeast Alaska regional community (Juneau, Sitka and other communities, groups and governments);
3. State of Alaska (individuals, groups, and government throughout the state); and
4. Other interested parties throughout the U.S., anticipated to be located largely in the Pacific Northwest and Washington, D.C. (hereafter referred to as Lower 48).

3.1 Angoon

The Angoon community includes both Alaska Natives and non-natives (see Table 1 for a list of key stakeholders for the Angoon community). Communication with Alaska Natives will need to be respectful and adhere to identified cultural practices. Based on a preliminary site visit and conversation with key community members, it is anticipated that a variety of outreach techniques, including one-on-one discussions, door-to-door visits, and meetings at the senior center can be combined with hardcopy newsletters and postings on the community, website-based bulletin board (www.myangoon.org) to ensure that information is effectively disseminated. Use of several techniques will be more effective in developing relationships and obtaining substantive input from this stakeholder group than using just one or two conventional NEPA outreach techniques.

Members of the Angoon EIS project team visited Juneau and Angoon in March 2008 for kickoff meetings with the Elders, mayor, tribal president, and the community. The following suggestions

and notes summarize the information gathered regarding communication with Angoon stakeholders:

- When scheduling a series of meetings, Angoon's meeting should be scheduled last, so that they feel that they have had the "final say".
- It is important to spend time in the community: Team members should stay for more than a day, visit the key locations and community members, buy something at the trading company, and eat at the senior center. Team members should not arrive immediately before and leave immediately after meetings.
- Open house meetings may not work well in Angoon. There should be a presentation of some sort. Formal tribal meetings will start and end with a prayer; less formal meetings are more flexible, but having a respected community member such as the mayor open the meeting is recommended.
- Team members should always provide food for meetings. Coffee and pastries or some food item that they cannot purchase in Angoon are recommended.
- Meeting times are approximate; if a meeting is scheduled for 7 PM, it may not start until 8 PM. The person opening the meeting will begin when it is culturally appropriate. If no one from the community is opening the meeting, the audience itself, by unspoken consensus, will make it known when they are ready to begin. The Team members need to be respectful of this community-based process, remain flexible, and wait until that happens before beginning the meeting.
- The rate and flow of communication will be very different for this community. Conversations are slower and may touch on a wide variety of topics, not just the issue at hand. Team members need to allow the speaker to express the full range of their thoughts without interruption and wait until they are certain the speaker is finished before acknowledging the comment. Team members may also need to talk more slowly.
- Side conversations during meeting presentations are to be expected.
- The relationship of the EIS process to the Angoon Airport Master Plan (2006) process will need to be explained at each meeting. A flow chart showing the progress of the project would be very helpful in outlining the distinction between the Master Plan and the NEPA processes.
- Although informal "informational" meetings have been identified as a very useful tool for establishing relationships, there may be confusion between the informal meetings, during which community members have, in fact, expressed their opinions, and the formal scoping or DEIS comment periods, during which those comments are collected. Community members may think they have already commented on the project and do not need to comment again during the formal comment periods. Education on the NEPA process and the legal necessity of those steps will be helpful.

- There may be anger from community members about the length of the process, the fact that the Proposed Site (selected by the community) may change, or that non-Angoon stakeholders will be involved in the process. Team members must be prepared for those sentiments, but it is important to note that while community members may express anger in their comments; this does not necessarily constitute non-support of the project.
- Community members may feel that stakeholders outside of the Angoon community should not be contacted, nor should meetings be held in cities like Sitka, Juneau, or Anchorage. It will be helpful to provide some education on the legalities of the NEPA process and why the Team would or should include those parties in the process, stressing that NEPA is not a "vote", and thus comments from stakeholders outside of Angoon would not receive more weight than comments from Angoon residents.
- Some community members may feel that previous public involvement processes did not make much of an effort in terms of "responding" to comments. Team members should verbally acknowledge comments during meetings. If suggestions to improve the process are given, the Team should act upon those suggestions whenever reasonable and within the confines of a neutral NEPA process.
- Although the Tlingit tribe is matriarchal, it is possible that the team may find that certain members of the community direct questions and comments more to the male Team members, regardless of their position.
- CB radios are used regularly around the community to quickly relay information. This medium can be used for announcing upcoming meetings, but should not be the only means for advertising meetings.

To facilitate better communication, refine the EIS Team's understanding about the effectiveness of outreach techniques, and to address issues such as potential distrust of non-locals and cultural differences, the PI Team strongly suggests a second pre-scoping visit, held in advance of the actual scoping period, during which the PI Team could introduce themselves to local stakeholders and begin to establish the relationships that would result in more involvement by these stakeholders. This pre-scoping visit would also provide a chance to test the effectiveness of outreach techniques and retool the PIP well before the public scoping meetings if changes are warranted based on information gathered during the visit.

3.2 Southeast Alaska

The general public in Southeast Alaska will be varied and have diverse opinions regarding the proposed project and its impacts. Groups will likely run the gamut from fishing and hunting guides, tourists, and recreationists to conservation groups and Native populations. This area will also include the bulk of interested agency representatives. Agency representatives, involved public individuals, and representatives from environmental groups, are likely going to have knowledge of the NEPA process and be comfortable with the use of websites, e-mail commenting, postcard mailings and other less personal means of communication. Native populations in the region, including Tlingit entities in Juneau and Sitka, may be more responsive to a more personal approach. The PI Team suggests a pre-scoping visit to Sitka and/or Juneau to include meetings

targeted to these Native populations. The PI Team has currently identified the following Southeast Alaska categories of potential stakeholders that should be included as part of the PI process:

- Culturally or regionally associated communities (e.g., Kake)
- Tlingit representatives/Native Alaskan cultural organizations
- Regional Native corporations
- Conservation groups
- Federal agencies
- State agencies
- Subsistence users
- Recreationists
- Hunting and Fishing Guides
- Commercial pilots/airlines

Table 1 includes a list of specific groups or stakeholders from Southeast Alaska.

3.3 Greater Alaska

It is anticipated that conservation organizations, government agencies, commercial guides, recreationists, Native Alaskans and other stakeholders listed in the section above will likely be interested in participating in the project, as well as members of the Greater Alaska area general public. This stakeholder group will likely comprise government and environmental groups familiar with the NEPA process and comfortable with the use of websites, postcard mailings, and other less personal means of communication more typical to NEPA processes in general. There may also be individuals in the Greater Alaska area that are interested in the project for a variety of reasons (access to hunting and fishing grounds, etc.). Additionally, members of Congress and the Executive Branch of the Federal Government representing the State of Alaska will need to be briefed as part of the ANILCA Title XI process. This requirement of ANILCA will likely evoke interest from these entities even before the briefing is presented. Table 1 includes a list of key stakeholders for Greater Alaska.

3.4 Lower 48

The U.S. Fish and Wildlife Service (USFWS) is expected to be a stakeholder on the project and some national organizations such as the Sierra Club, The Nature Conservancy (TNC) and other environmental Non-governmental Organizations (NGOs) may also be interested in providing input on the project, given the location of the proposed airport is in a wilderness area. The FAA will also need to provide updates to their headquarters in Washington, D.C. As with the Greater Alaska area, interested parties in the Lower 48 states are likely to be easily contacted through the website, postcard mailings, the Notice of Intent (NOI), and other commonly used methods of advertising and communication. Table 1 includes a list of key stakeholders for the Lower 48.

Table 1. Key Stakeholders for the Angoon Airport EIS Project

Angoon	SE Alaska	State of AK	Lower 48[1]
General population of Angoon, (pop=~500, 86% Tlingit)	Agencies located in SE AK:	FAA Regional Administrator (Anchorage office)	FAA Headquarters (Washington, DC office)
City of Angoon (Mayor, City Council, City Clerk and other key personnel)	ADOT&PF (Juneau office)	USEPA Alaska Operations Office (Anchorage office)	USEPA, Region 10 (Seattle office)
Village Council (ACA)	USEPA Alaska Operations Office (Juneau offices)	USFWS, Region 7 (Anchorage office)	USFWS (Washington, DC office)
Village Corporation (Kootznoowoo, Inc.)	USFWS, Region 7 (Juneau office)	DNR (Anchorage office)	Greenpeace (Washington, DC and/or San Francisco office)
Health Clinic/Health care workers	NOAA/ NMFS Alaska Regional office (Juneau office)	NOAA/NMFS-Protected Resources Division and Habitat Conservation Division (Anchorage office)	Sierra Club (Washington, DC and/or San Francisco office)
Town businesses/major employers:	USFS Tongass NF (Sitka and Juneau offices)	Alaska State Historic Preservation Officer (SHPO) (Anchorage office)	TNC (Arlington, VA office)
Post Office	USFS Admiralty Island National Monument (Juneau office)	AK National Congressional Delegation (Senators Ted Stevens and Lisa Murkowski, Congressman Don Young)	The Wilderness Society (Washington, DC office and/or Durango, CO wilderness support center)
Angoon Trading Company	ADNR OPMP(Juneau office)	The Wilderness Society (Anchorage office)	Alaska Wilderness League (Washington, DC office)
Lumber Mills (2)	ADF&G (Subsistence Division; Division of Wildlife Conservation/Stan Price State Wildlife Sanctuary-Juneau offices)	Alaska Conservation Alliance (Anchorage office)	National Audubon Society (NY or Washington, DC office)
B&B (Favorite Bay Inn)	ACMP (Juneau and Anchorage offices)	Alaska Wilderness League (Anchorage office)	
Chatham School District	Alaska Department of Commerce, Community and Economic Development (Juneau office)		
Business Center	Native Alaskan interest groups:		
Fitness Center at High School	Tlingit-Haida Regional House Authority (native housing authority, located in Juneau)		
Angoon Oil and Gas	Southeast Alaska Regional Health Consortium (regional native health corporation, located in Juneau)		
Commercial fishermen (44 individual commercial fishing permits)	Central Council Regional Tlingit-Haida (regional native non-profit, located in Juneau)		
Commercial outfitters and lodges and tourists (e.g., Whaler's Cove)	Alaska Native Brotherhood/Alaska Native Sisterhood		
Residents or others commuting for seasonal work	Sealaska (Regional Native Corporation located in Juneau)		
Angoon Fish and Game Advisory Council (citizen advisory council)	Community organizations:		
	Southeast Conference (regional development, Juneau office)		
	Southeast Regional Advisory Council (subsistence citizen advisory council)		
	Other citizen groups and community groups on the ADOT&PF, Tongass NF, and Admiralty Island National Monument mailing lists		
	State legislature representatives for the region (Senator Al Kookesh and Representative Bill Thomas)		
	Commercial and Governmental Transportation Providers:		
	AK Seaplane Services (only scheduled carrier, Summer 4 trips/day; winter 2 trips/day)		
	Alaska Marine Highway system (a state run service, 1 trip/wk or more in winter; more in summer)		
	Charter air services, such as Harris Aircraft Service, Ward Air or other carrier services		

[1] It is anticipated that the national level of some organizations will choose to be updated through their local or regional chapter.

Table 1. Key Stakeholders for the Angoon Airport EIS Project, continued

Angoon	SE Alaska	State of AK	Lower 48[2]
	Business and people dependent upon transportation:		
	Suppliers that transport goods or services to Angoon (e.g., mail, food, or other products)		
	Health care facilities in other cities (e.g., Mt. Edgecombe Hospital in Sitka) to which Angoon might transport patients		
	Environmental NGOs:		
	Friends of Admiralty Island (Juneau office)		
	Sierra Club Juneau group of the Alaska Chapter		
	TNC (Juneau office)		
	SEACC (Coalition of 16 volunteer citizen organizations based in 13 SE AK communities; Juneau office)		
	Tongass Futures Roundtable (collaborative stakeholder group, in Juneau)		
	Territorial Sportsmen (Juneau office)		
	SEAL Trust, (Juneau office)		
	Juneau Audubon (Juneau office)		
	Sitka Conservation Society (Sitka office)		
	Alaska Conservation Alliance (Juneau office)		
	Greens Creek Mine		

[2] It is anticipated that the national level of some organizations will choose to be updated through their local or regional chapter.

4.0 PUBLIC INVOLVEMENT APPROACH

To fulfill the participation needs of the community and to achieve the identified Angoon Airport EIS Project PI goals, the PI Team will tailor its PI approach to include opportunities for project education, collaboration, and community outreach. The following sections outline the PI Team's proposed approach for public involvement with cooperating agencies and the variety of stakeholder audiences we expect will be interested in the project.

4.1 Outreach Techniques

The PI Team will advertise the Angoon Airport EIS project through both traditional and non-traditional means to ensure high publicity and community involvement. As outlined above, each of the four categories of stakeholder audiences (see Table 1) may communicate differently and require different approaches to solicit useful public input throughout preparation of the Angoon Airport EIS. The following table outlines a variety of possible outreach methods, the expected audience for each type of technique, and the anticipated effectiveness of each method.

Table 2. Potential Outreach Techniques by Target Group and Effectiveness[1]

	Angoon	SE Region	State of AK	Lower 48
Display Advertisements in news media (Juneau, Sitka newspapers, radio, TV)	2	**1**	**1**	**1**
Updates at city and tribal council meetings	**1**	NA	NA	NA
Door-to-door	**1**	NA	NA	NA
Extend formal invitations to key stakeholders to attend (or even participate in) scoping meetings	**1**	**1**	**1**	**1**
Email to stakeholders, based on list created from client, research, interviews, etc	2	**1**	**1**	**1**
Federal Register Notice	2	**1**	**1**	**1**
Flyers posted in key locations as identified by key community individuals	**1**	2	NA	NA
Individual meetings with specific groups	**1**	**1**	NA	NA
Informal meeting/discussions such as lunches at senior center	**1**	NA	NA	NA
Information Booths	**1**	NA	NA	NA
Inserts in utility bills and/or other standard mailings	**1**	NA	NA	NA
Meeting announcement on CB	**1**	NA	NA	NA
Mail or hand deliver comment cards	2	2	2	2
Mailed postcards	2	**1**	**1**	**1**
Newsletters	2	**1**	**1**	**1**
Open house (formal scoping meeting)	2	**1**	**1**	**1**
Project presentation/update/Q&A, and comment meeting	**1**	2	NA	NA

Table 2. Potential Outreach Techniques by Target Group and Effectiveness[1]

	Angoon	SE Region	State of AK	Lower 48
Phone calls	2	**1**	**1**	**1**
Media notices to newspapers	2	**1**	**1**	**1**
Media notices to radio and TV stations	2	**1**	**1**	**1**
Put project information and/or weblink on stakeholder websites, newsletters or other forms of publicity (cooperating agencies in particular) for dissemination to other offices or constituents	2	**1**	**1**	**1**
Postings on myangoon.org website	**1**	2	2	2
Surveys	**1**	NA	NA	NA
Project webpage to announce project, give key information, provide updates and contact information. During comment period, stakeholders could comment on the project through the web page. Automatic email notifications about changes or additions to website will be issued.	2	**1**	**1**	2
Briefings to legislators, national delegates, etc.	2	2	**1**	**1**

[1] 1=most effective; 2=secondary outreach technique, NA=will not be used with that audience

4.2 Pre-Scoping Meeting(s) in Angoon and SE Alaska

There are currently a number of unknowns about how best to communicate effectively with stakeholders in the City of Angoon. As discussed in Section 3.1, the PI Team proposes an additional visit to SE Alaska (Juneau/Sitka) and Angoon well before the scoping meetings, spending one to three days at each location. This time would be spent meeting representatives of stakeholder groups, gathering information on public sentiment, determining best formats and venues for meetings, and assessing the most effective ways to disseminate project information. The Team could also schedule an informal meeting in the City of Angoon to introduce the rest of the team members and as a means to reevaluate the effectiveness of an open house meeting format in this traditional Native Alaskan community. Other informal social events such as a "fish-fry" might also be effective in assessing community interest and the most appropriate communication techniques.

The additional pre-scoping visit would:

- Identify potential disagreements in the community, or cultural differences not previously identified that need to be addressed to maximize communication;
- Provide an opportunity to evaluate the effectiveness of planned outreach techniques. The team received some additional information during the March visit that has resulted in some changes to the planned outreach and communication protocols. A second visit would allow the team another opportunity to expand upon that information--learn more about where community members primarily get their information and what format is most effective (e.g.,

TV, radio, newspaper, phone calls)---and develop more effective project advertising and update procedures in advance of scoping meetings.

- Provide an opportunity to continue to build relationships and trust levels well before the scoping meetings. A second visit allows the community to comment directly to team members on the project and the public outreach to date, and allows the Team to demonstrate its responsiveness to community needs by altering outreach techniques or providing additional project information, helping to convey the importance and value of community input to the process.
- Gauge the effectiveness of the proposed scoping meeting format (currently mixed open house/presentation) to allow for redesign of the PIP well before the public scoping meetings if changes are warranted based on information gathered during the visit.
- Present another project update opportunity. An additional pre-scoping visit will allow the Team to demonstrate progress on the project; expand upon the Team's understanding of residents' perceptions of the project and correct any misperceptions; educate community members on the NEPA process and in particular, the role of the scoping meetings; and provide updates on activities to date.

4.3 Scoping Meetings

The PI Team proposes three formal scoping meetings: one in Angoon, one in either Sitka or Juneau, and one in Anchorage.

The general design of scoping meetings would be a presentation/open house format where community members would: 1) be given information packets; 2) hear a brief presentation; 3) view information stations that provide project information on project purpose and need, alternatives development and the resources that may be discussed in the EIS; and 4) provide scoping comments. The potential meeting format would be as follows:

- 15-30 minutes Welcome, Introductions, distribute information packets
- 30 minutes Brief Project Presentation / Question and Answer session
- 75-90 minutes Open House with resource and comment stations (refreshments provided)

The format would use information packets and information stations to educate participants about the project, NEPA regulatory process, and resource issues. The presentation and the information stations would highlight opportunities and avenues for public input such as commenting at the scoping meetings, sending in written comments, or commenting on the project web page. Resource specialists would be available to answer questions one-on-one during the open house portion of the meeting. The PI Team would help guide attendees through the displays, direct them to appropriate resource specialists, and solicit comments.

It is important to stress that the PI Team sees this format as being most effective for the Anchorage and Juneau/Sitka meetings. The PI Team feels that in Angoon non-traditional outreach techniques such as information booths placed in key locations such as the Angoon Trading Company, Community Center/Senior Center, or door-to-door visits may result in more useful feedback than

an open house. Based on the results of the pre-scoping visit, the PI Team may employ some of these techniques in conjunction with the scheduled scoping meeting.

4.4 Project Updates

To keep stakeholders involved and interested in the project, a project mailing list will be developed from information provided by the client, as well as through the pre-scoping and scoping meetings. As the PI Team identifies other interested parties throughout the NEPA process, we will add them to the mailing list. The PI Team will develop informational material and progress notifications to be distributed (throughout the project at key milestones and in advance of important meeting dates) to participants and stakeholders through a combination of e-mail, community e-bulletin board postings, newsletters, media releases, utility bill or other regular mailing inserts, or postcards. Interested parties will also receive automatic e-mail notifications as information is posted to the project website. Interested parties preferring hard-copy correspondence will be mailed newsletter updates and informational postcards regarding project status and milestones.

Specific project update protocols have been identified as follows for different stakeholder groups:

Sponsor (ADOT&PF)

Keeping the Sponsor informed of project progress and decisions, and involving them in appropriate project processes will help the Lead Agency in developing project purpose and need and formulating an effective range of alternatives to meet that purpose and need. Additionally, it will prevent any potential miscommunications that could significantly extend the EIS schedule.

To ensure the Sponsor is kept informed of activities occurring under the FAA's direction, the FAA and the EIS Contractor Team will invite the ADOT&PF Angoon Airport EIS Project Manager to participate in monthly teleconferences. These teleconferences will be held the second Wednesday of every month, at approximately 8:30 AM (Alaska). The EIS Contractor Team will provide an FAA-approved agenda and any other required materials for the call to the Sponsor the Monday before each call. Additionally, if there are any changes in the call schedule, that information will also be provided to the Sponsor by the Monday before the call. In addition to the teleconferences, the ADOT&PF Angoon Airport EIS Project Manager will receive an FAA-approved e-mailed progress report from the EIS Contractor Team on the last Wednesday of each month.

Cooperating Agencies, Contributing Agencies, and Stakeholders

Numerous government agencies and non-governmental organizations (NGOs) will be involved in the Angoon Airport EIS process as cooperating agencies, contributing agencies, or stakeholders. The involvement of these agencies and groups throughout the NEPA process is important for identifying key resource concerns, ensuring compliance with regulatory requirements, and providing opportunities for well-informed input at specific points in the process. Communication protocols for cooperating agencies may be mandated by Memoranda of Understanding (MOU) between the FAA and those agencies. However, for those groups who do not enter into MOUs with the FAA, the following communication protocol will be followed throughout the project.

The FAA and the EIS Contractor Team will hold periodic meetings and/or teleconferences with agencies and NGOs at pertinent project milestones. These milestones will typically be associated with the issuance of draft deliverables, development of relevant portions of the EIS, or periods when substantive information is available. Accompanying e-mailed updates and agendas will precede these meetings by two to three days to allow agencies and groups to prepare for meetings/teleconferences. The frequency of e-mail updates may increase to bi-monthly or monthly for key cooperating agencies during periods of increased activity such as scoping, field work, or impact analysis. Email updates will describe progress made since the previous update, descriptions of important decisions or findings, updates to the project schedule, next steps, and notification of upcoming meetings or other activities requiring agency involvement.

City of Angoon, Angoon Community Association, and Citizens of Angoon

The City of Angoon, the Angoon Community Association (ACA; Tribal Government), and the citizens of Angoon are key stakeholders in the NEPA process for the Angoon Airport EIS. These groups represent the members of the public that would be most affected by the decision to build or not to build an airport in or near Angoon. The groups in Angoon have witnessed many years of study related to a potential land-based airport for their community. Because of the long-term nature of the process, they need to be kept informed of the continued project progress, as well as the opportunities for them to provide input regarding project needs, alternatives, and impacts. The EIS Contractor Team will submit monthly project updates to the "myangoon.org" website, as well as issuing hard copy newsletters for posting at the city offices, ACA offices, Angoon Business Center, and individuals (e.g., Maxine Thompson) who have volunteered to distribute these newsletters to the community. The website postings and newsletters will provide project updates, schedules, next steps, and educational information on the NEPA and airport planning processes.

Legislators

State legislators representing Southeast Alaska have expressed considerable interest the Angoon Airport EIS process. These legislators represent the interested public and are an excellent avenue for distributing information to the public and coordinating with key stakeholders or agencies. Keeping legislators wellinformed allows them to respond to constituent concerns with accurate and up-to-date information and ensures that their opinions regarding project benefits and impacts are based on accurate and independent analysis.

The FAA's EIS Contractor Team will keep interested state legislators informed of project status through written email updates at key milestones throughout the process. These updates, which will be sent to legislative staffers rather than the legislators themselves, will include information on activities since the last update, upcoming activities, schedules, comment periods, and other opportunities for public input.

4.5 Post-Scoping Meetings

The PI Team is prepared for the possibility that the FAA may request additional public meetings after the scoping period, but prior to the DEIS public meeting phase of the project. Examples of this

might be accommodating requests made during scoping for additional meetings in another city or with key stakeholder groups, requests from key stakeholders for a forum in which they could provide information to the Angoon Airport EIS project team, update meetings to explain any unanticipated changes in the project, or informal meetings held periodically with stakeholders as part of the ongoing and open communication plan.

The PI Team will work with the client to develop a suitable meeting format based upon meeting attendees and goals, and would create any necessary graphics, advertisements, or other meeting materials.

4.6 Public Meetings on the Draft EIS (DEIS)

Subsequent to release of the DEIS, the PI Team will plan four public meetings to answer questions and gather public input on the DEIS. These meetings would be held in Angoon, Juneau, Sitka, and Washington D.C. (as required by the Title XI ANILCA process) and would likely use the same presentation/open-house format described above. However, the EIS Team may adjust this format based on feedback obtained during the scoping process and post-scoping meetings. For example, if there is substantial controversy, a more structured format, such as a formal public hearing, would be more appropriate. Regardless of the general format of the meetings, they would be designed and scheduled to meet the public involvement requirements of both the project's parallel NEPA and ANILCA processes.

4.7 Public Meetings on the Final EIS (FEIS)

If deemed necessary by the FAA, the PI Team will plan three formal hearings after publication of the FEIS. These hearings would be held in Angoon, Juneau or Sitka, and Anchorage and would allow interested parties to provide final comments on the document.

4.8 Project Website

The PI Team will create an Angoon Airport EIS project website that will provide information to stakeholders about the Angoon Airport EIS planning effort. The design of the website would be linked with the design of all other public involvement materials, so that one unified, easily recognizable and positive visual theme is carried through all phases of the project. The website would be designed to provide for easy navigation and document downloading, and would be accessed through an easily remembered domain name such as www.angoon-eis.com.

The website will be updated regularly to provide the most current information regarding the project alternatives, the NEPA process and timeline, as well as upcoming opportunities for public input. The website will also host a Frequently Asked Questions (FAQs) section, designed to inform stakeholders on topics anticipated to be of general interest, and would provide stakeholders with access to technical reports and published EIS documents as they become available. Visitors to the website will be given the opportunity to subscribe to a project list-serve that would provide project

status updates and announcements of upcoming events. Visitors will also be able to submit questions through the website. During scoping and comment periods, the website will also provide an opportunity for stakeholders to submit comments, and would be linked with the comment database to assist in comment analysis.

The website will also provide stakeholders with an opportunity for submitting optional and confidential information designed to help track stakeholder participation, geographic representation, and trends. This information would provide a feedback loop to evaluate the success of PI techniques employed.

The website features outlined above are based upon the reference website provided by the client (http://www.vhb.com/pvd/eis/contact.aspx). The PI Team will research other websites for additional features that could be added to facilitate more effective public outreach for the project.

4.9 Follow-Up Surveys

It is often productive to conduct an evaluation of public involvement activities following the completion of key phases of the project and again at project completion. Evaluation results would highlight how future projects might be better approached, and would also act to strengthen relations among organizations, agencies and community members. The PI Team suggests the following steps subsequent to key public involvement activities (i.e., scoping, DEIS meetings, etc.).

- Interview key stakeholders (both internal and external) regarding project details, and public involvement activities. Request suggestions for improved community involvement.
- Conduct follow-up surveys (in person)

This information can be used to refine the public involvement efforts of the Angoon Airport EIS project, as well as subsequent FAA or ADOT&PF projects in the area. Depending upon the controversy of the project, role of the public involvement process, or need for future guidance, a results report could further FAA's understanding of effective public involvement strategies for future projects in the area.

4.10 Other Strategies to Consider

If FAA determines necessary through the scoping process or such conditions arise where it would facilitate the NEPA process, key stakeholder representatives could be invited to participate in an Angoon Airport EIS Community Forum or Technical Advisory Committee (TAC). The purpose of the forum would be to involve key stakeholders at key points throughout the NEPA process. Forum members would act as a sounding board to give suggestions and help brainstorm alternatives that address greater community concerns and could also provide input on resource impacts (providing quantitative data, qualitative descriptions of possible impacts, etc.). Their role would be to provide focused input and to serve as liaisons to their respective stakeholder groups. As an advisory group, they would not have decision-making authority. All roles and responsibilities of this group would be documented in a Memorandum of Understanding (MOU) between the group and the FAA.

5.0 MEDIA RELATIONS

Involvement of the media during the NEPA process contributes to positive community messages. SWCA will assist the FAA as needed in contacting and providing information to community reporters, popular radio stations and community calendar advisories. SWCA recommends that media notices be distributed at key points during project initiation and throughout the duration of the project. Media contact would focus on outlets in the Angoon/Juneau/Sitka/Anchorage area, unless information gathered indicates that key stakeholder groups are best reached by a media outlet outside the area. A summary of media strategies includes:

- Publishing newspaper notices or display ads;
- Contacting and provide media notices to reporters and radio stations covering the Angoon area at key points during the process;
- Contacting community calendar advisories and provide information packets regarding project overview and schedule;
- Inviting media representatives to public scoping meetings; and
- FAA/ADOT&PF representatives providing structured interviews at public meetings.

The following table lists potential media contacts located in the Juneau/Sitka/Anchorage area. The PI team will augment this table as additional useful media outlets are identified.

Table 3. Potential Media Contacts

Media Outlet	Media Type
Newspapers	
Juneau Empire http://www.juneauempire.com	Juneau, AK daily newspaper
Daily Sitka Sentinel http://www.sitkasentinel.net	Sitka, AK daily newspaper
Capital City Weekly http://www.capitalcityweekly.com	Juneau, AK weekly paper
Anchorage Daily News http://www.adn.com	Anchorage, AK daily newspaper
Radio Stations	
KCAW (104.7 FM / 90.1 FM; 105.5 in Angoon) http://kcaw.org/	Sitka, AK locally owned and operated public radio station. Can be picked up in Angoon.
KIFW (1230 AM) http://www.kifw.com	Sitka, AK. Not a public radio station, but airs a popular "Problem Corner" show where listeners call concerning local issues. Can be picked up in Angoon.
KTOO (104.3 FM) http://vwww.ktoo.com	Juneau, AK. NPR member radio station, affiliated with the Coast Alaska network.
Alaska Public Radio Network http://aprn.org/	Consortium of public radio stations to which KSKA, KNBA, KTOO, KCAW belong. The website has a number

Table 3. Potential Media Contacts

Media Outlet	Media Type
	of news and community calendar sections.
KNBA (90.3 FM) http://www.knba.org/	Anchorage, AK public radio station; community news as well as a Native American radio show.
KSKA (91.1 FM) http://www.kska.org/	Anchorage, AK public radio station with community forum and events calendar for KSKA as well as KAKM (see TV section below) and APRN (see above) websites.
KINY (800 AM; 103.9 FM in Angoon)	Juneau, AK. Not a public radio station, but airs local "news of the north". Can be picked up in Angoon
KJNO (630 AM)	Juneau, AK. Talk radio station with local news updates. Can be picked up in Angoon.
Television Stations	
KTOO-TV (Alaska One):	Juneau, AK public television station with website. (TV channel varies with location: Downtown Juneau - Channel 3; Lemon/Switzer Creek - Channel 10; Mendenhall Valley - Channel 6; Angoon - Channel 9; Sitka - Channel 10 ; GCI Cable in Juneau - Channel 10)
KSKA/KAKM Channel 7 http://www.kakm.org/	Anchorage, AK public television station with website.
KTNL-TV, channel 13 http://www.ktnl.tov	Sitka, AK CBS affiliate, seen in Juneau on KTNL-LP channel 24. Website has community calendar.

6.0 Ensuring Success

Contingency planning is a necessary part of any PIP to better prepare for unforeseen circumstances. There are a variety of issues that can affect the outcome of public involvement efforts, including previous PI history, unexpected scheduling issues, and information gaps that were not addressed in advance. The following sections outline some possible issues associated with the Angoon Airport EIS project and ways in which the PI Team can address those potential issues in a proactive manner.

6.1 Project History and Previous Public Involvement Approaches

This EIS process is just beginning; however, public involvement has been conducted in multiple previous studies for airport siting near Angoon (see Angoon Airport Master Plan [2006]; 14 possible airport locations have been identified dating back to 1982). Information gathered from previous approaches can be valuable in learning which approaches worked best in certain situations. For example, it is helpful to understand ADOT&PF's long-term relationship with the citizens of Angoon vis-à-vis the proposed airport, as well as the successes and failures of previous PI approaches.

The past public outreach efforts described in the Master Plan include:

1. Distribution of a project newsletter in November 2004 to inform residents and those on project mailing list about the results of the Reconnaissance Study (2004) and about brushing and surveying of two possible runaway centerlines;
2. Advertisement and hosting of a Public Information Meeting in Angoon in July 2005 to introduce the Airport Master Plan project, describe ongoing environmental field studies, and answer questions about the project. Display ads for the meeting were posted in the Capital City Weekly and Juneau Empire, flyers were posted in Angoon. Postcards were sent to agencies and the project mailing list;
3. Advertisement and hosting of a Public Meeting in Angoon in June 2006 coincident with release of the public review draft Angoon Airport Master Plan. Purpose of the meeting was to present the plan and answer questions to assist individuals who wished to submit comments on the draft. Display ads for the meeting were posted in the Capital City Weekly and Juneau Empire, flyers were posted in Angoon. Post cards were sent to agencies and the project mailing list; and
4. Issuance of the Angoon Airport Master Plan, and Background Report, in August 2006.

In addition to the actions listed above, the following information was provided by Verne Skagerberg (ADOT&PF) and Linda Snow (Southeast Strategies) regarding successful public involvement strategies in Angoon. Based on previous experience, there are several other steps in the public involvement process deemed crucial to the success of public outreach efforts. These include:

- Introductions and visits to tribal elders, tribal members, and other key individuals and organizations by the PI Team, in advance of the formal public meeting(s);
- Eating meals with locals (tribal elders) at the Senior Center; and
- Establishing a presence in the area early on in the process to build relationships.

The PI Team has incorporated these recommendations and previous successful approaches into our public involvement outreach efforts.

6.2 Funding, Planning and Legal Background, and Changes that Have Affected the Process to Date

The PI Team will consider other past, present, and planned future projects in the area during implementation of the PIP. The Angoon Airport Master Plan (2006) provides valuable information on public input on these previous planning efforts. Additionally, the area has experienced a number of capital improvement projects, as well as federal actions involving EISs. These include the Angoon Hydroelectric EIS; Green's Creek Silver Mine on the north side of the island; Kootznoowoo Wilderness designation; National Monument designation; upgrading the harbor; extension of water lines to the harbor; new infrastructure and affordable housing; and other proposals for new business investment. Some of these projects have been completed, but their public involvement experience will be useful in refining our public involvement approaches. The PI Team will determine if ongoing projects have public involvement processes and will plan our public involvement so it does not conflict with them.

6.3 Public Perception and Expectations of the Project and the Agency

The perception of the project and agency may vary by stakeholder group. Public involvement conducted for the Reconnaissance Study (2004) and Angoon Airport Master Plan (2006) indicates general support for the project locally. Angoon municipal election voters passed a measure in 1998 supporting development of a local land-based airport, resulting in ADOT&PF initiating the Reconnaissance Study. The City of Angoon also passed resolution 04-08 adopting the Angoon Airport Reconnaissance Study and encouraging ADOT&PF to proceed with development of an Angoon Airport Master Plan for the proposed site. Currently, it appears that most community members generally see some benefit to them personally. However, there may be some mixed feelings about the project among members of the local community since it would also open up the local community to outsiders. Prior to the 1998 election, the Angoon community turned down a proposal for an airport because it would increase access to fish and game by non locals. Some community members may still feel this way. Local and regional business interests are likely to be in support of the project since it would increase business and make it easier to obtain supplies. It is anticipated that some local, regional, and national environmental groups may have opposition to the Master Plan proposed airport site because of wilderness or wildlife issues. The EIS Team met with representatives of two environmental groups, Southeast Alaska Conservation Council (SEACC) and The Nature Conservancy (TNC), during their preliminary pre-scoping visit in March 2008. While both of those groups indicated they would prefer a site location away from wilderness lands, they also indicated they understood the need for the project and hoped that all groups could work cooperatively to meet those needs and protect wilderness values to the extent possible.

SWCA will continue to proactively identify parties interested in stalling or stopping the project and bring them into the process. One option for engaging these parties would be the use of a Community Forum or Technical Advisory Committee as appropriate to engage important stakeholders, as discussed in Section 4.8.

Stakeholder expectations may include the belief that public input does not matter. As noted in Section 3.1, some Angoon community members may feel that their comments have not been important to past processes. The Contractor understands the value in empowering the public by demonstrating that their input is a valued part of the process. The PI Team will incorporate previous successful approaches and create an environment that provides opportunities for input and equal access for stakeholders in decision-making through outreach techniques outlined in Table 2.

6.4 Potential Issues/Challenges and Proposed Solution/Contingency Plans

The following table outlines other potential issues pertaining to the Angoon Airport EIS project and provides proactive solutions to ensure the success of the PI effort.

Table 4. Potential Issue/Challenge and Proposed Solution/Contingency Plan

Potential Issue/Challenge	Proposed Solution/Contingency Plan
The right people are not contacted.	Develop list with help of locals, client, etc. and update list as needed.
Decisions were made prior to public involvement.	Early and ongoing public involvement would help avoid this scenario. However, if decisions were made by the agency, PI Team would clearly convey to stakeholders the rationale behind those decisions.
Changes in public values or public expectations are not considered.	Visible presence in the community, variety of outreach techniques, and creation of comfortable environment would allow the public to freely communicate with the PI Team regarding any changes in their values or expectations.
Trying to please everyone.	Open and honest communication about the project and decision-making process.
Starting public involvement too late or not having sufficient time/resources.	Addressed in schedule section.
Meeting communications are not effective: 1) Meeting format inappropriate for audience; 2) Responses too technical for audience; 3) Responses caught up in ego or emotion; 4) Answering questions where the answer is not yet known; 5) Not being prepared for meetings.	Pre-scoping visits will help inform the team regarding the best meeting format and level of technical detail needed. Advance preparation for meetings and media. Anticipate questions and prepare Q&A materials in advance; rehearse if necessary. Be prepared to defer questions if necessary. Identify which resource specialists will address which topics. Consider use of Community Forum or Technical Advisory Committee in addition to informal Open House as appropriate.
Time of year may affect PI opportunities (winter travel difficult, hunting/fishing/ subsistence harvesting seasons may affect who can participate, etc). Seasonal residents may not be able to participate easily.	Research schedule appropriately. Provide opportunity for long-distance involvement through a variety of outreach techniques as discussed in Table 2.
Cultural issues may prevent people from giving input.	Pre-scoping visits will help inform the team regarding appropriate meeting format to accommodate the social environment of Angoon; PI Team will coordinate with Sheri Ellis regarding all involvement activities with Native Alaskans; PI Team will change format as needed based upon any new information received, incorporate informal meeting strategies as outlined in Table 2.
Language barriers may prevent people from giving input.	Provide translator if necessary.
Information seen as a commodity; stakeholders unwilling to share unless they receive something in return.	Pre-scoping visits will help inform the team regarding appropriate meeting format to accommodate the social environment of Angoon. Team will structure meeting formats so that stakeholders feel that they have received something of value in return for their participation. (e.g., food, beverages, raffle prize, or other items as appropriate).

Table 4. Potential Issue/Challenge and Proposed Solution/Contingency Plan

Potential Issue/Challenge	Proposed Solution/Contingency Plan
The true issue, problem, purpose or need is not clearly identified (or incorrectly identified – trying to solve the wrong problem).	Clearly convey to the client and stakeholders what input the team would like regarding the process, the proposed project, alternatives, impacts, and other issues that may be important to them. Project purpose and need and constraints will be clearly communicated to public, as will rationale for any alternative or analysis decisions. Summarize what the team has learned from previous PI efforts.

6.5 Information Gaps

The following section outlines current known gaps in information that will need to be answered in subsequent trips to the affected communities and meetings with stakeholders, preferably during an additional pre-scoping visit, in order to refine the PIP prior to the scoping period:

- Where do people spend time? (Which demographic groups and where?)
- How widespread is internet use in Angoon? The www.myangoon.org website has been presented as a useful place in which to post project information, but we do not yet know how much of the community uses it, or if that usage varies by seasons (e.g., a lot in winter when there is not much to do, not much in summer when they are out hunting and fishing)
- Has public sentiment changed since the time of the 1998 resolution? Is there potential for change, especially with new leadership? What percentage of the community in Angoon is for, wavering, against, or doesn't care about the project?
- The tribal council and the city have relatively new leaders, who may still be figuring out their respective roles and positions. Are they all still in agreement that they support this project? Do City Leaders still speak for the Council?
- What times of the year should be avoided for meetings because of subsistence activities or other community events, such as potlatches in the fall? Are there any local events with which we can coordinate public involvement efforts? This is key to demonstrating that our public involvement efforts are sensitive to the local residents and that we value their input. Are there any non-traditional stakeholders not addressed in the above section (freight providers, disabled, etc)?

7.0 Cooperating Agency Involvement

Because interagency involvement and communication is an important aspect of any project, FAA will initiate cooperating agency involvement to foster education, understanding and two-way exchange of information. Federal, state and local governmental agencies with jurisdictional responsibility over a potentially-impacted resource will be invited and encouraged to participate

throughout this NEPA process. Tribal governments will be invited to participate at the same level as the cooperating agencies through government-to-government consultation.

The PI Team will participate in scoping and resource agency coordination meetings as directed by the FAA. The PI Team will provide necessary graphics and visual aids for these meetings as well as assistance in responding to questions and requests for information. The PI Team will submit times, locations and agendas for agency meetings for review and approval by the FAA and will then reserve meeting spaces, facilitate meetings, record notes, and provide meeting logistics. It is anticipated that general agency coordination with Federal, State, and local Agencies can be accomplished through formalized meetings held at appropriate points throughout the project. Additional coordination can be accomplished through conference calls and informal telephone communication. As with the previously described coordination efforts, the goal is to implement MOUs outlining disclosure roles and responsibilities between the cooperating agencies and the FAA. Anticipated cooperating agencies are the U.S. Forest Service-Tongass National Forest-Admiralty Island National Monument (USFS), Kootznoowoo, Inc., National Marine Fisheries Service (NMFS), and the Army Corp of Engineers (USACE).

The Alaska Department of Natural Resources Office of Project Management and Permitting (OPMP) will not be a cooperating agency for the project. However, the OPMP will coordinate formal responses from state agencies relative to distribution of project documents, document reviews, and submission of agency comments. The FAA will establish protocols with the OPMP to identify points of contact, outline methods of communication, clarify types of data requests that may be issued, and establish what documents they or the state agencies will review and the timeframes for those reviews. The Contractor will continue to facilitate as needed between the FAA and the OPMP.

7.1 The US Forest Service as a Cooperator

The USFS will have a substantial role in the NEPA and ANILCA Title XI processes for the Angoon Airport. Their role in the ANILCA process is described in more detail in Section 8.0 of this document. Their role in the NEPA Process is described here.

Lands managed by the USFS as part of the Admiralty Island National Monument and Kootznoowoo Wilderness were identified by ADOT&PF as the location of their 2007 Master Plan preferred airport location (Site 3). USFS managed lands would also be used for portions of the ADOT&PF's proposed access road leading to Site 3.

Assuming the ADOT&PF's Master Plan preferred site or any potential alternative site on lands managed by the USFS are included in the FAA's EIS, the USFS would be required to engage in some form of NEPA analysis and disclosure and issue a NEPA decision prior to granting a permit for use of those lands. In order to streamline the NEPA process for the project, the FAA intends to prepare its EIS for the proposed airport in such a fashion that the USFS will be able to adopt the FAA's EIS and NEPA process for its own NEPA purposes. The USFS would issue its own Record of Decision for the EIS, independent of the FAA's decision. Based upon discussions to date between the FAA and the USFS, the USFS has agreed with this approach. As such, the FAA must

ensure that the EIS addresses the issues required by USFS NEPA guidelines and is consistent with the USFS land use plan for the Monument and Wilderness area. Doing so will require close and sustained coordination between the FAA and USFS. This coordination will take place through formal meetings, teleconferences, and informal discussion between the FAA, the Contractor, and USFS project staff. (Note: All communications between the Contract and USFS will follow the protocols outlined in the *Angoon Airport EIS Team Communication Plan* and will be approved by the FAA prior to any such communication.)

8.0 ANILCA COORDINATION

The Angoon project will include coordination with the USFS; the OPMP; Kootznoowoo, Inc.; Sealaska, Inc.; the Alaska Department of Fish and Game (ADF&G), the USFWS, and the City of Angoon on ANILCA Title XI and Title VIII (subsistence).

8.1 ANILCA Title VIII

ANILCA Title VIII mandates special consideration of subsistence for undertakings on publicly owned lands in Alaska. Title VIII requires an analysis of potential project impacts on subsistence users, resources, and access and a public disclosure of the determination as to whether impacts, if any, would be significant. Completion of the relevant ANILCA Title VIII evaluations will require close coordination with those agencies having jurisdiction over subsistence resources and access within the affected area(s). These agencies include the ADF&G, the USFS, and the USFWS.

To initiate the Title VIII process during Phase 1 of the EIS process, the Contractor will communicate with subsistence resource managers in the area. During Phase 2 of the EIS process, the Contractor's subsistence specialist will conduct focus group interviews with local residents to gather more current information on subsistence uses in the project area. It is assumed that this will involve one trip to the City of Angoon. Additional information about subsistence uses may be gathered during discussions with local resource users during public meetings or other gatherings throughout the project and from discussions with landowners such as Kootznoowoo, Inc., Sealaska, and the City of Angoon. All communications will be approved by the FAA prior to their occurrence and all will follow the protocols of the *Angoon Airport EIS Team Communication Plan*.

8.2 ANILCA Title XI

Since the Angoon project is potentially the first large-scale test of the Title XI process laid out by Congress and each agency is required to make a determination on whether to approve or disapprove the project, it is imperative that FAA and the USFS agree on the process. It is also important to include the State OPMP to help facilitate buy-in from State entities and provide context regarding the ANILCA process for the project.

The PI Team will plan early coordination between the FAA, the OPMP, and the USFS to reach consensus on process goals and requirements. This coordination will serve three purposes: 1)

provide consistent information and direction regarding the Title XI process; 2) draft a strategy for addressing Title XI requirements; and 3) finalize an MOU between the FAA and USFS regarding each agency's specific needs, roles, key review timelines, and responsibilities to complete the Title XI process. The OPMP has no formal role in the ANILCA Title XI process other than providing technical support when asked and reviewing ANILCA documents as part of monitoring decisions related to the State's interests and interpretations of ANILCA. The USFS, on the other hand, will have a substantial role in the ANILCA process, culminating in an independent agency decision to approve or disapprove any Title XI application(s) submitted to them.

8.2.1 The Role of the US Forest Service in the ANILCA Title XI Process

As noted, the USFS not only has a role as a cooperating agency in the NEPA process but is also an integral part of the ANILCA Title XI process. The USFS receives a Title XI application from the airport Sponsor and must evaluate whether the application contains enough information for the USFS to make a decision. During the NEPA process, Title XI requires the USFS to assist FAA in development of the EIS and evaluating comments from other agencies and the public. Once the Final EIS is complete, the USFS must (independently of the FAA) evaluate the project on whether to approve the Title XI application and then forward their decision and supporting documents to the President of the United States. Finally, if the project is approved by the President and both houses of Congress, the USFS, as the primary landowner, must approve all permits and set up any terms and conditions for the airport.

9.0 SECTION 7 AND SECTION 106 CONSULTATION

Agency coordination also includes specifically required agency consultation under Section 106 of the National Historic Preservation Act and Section 7 of the Endangered Species Act. The Contractor will assist the FAA in preparing a formal request for Section 106 consultation with the Alaska State Historic Preservation Officer (SHPO) and will work with the FAA and the SHPO to define the area(s) of potential effects for cultural resources. After initiation of formal consultation, the Contractor will request the SHPO's input throughout the Scoping process. Additionally, the Contractor will assist the FAA in obtaining information regarding federally listed species that could be impacted by the proposed project and will continue to solicit USFWS input as needed throughout the Section 7 consultation process.

10.0 DELIVERABLES AND SCHEDULE

10.1 Public Involvement Documentation and Deliverables

Pre-Scoping Findings Report: Following each pre-scoping visit, a report will be prepared to summarize the information gathered during of the visit. This report will include a list of individuals contacted, meeting notes, general reactions to the project, and any recommendations for changes or additions to the final PIP.

Scoping Report: A scoping report summary and database will be prepared to adequately document all public scoping activities. The scoping report will outline all public involvement activities, how comments were recorded, content analysis approach, and content of public input. The PI Team will categorize all comments received during scoping. Comments will be coded and cross-referenced to the individuals who made them. The scoping report will summarize those comments into the main issues to be addressed during the NEPA process and will include a suggested disposition for the comments. Comments will likely fall into four categories: 1) those that will be addressed through impact analysis, 2) those that will be addressed through alternatives formulation and consideration, 3) those that will be addressed by holding additional meetings; and 4) those that are out of the scope of this EIS decision-making process. The Scoping Report will be provided to the FAA for review, after which, the PI Team will finalize and distribute it to the Contractor Team. The Scoping Report will serve as the basis for alternatives development and impact analysis in the EIS. In addition, a summary of community and stakeholder's views of the public involvement process and the project initiation phase will be provided with the Scoping Report.

Response to Comments: The purpose of responding to comments is to address all substantive comments on the DEIS and use that to develop the FEIS. The scrutiny is usually two-fold; first, a commenter wants to see if a comment was missed or ignored; second, they want to see if the comment has an adequate response. The PI Team will develop a database system to easily manage and account for large numbers of comments. The purpose of this database is to account for every comment and allow the FAA to demonstrate that they have responded to every comment regardless of how many are received.

In responding to comments, the PI Team will use a systematic, easily-documented, and defensible strategy. Comments can basically be broken down into the following categories and responses consistent with Order 5050.4B §1201: 1) the comment was already addressed in the DEIS; 2) the comment is out of the scope of the EIS process; 3) the comment is not substantive (merely expresses opinions); and 4) the comment is substantive and requires a change in the FEIS. All comments and their responses will be included in a Response To Comments report. This will be included as either an appendix or separate volume with the FEIS as per CEQ regulations.

FEIS Comment Summary Report: If deemed necessary by the FAA, the PI Team will provide a report on the comments received after publication of the FEIS. These comments will be documented, categorized, and responded to as described above for the Response To Comments on the DEIS.

10.2 Target & Milestone Public Involvement Dates

For successful public involvement, it is important to clearly communicate milestones and decision dates to the public, provide reasonable opportunity for review and comment, inform the public at each stage, and to identify the schedule for specific communication tasks for each audience, and who is responsible for completing them.

It is also important to allow time for changes in goals, tactics or messages if necessary. The following schedule outlines the major tasks and milestones through the various public involvement periods, including reviews and updates of the plan if needed.

Table 5. Public Involvement Tasks and Milestones

Task	Date	Responsible
Draft Final PIP	March 21, 2008	PI Team
Pre-scoping Trips	March 2008; May/June, 2008 (Exact date TBD)	PI Team
ANILCA Coordination	March 2008 (Exact dates TBD)	SWCA
Final PIP	April 2008 (timing based on receipt of FAA comments)	PI Team
Findings Report	June 30, 2008	PI Team
Publishing of the NOI	September, 2008 (Exact dates TBD)	FAA
Public Scoping Meetings	October, 2008 (Exact dates TBD)	SWCA
Public Scoping Report	December 30, 2008	PI Team
Scoping Phase Follow-up Survey Results	December 30, 2008	PI Team
Subsistence Interviews	TBD Phase II	SWCA
Public Comment Period (draft document)	TBD Phase II	PI Team
Project Completion Follow-up Survey Results	TBD Phase III	PI Team

ANGOON AIRPORT
Environmental Impact Statement

PUBLIC INVOLVEMENT PLAN
UPDATE #1

SUBMITTED TO:

FEDERAL AVIATION ADMINISTRATION
ALASKAN REGION, AIRPORTS DIVISION

SUBMITTED BY:

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April 22, 2009

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ANGOON AIRPORT EIS PROJECT
PUBLIC INVOLVEMENT PLAN UPDATE #1

1.0 INTRODUCTION

Client: Federal Aviation Administration (FAA)
Project Sponsor: Alaska Department of Transportation and Public Facilities (ADOT&PF)
Project Type: Environmental Impact Statement (EIS)
Project Identification/Title: Angoon Airport EIS Project

The FAA is preparing an EIS to analyze the potential effects of constructing a land-based airport near the City of Angoon, Alaska, located in the southeast portion of the state on Admiralty Island. Anticipating that the proposed airport will be of considerable interest to a variety of local, state, and regional stakeholders, the EIS public involvement (PI) team prepared a public involvement plan (PIP) in April 2008 that identified general public involvement goals, outreach techniques, and anticipated stakeholders. The plan included a recommendation that the PIP be updated as needed to reflect lessons learned regarding effective outreach techniques and other elements of a successful PI approach.

This PIP update includes 1) revisions to the PIP's outreach techniques to facilitate public involvement for both internet and non-internet users, 2) a suggested schedule for website updates, and 3) updated media contact information.

2.0 OUTREACH TECHNIQUES

To keep potential stakeholders involved and interested in the project, a project mailing list was developed from information provided in the original PIP. This list has been updated through pre-scoping and scoping meeting sign-in sheets, information provided by the FAA and U.S. Forest Service (USFS), and internet users who have subscribed to the project mailing list using the project website. To date, stakeholders on the list have received a project postcard, e-mails containing project materials, and one notification of website updates; they have also been invited to attend a number pre-scoping and scoping meetings in Anchorage, Juneau, and Angoon. Agencies were also invited to participate in a teleconference recap of the scoping materials. Additionally, members of EIS team (the FAA project manager and the FAA's consultants) have met informally with many Angoon residents during their visits to the area.

The EIS team has confirmed through these outreach efforts that project stakeholders include not only citizens who rely on electronic media for their information but also a more traditional population that prefers in-person project updates. Additionally, many stakeholders prefer hardcopy updates to electronic updates. The table below outlines this project's general stakeholder types and the PI team's understanding of the most effective outreach techniques for each.

Table 1. Outreach Techniques by General Stakeholder Type

Audience	PI Technique (in order of effectiveness)
General Angoon community	1) In-person updates 2) Town flyers 3) U.S. Postal Service–mailed updates 4) Electronic notification/website and/or www.myangoon.org updates
Mayor/ Angoon Community Association (ACA)/ Kootznoowoo, Inc.	1) In-person/teleconference updates 2) Hard copies of documents 3) Electronic notification/website
Other agencies and non-governmental organizations	Electronic notification (e-mail)/website

Because this is a multiyear and many-phased project, there will be periods when no public meetings are scheduled and when project progress is less obvious to the public. Updates provided to the public and other stakeholders during those times will need to identify the project phases and accomplishments that have taken place, such as field work, technical report completion, and alternatives development. Additionally, periods when there are fewer milestones to report can provide opportunities for the EIS team to develop and disseminate ancillary educational materials that help stakeholders learn more about the area's natural and cultural resources and, it is hoped, that create excitement about and interest in the project.

By providing an ongoing variety of website, media, and hardcopy project updates, the PI team will help ensure that stakeholders always have up-to-date project information and that the project stays fresh in their minds.

2.1 Engaging the Internet User

As part of project outreach, the PI team created an Angoon Airport EIS website (www.angoonairporteis.com). As the project has progressed, the website has become increasingly important as a primary means of providing up-to-date information to many of the stakeholders on the project mailing list. The PI team plans to notify those stakeholders who have provided e-mail addresses about website updates through an automatic e-mail notification system that provides a brief description of the update and a link to the website.

2.1.1 Changes to Existing Website Sections

The current website organizational structure was based on the reference websites provided by the FAA (Figure 1). The EIS team will continue to enhance and refine the website throughout the project. The website will be used to provide information in a variety of fashions, including text, streaming video, streaming audio, and graphics. Because members of the interested public may be novice website users, the PI team will ensure that the website will be easy to navigate as well as informative.

Websection 1. **Home Page**
Websection 2. Angoon Airport EIS Plan
- Proposed action/ improvements
- Process diagram
- Google Earth interactive map of project site

Websection 3. Documents
- Master plan documents
- Angoon Airport EIS technical studies

Websection 4. Community
- Public outreach
- Alaska National Interest Lands Conservation Act (ANILCA)

Websection 5. Other Resources
- Frequently asked questions
- Submit comments
- Web links
- Project contact information

Websection 6. Subscribe
Websection 7. Search Function

Figure 1. Current website structure.

The PI team researched other websites for additional features or navigational changes that would facilitate more effective public outreach for the project. The following sections outline suggested improvements to the existing website, as well as a proposed implementation schedule.

Websection 1. Home Page

Issue:

The current home page design, while very clean and visually attractive, provides minimal information to stimulate user interest in exploring embedded pages within the website.

Suggestions:

Additions for the home page would include

- a searchable calendar of upcoming events and/or relevant milestones;
- a link to a quick "fun fact" or trivia quiz regarding the Angoon area, its residents, or even the NEPA process;
- links to a news/action updates page (see Section 2.2 below on suggested new pages), frequently asked questions, and contact information; and
- a message at the page footer highlighting interesting pages that visitors might want to check out (*see example website footer below*).

Check out the FAA web camera's latest photographs of Angoon on the Project Description page!

Websection 2. Angoon Airport EIS Plan

Issue:

Upon entering the website, the viewer is auto-directed to the Angoon Airport EIS Plan "Welcome!" page. This section provides a very brief text overview of the project and what is on the website.

- There is no background information to put this project into any context or to catch the reader's interest; no discussion of where Angoon and Admiralty Island actually are; no mention of a national monument; no mention of tribes affected. Detailed information about proposed alternatives is only available via downloaded scoping documents several layers deep within the website. **Without understanding first why this project is interesting or should matter to them, visitors may not choose to investigate those links.** Novice website users may not be able to find the information.
- All information on the welcome page is text-based. The text discusses key information provided on the website but provides no hyperlinks to those items. There is nothing to capture the user's attention.
- Without more introductory project information, the process diagram and map pages lack context: It is hard to tell from the map where in Alaska the project is, for example, and the process diagram does not show which stages have been completed. Moreover, none of the text accessed while navigating to those two pages has provided that information.
- The navigation bar for the "Angoon Airport EIS Plan" section is confusing: it contains additional subsections, but the actual Welcome page is not one of them, thus there is no link back to that page, only to the front page, whereupon the viewer must re-enter the site.

Suggestions:

Provide additional information *in a variety of media formats* to engage visitors and educate them about the project location and process. Possible additions for this section include the following:

- A new page in this section outlining the project Purpose and Need, including
  - video, text, and/or audio interviews with community leaders such as the mayor, city council members, or ACA president, and/or agency representatives such as FAA Project Manager Leslie Grey or ADOT&PF Project Manager Verne Skagerberg discussing current and past airport planning efforts and results;
  - video, text, and/or audio interviews with community leaders and/or agency representatives discussing project Purpose and Need; and
  - sidebars (*see example at left)* to text/audio/video links to public and stakeholder comments on the project.
- A new page in this section outlining Angoon's location and history, including
  - a brief general history of Angoon (possibly including audio or photographs by instructors Alan Zuboff and Daniel Johnson; see www.myangoon.org);
  - pictures of current key locations within the project area, such as Favorite Bay (although photographs are available on the interactive map, this location may not be intuitive for all visitors); and

Mr. X of Angoon, AK shares his medical evacuation story and why he wants an airport in Angoon... (click here)

  - aerial or historic photographs and maps of the region (example maps can be accessed at http://www.commerce.state.ak.us/dca/profiles/profile-maps.htm).
- A new Proposed (or Preliminary) Alternatives page in this section, including
  - downloadable .pdf maps and brief text descriptions of the alternatives;
  - embedded lower-resolution flyover videos (that would not require downloading prior to use) of the project area (visitors could still be given the option of downloading a higher-resolution video, if they so desired); and
  - Google Earth tours (separate from the interactive map) comparing the alternatives' potential impacts on key resources (*see example website sidebar to right*).
- Time and weather reports, including a link to the FAA Angoon webcam at (http://akweathercams.faa.gov/sitelist.php).
- Sidebars *(see example sidebar below, right)* highlighting interesting cultural or natural features of the project area. These sidebars would have links to a new *Resources* section (described in Section 2.1.2 of this plan) for more information.
- Updates to the NEPA process flow chart by color or arrow to note the project's current position; this would have links to full documents (master plan and working papers) and other related material (such as the scoping meeting handouts) in the appropriate boxes.
- An inset on the map page that shows Southeast Alaska in relation to the state;
- A brief text or audio explanation (by the EIS team) of why an EIS is needed and the information that an EIS contains. This is currently addressed under the frequently asked questions section but may be more useful as a stand-alone page.
- A new Glossary/Definitions page that defines key words and terms used throughout the website.

Click here for a Google Earth tour of the coastlines potentially affected by proposed sites 3/3a, 4, and 12a!

DID YOU KNOW?

TAKU WINDS can blow at over 100 miles per hour! Learn more about these winds and their impact on airport safety here.

Websection 3. Documents

Issue:

The Documents section currently contains links to only Airport Planning materials, although many other documents are currently located elsewhere on the website. This may make site navigation frustrating for website visitors. Additionally, this does not reflect the true scope and progress of the project.

Suggestions:

This section could be improved by including downloadable .pdfs of all public reports, outreach materials, and other relevant documents for the project, such as

- the review of existing research reports;
- past meeting agendas and summaries;
- media releases, printed project interviews, or meeting advertisements;
- resource technical reports; or
- the notice of intent and notice of availability.

As an alternative to including full .pdfs, a flow chart or table could be developed to show the history of document development for the project. The PI team also recommends developing an archive page for older materials to keep the main document page fresh with links to only the most recent documents.

Websection 4. Community

Issue:

The Community section provides a section on public outreach (currently just a text summary of subsistence interviews and public scoping meetings) and a discussion on ANILCA. The title of this section, "Community," is misleading: There is no information about the actual community of Angoon nor is there a discussion of the culture. Description of past stakeholder involvement in the project is also limited, encompassing only attendance at scoping meetings.

Suggestions:

To further engage the viewer, this section could be improved by the addition of a variety of media forms providing information that ties this project to the community of Angoon and shows active engagement by the project team. Suggestions include the following:

- Providing a searchable calendar of events for public involvement activities (also possibly placed on the front page)
- Inviting website visitors to contact the PI team if they have an upcoming event (for example, the recent sports tournament) for which they would like a project update or handout materials
- Incorporating photographs and captions, as appropriate, to show the PI team in action during public meetings and other public outreach opportunities
- Soliciting feedback from visitors regarding public involvement activities using a web-based survey (described in more detail later in this plan)
- Providing text/audio/video links to Angoon resident testimonies regarding the need for an airport in the area
- Posting videos or transcripts of oral history interviews, if conducted and appropriate
- Providing a blog or audio description (by the PI team) that discusses how public comments are used in the EIS process and that thanks visitors for their involvement
- Developing a scoping comment search function to enable visitors to search comments online by subject and view letters (e.g., http://windeis.anl.gov/comments/index.cfm)
- Developing a table of outreach opportunities provided to targeted stakeholders (Table 2).

Table 2. Sample Table of Outreach Opportunities to Date

Audience	Public Involvement
General Angoon community	Three meetings
ADOT&PF (Juneau office)	Four meetings Bimonthly teleconferences
Kootznoowoo, Inc.	One meeting
U.S. Fish and Wildlife Service, Region 7 (Anchorage office)	Four meetings Two teleconferences
Friends of Admiralty Island (Juneau office)	Two meetings

Note: Example table only; does not include all stakeholders or stakeholder meetings held to date.

- Developing a journal-entry blog page, where EIS team members could share stories and photographs from their recent trips to Angoon (for example, entries about lunch at the senior center or a Favorite Bay boat tour)
- Placing links or downloadable .pdfs of radio, newspaper, or television reports related to the Angoon community or the EIS project (currently limited to media releases and scoping advertising)
- Highlighting local cultural events and activities through community-posted photographs or videos and a community calendar of events (or via links to www.myangoon.org)

Websection 5. Other Resources

Issue:

This section currently contains frequently asked questions (FAQ) as well as links to pages where visitors can obtain contact information, submit comments, and see other website resources. The FAQ page contains the most user-friendly and explicit project information, yet it is buried several pages deep into the website. Contact information is also somewhat hidden, and it is unclear which persons should be contacted for which reasons. The comment form is located here—separately from the Subscribe page—and the relationship between the two is not explained. (For example, is a person necessarily registered when they submit a comment?). Additionally, there is no mention of the formal comment periods.

Suggestions:

- Move the FAQ page to the Angoon Airport EIS Plan section, where those seeking an overview of the project can easily access it.
- Augment the current contact page by
  - linking audio or video to each member of the EIS team that explains their roles and responsibilities as part of the NEPA process;
  - scheduling webinars that visitors can use to get an interactive project update from the FAA project manager or the EIS team at key milestones (e.g., fieldwork kick-off, release of preliminary results for the affected environment, and completion of preliminary impact analysis); and

  - adding an instant messaging function to allow for direct online communication between the FAA project manager or EIS team and website visitors at specified dates and times.
- Move the comment form to the "Subscribe" section and perhaps rename it "Subscribe and Comment." Provide clear posting of formal comment period dates and additional information regarding consideration of comments during non-formal time periods.
- Add a "Tell a Friend" link, a simple form tool that allows visitors to send a link to the Angoon Airport EIS website to enter e-mail addresses.

There are no additional issues or suggestions identified for Websections 6 and 7.

2.1.2 New Website Pages and Sections

Based on a review of other websites, several other features might be of interest to the visitors of the Angoon Airport EIS website, including a survey section, a resource section, an action item section, and an Angoon Airport EIS user section. Each is described below.

NEW Websection: Website Surveys

Developing a website survey section and including a link on the home page (see sample below, left) would allow the EIS team to receive feedback regarding recent public involvement events and to receive suggestions for future improvements. This could be developed as a page within the website, or it could be a link to other online survey tools, such as SurveyMonkey.com (http://www.surveymonkey.com/). Survey topics could include:

- meeting format, presentation, and timing;
- perceived inclusion of all relevant stakeholders;
- perceived inclusion of all public values;
- appropriate cultural context;
- perceived level of involvement; and
- best ways to distribute information.

HELP US IMPROVE!
Click here to give us your feedback regarding our recent scoping meetings. This survey will be open until May 1, 2009. If you'd like a hardcopy to fill out and mail back to us, contact us.

The incorporation of a survey section into the website would provide the public with an opportunity to stay actively involved in the project and would provide valuable information during those times when there is no formal comment period.

This section could also be used to post previous survey results and to advertise upcoming survey opportunities.

NEW Websection: Action Items

Providing a distinct action item or project update section, either as a new page within the Angoon Airport EIS Plan section or as a stand-alone section, could allow visitors to have a better understanding of the project's current status, and could serve as a supplement to the overall process flow chart. Information that could be placed on this page includes the following:

- Action item updates or a check-off sheet.
- Notices of upcoming activities.
- An overall task and milestones calendar.
- Monthly blogs by EIS team members, which might consist of
  - reflections by the FAA on the project's successes over the last 12 months;
  - commentary by a team member in conjunction with a media release (such as for an upcoming meeting), giving a personal message about what the meeting means to the EIS team; and
  - commentary by a team member about what ANILCA Title XI (or other) legislation may mean for the project.

ACTION ITEM UPDATES:
What's new this month?

- Kootznoowoo, Inc. signed their MOU with the FAA.
- The Phase 2 budget and scope of work is currently under review.
- Fieldwork season to start this summer. Look for us in Angoon!

This section would change each month and would provide an area to show behind-the-scenes progress not normally apparent to the public, as well as other informational pieces during slower times. Webinars or instant messaging times could also be posted in this section.

NEW Websection: Resources

Currently, the Angoon Airport EIS website does not have a section discussing key resources that will be analyzed as part of the EIS process. The PI team suggests developing such a page, which could include the following:

- A list of key resources with brief text descriptions, as necessary, and photographs
- An upcoming fieldwork schedule and photographs or videos of fieldwork in progress or completed, including audio or video discussion of fieldwork techniques and methodologies
- Resource-related "fun facts" or trivia (see example below)

FUN NATURE FACTS
Did you know…

- Admiralty Island has the highest density of brown bears in the world?!
- Kootznoowoo Wilderness receives 4 feet of rain annually?!

Click here to learn more about our recent natural resources fieldwork!

- Links to other relevant websites, such as the Admiralty Island National Monument page on the Tongass National Forest website (http://www.fs.fed.us/r10/tongass/districts/admiralty/);
- A resource topic highlighted each month. Possibilities include the following:
  - Pictures of the coastline with an audio or video discussion of visual impacts analysis or a video of immersive video imagery being taken

- Wind-monitoring photographs and/or links to wind-related stories, songs, or videos (e.g., http://dwb.adn.com/life/story/8331652p-8227671c.html, Can You Hear the Taku Wind by Shoowee ka' & the Ravens)
- Descriptions and/or photographs of the Kootznoowoo Wilderness, with an audio or video description of managing wilderness areas and implications for airport construction
- Photographs, art, or stories about cultural resources and an audio or video description of the Section 106 consultation process
- A discussion of general subsistence resources, uses, and practices, with links to the interactive map, oral histories, or other related material
- Links to a site addressing the effects of noise on wildlife or human health (e.g., the website for the Federal Interagency Committee on Aviation Noise) and a discussion of aircraft decibels with a supplemental reading list
- Links to Angoon census data and a discussion of community economic, social, and environmental justice issues (http://quickfacts.census.gov/qfd/states/02/02232.html)
- GIS natural resource map layers, when available (separate from the interactive map), and a discussion of GIS and mapping applications in natural resources planning
- Photographs of threatened and endangered species, with an audio or video description of the Endangered Species Act Section 7 consultation process
- Interviews with resource specialists discussing topics of interest, such as wildlife behavior or Tlingit culture

Many of these resource topics could be easily developed from the references obtained by specialists during the literature review stage of the EIS development.

NEW Websection: Angoon Airport EIS Website User

A fourth possible new section for the Angoon website could focus on fun, social, and/or educational activities for website visitors. Possible activities include the following:

- A select list of fictional or fact-based reading materials containing topics related to the Angoon area, culture, natural resources, and EIS project
- A link to learning activities for children (e.g., http://www.fs.fed.us/r10/tongass/education/education.shtml)
- A phrasebook or vocabulary of the Tlingit language, as provided by local elders or by a source such as Yahoo Widget (see Table 3 and http://www.alaskool.org/language/dictionaries/akn/dictionary.asp for an example)

Table 3. Sample Table of Tlingit Phrases

Word	Meaning
ch'aak'	eagle
du tlaa	mother
eesh	father
gooch	wolf
heen	water
Ixsixan	I love you
neil si goot	welcome
Klumu Gutta	Spirits' Home, the Tlingit name for Taku Glacier
Khutz-n-hu	Bear Fort, on Admiralty Island
xaat	salmon or fish
s'eek	black bear

- Space for visitors to post blogs or other materials (such as photographs or videos). (Tongass National Forest's forest plan amendment of 2008 allowed visitors to officially participate by commenting in their blog)
- Use of a social connections utility (e.g., LinkedIn) to allow visitors to identify and respond to other interested Angoon website visitors

Because some of the suggested activities involve unsolicited public feedback, this section would most likely need an explicit statement clarifying that participation in this section is not part of the legal NEPA process and any opinions or information shared there would be for entertainment purposes only, and that offensive, derogatory, or foul language would not be tolerated. A moderator would be required to screen comments for language and appropriateness.

2.1.3 Proposed Schedule for Implementing Website Changes

A prioritization and timeline of projected completion dates for suggested website changes is provided in Table 4. Task priorities and the timeline are contingent upon FAA approval and may be updated periodically to include additional tasks or changes in FAA-preferred timing.

Table 4. Prioritization and Time Line for Proposed Website Changes

High Priority Tasks	
Time Frame for Completion: June 2009	
• Website, Home Page	• Add links to news/action updates, FAQs, and contact information
• Website, Angoon Airport EIS Plan	• Add map insert and Angoon project history/location introduction material
• Website, Community	• Create web-based PI survey; add event request option
• Website, Other Resources	• Move FAQ page
• New website sections	• Create action items update page

Table 4. Prioritization and Time Line for Proposed Website Changes

Moderate Priority	
Time Frame for Completion: September 2009	
• Website, Home Page	• Add link to searchable event calendar
• Website, Angoon Airport EIS Plan	• Add Angoon project history/location and alternatives pages, flow chart update, EIS explanation
• Website, Documents	• Create .pdfs or flow chart of project documents
• Website, Community	• Implement scoping comment search function, searchable calendar of events, outreach table
• Website, Other Resources	• Augment contact information with photographs and audio
• New website sections	• Create Resources page
Low Priority	
Time Frame for Completion: December 2009	
• Website, Home Page	• Add page footer "fun fact" or trivia quiz link
• Website, Angoon Airport EIS Plan	• Add time/weather reports links, cultural/natural resource sidebars, and glossary
• Website, Documents	• Add Archive page
• Website, Community	• Add blogs, videos, links, and photographs
• Website, Other Resources	• Add Tell a Friend link
• New website sections	• Create Angoon user page

2.2 Engaging the Non-Internet User

Issue:

Although the EIS team is continuing to refine the website, project stakeholders will always include individuals who are unable or choose not to utilize website or e-mail resources. The EIS team will continue to develop easy-to-read and informative materials and progress notifications to be distributed through an ongoing combination of newsletters, media releases, utility bill or other regular mail inserts, or postcard mailings.

Suggestions:

- The EIS team will develop hardcopy newsletters or update bulletins providing project updates, schedules, next steps, and educational information on the NEPA and airport planning processes at key project milestones. The updates will be sent to all individuals on the current mailing list and to the city offices, ACA offices, the Angoon Business Center, and individuals (e.g., Maxine Thompson) who have volunteered to distribute/post these newsletters to the community. (The EIS team will also submit quarterly project updates to the www.myangoon.org website).
- The PI team will work with the ACA, the USFS, and other organizations to identify upcoming open houses, meetings, or events in Angoon, Juneau, or other nearby areas where project information can be distributed to local residents as appropriate and as requested. (See also "Community" section of this document regarding submitting events online).

- Anyone attending an open house, meeting, or community event where a project information sign-up sheet is used will be sent a postcard thanking them for their interest, and their contact information will be added to the project mailing list.
- An information repository will be established at the Angoon Business Center to provide local residents with access to hardcopies of EIS documents and technical reports as they become available.
- Radio, television, and newspaper media releases will be disseminated using media stations accessible to the Angoon community to inform local residents about upcoming public involvement opportunities. Radio interview requests to the same stations will be made as appropriate so that the PI team can share "newsworthy" project updates and activities. Additional discussion of media use is provided in Section 3.0 of this report.
- CB radios could also be utilized as a means of information dissemination to Angoon residents as appropriate, particularly in regard to the advertising of meetings, availability of published documents, and EIS team presence for fieldwork and other visits to Angoon. (Angoon resident Maxine Thompson has volunteered to disseminate information using her CB radio; alternatively, the PI team could contact the mayor or other key local figures to request assistance with this.)
- EIS team visits to Angoon for fieldwork, project coordination, or public involvement will include a courtesy visit to the Mayor of Angoon (and/or other key personnel) and the ACA by a senior EIS team member to provide a project status update and to respond to questions.

- All EIS team visits to Angoon for fieldwork, project coordination, or public involvement will include a publicized luncheon at the senior center. A senior EIS team member will be available during the luncheon to respond to questions and comments by local residents. This informal meeting would be advertised via posting on www.myangoon.org, as well as by posted flyer or CB announcement whenever possible.

3.0 Media Relations

Table 5 provides updated media contact information for Angoon, the general Southeast Alaska region, and the Anchorage area, where some agency stakeholders and other interested parties are located. The PI team will continue to augment this table with additional information as useful media outlets are identified.

Media outlets will be used to disseminate project findings and upcoming public involvement activities at the following key milestones:

- Fieldwork kick-off
- Affected environment results
- Resource impacts analysis completion
- Draft EIS release and public comment period
- Summary of comment period results
- Final EIS release and public comment period
- Record of Decision (ROD)

Media releases will be distributed to radio, television, and newspaper stations at each milestone. Selection of appropriate media outlet will be based on desired target audience. General information will be sent to all listed stations (see below). For information or events targeting the Angoon community, only sources available to local residents would be used. Similarly, for news or events targeting the Southeast Alaska or Anchorage area, only those sources targeting those areas will be used. When deemed appropriate to enhance stakeholder interest and awareness, radio interviews will also be requested for designated talk radio shows (see Media Contacts in Table 5 for a description of available shows). All requested interviews would be contingent on radio host interest and perceived relevance to their audience base. The PI team will work with talk show hosts to identify topics of interest, set up interview times, and provide other planning or logistical needs for interviewees.

Table 5. Media Contacts

Media Outlet	Address	Phone	Contacts
Newspapers			
Juneau Empire http://www.juneauempire.com Juneau, AK daily newspaper	3100 Channel Dr. Juneau, AK 99801	Phone: 907.586.3740 Circulation Phone: 907.523.2222 Newsroom Fax: 907.586.3028 Business Fax: 907.586.9097	News Editor: Ken Lewis ken.lewis@juneauempire.com Community Editor, Obituaries, and Public Service Announcements: Kim Andree nrclerk@juneauempire.com
Daily Sitka Sentinel http://www.sitkasentinel.net Sitka, AK daily newspaper	112 Barracks St. Sitka, AK 99835	Main Office: 907.747.3219 Fax: 907.747.8898	Editor: Thad Poulson thad@sitkasentinel.com
Capital City Weekly http://www.capitalcityweekly.com Juneau, AK weekly paper	134 North Franklin Juneau, AK 99801	Phone: 907.789.4144 Fax: 907.789.0987	Managing Editor: Charles Westmoreland charles.westmoreland@capweek.com
Anchorage Daily News http://www.adn.com Anchorage, AK daily newspaper	P.O. Box 149001 Anchorage, AK 99514-9001	Main phone: 907.257.4200 Newsroom main phone: 907.257.4300 Toll-free in Alaska: 800.478.4200 City desk: 907.257.4301 Copy desks 907.257.4356 (News)	Rural Affairs Reporter: Kyle Hopkins khopkins@adn.com News: Mike Jakiemiec mjakiemiec@adn.com Native corporations, tourism, mining, timber, environment: Elizabeth Bluemink ebluemink@adn.com
Radio Stations			
KCAW (104.7 FM / 90.1 FM; 105.5 in Angoon) http://kcaw.org/ Sitka, AK locally owned and operated public radio station. Can be picked up in Angoon.	2 Lincoln St. Suite B Sitka, AK 99835	907.747.5877 KCAW offices 907.747.5879 KCAW News Department 800.478.5877 Toll-Free Fax: 907.747.5977	Contact Info Link: http://kcaw.org/modules/contact_form Robert Woolsey – morning news interviews M–F 8:18
KIFW (1230 AM) http://www.kifw.com Sitka, AK. Not a public radio station, but airs a popular "Problem Corner" show where listeners call concerning local issues. Can be picked up in Angoon.	611 Lake Street Sitka AK, 99835	Monday Through Saturday 907.747.6626 For the Business Office call 907.747.KIFW(5439)	For Public Service Announcements, please e-mail kifw@abcstations.com Valerie See – radio interviews during Problem Corner. 2-3 days notification unless flying in, then 1 week required. Mondays generally not available. Cell: 907.441.6169

Table 5. Media Contacts

Media Outlet	Address	Phone	Contacts
KTOO (104.3 FM) http://www.ktoo.com Juneau, AK. NPR-member radio station, affiliated with the Coast Alaska network.	360 Egan Drive Juneau, AK 99801-1748	907.586.1670 Connecting all departments 907.586.1212 KTOO News and Rain Country Fax: 907.586.2561	Contact Info Link: http://www.ktoo.org/contact.cfm Jeff Brown – afternoon show M–F 3–4 jeff@ktoo.org 907.463.6425 Radio interviews for activities with Juneau connection 1–2 weeks notice
Alaska Public Radio Network http://aprn.org/ Consortium of public radio stations to which KSKA, KNBA, KTOO, KCAW belong. The website has a number of news and community calendar sections.	3877 University Dr Anchorage, AK 99508	907.550.8400 general business 907.550.8444 news room Fax: 907.550.8401 general business 907.550.8402 press releases / news	Press Releases/News: news@aprn.org Contact Info Link: http://aprn.org/about/contact/
KNBA (90.3 FM) http://www.knba.org/ Anchorage, AK public radio station; community news as well as a Native American radio show.	3600 San Jeronimo Drive, Suite 480 Anchorage, AK 99508	Office: 907.793.3500 Toll Free: 888.278.KNBA (5622) Office Fax: 907.793.3536 Newsroom Fax: 907.793.3536	E-mail: feedback@knba.org Contact Info Link: http://www.knba.org/ Radio interviews not available.
KSKA (91.1 FM) http://www.kska.org/ Anchorage, AK public radio station with community forum and events calendar for KSKA as well as KAKM and APRN websites.	3877 University Dr Anchorage, AK 99508-4676	907.550.8400 general business Fax: 907.550.8401 general business 907.550.8403 PSAs and press releases	Community Forum E-mail: communityforum@kska.org Contact Info Link: http://kska.org/about/contact/ Ellen Lapier – Community Forum Steve Heimel – Talk of Alaska Will accept radio interviews if deemed "newsworthy" to audience
KINY (800 AM; 103.9 FM in Angoon) Juneau, AK. Not a public radio station, but airs local "news of the north." Can be picked up in Angoon.	1107 West 8th, Suite 2 Juneau, AK 99801	Main: 907.586.1800 Problem Corner: 907.586.1800 Fax: 907.586.3266 News Line: 907.586.6397	News room: kinynews@eagle.ptialaska.net Contact Info Link: http://www.kinyradio.com/statinfo.html

Table 5. Media Contacts

Media Outlet	Address	Phone	Contacts
KJNO (630 AM) Juneau, AK. Talk radio station with local news updates. Can be picked up in Angoon.	3161 Channel Drive Juneau AK, 99801	Office and Studio: 907.586.3630 Community Notice Board: 907.586.3630 Fax: 907.463.3685	noticeboard@kjno.com Contact Info Link: http://kjno.com/cms/kjnopages?id=25 Program Director – radio interviews unknown
Television Stations			
KTOO-TV (Alaska One): Juneau, AK public television station with website.	Same as KTOO Radio		
KSKA/KAKM Channel 7 http://www.kakm.org/ Anchorage, AK public television station with website.	3877 University Dr Anchorage, AK 99508-4676	907.550.8400 general business Fax: 907.550.8401 general business	Contact Info Link: http://kakm.org/about/contact/
KTNL-TV, channel 13 http://www.ktnl.tv Sitka, AK CBS affiliate, seen in Juneau on KTNL-LP channel 24. Website has community calendar.	520 Lake Street Sitka, AK 99835	Phone: 907.747.5749 Fax: 907.747.8440	E-mail: ktnltv@alaska.com Contact Info Link: http://www.ktnl.tv/contact.htm

ANGOON AIRPORT
Environmental Impact Statement

PUBLIC INVOLVEMENT PLAN UPDATE #2

Prepared for

Federal Aviation Administration
and
Alaska Department of Transportation and Public Facilities

Prepared by

SWCA Environmental Consultants

October 15, 2013

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1.0 INTRODUCTION

The Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) in response to a request from the Alaska Department of Transportation and Public Facilities (DOT&PF), the Sponsor, for funding and other approvals for a new land-based airport near the community of Angoon in Southeast Alaska. The Angoon Airport project involves the construction and operation of a land-based airport to serve the community of Angoon, a small village located approximately 60 miles south of Juneau and 40 miles northeast of Sitka. Angoon is the only permanent settlement on Admiralty Island and is located on a small peninsula on the western coast of the island. At present, there is no land-based airport runway in or near Angoon.

Anticipating that the proposed airport will be of considerable interest to a variety of local, state, and regional stakeholders, the EIS public involvement (PI) team prepared a public involvement plan (PIP) in April 2008 that identified general public involvement goals, outreach techniques, and anticipated stakeholders. The PIP was updated in April 2009 to include 1) suggested website changes and 2) revisions made to outreach techniques for both internet and non-internet users.

This second plan revision provides a summary of key public involvement efforts completed-to-date, as well as describes outreach activities conducted by the FAA that were not included in either the 2008 PIP or 2009 update.

2.0 SUMMARY OF PUBLIC INVOLVEMENT

Since the start of the Angoon Airport EIS project, the FAA has completed or is continuing the following key public involvement steps, as laid out in the 2008 and 2009 PIP:

• Pre-scoping meetings, public notification, and report	Completed 2008
• Scoping meetings, public notification, and report	Completed 2008
• Mailing list updates	Ongoing
• Development and updates to website	Ongoing
• Project updates posted to website (notification of update sent via e-mail)	Monthly, or as applicable based on project activity
• Newsletters (sent via e-mail and postal service)	Quarterly, or as applicable based on project activity
• Progress report to DOT	Ongoing
• Agency/NGO meetings	Ongoing
• Monthly project updates to the "myangoon.org" website	Website closed
• CB announcement and posted flyers to advertise local, informal meetings and visits	Ongoing

• Courtesy visits to the Mayor of Angoon (and/or other key personnel), the ACA, and attendees at the senior center by EIS team members to provide a project status update and to respond to questions.	Ongoing

The 2009 PIP update #1 also contained specific suggestions for project website updates. These updates were reviewed and have been incorporated into the latest version of the website, as appropriate. In particular, the front page has been revised to include FAA contact information and links to what's new on the site. A new section was added to provide information on area resources. More generally, all pages have been revamped to be more user friendly, through the addition of pictures, maps, and links, as well as to improve reader navigation.

Several 2009 PIP suggestions were not implemented due to lack of public interest or time constraints. For example, the FAA initiated a website survey in 2009 to solicit feedback on the scoping process but did not receive any feedback from the community. As such, additional surveys have not been conducted or made available on the website. The FAA has also not been able to identify or attend open houses, meetings, or events in Angoon, Juneau, or other nearby areas where project information can be distributed to local residents as appropriate and as requested. However, the FAA has continued to provide regular, informal visits to the community of Angoon to provide information and answer resident questions (see Section 3.0, below).

Because the Angoon Business Center closed, an information repository was not established at that site to provide local residents with access to hardcopies of technical reports or the Draft EIS (when it becomes available). Hard copy technical reports were provided to the ACA. The FAA will provide hard copies of the EIS to the ACA and City government.

3.0 New Public Involvement Activities

The FAA has also initiated the following new public involvement activities for the Angoon Airport EIS since the last plan update:

- Postings on the Angoon Airport EIS Facebook page. The Angoon Airport EIS now has a Facebook site, where updates on project activities and local, relevant news are posted on a regular basis.
- Focus on plain language EIS. The FAA has developed a plain language EIS and supporting documents to improve the readability and navigability of the document for the public.
- Additional informal community visits. The FAA has conducted on-going visits to the community of Angoon over the past several years to provide project updates and answer resident questions and concerns.

4.0 Fair and Meaningful Involvement

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (February 11, 1994) requires that federal agencies, to the greatest extent practical and required by law, identify and address adverse effects to environmental justice populations. This order includes ensuring that affected individuals do not bear a disproportionate share of potential negative project effects (a.k.a. "fair treatment") and that they have "meaningful involvement" opportunities to participate in decisions about a proposed action that may affect their environment or health.

Since the onset of the planning process for the Angoon Airport EIS, the FAA has actively worked to fully engage the Angoon community, tribe, and local government through varied outreach activities (see Sections 2.0 and

3.0, above). These approaches were developed to establish a positive relationship with the community and solicit public input. For example, all public meetings have been held in an open house format, some with presentations, so the public could talk with members of the project team in a one-on-one setting. Comment cards were available for the attending public to complete. Project team members were also available to take comments verbally if members of the public were unable to fill out their own comment cards. Meeting facilities were selected based on their familiarity to the community and proximity to town. All meeting facilities were Americans with Disabilities Act (ADA) accessible. To increase awareness of public meetings about the project, posters were placed in local businesses and community centers. The FAA also continues to provide project information through newsletters and emails.

APPENDIX Q

DOCUMENTATION OF COMMUNICATIONS WITH AGENCIES AND TRIBES

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES

FEDERAL AVIATION ADMINISTRATION AND

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Angoon Airport Environmental Impact Statement

I. INTRODUCTION AND PURPOSE

A. This Memorandum of Understanding (MOU) provides a framework in which the United States Federal Aviation Administration (FAA) will prepare an Environmental Impact Statement EIS) for proposed construction of the Angoon Airport. The MOU describes the relationship of the FAA and the Alaska Department of Transportation and Public Facilities; hereafter referred to as the "Sponsor", in preparing the EIS. Subject to completion of the EIS, the FAA will determine whether to proceed with the proposed construction. This determination will be set forth in a Record of Decision.

B. As lead agency, the FAA, with the assistance and input from the Sponsor, will select an independent contractor ("Contractor") to prepare the EIS. The Sponsor shall be the party responsible for engaging and retaining a contractor.

C. The EIS and any related documents shall comply with the provisions of the National Environmental Policy Act of 1969 (NEPA) and appropriate Council on Environmental Quality (CEQ), United States Department of Transportation (DOT), and FAA environmental regulations and guidance, as well as all applicable local, state and Federal laws, as appropriate.

D. It is the purpose of this MOU to establish an understanding between the Sponsor and the FAA regarding the responsibilities of the parties and the conditions and procedures to be followed in the development and preparation of the EIS.

E. The parties hereto intend that development and preparation of the EIS as provided in this MOU will satisfy the pertinent environmental requirements of the FAA.

II. GENERAL PROVISIONS

A. As the lead agency, the FAA will be responsible for ensuring compliance with all the requirements of NEPA (42 U.S.C. 4321 et seq.), CEQ Regulations (40 C.F.R. Parts 1500- 1508), and appropriate DOT and FAA environmental orders. The procurement process shall be conducted in accordance with Alaska Statute 36.30, unless otherwise in conflict with federal requirements or prohibitions, with particular reference to 36.30.890 Federal Assistance. The FAA shall ensure that all pertinent environmental issues and impacts, and reasonable alternatives and their impacts are treated in the EIS, and shall be responsible for the scope and content of the EIS.

B. The Sponsor will engage and retain a Contractor, selected by the FAA with the assistance and input from the Sponsor, for the preparation of the EIS. The Contractor, with the approval of the FAA and Sponsor, may employ such other contractors and experts (collectively referred to as "Subcontractors"), as are required for the adequate development and preparation of the EIS.

C. The Contractor will provide, through its staff or by Subcontractor, the expertise, staffing, and technical capabilities required for the preparation of the EIS. The FAA will direct the scope of the EIS and will independently evaluate all information, environmental data and analyses submitted by the Contractor, or others, and revise or cause additional study and analyses to be performed as necessary.

D. The Contracts between the Sponsor and Contractor and between the Contractor and Subcontractors (collectively the "Contract") shall be consistent with the provisions of this MOU and shall specifically incorporate those provisions herein, which address the conduct of the Contractor. The Contract shall provide, and the Sponsor hereby represents, consistent with FAA Order 5050.4A, Paragraph 76(g), that the Contractor and any Subcontractors has not entered into and, during the lifetime of the EIS preparation, will not enter into any agreement affording the Contractor and any Subcontractors with any direct or indirect financial interest in the planning, design, construction or operation of the Project except with regard to the preparation of the EIS.

(1) Prior to beginning work on the EIS, the Contractor and any Subcontractors shall sign a "Disclosure Statement" provided by the FAA per the requirements of FAA Order 5050.4B, specifying they have no financial or other interest in the outcome of the project.

(2) The FAA shall evaluate the Disclosure Statement prior to its approval.

E. The FAA and Sponsor shall make all reasonable efforts to ensure the satisfactory and timely performance of the duties of the Contractor as specified in this MOU. The FAA agrees that the Sponsor will be reimbursed for allowable costs per FAA Order 5100.38b, not to exceed the amount available from AIP Grant.

F. The Sponsor and FAA shall:

(1) Appoint such representatives as necessary to accomplish the coordination necessary for the satisfactory preparation of the EIS. Notice to any such representative shall constitute notice to that party.

(2) Review substantive phases of preparation of the EIS as each deems necessary.

(3) Have their respective representatives attend meetings with other Federal, state, regional, and local agencies for the purpose of increasing communications and receiving comments, as the same may be necessary, desirable, or required by law in preparation of the EIS.

(4) Facilitate the coordination of effort and the exchange of information related to the planning, design and construction of the proposed improvements, as these activities relate to the preparation of the EIS among and between the Contractor and its Subcontractors, the Sponsor and the FAA.

G. All costs incurred in connection with the employment of the Contractor and any and all Subcontractors, or other persons retained or employed by the Sponsor, shall be paid by the Sponsor upon receipt of the FAA Project Manager's endorsement on the contractor's invoice. The FAA agrees to reimburse the Sponsor for all FAA approved costs incurred by the Sponsor in connection with the EIS.

III. PROCEDURES

A. Under the direction of the FAA, the Contractor shall develop and submit a scope of work to the FAA for approval. The scope of work shall include detailed descriptions of all work to be performed, the methodologies proposed to perform the work, the name and qualifications of the person performing each aspect of the work, estimated hours required for completion of each aspect, the schedule for performing each aspect and a description of the internal and external review procedures to assure quality control. Also, the scope of work shall include a provision for a thorough literature search and bibliography of references and methodologies to be used in the acquisition of the environmental data and analyses and the development and preparation of the EIS. The scope of work shall include maintenance of and access to a complete administrative file.

B. The FAA will forward the contract scope of work to the Sponsor for review and comment. After receiving comments from the Sponsor, and the scoping process conducted pursuant to 40 C.F.R. Sec. 1501.7, the FAA will finalize and approve the contract scope of work. The scope of work and this MOU shall establish the scope of work required of the Contractor in the development and preparation of the EIS.

C. The scope of work may be amended by the FAA from time to time as the work of the Contractor or its Subcontractors proceeds, but any amendments or changes which require the expenditure of additional funds by the Sponsor must be agreed to by the Sponsor. The Sponsor will be notified and consulted prior to any significant amendments or modifications to the scope of work.

D. Unless otherwise directed by the FAA, any and all work performed by the Contractor and its Subcontractors in preparation of the EIS shall be submitted directly to the FAA, and upon request of the FAA, to the Sponsor. The Sponsor may communicate with the Contractor and its Subcontractors during the development of the EIS, but no prior review or discussion of data or analyses developed by the Contractor or Subcontractor as related to the EIS shall be afforded the Sponsor. In no case will the Sponsor discuss, review, modify, or edit the Contractor's work or the work of its Subcontractors prior to submission to the FAA, or be provided the opportunity to do so. All suggestions for modifications or changes to such sections shall be recommended by the Sponsor only to the FAA.

E. The FAA reserves the right to review periodically and modify the work of the Contractor to ensure that requirements under NEPA and other applicable laws and regulations are satisfied. The Contractor shall submit monthly written reports on the progress of its work to the FAA, with a concurrent copy to the Sponsor. This report shall describe the present status of each aspect of the work, any problems encountered, and recommendations for modifications to the scope of work and any changes in personnel, methodology or schedules for completion.

F. As each portion of any draft or final document is completed, the FAA shall review each portion and those tasks completed there under and, after consultation with the Sponsor, shall approve, modify, comment thereon and/or direct further work with regard to such portion or tasks as necessary. Said directions and/or comments shall be made by the FAA in a timely manner, and the Contractor shall ensure incorporation of such comments into any editorial changes to the satisfaction of the FAA. Final drafts of any documents will require FAA approval. Prior to approval, the FAA will forward final drafts to the Sponsor for review and comment. Comments from the Sponsor shall be sent to the FAA. The Contractor will make modifications only as the FAA directs regarding these comments.

G. If requested, the Contractor will provide the FAA access to and review of all procedures and underlying data used by the Contractor in developing submitted sections of the EIS, including, but not limited to, field reports, Subcontractor reports, and interviews with concerned private and public parties, whether or not such information may be contained in a draft or final EIS. The Sponsor will also have access to such procedures and underlying data. Such access by the FAA and Sponsor shall be governed by paragraph III.T hereunder.

H. To facilitate the development and preparation of the EIS, joint meetings among the FAA, Sponsor, and Contractor may be held. However, the FAA reserves the right to work directly with the Contractor for purposes of assuring objectivity in preparing reports and/or for assuring expeditious communications. The Contractor will notify the FAA and Sponsor of any substantive meetings that are scheduled and of their purpose and will provide an opportunity for the parties to attend if desired. No meeting will be held between the Contractor and Sponsor without prior notification to and approval of the FAA. A summary of all matters relating to EIS discussions in any meetings or communications between the Contractor and a party hereto without the participation of the other said party will be included in each formal monthly report submitted by the Contractor to the FAA and Sponsor. The FAA reserves the right to consult directly with other Federal, state, and local officials and agencies during the preparation of the EIS to ensure compliance with NEPA and other applicable laws and regulations. The contractor shall provide minutes of milestone meetings for review and comment by agency representatives present at the meeting prior to submitting the official minutes.

I. The FAA shall direct the full cooperation of the Contractor and its Subcontractors with respect to participating in any public workshops, hearings, or meetings as required by the FAA to foster public familiarity and participation with respect to the assessment of impacts related to the Project.

J. The Contractor shall be responsible for the costs associated with the printing and publication of the draft and final copies of the EIS and the administrative record associated with the EIS. The Contractor shall be responsible for all costs associated with the publication of notices announcing public workshops, meetings, hearings, and the like. The Contractor shall also be responsible for costs of stenographic and clerical services, preparation of graphics and visual aids associated with any public workshops, meetings, and hearings. All such costs shall be deemed Airport Improvement Program (AIP) eligible costs under the Contract.

K. At such time as the FAA, after consultation with the Sponsor, has approved the Draft EIS developed and prepared by the Contractor and its Subcontractors, the FAA shall direct the Contractor to print the contracted quantity of Draft EIS and submit the same to the FAA. The FAA shall submit an appropriate number of copies of the Draft EIS to the Sponsor. The FAA shall proceed expeditiously to comply with the provisions of NEPA.

L. In all instances involving questions as to the content or relevance of the environmental data and analyses, and evaluations and wording prepared by the Contractor, the FAA, with appropriate advice and consultation where deemed necessary by the FAA, will make the final determination on the inclusion, deletion or modification of the same in the Draft or Final EIS.

M. Upon completion of the Draft EIS, the FAA, with the Contractor's assistance, shall be responsible for organizing and conducting any public hearings.

N. The FAA will receive all comments during the Draft EIS review and comment period. This period (at least 45 days) will be initiated when the Environmental Protection Agency (EPA) publishes the "Draft EIS Notice of Availability" in the Federal Register.

O. At the close of the Draft EIS review and comment period, the FAA shall identify the issues and comments submitted which will require response in the Final EIS. The FAA will direct those comments to the Contractor for preparation of proposed responses, and shall furnish the Sponsor with copies of all comments received. The Contractor will furnish proposed responses to the FAA and Sponsor for review and comment. The FAA, after consulting with and considering any advice from the Sponsor, shall modify the proposed responses, as it deems necessary.

P. After receipt of comments and preparation of responses, the FAA, after consulting with and considering any advice from the Sponsor, may direct the Contractor to make changes to the text of the Draft EIS as necessary.

Q. At such time as the FAA has approved the Final EIS, the FAA shall direct the Contractor to print the contracted quantity of Final EIS. The FAA shall submit an appropriate number of copies of the Final EIS to the Sponsor. The FAA shall proceed expeditiously to comply with the provisions of NEPA.

R. The FAA will receive all comments on the Final EIS during the mandatory "hold period". This period (at least 30 days) will be initiated when the EPA publishes the "Final EIS Notice of Availability" in the Federal Register.

S. The FAA, with assistance from the Contractor, will prepare and issue the FAA Record of Decision.

T. The parties recognize that statutory record disclosure requirements affect both the FAA and the Sponsor. The parties agree to develop document control procedures in the future that will provide for confidential evaluations and discussion of materials not appropriate for, and legally exempt from, public disclosure. The FAA will maintain the confidentiality of, and will not release or allow access to, any information, documents or materials which in its opinion are validly designated as confidential by the Sponsor or Contractor and which contain trade secrets, proprietary data, or commercial or financial information. Information developed under this MOU is disclosable to the public to the extent required by law. In any instance where the FAA proposes to release to the public or allow access to any information, documents or materials which the Sponsor or Contractor has designated as confidential, it shall notify the Sponsor or Contractor of its intension to do so and provide the Sponsor or Contractor the opportunity to appeal the decision in accordance with the applicable regulations on such release or access prior to any such release or access.

IV. CESSATION AND TERMINATION

Any of the parties to this MOU may withdraw from the terms of this MOU for good cause upon 30 days written notice to the other party. During this period, the parties will actively attempt to resolve any disagreement. Termination of this MOU shall in no way impair the Sponsor's eligibility for reimbursement for costs and obligations incurred prior to termination, including all costs, obligations and damages arising out of the Contract.

In the event of a termination of this MOA, and if the preparation of an EIS by the FAA is still required, it is agreed as follows:

(1) The FAA shall have access to all documentation, reports, analyses, and data by the Contractor and Subcontractors with confidentiality governed by paragraph III.T.

(2) The Sponsor shall no longer be responsible for the payment of costs associated with preparation of the EIS under the terminated MOA, apart from costs already incurred, invoiced, and endorsed by the FAA under the contract with the Contractor.

(3) Liability for termination shall be in accordance with paragraph II.G. hereof.

V. NO RIGHTS FOR NON-PARTIES

No rights or privileges are created or intended to be created by this MOU in anyone not a signatory of this MOU.

VI. MODIFICATION

This MOU represents the entire agreement and may be modified by the parties hereto only by written agreement by all the parties.

United States Federal Aviation Administration

Byron Huffman – Division Manager, Airports Division, Alaska Region

11/6/06
Date

State of Alaska Department of Transportation and Public Facilities

Malcom Menzies P.E. – Regional Director, Southeast Region, ADOT&PF

10/31/06
Date

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

May 29, 2008

Ms. Judith Bittner
Alaska State Historic
Preservation Officer
550 W. 7th Ave., Suite 1310
Anchorage, Alaska 99501-3565

RE: Initiation of Section 106 Consultation for the Angoon Airport Environmental Impact Statement, Angoon, Alaska

Dear Ms. Bittner:

The Federal Aviation Administration (FAA), Alaskan Region, is beginning preparation of an Environmental Impact Statement (EIS) for proposed development of a land-based airport in or near the City of Angoon, Alaska. This letter is intended to serve as a formal initiation of Section 106 consultation between the FAA, its consultants, and the Alaska State Historic Preservation Office (ASHPO) as required under 36 CFR 800.

SWCA Environmental Consultants (SWCA) is the prime third-party consulting firm for this project and will be assisting the FAA in working through the Section 106 process and in complying with the requirements of the National Environmental Policy Act (NEPA) relative to cultural resource issues. Specifically, Sheri Murray Ellis of SWCA has been appointed as the coordinator of cultural resource studies, including archaeological investigations and Native American consultation for the EIS.

As per the requirements of 36 CFR 800.4(a)(1), we are asking for your input on defining the area of potential effects (APE) for cultural resources for the purpose of future evaluation in the EIS. The Alaska Department of Transportation and Public Facilities (ADOT&PF) is the project Sponsor. They prepared a site selection study and developed a Master Plan, identifying an ADOT&PF proposed airport location (see Figure 1, attached). The FAA will likely be considering this location or a variation thereof as one of the alternatives in the EIS. The FAA proposes to define the APE for this location as shown on Figure 1, ADOT&PF Proposed Location. We believe this APE is sufficient to encompass all areas and resources that could be directly affected by physical disturbance or indirectly affected by potential noise intrusions.

In addition to the ADOT&PF's proposed airport location, the FAA will be considering at least one, and possibly several alternative locations for the airport. We are still in the process of gathering data to determine where those alternative locations will be, and will not identify specific locations until early 2009. We will collect existing data for the broader Angoon area peninsula and surrounding islands and lands until such time as specific alternative locations are identified. At that time, we will consult with your office regarding definition of an appropriate APE for more detailed investigations.

Should you have any concerns with how we have defined the APEs for the ADOT&PF proposed airport location and potential alternative locations, please, do not hesitate to contact me. We welcome your expertise and knowledge of the area in making sure we define the APEs to encompass those cultural resources that could be affected.

Pursuant to 36 CFR 800.4(a)(2)-(3), SWCA staff will be examining the records held by your office for previous cultural resource studies and known cultural resource sites within the agreed upon APE to be addressed in the EIS. This work will take place later this spring. Should it be determined that field surveys are necessary to determine the presence/absence of archaeological sites within the APE, SWCA will conduct such studies. All lands potentially involved in the project are under the jurisdiction of either Kootznoowoo, Inc., the village Native Corporation, or the U.S. Forest Service (USFS), as part of Admiralty Island National Monument. SWCA will coordinate with the USFS and seek a permit from them for any work on USFS lands. Any archaeological fieldwork associated with the EIS would likely not take place until at least the spring of 2009. Preparation of the EIS and completion of the NEPA process is expected to take at least three years, with a draft EIS potentially distributed for comment in the spring of 2010.

Development of the runway, hangar, and apron space would include ground-disturbing activities that could have the potential to impact cultural resources that may be present in the selected airport location. As such, and as part of our consultation with your office under 36 CFR 800, we invite you to let the FAA know at this time of any concerns you may have about potential impacts to cultural resources that could result from development of the airport at the location proposed by the ADOT&PF in their Master Plan (shown on Figure 1) or in any other areas within or immediately surrounding Angoon and the peninsula on which the community is located. Information about specific known sites in these areas, other parties with whom we should consult regarding cultural resource concerns, or general cultural resources issues of which we should be aware, would be greatly appreciated.

We look forward to working with you on this project and welcome your active participation. Please, do not hesitate to contact either myself or Ms. Ellis at any time should you have questions or comments. I can be reached at Leslie.Grey@faa.gov or (907) 271-5453, and Ms. Ellis can be reached at either sellis@swca.com or (801) 322-4307.

Sincerely,

Leslie A. Grey

Leslie A. Grey
FAA Project Manager
Angoon Airport EIS

cc: Sheri Murray Ellis, SWCA

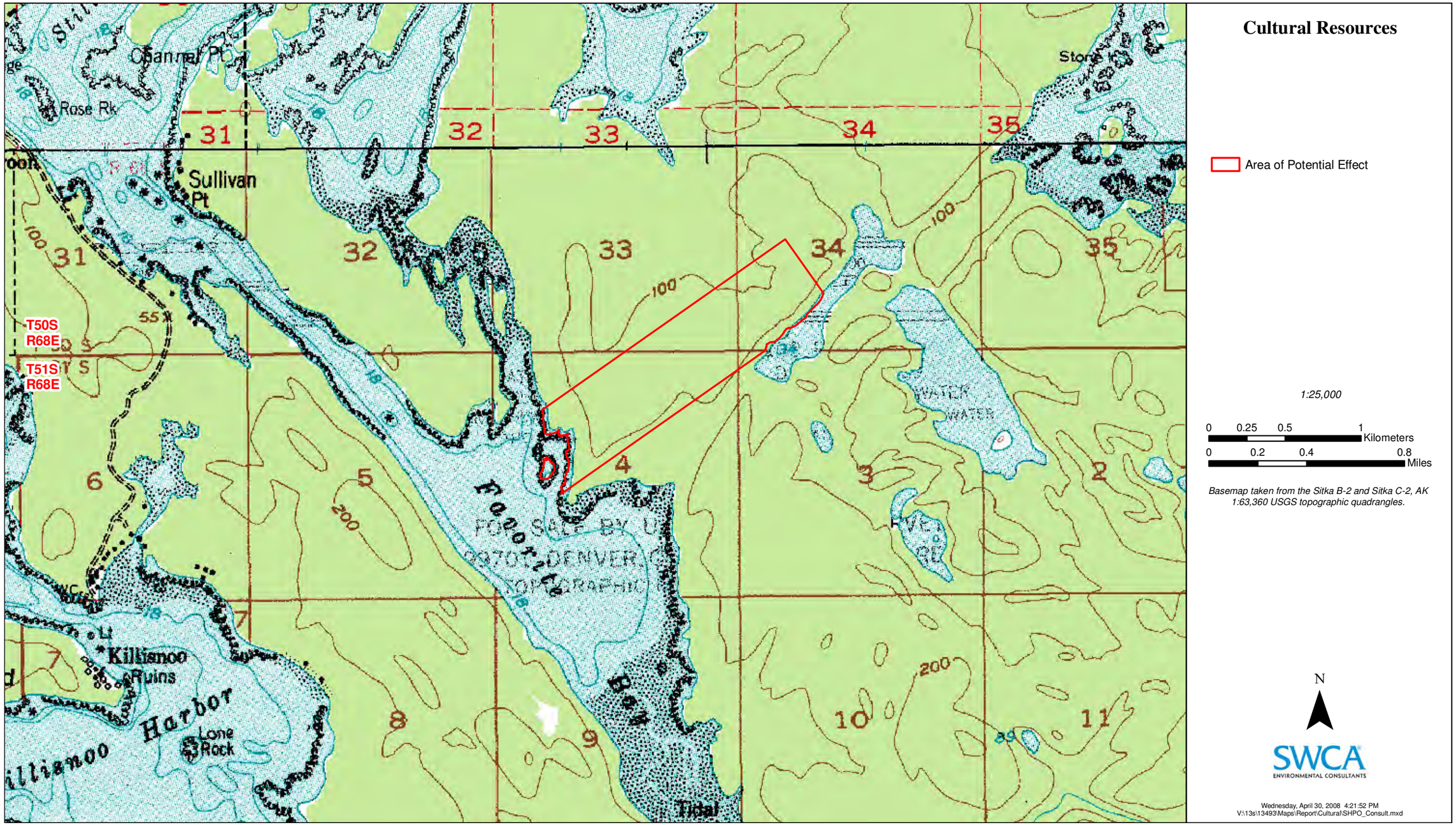


Figure 1. Location of APE for the ADOT&PF's Master Plan preferred airport location.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

July 2, 2008

Matthew Fred, Jr.
President
Angoon Community Association
P.O. Box 188
Angoon, AK 99820

Dear President Fred, Jr.:

It has been great working with you on the Angoon Airport Environmental Impact Statement (EIS) process, and I look forward to continued involvement from you and other members of the Angoon Community Association (ACA) Council. My goal is to ensure that we have the clearest and most efficient communication possible throughout this project. As you know, the Alaska Department of Transportation and Public Facilities' (DOT&PF) proposal to use federal funds to build an airport to service the City of Angoon requires Federal Aviation Administration (FAA) approval under the Airport Improvement Program [Title 49 U.S.C., Section 47104(a)]. This approval constitutes a federal action with the potential to have significant impacts on the human and natural environment and requires preparation of an EIS to disclose those impacts to the FAA, other agencies, and the interested public. This EIS process serves as a vehicle to solicit input from interested parties, particularly key stakeholders such as the ACA.

The FAA has statutory authority to promote and develop a safe and efficient nation-wide system of airports adequate to meet the current and projected growth in aviation (49 U.S.C. 47101). In carrying out its statutory responsibilities, the FAA must ensure that its actions comply with federal law, including the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA), among others. As the lead Federal Agency the FAA is responsible for supervising the preparation of the EIS (40 CFR Part 1501.5(a)) and complying with requirements of the NHPA (implementing regulations at 36 CFR Part 800) and Executive Order 13175 regarding government-to-government consultation with federally recognized Alaska Native tribal governments.

The ACA Council is the cultural and governmental body of the federally recognized Alaska Native community in Angoon. The ACA Council is the entity responsible for representing the members of the ACA in relations with the federal government and in perpetuating the cultural maintenance and well-being of the Alaska Native community in Angoon. As such, FAA recognizes that the ACA is a primary stakeholder in the Angoon Airport EIS process and a qualified party for formal government-to-government consultation. The ACA Council can assist the FAA throughout the EIS process by providing information and materials to help characterize the affected environment, supplying information for consideration in the EIS analysis, assisting in coordinating public meetings (in cooperation with the City of Angoon Mayor's Office), providing venues for public meetings and/or workshops as necessary (also in conjunction with the City of Angoon Mayor's Office), and officially representing the position of the ACA on issues related to the proposed airport. This

assistance can best be obtained through a clear line of communication between the FAA and the ACA Council.

As you may recall from our teleconference of April 30, 2008 with the FAA, the ACA, the City of Angoon Mayor's Office, and the FAA's third-party contractor, we discussed the best approach to coordinating information exchange between the FAA, the ACA Council, and the City. At that time, you indicated that FAA should coordinate through the City of Angoon Mayor's Office to distribute information to the citizens of Angoon, including the ACA Council. However, all parties agreed that FAA would solicit independent comments and input from the ACA Council as part of government-to-government consultation. With this in mind, the FAA has developed a communications protocol with the City of Angoon Mayor's Office (see Attachment A) that will ensure distribution of project information and documents to the ACA Council for review and comment. Documents that will be distributed for the ACA Council's review through the City of Angoon Mayor's Office include the following:

1. Those sections of the preliminary Draft EIS (DEIS) and preliminary Final EIS (FEIS) pertinent to resources under the jurisdictional authority or of special concern to ACA Council (provision of certain information related to the preliminary DEIS and preliminary FEIS may be subject to limitations from existing laws and/or policy; for example, the National Historic Preservation Act restricts the distribution of archaeological site location information).
    a. FAA will allow a minimum 30-day period for the ACA Council to complete their review of the aforementioned sections of the preliminary DEIS and preliminary FEIS. This time period may be extended upon request to FAA by the ACA Council.

2. The Public DEIS (entire document) and Public FEIS (entire document).
    a. FAA will allow a minimum 45-day period for the ACA Council to complete their review of the Public DEIS and Public FEIS. This time period may be extended upon request to FAA by the ACA Council.

3. Technical reports related to resources under the jurisdiction or of special concern to the ACA Council (subject to limitation from existing laws and/or policy as described in Item 1 above).

As noted previously, there are many ways that the ACA Council can assist the FAA in expediting the EIS process and incorporating the Council's comments into the FAA's final decision about the airport. These include:

- Coordinating with the City of Angoon Mayor's office on EIS public meeting times and EIS public meeting locations.

- Helping the City of Angoon Mayor's Office to arrange for buildings or rooms for public meetings in Angoon related to the Angoon Airport EIS, as well as posting public meeting notices in community buildings and otherwise helping to inform interested citizens and public officials of upcoming meetings.

- Submitting comments on the sections of the preliminary DEIS and preliminary FEIS sections distributed to the ACA by the City of Angoon Mayor's Office within the aforementioned 30-day period, or requesting additional time from the FAA if necessary. The ACA Council may choose to

submit their comments on the sections of the preliminary independently or jointly with the City of Angoon Mayor's Office.

- Submitting comments on the Public DEIS and Public FEIS documents distributed to the ACA by the City of Angoon Mayor's Office within the minimum 45-day comment period, or requesting additional time from the FAA if necessary. The ACA Council may choose to submit their comments independently or jointly with the City of Angoon Mayor's Office.

In order to further facilitate consultation between the FAA and the ACA Council:

- All communications to the ACA Council by the FAA or the FAA's third-party contractor will be directed through the Council President.

- The FAA and/or the FAA's third-party contractor (at the request of FAA) will communicate directly with the ACA Council President for data requests, local experience questions, technical report review, or technical expertise as part of government-to-government consultation. The ACA Council President may delegate an alternative contact on his/her behalf.

- FAA encourages that all information requests from ACA Council regarding the Angoon Airport EIS project be directed to Leslie Grey, FAA Project Manager for the Angoon Airport EIS.

Confidentiality

Ensuring confidentiality in information exchanged between the FAA and the ACA Council builds mutual trust and encourages free and open dialogue. Both parties may provide information the other that cannot or should not be shared with members of the general public or other parties. To that end:

- All preliminary EIS sections, technical reports, and other pre-decisional information distributed to the ACA Council by the FAA (directly or through the City of Angoon Mayor's Office) will be used for internal review only and not released to the general public. Such information is considered confidential and will be marked "Not for Public Release".

- Information provided to the FAA by the ACA Council and identified as privileged information by being marked "Not for Public Release" or "Confidential" will be kept confidential by the FAA.

Finally, for the purpose of the EIS process and the government-to-government consultation, the official point of contact for both the FAA and the ACA Council will be as follows:

Leslie Grey – AAL-614
FAA Project Manager
Angoon Airport EIS
222 W. 7th Avenue #14
Anchorage, Alaska 99513-7587
907.271.5453
Leslie.Grey@faa.gov

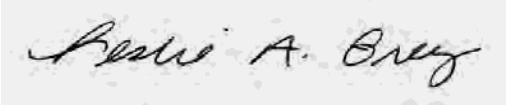
Matthew Fred, Jr.
President
Angoon Community Association
PO Box 188
Angoon, Alaska 99820
907.788.3411
jrwolf6@yahoo.com

Sheri Murray Ellis, a member of the FAA's third-party contractor helping to prepare the EIS, is assisting the FAA with the government-to-government consultation. Ms. Ellis will serve as a secondary contact for the ACA Council. Her contact information is as follows:

Sheri Murray Ellis
Asst. Project Manager
Angoon Airport EIS
257 E. 200 S., Suite 200
Salt Lake City, UT 84111
801.322.4307
sellis@swca.com

Again, I look forward to your continued participation in this project and to working with you to ensure that the FAA responds to your information needs throughout this process.

Sincerely,



Leslie Grey
FAA Project Manager, Alaskan Region
Angoon Airport EIS

Attachment: Communications Protocols, FAA and City of Angoon

cc: S. Ellis (SWCA)

MEMORANDUM OF UNDERSTANDING
BETWEEN
FEDERAL AVIATION ADMINISTRATION
AND
KOOTZNOOWOO, INCORPORATED
Angoon Airport EIS
Angoon, Alaska
(September 16, 2008)

This Memorandum of Understanding (MOU) is by and between the Federal Aviation Administration (FAA) Alaskan Region Airports Division, as the lead Federal agency for preparing an Environmental Impact Statement (EIS) for the proposed Angoon Airport, and Kootznoowoo, Inc., as a major landholder that may be affected by the proposed Angoon Airport.

I PURPOSES

The purposes of this MOU between the FAA and Kootznoowoo, Inc. ("the parties") are:

1. To formalize and provide a framework for the cooperation and coordination by and between the parties to successfully complete the EIS for the proposed Angoon Airport in a coordinated, timely, and efficient manner;

2. To define the respective roles, obligations, and authorities of the parties in the environmental review process;

3. To confirm the FAA's status as the lead Federal agency with decision-making authority for the EIS;

4. To confirm Kootznoowoo, Inc.'s status as a cooperator with responsibilities for lands under its ownership, as well as lands and their immediate environs managed in consultation and cooperation with the Secretary of Agriculture as defined under Section 506(a)(3)(E) of the Alaska National Interest Lands Conservation Act (ANILCA); and

5. To ensure a working relationship between the parties that meets the purposes and intent of the National Environmental Policy Act (NEPA) and its accompanying regulations.

II INTRODUCTION

Under the policies, directives, plans, and operations of the FAA, and under the directives of NEPA and its accompanying regulations, the FAA, as lead federal agency, must request that any agency or group that "has jurisdiction by law" or "has special expertise with respect to any environmental issue" be a cooperating agency (40 CFR § 1501.6; FAA Order 5050.4B 9(d)). Kootznoowoo, Inc. is a major landholder in and around the community of Angoon, including lands that could be considered for potential airport and access road locations. Because of Kootznoowoo, Inc.'s ownership of lands within the airport study area and because of its specialized interest in uses that may affect of those lands, the FAA invites Kootznoowoo, Inc. to participate as a cooperating party. It is the intention of this MOU to establish a working atmosphere of

cooperation among the parties where full recognition and respect to the authority and responsibility of one another is recognized.

III FAA RESPONSIBILITIES

1. The FAA, as lead federal agency, is responsible for preparing the Draft EIS (DEIS), Final EIS (FEIS), and the subsequent Record of Decision (ROD) for the Angoon Airport project.

2. The FAA seeks the full participation of Kootznoowoo, Inc. as the FAA prepares the DEIS and FEIS.

3. The FAA will provide copies of the following EIS and EIS-related documents to Kootznoowoo, Inc. for its review and comment:
   - Sections of the preliminary DEIS related to Kootznoowoo, Inc.'s land ownership, interests, and other matters as established by statute or regulation (subject to limitations from existing laws and policies; for example, the National Historic Preservation Act, which restricts the distribution of archaeological site location information);
   - The DEIS;
   - Sections of the preliminary FEIS related to Kootznoowoo, Inc.'s land ownership, interests, and other matters as established by statute or regulation (subject to limitations from existing laws and policies);
   - The FEIS.

4. The FAA will provide final copies of technical reports (e.g., resource reports) prepared as part of the EIS process and related to Kootznoowoo, Inc.'s land ownership interests to Kootznoowoo, Inc. (subject to limitations from existing laws and policies).

5. The FAA will request permission from Kootznoowoo, Inc. before conducting any fieldwork on Kootznoowoo, Inc. lands as shown in the attached map of the project area.

6. The FAA, as lead federal agency, will retain ultimate responsibility for determining the purpose and need of the project, selecting the FAA's preferred alternative, issuing decisions (i.e., the ROD), identifying mitigation measures to be included in the project, and formulating conclusions for the FAA's environmental analysis. That the FAA retains these responsibilities does not preclude Kootznoowoo Inc.'s right to comment on documents (see Item III.3) prepared by the FAA.

7. The FAA will ensure that all alternatives retained for detailed analysis in the EIS conform to ownership requirements described under ANILCA Section 506(a).

8. The FAA invites Kootznoowoo, Inc. to help it develop potential mitigation measures that may affect lands under the Kootznoowoo, Inc's ownership or other lands or environs that are managed through consultation or cooperation between the Secretary of Agriculture and Kootznoowoo, Inc. (ANILCA Section 506 (a)(3)(E)). The FAA will incorporate Kootznoowoo, Inc. input regarding mitigation as appropriate before determining which measures will be included in the Record of Decision. Kootznoowoo, Inc., however, will determine which mitigation measures will be implemented on lands under its ownership.

9. The FAA will duly consider Kootznoowoo, Inc.'s comments submitted as part of the NEPA process and related legislation and within the scope of the Angoon Airport EIS Project.

IV KOOTZNOOWOO, INC. RESPONSIBILITIES

1. Kootznoowoo, Inc. is responsible for managing Kootznoowoo, Inc. and ANILCA Section 506 (a)(3)(C) (Kootznoowoo Corridor) lands.

2. Kootznoowoo, Inc. will fully participate in the Angoon Airport EIS NEPA process as a cooperating party as outlined in this MOU.

3. Kootznoowoo, Inc. will review the documents described in Item III.3 and will comment on the FAA's characterization of lands and resources (i.e., Affected Environment) under Kootznoowoo, Inc.'s ownership and the FAA's assessment of impacts on those lands and resources (i.e., Environmental Consequences). Kootznoowoo, Inc. will submit its written comments and the data it deems necessary to support its comments to the FAA within 30 days of receipt of the documents referenced in Item III.3. If requested, the FAA will make good faith efforts to give Kootznoowoo, Inc. additional time to gather, consolidate, and submit comments from Kootznoowoo, Inc.'s Board of Directors. Kootznoowoo, Inc. will submit its written comments on the DEIS to the FAA during the public comment period, which may exceed 30 days in duration.

4. Kootznoowoo, Inc. will consider all FAA requests to enter Kootznoowoo, Inc. lands for the purpose of fieldwork related to the EIS and will process these requests in as timely a manner as possible. Kootznoowoo, Inc. will notify the FAA in writing of its decisions on such requests and include any stipulations or conditions.

5. Kootznoowoo, Inc. may also provide blanket permission to FAA for entry onto Kootznoowoo, Inc. lands for the purpose of fieldwork related to the EIS.

6. Kootznoowoo, Inc. recognizes the FAA's unique decision-making authority relative to aviation planning and as the lead agency within the NEPA process. Kootznoowoo, Inc. will provide its comments on issues related to its ownership and land management interests to the FAA as outlined in other stipulations of this MOU so that the FAA can be fully informed when the FAA exercises its decision-making authority. Beyond providing comments, Kootznoowoo, Inc. bears no responsibility for preparing the EIS.

7. Kootznoowoo, Inc. will assist the FAA in developing mitigation measures pertaining to impacts affecting lands and resources within Kootznoowoo, Inc.'s ownership; however, the FAA will determine which measures will be included in the ROD. Kootznoowoo, Inc. will report to its Board of Directors on all proposed mitigation within lands under the corporation's ownership, and the Board of Directors will make the final determination on which mitigation measures will be implemented on Kootznoowoo, Inc. lands.

8. Comments provided to the FAA by Kootznoowoo, Inc.'s will be within the umbrella of the NEPA and related legislation and will be limited to actions evaluated in the Angoon Airport EIS.

V CONFIDENTIALITY

Throughout the EIS process, the parties anticipate that documents related to the EIS (including sections of the preliminary DEIS and preliminary FEIS) will be made available to Kootznoowoo, Inc. for discussion, review, and comment before the DEIS and FEIS are made available to the general public. The parties further anticipate that Kootznoowoo, Inc. may provide proprietary information to the FAA in the course of commenting on EIS-related documents. The parties understand that these draft/preliminary and proprietary documents are not for public review or distribution. Kootznoowoo, Inc. agrees to keep confidential and protect from public disclosure any and all FAA documents it receives before the FAA determines their suitability for public review, subject to the requirements of the Freedom of Information Act. Kootznoowoo, Inc. agrees to keep confidential and protect from public disclosure all information identified by the FAA as confidential or pre-decisional (and marked as such) and disclose it only to Kootznoowoo, Inc.'s employees and the Board of Directors as necessary. Similarly, the FAA agrees to keep confidential and protect from public disclosure all information identified by Kootznoowoo, Inc. as confidential or proprietary (and marked as such).

VI COMMITMENT TO COOPERATE

1. The parties agree to participate in this EIS in good faith and make every effort to resolve any perceived areas of conflict. The parties further agree to fully explore issues before coming to conclusions, and to commit to searching for opportunities for resolution designed to contribute to an efficient and accurate EIS.

2. The parties agree to provide one another with 30 days written notice before withdrawing from this MOU.

VII TERMINATION

This MOU will terminate when the FAA issues its ROD. If proposed implementation or mitigation requires further involvement by Kootznoowoo, Inc., a new MOU will be negotiated specific to that involvement.

VIII NO TRANSFER OF APPROPRIATED FUNDS

The Parties agree that this MOU requires no transfer or commitment of funds or any action that may violate the Anti-Deficiency Act. The Anti-Deficiency Act (31 U.S.C. §1341) prevents the incurring of obligations or expenditures in excess of available appropriations or funds.

IX POINTS OF CONTACT

1. The points of contact for each party to this MOU are:

Leslie Grey, AAL-614
FAA Project Manager
Angoon Airport EIS
222 W. 7th Avenue #14
Anchorage, Alaska 99513-7587
(907) 271-5453
leslie.grey@faa.gov

Peter Naoroz,
Kootznoowoo, Inc. General Manager
8585 Old Dairy Road, Suite 201
Juneau, Alaska 99801
(907) 790-2992
peter@kootznoowoo.com

2. The FAA may contact Kootznoowoo, Inc. through the following FAA-authorized third-party contractor staff members; Matt Petersen, Sheri Ellis, or George Weekley.

3. Kootznoowoo, Inc will direct all correspondence to Leslie Grey.

Bryon K. Huffman, Manager
Federal Aviation Administration
Alaskan Region Airports Division

12/3/08
Date

Peter Naoroz
General Manager
Kootznoowoo, Inc.

November 26, 2008
Date

MEMORANDUM OF UNDERSTANDING
BETWEEN
FEDERAL AVIATION ADMINISTRATION
ALASKAN REGION, AIRPORTS DIVISION
&
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE, ALASKA REGION

This **MEMORANDUM OF UNDERSTANDING (MOU)** is hereby entered into by and between the Federal Aviation Administration (FAA) and the USDA Forest Service (Forest Service).

I. INTRODUCTION

Alaska Department of Transportation and Public Facilities (ADOT-PF) is proposing to build an airport to provide commercial service to the City of Angoon on Admiralty Island. The ADOT-PF's proposed airport site, as identified in their Master Plan, is on the northeast side of Favorite Bay, on lands partially within the City of Angoon and partially within the Admiralty Island National Monument-Kootznoowoo Wilderness. Airport access would be provided by a proposed 4.2 mile road paralleling the Favorite Bay shoreline. The ADOT-PF's Master Plan proposed airport site would encompass approximately 270 acres and would include a single 3,300 foot runway and a 3.5 acre apron that would include areas for aircraft tie downs, construction of a terminal and airport support structures, a 50 foot wide taxiway to the runway, and a 40 foot roadway connecting the proposed access road.

The City of Angoon is home for 500 to 600 residents, most of whom are native Tlingit Indian. Angoon is located approximately 55 miles southeast of Juneau and 41 miles northeast of Sitka, the two closest major cities. It has no road links to any other developed areas and is completely dependent upon either marine or seaplane commercial passenger transportation. At this time, it is the largest southeast Alaska community without an airport (Angoon Airport Master Plan 2004). Travel and transport to and from the community is accomplished through daytime ferry service, chartered ferry, or commercial or chartered seaplane.

Four to five flights stop at Angoon daily while traveling to and from Juneau. Chartered flights typically arrive at Angoon from Juneau, Sitka, Kake, and Tenakee Springs. Seaplanes dock at an unattended seaplane float located 2.1 miles east-southeast of the entrance to Favorite Bay. In addition to a floating dock, the seaplane facility includes a small, unheated waiting area/ maintenance building. There is no directional or landing light system at the seaplane landing zone so night landing is prohibited. Generally, seaplanes have acceptable landing conditions in the late spring, summer, and early fall. Other times of the year, prevailing northeasterly winds make landing difficult. Additionally, rocks approximately 2,000 to 3,000 feet west/northwest of the seaplane float create another hazard for landing planes.

Ferry service to Angoon is provided by the Alaska Marine Highway System. Ferry service is generally two to three times a week in the summer and once a week during late fall, winter, and

early spring. The nearest commercial center (Sitka) is more than five hours away by ferry. The Angoon Ferry terminal is located 2.5 miles east-southeast of the city.

Because of the combination of isolation and limited transportation options, Angoon has difficulty in accessing emergency health care, markets for its products, necessary goods, and social, recreational, and educational opportunities. The ADOT-PF has indicated that an airport that could accommodate Part 135 air carriers—scheduled commuter and unscheduled, on-demand charter carriers—would provide safe and reliable access to health care, goods, and services available in nearby developed areas.

II. PURPOSE

This MOU provides the framework under which the FAA and the Forest Service will cooperate in the preparation and review of an Environmental Impact Statement (EIS) to meet the requirements of the National Environmental Policy Act of 1969 (NEPA) and Title XI of the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) for the proposed new commercial service airport near the City of Angoon, Alaska on Admiralty Island (Project). Collectively, the FAA and the Forest Service are referred to as the "Parties." The purpose of this MOU is to establish an understanding between the Parties regarding their respective roles and responsibilities and the conditions and procedures to be followed to comply with NEPA and ANILCA. As such, this MOU defines the roles and responsibilities of the FAA as the Lead Agency and the Forest Service as the Cooperating Agency in the preparation of the EIS for the Project to meet the requirements of Title XI of ANILCA. Although it is not a party to this MOU, this MOU also describes the role of the ADOT-PF in the preparation, submission, and review of the EIS.

III. AUTHORITY:

1. Public Law 91-190, 42 U.S.C 4321 - 4347, *National Environmental Policy Act of 1969 (NEPA)*

2. Public Law 96-487, *Alaska National Interest Lands Conservation Act of 1980 (ANILCA)*

Each Party, in the performance of its obligations under this MOU, will follow laws, which apply to both Parties, and policies that apply to each Party individually. In addition to NEPA and ANILCA, those laws and policies include, but are not limited to:

a. FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*

b. FAA Order 1050.1E, *Policies and Procedures for Considering Environmental Impacts*

c. Forest Service Handbook (FSH) 1909.15, *USFS Environmental Policies and Procedures Handbook*

d. 36 C.F.R. 220, *National Environmental Policy Act (NEPA) Compliance*

e. Public Law 88-577, *Wilderness Act of 1964*

f. 40 C.F.R 1500, *Council on Environmental Quality (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA)*

g. Public Law 94-579, *Federal Land Policy and Management Act of 1976 (FLPMA).*

IV. FAA RESPONSIBILITIES – NEPA PROCESS. The FAA, as the Lead Agency for the NEPA process, shall:

1. Be at all times the Lead Agency retaining full responsibility for the content and findings of the Draft Environmental Impact Statement (DEIS) and the Final Environmental Impact Statement (FEIS).

2. Ensure that the DEIS and FEIS include the information needed to address the federal compliance requirements of its Cooperating Agency, the Forest Service.

3. Assume primary responsibility for preparation of the DEIS and FEIS to meet the compliance requirements of NEPA and Title XI of ANILCA.

4. Request that the Forest Service review the DEIS and FEIS and comment on alternatives, affected environment, and environmental consequences related to its jurisdiction and expertise.

5. Ensure full access to FAA expertise, data, information, analyses, and comments so that the Forest Service may effectively complete its responsibilities under Federal law and this MOU.

6. Use the comments and information provided by the Forest Service as a Cooperating Agency, and its expertise as the land management agency responsible for the Admiralty Island National Monument-Kootznoowoo Wilderness, to the maximum extent authorized by law while still meeting the FAA's regulatory requirements.

7. Retain responsibility for developing and identifying the proposed action.

8. Retain ultimate responsibility to identify and prepare the Project purpose and need, range of reasonable alternatives retained for detailed analysis in the EIS, the selection of the Preferred Alternative, the conclusions of the environmental analysis, the Record of Decision (ROD), and required mitigation measures. This does not preclude the right of the Forest Service or other Cooperating Agencies as may be identified to submit comments or independent recommendations with respect to these matters. Similarly, the FAA will incorporate these comments to the maximum extent authorized by law while

still meeting the FAA's regulatory requirements, the Project purpose and need, and the requirements of NEPA.

9. Provide copies of all documents necessary for the Forest Service to complete its EIS review, including technical reports concerning resources under Forest Service jurisdiction or expertise, the preliminary (administrative) DEIS, public DEIS, preliminary draft FEIS, public FEIS, and all comments and information necessary for the EIS and its conclusions.

10. Meet with the Forest Service regarding any concerns related to effects, the range of alternatives, and the proposed mitigation measures to be analyzed in the EIS.

11. Include in the EIS an analysis of the FAA's Preferred Alternative and a reasonable range of alternatives sufficient to meet NEPA and the requirements of Title XI of ANILCA.

12. Revise, to the extent authorized by law, the drafts of the DEIS and FEIS in response to comments from the Forest Service.

13. In consultation with the Forest Service and other state and federal agencies, hold public workshops, information meetings, and public hearings as required by Title XI of ANILCA, subsistence hearings as may be required under Title VIII of ANILCA, and other pertinent permitting processes.

14. Ensure that the Forest Service receives copies of all public and agency comments received during development of the DEIS, as well as public comments on the public DEIS and FEIS. The FAA shall provide the initial identification and classification of these comments to facilitate the Forest Service's review and response to those comments.

15. Ensure that the DEIS and FEIS identify the Forest Service as a Cooperating Agency and that the introductory section of these documents describes the role and authority of the Forest Service in this Project.

16. Provide the Forest Service 30 days for review of the preliminary draft of the DEIS and 30 days for review of the draft FEIS. The DEIS will be available for public review and comment for at least 45 days, as required by 40 CFR 1506.10(c).

17. Consult with the Forest Service regarding legal and management policy requirements regarding the Admiralty Island National Monument Kootznoowoo Wilderness.

18. Provide the Forest Service the opportunity to review technical reports documenting analysis of aviation and operational matters, such as selection of design aircraft for practicability analysis, alternative runway alignments, safety area designs, and sighting of airport facilities.

19. Retain sole responsibility for determining which alternative is selected as the FAA Preferred Alternative. Use any environmental analysis, alternative proposals, and

comments of the Forest Service to the maximum extent provided by law while still meeting Project purpose and need and all applicable FAA regulations.

20. Direct and administer all contract actions with the FAA's NEPA Contractor (SWCA) for preparation of the EIS. Any work requested by the Forest Service beyond that included in the SWCA's scope of services must be approved by the FAA prior to implementation.

V. FAA RESPONSIBILITES – TITLE XI OF ANILCA. With respect to compliance with Title XI of ANILCA, the FAA shall:

1. Be at all times the Lead Agency for the Angoon Airport EIS and one of the Federal agencies with decision-making responsibility for authorizing the Project as provided in Title XI of ANILCA.

2. Collaborate with the Forest Service to implement the NEPA process so that it provides an analysis to support the Parties' responsibilities under Title XI of ANILCA.

3. Process the application filed with the FAA by the ADOT-PF for the Project.

4. Review and determine the accuracy of the information in the Title XI application and inform the ADOT-PF in writing within 60 days of any information gaps or data inadequacies.

5. If more information is submitted, inform the ADOT-PF within 30 days regarding the adequacy of the new information.

6. Collaborate with the Forest Service to ensure consistency between the Title XI provisions and the EIS analysis.

7. Complete a draft EIS within 9 months and a final EIS within 12 months of the ADOT-PF application. Per ANILCA Title XI, if the timelines need to be extended, the FAA will inform ADOT-PF and the Forest Service, in writing, and will publish a notice of determination for timeline extensions and reasons for the extension in the Federal Register.

8. Hold public hearings in Washington DC and at appropriate locations in the State of Alaska, consistent with Title XI of ANILCA.

9. Within four months after publication of the FEIS, decide whether the FAA approves or disapproves the application and identify the reasons and findings supporting the FAA's position. In making its decision, the FAA shall make detailed findings as prescribed by Section 1104(g)(2) of ANILCA.

10. Promptly submit the recommendation, with detailed findings supporting the decision, to the President of the United States, as prescribed by Section 1106(b) of ANILCA.

VI. FOREST SERVICE RESPONSIBILITIES – NEPA PROCESS. As a Cooperating Agency in the NEPA process, the Forest Service shall:

1. Share data, information, and expertise to assist in the analysis of potential project impacts on resources within its jurisdictional authority or for which it has special expertise.

2. Participate in the NEPA process at the earliest possible opportunity, including providing comment regarding the project purpose and need, development of alternatives, public and agency scoping, and the environmental impact analysis.

3. Assist as needed in the FAA's government-to-government tribal consultation for the EIS process. Additionally, the Forest Service will initiate their own government-to-government tribal consultation process for specific project decisions under Forest Service jurisdiction.

4. Review and comment on resource technical reports and cause-and-effect analyses for resources within its jurisdictional authority or for which it has special expertise. Submit these comments within 30 days of the receipt of the reports and analyses.

5. Assist the FAA in developing mitigation measures for impacts to resources within the Forest Service's jurisdiction or special expertise.

6. Prepare and submit comments for inclusion in the public DEIS within 30 days of receipt of the preliminary DEIS. The Forest Service may also prepare and submit comments for inclusion in the FEIS within 45 days of receipt of the public DEIS.

7. Assist the FAA in developing responses to comments received on the DEIS and FEIS pertaining to resources within the Forest Service's jurisdiction or expertise.

8. Provide guidance and specific direction to the FAA concerning process or analysis necessary for the EIS to fulfill the Forest Service's internal decision-making process regarding any authorizations within its jurisdiction, including Title XI of ANILCA.

9. Prepare and submit Forest Service Record of Decision.

10. Prepare, if needed, a Forest Plan amendment for the Transportation Utility System (TUS) Land Use Designation (LUD), which will meet the needs of the Project.

VII. FOREST SERVICE RESPONSIBILITIES – TITLE XI OF ANILCA. With respect to compliance with Title XI of ANILCA, the Forest Service shall:

1. Be a Cooperating Agency for the Angoon Airport EIS and one of Federal agencies with decision-making responsibilities for authorizing the Project as provided in Title XI of ANILCA.

2. Collaborate with the FAA to implement the NEPA process so that it provides an analysis to support the Parties' responsibilities under Title XI of ANILCA.

3. Review and determine the accuracy of the information submitted by the ADOT-PF in its application. Coordinate with the FAA and inform the ADOT-PF in writing within 60 days of any information gaps or data inadequacies.

4. If more information is submitted, coordinate with the FAA and inform the ADOT-PF within 30 days regarding the adequacy of the new information.

5. Collaborate with the FAA to ensure consistency between the Parties with respect to processing the Title XI application and the NEPA process.

6. Cooperate with the FAA to facilitate completion of a draft EIS within 9 months and a final EIS within 12 months of the ADOT-PF's application.

7. Assist the FAA as necessary in preparation for public hearings in Washington DC and other locations consistent with Title XI of ANILCA.

8. Within four months after publication of the FEIS, decide whether the Forest Service tentatively approves or disapproves the application and identify the reasons and findings supporting the Forest Service's position. In making its decision, the Forest Service shall make detailed findings as prescribed by Section 1104(g)(2) of ANILCA.

9. Submit its decision, with detailed findings as prescribed by Section 1104(g)(2) of ANILCA supporting that decision, to the President of the United States.

10. If the Project is approved by the President and Congress as provided in Title XI of ANILCA, issue an appropriate authorization in accordance with Title V of the Federal Land Policy and Management Act of 1976 or other applicable law.

VIII. IT IS MUTUALLY AGREED AND UNDERSTOOD BY AND BETWEEN THE PARTIES THAT:

1. THE FAA AND FOREST SERVICE MUTUALLY AGREE TO: The Parties agree to participate in this EIS process in good faith and make every effort to resolve any perceived areas of conflict, to fully explore issues before coming to conclusions, and to commit to working collaboratively to ensure an efficient and accurate EIS process. The Parties will make every effort to effectively communicate throughout the process and employ innovative problem-solving approaches to resolve any differences related to EIS process, analysis, or other issues. Appoint an agency point of contact person annually (by January 1) through the life of this MOU.

2. FREEDOM OF INFORMATION ACT (FOIA). Any information furnished to the Forest Service under this instrument is subject to the Freedom of Information Act (5 U.S.C. 552).

3. VOIDANCE OF FINANCIAL CONFLICTS OF INTEREST. The Parties agree not to employ the services of any consultant, counsel or representative having a financial interest in the outcome of the proposed project.

4. NON-FUND OBLIGATING DOCUMENT. Nothing in this MOU shall obligate either the Forest Service or the FAA to obligate or transfer any funds. Specific work projects or activities that involve the transfer of funds, services, or property among the various agencies and offices of the Forest Service and the FAA will require execution of separate agreements and be contingent upon the availability of appropriated funds. Such activities must be independently authorized by appropriate statutory authority. This MOU does not provide such authority. Negotiation, execution, and administration of each such agreement must comply with all applicable statutes and regulations.

5. EFFECTIVE DATE. This MOU shall be effective upon the date of final signature and will remain effective unless modified as provided for elsewhere in this MOU.

6. PERIODIC REVIEW. Each year, the Parties shall evaluate the effectiveness of this MOU and determine the need for modification or continuation.

7. EFFECT ON OTHER AUTHORITIES. Nothing in this agreement alternates, amends or affects in any way the statutory or regulatory authorities of the Forest Service or the FAA.

8. MODIFICATION. Modifications within the scope of the MOU shall be made by mutual consent of the Parties, by the issuance of a written modification, signed and dated by the Parties, prior to any changes being performed.

9. TERMINATION. This MOU shall terminate on 12/31/2013. By mutual consent of the Parties, in writing, the MOU may terminate in whole or in part, at any time before the date of termination.

10. RESPONSIBILITIES OF PARTIES. The Forest Service and the FAA and their respective agencies and offices shall handle their respective activities and utilize their own resources, including the expenditure of their own funds, in pursuing these objectives. Each party shall carry out its separate activities in a coordinated and mutually beneficial manner.

11. AUTHORIZED REPRESENTATIVES: By their signatures below, the representatives of the FAA and Forest Service certify that they are authorized to act on behalf of their respective agencies for all matters related to this MOU.

12. AUTHORIZED REPRESENTATIVES: By signature below, the FAA certifies that the individual listed in this document as representative of the FAA is authorized to act in his respective area for matters related to this MOU.

APPROVED BY:

Byron K. Huffman
Division Manager
Federal Aviation Administration
Alaska Region, Airports Division

Date: 2/19/09

Dennis E. Bschor
Regional Forester
Alaska Region
USDA Forest Service

Date: 2/12/2009

The authority and format of this instrument has been reviewed and approved for signature.

/s/Mechele M. MacDonald 1/27/09

Mechele M. MacDonald Date
Agreements Specialist

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

April 3, 2009

Bill Martin, President
Central Council of the Tlingit and Haida
Indian Tribes of Alaska
320 West Willoughby Avenue, Suite 300
Juneau, Alaska 99801

RE: Angoon Airport Environmental Impact Statement

Dear President Martin,

The Federal Aviation Authority (FAA) is considering building a new land-based airport in or near the community of Angoon, Alaska. As part of our consideration of a new airport, the FAA will be preparing an environmental impact statement (EIS). Within the EIS the potential impacts that airport construction and access would have on the human and natural environment will be analyzed and disclosed. Among the issues to be analyzed are those related to cultural resources (such as archaeological sites, sacred sites, and traditional use sites) and Alaska Native customary and traditional practices. We anticipate that the preparation of the Angoon Airport EIS will take at least three years to complete.

In accordance with regulations of the National Historic Preservation Act (NHPA) as outlined in 36CFR800 and Executive Order 13175, the FAA has identified the Central Council of the Tlingit and Haida Indian Tribes of Alaska (CCTHITA) as a potential interested party with regards to cultural resources within the EIS project area. For this reason, we invite you to become a formal consulting party for the EIS. If you would like more information about the proposed airport and the EIS process before deciding whether you wish to become a consulting party, we encourage you to examine the project website at www.angoonairporteis.com. If you do not wish to be a formal consulting party but would still like to receive updates on the status of the EIS, notifications about public meetings, and copies of the draft and final EIS documents, we would be happy to accommodate you.

At the present time, the FAA has identified four preliminary airport location alternatives (see attached figure). Three of these location alternatives are on the east side of Favorite Bay on lands within the Admiralty Island National Monument/Kootznoowoo Wilderness Area. One location alternative is on the west side of Favorite Bay on lands owned by a combination of parties, including the City of Angoon, private individuals, and Kootznoowoo Incorporated. Access roads to each of these location alternatives are also being considered. The enclosed figure also depicts the preliminary access routes being considered for the four airport location alternatives.

The FAA conducted public scoping in which members of the public, agencies, and interested organizations provided comments on the proposed airport project, the potential environmental impacts that should be analyzed in the EIS, and the preliminary range of alternatives for consideration in the EIS. This public scoping comment period ended on December 31, 2008; however, the CCTHITA is still invited to provide comments at any time throughout the EIS process. Written comments can be sent to me via email or regular mail, or they can be submitted through the aforementioned project website.

The FAA has selected SWCA Environmental Consultants (SWCA) to assist us in preparing the EIS, addressing cultural resource issues, and consulting with interested parties such as the CCTHITA and the Angoon Community Association, with whom we have also been in contact. Specifically, Sheri Murray Ellis of SWCA has been assigned as the project lead for cultural resource issues. Ms. Ellis is available to you at any time, and she invites you to contact her with any questions you might have about the project.

If the CCTHITA wishes to become a formal consulting party for the EIS or if you would rather just receive updates on the project, please notify either Ms. Ellis or me. I can be reached via phone at (907) 271-5453, via email at Leslie.Grey@faa.gov, or at the address above. Ms. Ellis can be reached via phone at (801) 322-4307, via email at sellis@swca.com, or via regular mail at 257 East 200 South, Suite 200, Salt Lake City, Utah, 84111. We look forward to hearing from you.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Enclosure

cc: S. Ellis (SWCA)

MEMORANDUM OF AGREEMENT
Angoon Airport Environmental Impact Statement (EIS)
Angoon, Alaska
September 23, 2008

COOPERATING AGENCY – the Corps of Engineers

This MEMORANDUM OF AGREEMENT (MOA) is established and entered into by and between the Federal Aviation Administration, Alaskan Region (FAA) and the U.S. Army Corps of Engineers, Alaska District ("the Corps") (collectively the ""the parties"). The FAA has determined that FAA approval and funding for proposed construction by the Alaska Department of Transportation and Public Facilities ("the Sponsor") of a new land-based airport in or near the community of Angoon ("the Angoon Airport") constitutes a major Federal action significantly affecting the quality of the human environment and that an Environmental Impact Statement (EIS) is required. This MOA acknowledges FAA as the lead Federal agency and the Corps as a cooperating agency in preparation of the EIS. A goal of this MOA is to foster a working atmosphere of cooperation that serves the mutual interests of all parties and the public in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. § 4332) and as detailed in the Council for Environmental Quality (CEQ) regulations for Implementing the Procedural Provisions of NEPA (40 CFR §1500).

The EIS will analyze alternative locations for the Angoon Airport, potentially including one within Admiralty Island National Monument, which is managed by the U.S. Forest Service (USFS). This EIS serves an important function in disclosing project consequences to the public and agencies, and providing a process to develop an alternative that meets the needs of the community of Angoon while minimizing impacts to natural and human resources. The Corps can provide critical insight into resource concerns and appropriate analysis techniques for those resources under their jurisdiction or for which they have special expertise.

I. AUTHORITIES

FAA: The FAA has statutory authority to promote and develop a safe and efficient nation-wide system of airports adequate to meet the current and projected growth in aviation (49 U.S.C. 47101). In carrying out its statutory responsibilities, the FAA is responsible for ensuring that its actions comply with NEPA. The FAA's Airports Program is responsible for analyzing the environmental consequences of proposed Federal actions involving airports. As the lead Federal agency, the FAA is responsible for preparing the EIS (40 CFR ¶1501.5(a)), and for requesting the Corps to participate in the EIS as a cooperating agency (40 CFR ¶1506.6).

Corps: The Corps has the following statutory authorities and jurisdictions: Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 U.S.C. 403) requires Department of Army permits for structures or work in or affecting navigable waters of the United States; Section 404 of the Clean Water Act (CWA) of 1977 (33 U.S.C. 1344) requires permits for the discharge of dredged or fill material into waters of the United States, including wetlands, and; under Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1413), for the transport of dredged material for the purpose of dumping it into ocean waters.

II. INTRODUCTION

Under the policies, directives, plans, and operations of the FAA, and in compliance with NEPA and its accompanying regulations, the FAA, as lead agency, is responsible for requesting at its discretion the participation of "any other Federal agency which has jurisdiction by law" to be a cooperating agency (40 CFR § 1501.6). As a cooperating agency, the Corps, through the AUTHORITIES cited above, has jurisdiction by law over above-mentioned resources which could be impacted by the proposed Angoon Airport project. Additionally, the FAA and the Corps have interests in maintaining the "quality of the human environment" (40 CFR §1500) as it relates to any potential adverse impacts of the proposed Angoon Airport project. Accordingly, the FAA invites the Corps to participate as a cooperating agency in the Angoon Airport EIS process.

It is acknowledged that the FAA, as lead agency, has the responsibility for the content of the Draft EIS (DEIS), Final EIS (FEIS), and FAA's findings (i.e., Record of Decision). It is further acknowledged that the FAA seeks the full participation of the Corps as a cooperating agency. To this end, the FAA will provide to the Corps copies of all documents necessary for EIS review including technical reports for resources over which the Corps has jurisdictional authority or particular expertise; the preliminary DEIS (not for public review), the public DEIS, the preliminary FEIS (if prepared; not for public review), the public FEIS, and all public and stakeholder comments and information necessary for the EIS and its conclusions. The Corps will also share information and technical expertise in order to evaluate the potential operational impacts of the proposed action for the Angoon Airport and alternatives to that action, including the alternative of no action. It is the intention of this MOA to establish a working atmosphere of cooperation among the participants where full recognition and respect to the authority and responsibility of one another is recognized.

III. PURPOSE

The purpose of this MOA between the FAA and the Corps is to:

(1) formalize a framework for cooperation and coordination that fosters timely and efficient preparation of the DEIS and the FEIS;

(2) define the respective roles, obligations, and jurisdictional authority of the lead and cooperating agencies in the environmental review process;

(3) confirm the designations of the FAA as lead agency and the Corps as a cooperating agency in preparation of the EIS, with both agencies maintaining respective jurisdictional responsibilities as are established in the previously cited AUTHORITIES and applicable law;

(4) prepare a single EIS for the proposed Angoon Airport project that satisfies the NEPA and Section 404(b)(1) compliance requirements for the FAA and Corps; and

(5) ensure that the working relationship between the FAA and the Corps meets the purposes and intent of NEPA and its accompanying regulations.

The EIS is being prepared under the authority of NEPA and in compliance with the CEQ Regulations. The EIS will be prepared in accordance with the FAA's *National Environmental Policy Act Implementing Instructions for Airport Actions, Order 5050.4B*; FAA's *Policies and Procedures for Considering Environmental Impacts, Order 1050.1E*; and other regulations specific to the responsibilities of applicable state and Federal jurisdictions.

IV. STATEMENT OF MUTUAL BENEFITS AND THE PUBLIC INTEREST

It is in the interest of and beneficial to the Federal government, the State of Alaska, and the general public:

- That the FAA and the Corps work together in meeting their NEPA and Section 404(b)(1) guidelines compliance and other applicable regulatory responsibilities;
- That the FAA and the Corps coordinate efforts under this MOA in order to maximize use of available resources and minimize duplication in those areas of overlapping agency responsibilities; and
- For the FAA and the Corps to identify and resolve issues associated with each party's responsibilities and jurisdictions prior to issuance of the DEIS, FEIS, draft Permits, and public review processes.

V. THE FAA SHALL

(1) As the lead agency, have primary responsibility for meeting the compliance requirements of NEPA and for preparing the DEIS and FEIS for the Angoon Airport project. In this capacity, the FAA will ensure that the EIS includes information needed to address the compliance requirements of all cooperating agencies.

(2) Request that the Corps review the DEIS and FEIS (and preliminary DEIS and FEIS, if prepared) and comment on the Angoon Airport project's impacts, consistent with the Corps' jurisdiction or expertise, on the surrounding environment.

(3) Retain ultimate responsibility for determining the purpose and need of the Angoon Airport project, establishing the range of reasonable alternatives to be considered in the EIS, selecting the FAA's preferred alternative, proposing mitigation measures for the Angoon Airport project, and making conclusions about the project's environmental analysis. That the FAA retains such responsibilities does not preclude the right of the Corps to comment on these areas, or to make the final determination on the Corps' preferred alternative and associated mitigation measures for their permitting purposes.

(4) As appropriate, incorporate into the DEIS and FEIS comments, recommendations, and data submitted by the Corps.

(5) Consult with the Corps regarding the EIS issues of concern, the range of EIS

alternatives considered, and the associated mitigation measures to be analyzed in the EIS.

(6) In consultation with the Corps, include in the EIS written materials requested by the Corps to meet NEPA compliance and regulatory permitting requirements including information necessary to comply with the Section 404(b)(1) guidelines. Materials may include descriptions of waters of the United States, including wetlands and water resources; descriptions of biological resources; impacts and functional assessments to aquatic resources including wetlands; and the development and evaluation of mitigation measures.

(7) Include in the EIS an analysis of FAA's preferred alternative and a reasonable range of alternatives sufficient to meet both NEPA and any permit or approval requirements of the Corps for Section 404(b)(1) compliance.

(8) In consultation with the Corps and other state and Federal agencies, hold public workshops, information meetings, and public hearings for the EIS and permitting processes.

(9) Ensure that the Corps receives copies of all comments received during development of the DEIS (i.e., scoping) and on the DEIS and FEIS during the public comment periods. The FAA shall identify to the Corps those comments pertaining to the expertise or regulatory authority of the Corps, including those comments which may require the Corps to prepare or assist the FAA in preparing written responses for inclusion in the EIS.

(10) Ensure that the Notice of Intent (NOI) to prepare the EIS and the cover pages of the DEIS and FEIS identify the Corps as a cooperating agency and that the introduction section of the DEIS and FEIS briefly describes the Corps' roles and authorities.

(11) Provide to the Corps an EIS work schedule from the NOI to prepare an EIS to completion of the Record of Decision (ROD), and promptly inform the Corps of all schedule changes that would affect the Corps' input into the ROD.

(12) Provide to the Corps technical reports documenting analyses of aviation and airfield operational matters including reports regarding selection of design aircraft for practicability analysis and feasibility of alternative runway safety area designs. The FAA will maintain final authority for decisions related to aviation planning and safety.

VI. THE CORPS SHALL

(1) Concurrent with the scoping and FAA's development of the purpose and need statement for the DEIS and FEIS, independently develop (with input and comment from the FAA) the overall project purpose to establish the basis for the Corps' Section 404(b)(1) guidelines compliance determination.

(2) Prepare a Public Notice of the DA permit application concurrent with the release of the FEIS. The Corps' Public Notice comment period shall be the same as the comment period for the FEIS.

(3) Coordinate closely with the FAA in the preparation of the Corps' independent ROD within 90 days of publication the FEIS or publication of the FAA's ROD, whichever comes last.

(4) Help the FAA develop responses to comments received on the DEIS and FEIS that pertain to the Corps' areas of expertise. Similarly, the FAA maintains primary responsibility to respond to inquiries that relate to its special expertise, jurisdiction, and role as lead agency.

(5) Help the FAA in develop those mitigation measures pertaining to impacts affecting areas within the Corps' expertise; however, FAA maintains final authority for determining what mitigation measures will be proposed for the Angoon Airport project and which will be implemented for those resources under the FAA's jurisdiction. Similarly, the Corps will retain ultimate responsibility for determining which the Corps' preferred alternative and associated mitigation measures for its permitting process.

(6) Fully review the technical and scientific data supplied by the FAA.

(7) Compile and review those comments which are both within the umbrella of the NEPA, the CWA, the RHA, and Environmental Protection Agency 404(b)(1) and germane to alternatives within the scope of the FAA's and Corps' decisions for the Angoon Airport project.

(8) Prepare and submit to the FAA the Corps' written comments within 30 days of the Corps' receipt of technical reports.

(9) To the extent practicable, prepare and submit the Corps' written comments (plus any necessary supporting data for those comments) to the FAA for inclusion in the DEIS within 30 days of the Corps' receipt of the preliminary DEIS. The Corps shall prepare and submit to the FAA its written comments and data for inclusion in the FEIS within 45 days of the Corps' receipt of the public DEIS. The Corps shall submit responses to public comments on the DEIS, within the Corps' areas of expertise, to the FAA within 30 days from the Corps' receipt of those comments.

(10) Provide the FAA with timely input on significant issues, mitigation measures, and potential alternatives so that the FAA may consider including that input in the DEIS and FEIS.

(11) Guide and direct the FAA concerning work needed for the EIS to fulfill the Corps' regulatory evaluation and decision-making processes such that the FAA can develop those sections of the EIS in accordance with the expressed needs of the Corps. The Corps shall also assist the FAA in identifying the least environmentally-damaging practicable alternative to comply with the Section 404(b)(1) guidelines.

(12) Defer to the FAA in aviation and airfield operational matters, such as selection of design aircraft for practicability analysis, or feasibility of alternative runway safety area designs.

VII. THE PARTIES

(1) Shall participate in this EIS in good faith and make every effort to resolve any perceived areas of conflict. The parties further agree to fully explore issues before coming to conclusions, and to commit to searching for opportunities for resolution designed to contribute to an efficient and accurate EIS.

(2) Shall keep confidential and protect from public disclosure all FAA documents exchanged prior to determination of suitability for public review by the FAA, subject to the directives of the Freedom of Information Act.

(3) Shall inform all persons within the FAA and the Corps working on Angoon Airport EIS-related documentation (including internal drafts, technical memoranda, delineation reports, and so forth) of the confidentiality requirements noted in item VII(2) above to preclude public release of the documentation before a determination of suitability for public release has been made.

(4) Shall not employ the services of any representative or party having a financial interest in the outcome of the proposed Angoon Airport project. Consistent with 40 CFR § 1506.5(c), the parties shall also take all necessary steps to ensure that no conflict of interest exists with any consultants, counsel, or representatives they may employ in this undertaking.

(5) Shall terminate this MOA when the FAA issues its ROD. If any proposed implementation or mitigation measures within the ROD require further involvement of the Corps, the parties shall, at their discretion, either negotiate a new MOA that is specific to that involvement, or amend and extend this MOA.

(6) Agree that this MOA requires no transfer of appropriated funds and that any obligations contained herein are subject to appropriations by Congress.

(7) Agree that this MOA is effective upon execution of the signature of the parties.

(8) Agree to provide the other party at least 30 days written notice before withdrawing from this MOA.

(9) Agree that nothing in this MOA alters, amends, or affects in any way the statutory or regulatory authorities of the Corps or the FAA.

(10) Agree to make every reasonable effort, including innovative approaches to problem solving, to resolve differences relating to the EIS analysis, scope, alternatives, or other issues as may arise.

(11) Understand that the FAA is responsible for directing the work and actions of any third-party consultant that assists in the preparation of the EIS, and that any work requested by the Corps beyond that included in a consultant's scope of work must be pre-approved by the FAA.

(12) Establish the following points of contact for each party to this MOA:

FAA	Leslie Grey	Project Manager	(907) 271-5453	Leslie.Grey@FAA.gov
Corps	Victor Ross	Project Manager	(907) 753-2779	victor.o.ross.usace.army.mil

MOA Signatories

Byron K. Huffman, Manager
Alaskan Region, Airports Division
Federal Aviation Administration

4/6/09
Date

Victor Ross, Acting ~~Team Leader~~ Branch Chief
East Section, Regulatory Branch
U.S. Army Corps of Engineers, Alaska District

3/18/2009
Date

ANGOON AIRPORT
Environmental Impact Statement

Memo

To: Angoon Airport EIS Administrative Record

From: Sheri Ellis (SWCA)

CC: Leslie Grey (FAA); Matt Petersen (SWCA); Liz Perry (SWCA)

Date: July 28, 2009

Re: Change in government-to-government consultation protocol with the Angoon Community Association

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This memo is intended to serve as a record of a change in approach to government-to-government consultation with the federally recognized Angoon Community Association.

Background

In April 2008, the FAA and SWCA participated in a telephone conference with Matthew Fred, Jr., then president of the Angoon Community Association (ACA), and Albert Howard, Mayor of the City of Angoon. During the call, we discussed the approach to government-to-government consultation with the ACA, as well as general consultation protocols with the City. President Fred requested that all consultation with the ACA be carried out through the City (the Mayor's Office) so that both entities would be on the same page with regards to the project. Pursuant to this conversation, FAA prepared a letter outlining protocols to carry out consultation with the ACA through the City. These protocols were finalized in a letter agreement from the FAA dated July 2, 2008 (see attached).

Since establishment of the protocols, President Fred left his position with the ACA, and Mr. Wally Frank, Sr. took over as president.

Change in Approach

Given the change in leadership of the ACA, FAA determined it appropriate to meet with the new president while we were in Angoon on July 9, 2009. During a meeting held from 3pm to 5pm at the ACA community center, FAA met with President Frank and several members of the ACA Council, including Denise Jack (vice president); Alan Zuboff (Historian); Ed Gamble, Sr. (Administrator); Floyd Jim (Secretary); Kevin Frank (position?); and Walter Jack (position?).

During the meeting, FAA asked the Council how they would like to proceed with consultation and whether they wanted to continue consultation under the old protocols, whereby consultation would occur through the City, or to have direct consultation with the FAA. While we received no direct and clear answer to this question, President Frank alluded to the fact that the ACA and City may not agree on everything and said the FAA should talk to the ACA. FAA determined that the best approach hereafter is to engage the ACA in direct consultation and nullify the previously established protocols for consultation through the City. This memo documents this change for the administrative record.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

July 28, 2009

Bill Martin, President
Central Council of the Tlingit and Haida
Indian Tribes of Alaska
320 West Willoughby Avenue, Suite 300
Juneau, Alaska 99801

RE: Angoon Airport Environmental Impact Statement

Dear President Martin,

In early April of this year, the Federal Aviation Administration (FAA) sent you a letter (see attached) inviting the Central Council of the Tlingit and Haida Indian Tribes of Alaska (CCTHITA) to be a consulting party for the National Historic Preservation Act (NHPA) Section 106 process associated with the environmental impact statement (EIS) being prepared by the FAA for a proposed land-based airport in Angoon, Alaska. The proposed project has the potential to affect natural and heritage resources, including archaeological sites and traditional use sites, in the area of Favorite Bay; two potential airport locations on Admiralty Island National Monument and Kootznoowoo Wilderness Area lands and one potential location on private, municipal, and native corporation lands on the Angoon peninsula are being considered in the EIS. In accordance with regulations of the NHPA, as outlined in 36CFR800, and Executive Order 13175, the FAA invited CCTHITA to become a consulting party with regards to consideration of these resources.

As we have not heard from you as to whether you wish to become a consulting party, we would like to extend the invitation again. If you would like more information about the proposed airport and the EIS process before deciding whether you wish to become a consulting party, we encourage you to examine the project website at www.angoonairporteis.com or to contact me at the address in the letterhead or via the phone number at the end of this letter. If you do not wish to be a formal consulting party but would still like to receive updates on the status of the EIS, notifications about public meetings, and copies of the draft and final EIS documents, we would be happy to accommodate you.

The FAA has selected SWCA Environmental Consultants (SWCA) to assist us in preparing the EIS, addressing cultural resource issues, and consulting with interested parties such as the CCTHITA and the Angoon Community Association, with whom we have also been in contact. Specifically, Sheri Murray Ellis of SWCA has been assigned as the project lead for cultural resource issues. Ms. Ellis is available to you at any time, and she invites you to contact her with any questions you might have about the project.

If the CCTHITA wishes to become a formal consulting party for the EIS or if you would rather just receive updates on the project, please notify either Ms. Ellis or me. I can be reached via phone at (907) 271-5453, via email at Leslie.Grey@faa.gov, or at the address above. Ms. Ellis can be reached via phone at (801) 322-4307, via email at sellis@swca.com, or via regular mail at 257 East 200 South, Suite 200, Salt Lake City, Utah, 84111. We look forward to hearing from you.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Enclosure

cc: S. Ellis (SWCA)

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

July 28, 2009

Mr. Chris E. McNeil, Jr.
President and CEO
Sealaska Corporation
One Sealaska Plaza, Suite 400
Juneau, AK 99801

RE: Angoon Airport Environmental Impact Statement

Dear Mr. McNeil:

In early December 2008, the Federal Aviation Administration (FAA) sent you a letter (see attached) notifying you of FAA's consideration of a land-based airport near the community of Angoon and the agency's preparation of an environmental impact statement (EIS) to analyze and disclose the potential impacts to the natural and human environment from constructing such an airport. At that time, we also invited Sealaska to provide comment on the project and to sign up on the project mailing list to receive updates and announcements of upcoming meetings.

As we have not heard from you regarding Sealaska's interest in the project, I want to extend the invitation again for you to contact me to discuss the project or let me know if you would like to be added to our project mailing list. I also invite you to visit the EIS website at www.angoonairporteis.com to learn more about the project. You may also submit comments or sign up for the mailing list via the website.

At the time FAA contacted you in December, we had identified four preliminary airport location alternatives. Three of these alternatives were located on the east side of Favorite Bay, on lands within the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument-Wilderness Area). One was located on the west side of Favorite Bay, on lands owned by a combination of parties, including the City of Angoon, private individuals, and Kootznoowoo, Inc. Since then, we have narrowed the range of alternatives to three locations, two on Monument-Wilderness Area lands, and one on the Angoon peninsula (see attached figure). Access roads to each of these locations are also being considered.

Should you have any questions about the project, please feel free to contact me via phone at (907) 271-5453, via email at Leslie.Grey@faa.gov, or at the address above. I look forward to hearing from you.

Sincerely,

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Enclosure

cc: S. Ellis (SWCA)

ANGOON COMMUNITY ASSOCIATION

November 17, 2009

Leslie Grey, Project Manager
Angoon Airport EIS
222 West 7th Ave., Box #14
Anchorage, AK 99513-7587

Dear Ms. Grey,

This letter is in regard to the proposed "Angoon Airport EIS Public Meeting" to be held in Angoon on November 19, 2009.

In regard to the EIS the Tribal Government would like to express the concern on the location being reviewed for the proposed airport. The proposed site is between two subsistence use areas that need to be considered a sensitive area, let alone a wilderness area. The activity of an airport creates a concern for the stabilization of a wilderness. Even a small airport facility would change the area surrounding the airport from its subsistence and wilderness status, which would be unacceptable to the community.

The Tribal Government is in the process of doing road inventory with the Federal Government and we do have a road to Hood bay (IRR Route 0012) in our inventory. The airport would compliment the construction of this road.

The road would be built through City of Angoon and Kootznoowoo, Inc. properties.

The council of the Angoon Community Association recommends that immediate consideration be given to the area near the proposed road and that this be recorded as the position of the Community of Angoon.

After the EIS is done and if it does get approved, the facility to be built will be built to accommodate only Angoon. This being the case, the community of Angoon should have the final say on the location.

I am sure that you will carry the concern and let it be known to the final decision makers. Thank you.

Sincerely,
Wally R. Frank Sr.

Wally R. Frank, Sr., President

CC: Monument Manager
Peter Naoroz, President Kootznoowoo, Inc.
Albert Howard, Mayor Angoon

PO BOX 328 • ANGOON, ALASKA • 99820
PHONE: (907) 788-3411 • FAX: (907) 788-3412

LOCAL T&H COUNCIL
P.O. Box 139
Angoon, Alaska 99820

November 22, 2009

Ms. Leslie Grey, Project Manager
ANGOON AIRPORT EIS
222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587

RE: ACA Letter

Dear Ms. Grey:

We are in receipt of Angoon Community Association's (ACA) letter dated November 17, 2009, in which they ask that the purposed site of the Airport be relocated. ACA states the reason for their proposal to be the impact on subsistence.

The Local T&H Council's position, in addition the majority of Angoon, believes that the site purposed by ACA has already been evaluated and rejected early on. Because of this, we would state our support for the site that has survived the evaluation process.

Furthermore, to stop and reconsider another site at this stage would seriously jeopardize construction of our airport, something that none of us want. It is also our impression that the period for comments has passed and that we need to proceed.

Sincerely,

Daniel Johnson, Jr.
President
Local T&H Council

Cc: Mr. Wally Frnak, Sr., Angoon Community Association
Mr. Peter Naoroz, Kootznoowoo, Inc.
Mr. Albert Howard, City of Angoon
File [.../AA-EIS.001]

U.S. Department
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AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

January 21, 2010

President Wally R. Frank, Sr.
Angoon Community Association
P.O. Box 190
Angoon, AK 99820

Dear President Frank, Sr.:

I am writing in response to your letter of November 17, 2009, requesting that the Federal Aviation Administration (FAA) consider an airport alternative along IRR Route 0012, the proposed road to Hood Bay. I understand that the Angoon Community Association (ACA) has concerns about the airport site proposed by the Department of Transportation & Public Facilities (ADOT&PF) because of potential impacts to local subsistence use areas. The ADOT&PF completed an Angoon Airport Reconnaissance Study (2004) and an Airport Master Plan (2007) that identified and studied numerous potential airport locations. At the conclusion of the Airport Master Plan, the ADOT&PF selected Site 3 as the Master Plan preferred airport site.

Shortly after the completion of the Master Plan, the FAA began the Environmental Impact Statement (EIS) process to assess the proposed project. Recognizing that the proposed airport site would likely result in environmental impacts, a review was conducted early in the EIS process to determine if there are alternative airport locations that could meet the needs of the project while further reducing impacts. All previous airport location alternatives were reexamined to validate the ability of each to meet planning criteria and FAA airport safety and operational standards. Of the numerous sites reexamined, only three sites appear to be viable. One of the locations is on the east side of Favorite Bay (Airport Alternative 3a). One is near the head of Favorite Bay (Airport Alternative 4), and one is on the peninsula, south of the Salt Lagoon (Airport Alternative 12a). All three of these viable airport alternatives (3a, 4 and 12a) are being considered in the EIS in order to address potential impacts to subsistence and other resources. As required by Council of Environmental Quality regulations, the FAA is also considering a No Action Alternative, which evaluates the potential effects of not building an airport in Angoon. It is still early in the EIS process and at this time, the FAA has not identified any airport location as a preferred alternative.

With regard to alternatives in the Hood Bay area, based on the maps, it appears that the road to Hood Bay would parallel the western shoreline of the Angoon peninsula from an intersection with the existing road to the ferry terminal to Hood Bay. As noted above, through the planning and EIS processes, the ADOT&PF and the FAA have examined and considered several airport location alternatives along this proposed road. The supplemental aviation analysis completed for the EIS verifies the ADOT&PF's conclusions that the steep terrain of Hood Mountain precludes the ability for a safe and reliable airport to be built and operated in this area. The airport sites we considered but not meeting project standards include: Airport Sites 5, 6, 6a, 7, 8, and 12. While airport facilities may be able to be sited at these locations, the surrounding hilly terrain would interfere with the safe use of airport. Please, refer to the attached map for these airport locations.

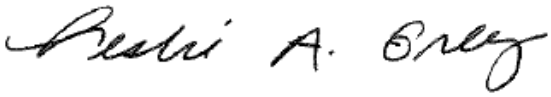
Specifically, the detailed aviation studies for Airport Site 5, which is located along the IRR 0012, concluded that just over 9,000 acres of terrain, including the top of Hood Mountain itself, and up to 8,900 acres of trees would have be to removed in order to eliminate obstacles (hazards) and render this location feasible for an airport. The magnitude of

these environmental impacts would be so substantial and so far reaching that the FAA cannot consider such an alternative to be viable. Therefore, Airport Site 5 was eliminated from further consideration in the EIS.

We appreciate the ACA's concern regarding the potential impacts of the airport project and your desire to help select an alternative that will work for the community long after the EIS is complete. Knowing the potential long-term effects an airport could have on the community, the FAA has made every effort to identify possible airport locations that will minimize the environmental impacts and still provide a safe and reliable airport for the residents of Angoon. After studying 15 possible locations around the Angoon area, the FAA has determined that the only three locations that can provide such an airport are those currently being studied in the EIS, and we cannot give further consideration to alternatives along IRR 0012.

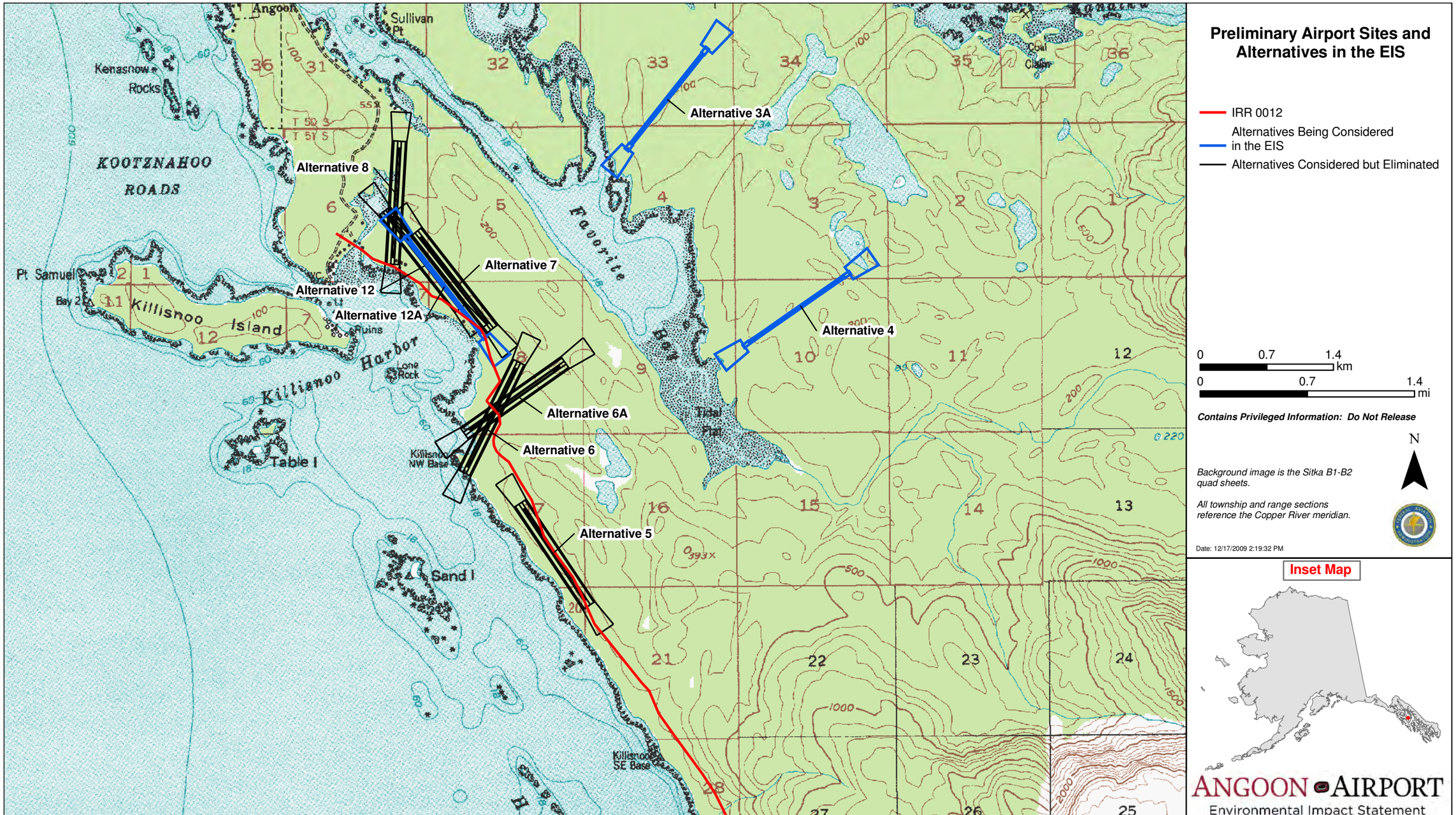
As always, please do not hesitate to contact me if you have questions. I can be reached at (907) 271-5454 or leslie.grey@faa.gov.

Sincerely,



Leslie Grey
FAA, Alaskan Region Airports Division
Angoon Airport EIS Project Manager

cc: S. Ellis (SWCA)
M. Marshall (USFS-Monument Mgr.)
P. Naoroz (Kootznoowoo)
A. Howard (Mayor)
D. Johnson, Jr. (Local T&H Council)
V. Skagerberg (DOT&PF)


Preliminary Airport Sites and Alternatives in the EIS
IRR 0012
Alternatives Being Considered in the EIS
Alternatives Considered but Eliminated
0 0.7 1.4 km
0 0.7 1.4 mi
Contains Privileged Information: Do Not Release
N
Background image is the Sitka B1-B2 quad sheets.
All township and range sections reference the Copper River meridian.
Date: 12/17/2009 2:19:32 PM
Inset Map
ANGOON AIRPORT
Environmental Impact Statement
Alternative 3A
Alternative 8
Alternative 7
Alternative 12
Alternative 12A
Alternative 4
Alternative 6A
Alternative 6
Alternative 5
Angoon
Sullivan Pt
Kenasnow Rocks
KOOTZNAHOO ROADS
Pt Samuel
Bay 2
Killisnoo Island
Killisnoo Harbor
Ruins
Lone Rock
Table I
Killisnoo NW Base
Killisnoo SE Base
Sand I
Favorite Bay
Tidal Flat
Coal Claim

U.S. Department
of Transportation
**Federal Aviation
Administration**

September 13, 2010

Mr. Wally Frank Sr.
President, Angoon Community Association
P.O. Box 188
Angoon, AK 99820-0328

Dear Mr. Wally Frank Sr.

I am writing you at the request of Ms. Echo Hawk. I had a wonderful conversation with Ms. Echo Hawk on Tuesday, August 31. She was a strong advocate for the land based airport project in Angoon, asked some excellent questions, and requested that I send you a letter responding to a Community concern.

First, I would like to express my sincere apologies. It is my understanding that the tribal council sent us an e-mail via the Angoon Environmental Impact Study webpage (http://www.angoonairporteis.com/main.html) and no response was received. I can assure you, that oversight was completely unintentional. We never received that e-mail and are currently looking into why not, and I have to thank Ms. Echo Hawk raising that issue to our attention. In the event future communication is not responded to in a timely manner, please contact me directly. My contact information is below.

It is my understanding that your community has concerns about the effect a security action, for example a Department of Homeland Security directed closure of airports, would have on your ability to continue a subsistence lifestyle. The concern is, would such an event impact your ability to provide for your families?

I can assure you a temporary closure of the airport due to a Federal or State security action will not have an impact on your community's ability to continue subsistence activities.

With the airport in place and operational, for safety and security reasons you would not be performing any subsistence activities on airport property. If the airport is closed due to a security action, the same square acreage would remain unavailable for subsistence activities. When considering subsistence activities, there is no difference between an operational airport and one that is closed for security purposes.

I do have to add the above answer represents only the opinion of this office, and does not speak for the Department of Homeland Security, the Department of Defense, or any other Federal or State department or agency that has legal authority to take security action. I would recommend that you contact these offices individually upon receipt of this letter.

In the future, if you have any questions, please feel free to contact me directly. My contact information is below.

Sincerely;

Michael Edelmann
FAA Airports Division
222 West 7th Ave., Suite 14
Anchorage, AK 99513

907-271-5026
mike.edelmann@faa.gov

CC:
Ms. Echo Hawk, ACA Travel Liaison

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

In Reply Refer To:
AIP-3-02-0018-0705

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 West 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565

April 12, 2012

Dear Ms. Bittner:

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Aviation Administration (FAA), is proposing to construct a new airport for the community of Angoon on Admiralty Island in Southeast Alaska. The FAA is preparing an environmental impact statement (EIS) to evaluate and disclose the potential impacts of the DOT&PF's proposed airport location (Airport Alternative 3a) and is considering two other airport location alternatives (Airport Alternatives 4 and 12a), three airport access road alternatives (Access Alternatives 2, 3, and 12a), and an alternative to take no action regarding the proposed airport. The DOT&PF has proposed the airport for lands located in Sections 33 and 34, Township 50 South, Range 68 East, and Section 4, Township 51 South, Range 68 East, Copper River Meridian (U.S. Geological Survey quadrangles Sitka B-1 and Sitka B-2). The two airport alternatives and the three access road alternatives are located near Sections 2–6, 8–10, 15, and 16, Township 51 South, Range 68 East. The DOT&PF's proposed airport location and the alternatives to it are depicted on Figure 1, enclosed. A portion of these lands is managed by the U.S. Forest Service (USFS) as the Admiralty Island National Monument and Kootznoowoo Wilderness Area. The remainder is privately owned; owned by Kootznoowoo, Inc. (the local native corporation); or owned by the City of Angoon. The USFS is a cooperating agency in the preparation of the EIS and a cooperator in the Section 106 process associated with the EIS.

Pursuant to 36 Code of Federal Regulations (CFR) § 800.4(c)(1)–(2), implementing regulations of Section 106 of the National Historic Preservation Act, the FAA and USFS have determined that a historic property is present in the area of potential effects (APE) for the proposed undertaking (hereafter referred to as the Project). The FAA and USFS also notify you of their intention to conduct phased identification of historic properties, as provided for in 36 CFR § 800.4(b)(2), and to consult with you regarding their findings of effect under separate cover.

The Project

The three airport alternatives being considered in the EIS are Airport Alternatives 3a, 4, and 12a. These alternatives were identified through detailed aviation planning, which indicated that extreme terrain in the area in and around Angoon limits the potential locations for airports that would meet FAA requirements for safe aircraft operations, particularly approaches and departures. Therefore, only a very small number of potential airport locations is considered viable, and the alignments of the runways at these locations are limited to within a few degrees of variation. Three access alternatives are also under consideration in the

EIS: Access Alternatives 2, 3, and 12a. At the time the field studies reported herein were conducted, a fourth access road alternative, Access Alternative 5, was also under consideration; however, the FAA has since eliminated this alternative from consideration.

The Project consists of a new airport and an associated access road. The Project—whether constructed at the DOT&PF's proposed location or at one of the alternative locations also being considered in the EIS—would require ground disturbance from both temporary construction activities and long-term or permanent structures and terrain alteration. The design of the Project is still in development. In general terms, the Project would consist of the following activities and components with the potential to affect historic properties:

- Vegetation clearing, excavation, and fill placement for the following:
    - A 3,300-foot-long, 75-foot-wide paved runway
    - A 150-foot-wide runway safety area centered on the runway centerline but extending 300 feet beyond each runway end
    - A 75-foot-wide, roughly 150-foot-long paved taxiway
    - A roughly 70,000-square-foot paved apron area with future hangar, lease lots, and passenger shelter space and vehicle parking space
    - A paved airport access road comprising two 9-foot-wide travel lanes with minimal shoulders
- Excavation of post holes and installation of an airport perimeter fence
- Vegetation clearing inside the airport perimeter fence in areas immediately surrounding the runway and taxiway
- Vegetation clearing in select locations outside the airport perimeter fence along the approach and departure paths
- Vegetation clearing in portions of the access road right-of-way to provide for line-of-sight
- Installation of an overhead power and telephone line along the access road right-of-way
- Construction of bridges and culverts (number and extent vary by airport and access road alternative)
- Possible excavation of material sources from one or more existing or newly developed material source locations
- Possible transfer of lands from federal ownership to state ownership (depending on selected airport alternative, a lease or special use permit under the Alaska National Interest Lands Conservation Act [ANILCA] Title XI may apply instead)

Area of Potential Effects

Because of the nature of EIS preparation and the timing during which identification of potentially significant resource conflicts needs to occur, field studies for cultural resources (and other resources) generally need to take place before the design of a proposed action and before any alternatives to the proposed action are sufficiently advanced to identify a distinct project footprint and all project design features to a degree that a firm direct and indirect effects APE can be established. For this reason, and because of the high cost of conducting cultural resource field studies in Angoon, the FAA opted to proceed with a process of phased definition of the APE and phased identification of historic properties to limit the survey of areas not directly or indirectly affected by the final alternatives. Therefore, the APE is defined as follows:

- **Phase 1 APE** (Figure 2, enclosed): The FAA identified a 1,000-foot-wide by 8,000-foot-long area (the Phase 1 APE) around each potential runway location within which most direct effects

from construction of the runway, taxiway, apron, and safety areas are likely to occur; this APE does not capture areas within which indirect effects might occur. The same approach was applied to potential access road locations, where a 50-foot-wide corridor along each road alignment was established as the Phase 1 APE. In total, these airport and access road APEs encompass 615 acres. Field studies have been conducted in these areas (see Historic Properties Identification Efforts below).

The APE was defined as such to obtain sufficient information to compare alternatives in the EIS relative to known or potential direct risk to historic properties. Relative potential direct effects on historic properties will also be estimated using the USFS cultural resources sensitivity model (see pages 16 and 17 section 5.2.1 of the enclosed report).

The FAA and USFS are using information obtained for the Phase 1 APE in partial fulfillment of the Section 106 process but recognize that it is insufficient to complete the Section 106 process.

- **Phase 2 APE:** When the airport and access road locations and designs have progressed sufficiently to allow for more concrete definition of the APE, the FAA, in consultation with the USFS, the State Historic Preservation Officer (SHPO), and other consulting parties, will re-define the APE to include all areas of anticipated direct <u>and</u> indirect effects. At this time, the FAA will see to it that additional field studies are conducted, as necessary, to fulfill the Section 106 process. This phase of APE definition is expected to occur between the draft EIS and final EIS, when the FAA has considered public and agency comments on the airport and access road locations and modifies the Project designs accordingly or, possibly, eliminates alternatives from further consideration. The FAA fully anticipates that this Phase 2 APE will be larger than the Phase 1 APE. A separate report of survey methods and findings for the Phase 2 APE will be prepared at a later date, and the FAA, in cooperation with the USFS, will consult with the SHPO regarding additional or amended determinations of eligibility and findings of effect.

Historic Properties Identification Efforts

Efforts to date to identify historic properties comprise the following: 1) a search of available site and project records from the Office of History and Archaeology and the Tongass National Forest, Admiralty Island National Monument office for areas within 1 mile of the Phase 1 APE; 2) oral interviews with elders and others from the community of Angoon; 3) consultation with the Angoon Community Association, the Central Council of the Tlingit and Haida Indian Tribes of Alaska, Sealaska Corporation, and Kootznoowoo, Inc.; and 4) archaeological field surveys in the Phase 1 APE. The cultural resource studies conducted to date constitute the first phase of a two-phase approach in identifying historic properties and in determining Project effects. This first phase considers the Phase 1 APE. The second phase will focus on a refined APE (the Phase 2 APE) that will be defined when the Project design details and FAA's preferred alternative are identified. The results of the first phase of study are contained in the enclosed report, Cultural Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement, Angoon, Alaska, prepared by SWCA Environmental Consultants (SWCA).

As a result of the identification efforts completed thus far, a single heritage resource site was identified in the Phase 1 APE. This site was previously documented by the USFS as SIT-00302 (the Favorite Bay Garden Site). See Figure 2 for the location of SIT-00302. At the time of their documentation, the USFS did not make a determination of the site's eligibility for the National Register of Historic Places (NRHP). SIT-00302 is located on the eastern shore of Favorite Bay. The site includes numerous discernable garden furrows and other landscape features likely attributable to the ethnographic and historic periods of

occupation in the area. Shovel probing conducted by SWCA uncovered an obsidian microblade within the site boundary, but no other prehistoric artifacts were identified.

Determination of Eligibility

The FAA and USFS believe that SIT-00302 is ***eligible for the NRHP under Criterion D***, as set forth in 36 CFR § 60.4 (see report pages 31–38). In compliance with the implementing regulations (36 CFR Part 800) of the NHPA, the FAA and USFS are affording the Alaska State Historic Preservation Officer an opportunity to comment on this evaluation.

The determination that the site is eligible for the NRHP is based on the following findings:

- Shovel probing identified a prehistoric artifact in a subsurface context, which indicates the potential for additional data regarding land-use patterns, palimpsests, and important research questions to be recovered.
- The presence of an obsidian microblade, the first found in the Angoon area, indicates the site has the potential to significantly refine present interpretations of the area's cultural chronology, tool stone acquisition practices, and, potentially, trade relationships.
- The site retains good archaeological integrity, which would allow for confidence in the vertical and horizontal relationships of artifacts, features, and cultural strata.

The FAA believes that the Favorite Bay Garden Site (SIT-00302) has minimal value for preservation in place and is important chiefly for what can be learned through data recovery, and, as per 23 CFR § 771.135(g), your concurrence would result in the FAA determining that Section 4(f) of the U.S. Department of Transportation Act would not apply.

Finding of Effect

As noted previously, the Project design is not sufficiently developed to fully evaluate its expected impacts on historic properties. As such, the FAA and USFS will make a finding of effect for SIT-00302 at a later date. We will consult with your office and with other consulting parties regarding this finding at that time.

Results of Consultation

The FAA has consulted with other parties, including the Project sponsor (DOT&PF), the USFS, the Angoon Community Association, the Central Council of the Tlingit and Haida Indian Tribes of Alaska, Sealaska Corporation, Kootznoowoo, Inc., and several members of the Angoon community as part of our efforts to identify historic properties. All consulting parties will receive a copy of this DOE. Beyond the USFS, only local community members and Kootznoowoo, Inc. have provided information regarding the potential locations of historic properties and their relative importance to the community. Other than SIT-00302, these parties have identified two other previously documented sites in the Favorite Bay area as being of cultural importance. These are a wood stake fish weir (SIT-00033) located in the tidally influenced channel of Favorite Creek and the Tlingit legend site of Beaver Tail Rock located along the eastern shoreline of Favorite Bay. Both of these sites are outside the Phase 1 APE.

At this time, we request your concurrence with our determination that SIT-00302, the Favorite Bay Garden Site, is eligible for the NRHP. We also request any information you may have regarding other considerations related to historic properties we should take into account. Please direct your concurrence or comments to me at the address above, by telephone at (907) 271-5453, or by e-mail at Leslie.Grey@faa.gov.

Sincerely,

Leslie A. Grey
FAA Project Manager
Angoon Airport EIS

Chad M. VanOmer
Monument Ranger
Admiralty Island National Monument
Tongass National Forest

Enclosures:

Figures 1 and 2
Office of History and Archaeology Coversheet
SWCA Environmental Consultants. 2012. *Cultural Resources Existing Conditions Technical Report for the Angoon Airport Environmental Impact Statement. Prepared for Federal Aviation Administration and Alaska Department of Transportation and Public Facilities.* Salt Lake City, Utah: SWCA.

cc w/o enclosures:

Verne Skagerberg, DOT&PF Southeast Region, Project Manager
Jane Gendron, DOT&PF Southeast Region, Regional Environmental Manager
Laurie Mulcahy, DOT&PF, Cultural Resources Manager

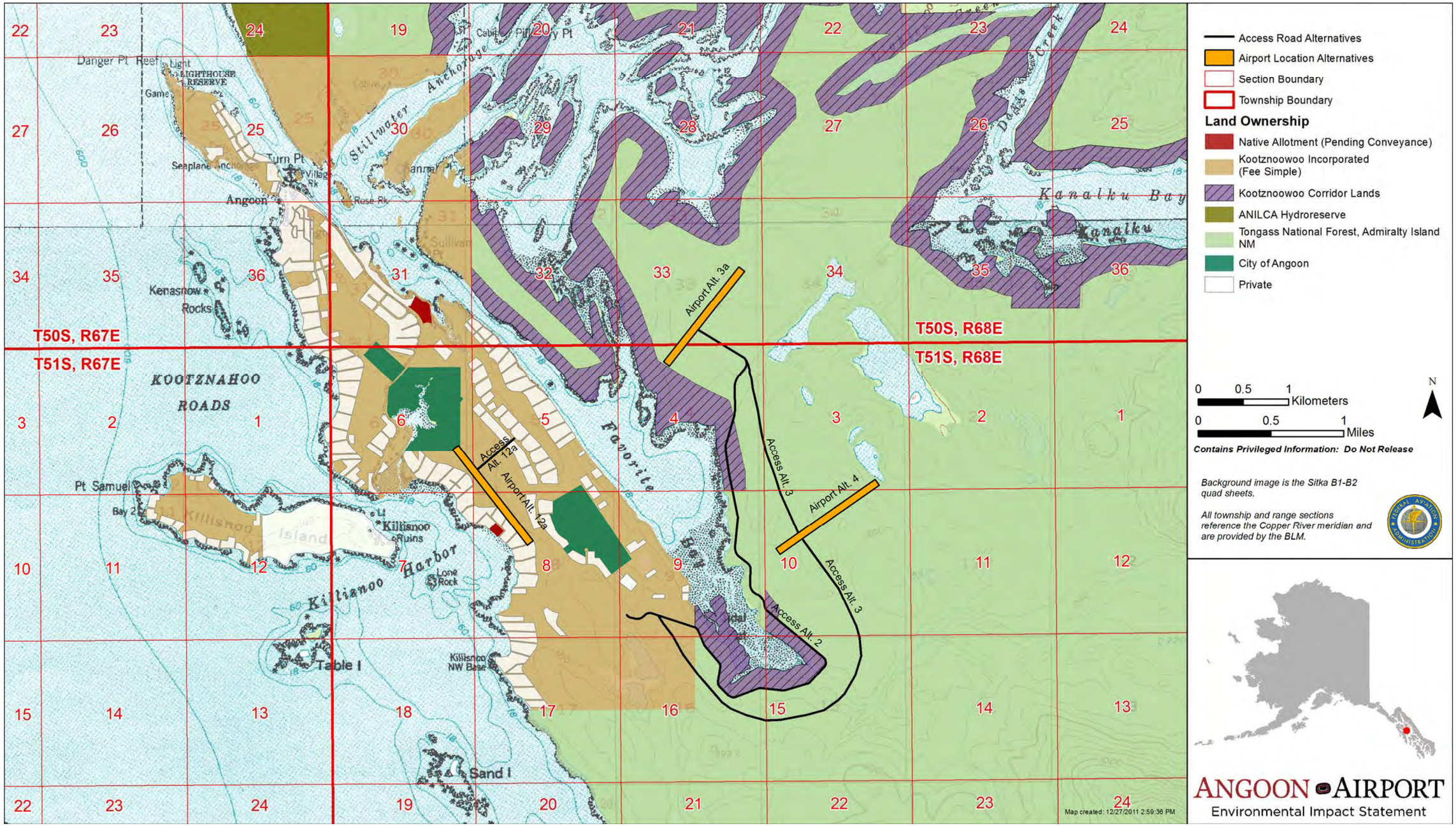


Figure 1. Airport location and access road location alternatives and land ownership.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

January 8, 2014

Randy Vigil
Juneau Regulatory Field Office
U.S. Army Corps of Engineers
8800 Glacier Highway, Suite 106
Juneau, AK 99801-8079

RE: Wetland and Waters Delineation for the Angoon Airport Environmental Impact Statement
Preliminary Jurisdictional Determination Report (JDR)
T51S, R68E, Sections 5, 6, and 8; Copper River Meridian (C.R.M.), Southeast Alaska
Site centroid = 57.4722˚N; -134.5468˚W; Study Area = 163.54 acres
Directions to Site: From the Angoon float plane dock, travel southeast on Killisnoo Road (NF-7430). Take the first gravel road to the left. Travel approximately 0.5 miles to the project site, located to the south of the gravel road.

Dear Randy:

Please find attached the preliminary JDR for the Angoon Airport Environmental Impact Statement located in Sections 5, 6, and 8 of T51S, R68E, C.R.M., on Admiralty Island in the Hoonah-Angoon Borough. This report was prepared by SWCA Environmental Consultants (SWCA) under the direction of the Federal Aviation Administration (FAA) and under contract with the Alaska Department of Transportation and Public Facilities (DOT&PF) to determine the extent of likely jurisdictional wetlands and waters in the 163.54-acre study area located in southeast Alaska, on the Sitka B-2 Alaska U.S. Geological Survey quadrangle. The study area consists of lands owned by private individuals, the City of Angoon, and Kootznoowoo, Inc. The purpose of this preliminary JDR is to define the extent of likely jurisdictional wetlands and waters in the study area for a wetland permit application for the proposed Angoon Airport.

The study area contains palustrine forested needle-leaved evergreen saturated organic (PFO4Bg), palustrine scrub-shrub needle-leaved/deciduous and broad-leaved deciduous saturated organic (PSS4/1Bg), and palustrine emergent persistent saturated organic (PEM1Bg) wetlands. In total, 128.43 acres of potentially jurisdictional wetlands were delineated in the study area. Two potentially jurisdictional perennial waters, totaling 1.31 acres, were also delineated in the study area. The wetland and waters delineation was conducted by Wetland Scientists Stacey Reed and Taya MacLean of SWCA from August 19 through August 22, 2013, and from September 14 through September 16, 2013.

The FAA will provide written land owner permission when necessary if you would like to conduct a site visit. Please let me know if you have any questions concerning the attached report, and whether you would like to schedule a site visit.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division

Angoon Airport EIS Project Manager

Attachment

cc: A. Childs (SWCA)
V. Skageberg (ADOT&PF)

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Mr. Wally Frank, Sr.
President
Angoon Community Association (ACA)
P.O. Box 328
Angoon, AK 99820

RE: Angoon Airport Environmental Impact Statement (EIS) Preferred Alternative

Dear Mr. Frank:

As you know, the Federal Aviation Administration (FAA) is preparing an EIS for a proposed land-based airport for the community of Angoon. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and tribal, public, and agency input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula on lands owned by a combination of parties, including the City of Angoon, private individuals, and Kootznoowoo, Inc. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' proposed action. The EIS analyzes and discloses the potential effects to the natural and human environment from constructing such an airport.

The intent of this letter is to inform you of the FAA's decision to identify a preferred alternative in the Draft Angoon Airport EIS. The bulk of the EIS analysis has been done, and the FAA is in the process of finalizing the agency review draft EIS. Based on the analysis completed to date, the FAA has decided to move forward with identifying Airport Alternative 12a with Access 12a as the preferred alternative. There are two key factors to this decision as follows:

1. Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303) requires transportation agencies to evaluate whether there are feasible and prudent alternatives to affecting lands determined to be 4(f) properties and demonstrate that planning has been done to avoid harm to the 4(f) property. The FAA has completed a draft 4(f) evaluation and determined that the Monument–Wilderness Area is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a

with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources.

2. Alaska National Interests Lands Conservation Act Section 1104(g)(2)(B) states that each federal agency should consider "alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit." Analysis in the EIS to date indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system unit).

CEQ and FAA guidance encourage us to identify the preferred alternative as soon as we have the justification to do so—and to communicate to the public that we believe this alternative is preferable to FAA. What this means is that on balance, we feel the preferred alternative minimizes effects while best fulfilling the project's purpose and need.

FAA's identification of 12a means that it is most likely to choose this alternative for the Record of Decision, but it is not guaranteed. Please provide your input during the draft EIS comment period, so that the FAA can better understand project effects to local resources for each of the action alternatives. We hope that knowing the FAA's preference helps you provide more informed comments.

As mentioned above, the FAA is currently finalizing the agency review draft EIS. At this time we anticipate that the agency review will occur during the fall of 2013, with the release of the public draft EIS in early 2014. We will continue to keep you updated on the status of the EIS as we get closer to this date.

We will be in Angoon on June 25, 2013 and we would like to meet with the ACA Tribal Council to discuss in person any concerns and questions that you have regarding the identification of this preferred alternative. Please email me by Friday, May 31, 2013, what time you would like to meet on June 25.

Should you have any questions about the project, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above. I look forward to hearing from you.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA

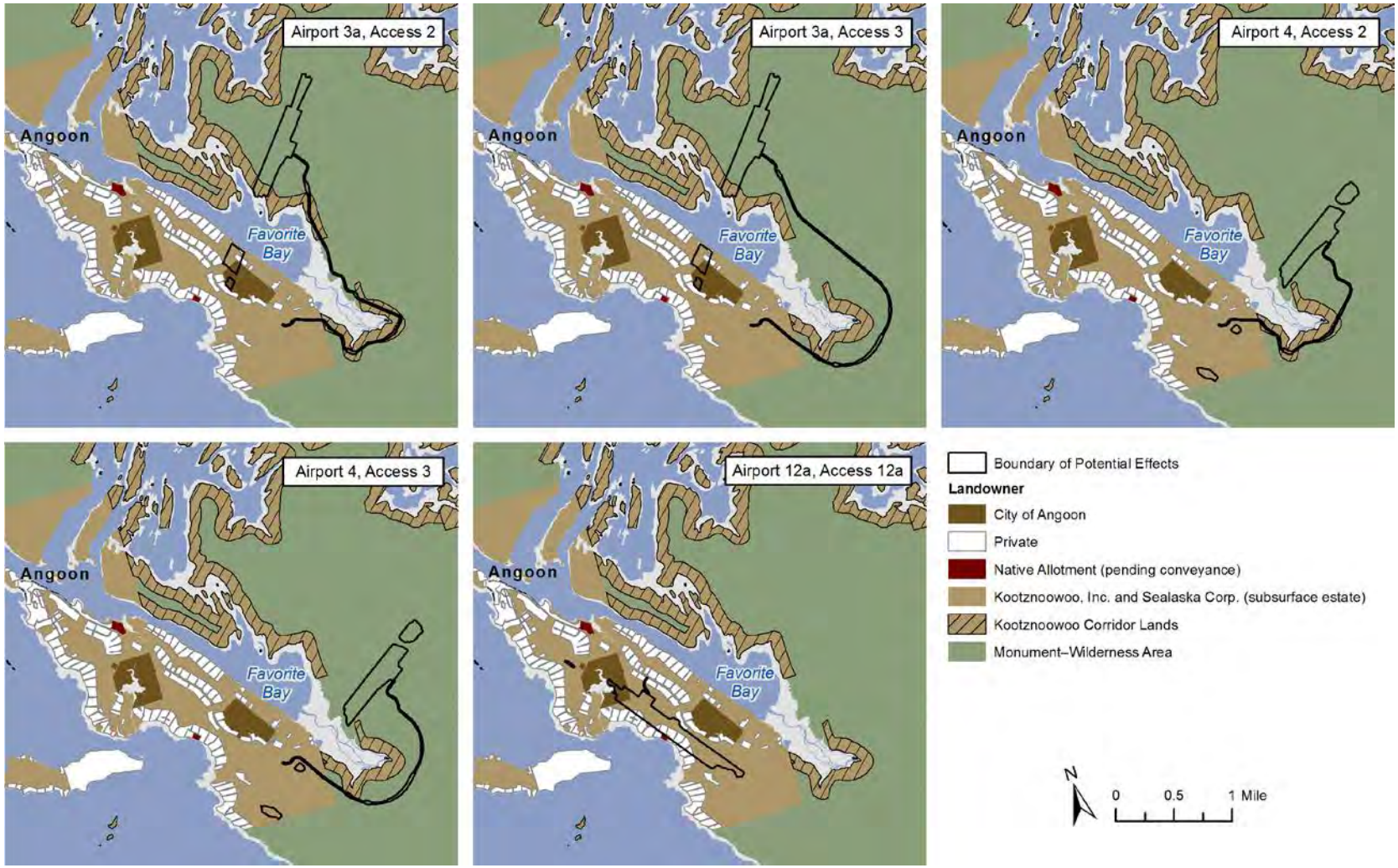


Figure 1. Alternatives analyzed in the EIS.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Mr. Peter Naoroz, Chief Executive Officer
Kootznoowoo, Inc.
8585 Old Dairy Road, Suite 104
Juneau, AK 99801

RE: Angoon Airport Environmental Impact Statement (EIS) Preferred Alternative

Dear Mr. Naoroz:

As you know, the Federal Aviation Administration (FAA) is preparing an EIS for a proposed land-based airport for the community of Angoon. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and tribal, public, and agency input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula on lands owned by a combination of parties, including the City of Angoon, private individuals, and Kootznoowoo, Inc. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' proposed action. The EIS analyzes and discloses the potential effects to the natural and human environment from constructing such an airport.

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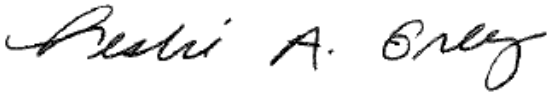
The EIS team will be in Juneau and Angoon the week of June 24 and we would like to meet with you to discuss any concerns and questions that you have regarding the identification of this preferred alternative. Please email me what time you are available to meet on Monday, June 24 or Wednesday, June 26.

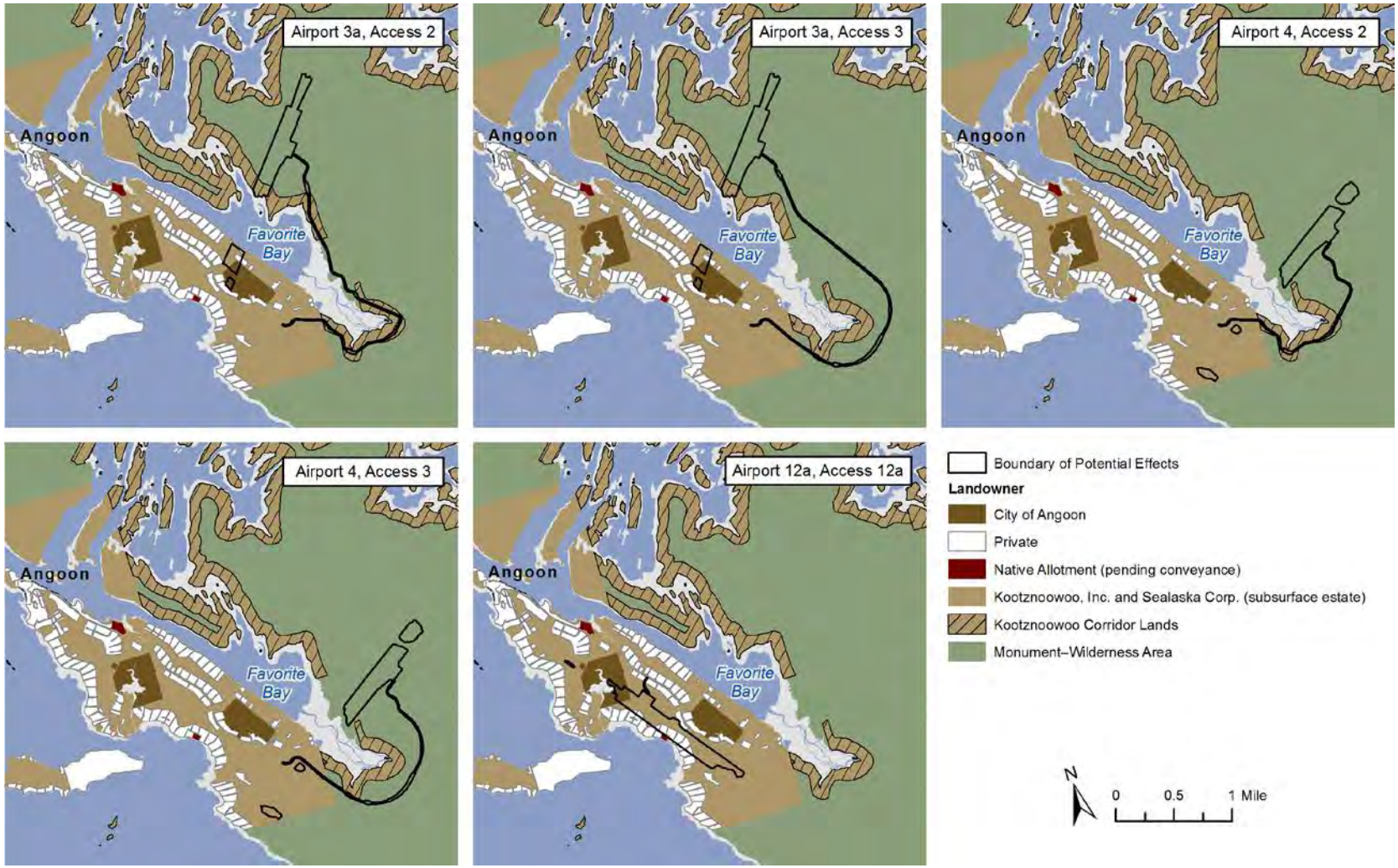
Should you have any questions about the project, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above. I look forward to hearing from you.

Sincerely,



Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA



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U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Mr. Richard George, Mayor
City of Angoon
P.O. Box 40
Angoon, AK 99820

RE: Angoon Airport Environmental Impact Statement (EIS) Preferred Alternative

Dear Mr. George:

As you know, the Federal Aviation Administration (FAA) is preparing an EIS for a proposed land-based airport for the community of Angoon. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and tribal, public, and agency input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula on lands owned by a combination of parties, including the City of Angoon, private individuals, and Kootznoowoo, Inc. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' proposed action. The EIS analyzes and discloses the potential effects to the natural and human environment from constructing such an airport.

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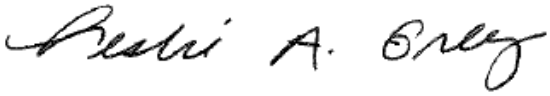
We will be in Angoon on June 25, 2013 and we would like to meet with you and the City Council to discuss in person any concerns and questions that you have regarding the identification of this preferred alternative. Please email me by Friday, May 31, 2013, what time you would like to meet on June 25.

Should you have any questions about the project, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above. I look forward to hearing from you.

Sincerely,



Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA

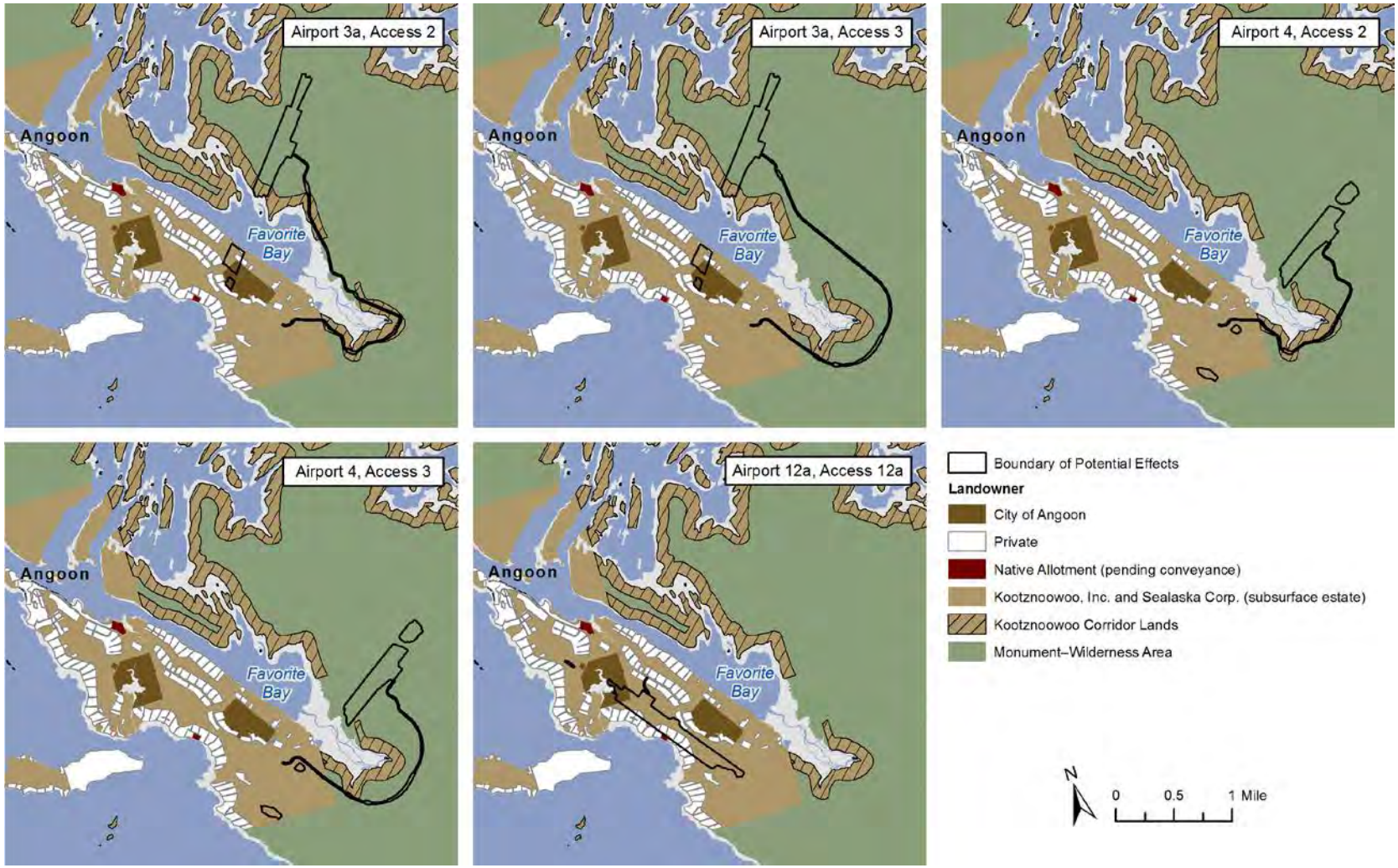


Figure 1. Alternatives analyzed in the EIS.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Kate Savage, Marine Mammal Specialist
NMFS Alaska Region
Protected Resources Division
P.O. Box 21668
Juneau, AK 99802

Re: Angoon Airport EIS Preferred Alternative

Dear Ms. Savage:

As you know, the Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) for a proposed land-based airport for the community of Angoon in Southeast Alaska. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and public, agency, and tribal input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' (DOT&PF's) proposed action.

The intent of this letter is to inform you of the FAA's decision to identify a preferred alternative in the Draft Angoon Airport EIS. The bulk of the analysis has been done, and the FAA is in the process of finalizing the EIS for agency review. Based on the analysis completed to date, the FAA has decided to move forward with identifying Airport Alternative 12a with Access 12a as the preferred alternative. There are two key factors to this decision as follows:

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2. Alaska National Interests Lands Conservation Act (ANILCA) Section 1104(g)(2)(B) states that each federal agency should consider "alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit." Analysis in the EIS to date indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system).

The identification of the preferred alternative in the Draft EIS rather than the Final EIS alters several project milestones. Specifically, because the preferred alternative is not located in the Monument–

Wilderness, the DOT&PF will not be submitting an ANILCA application with the agency review draft EIS as had been planned. An ANILCA application would only need to be filed if, after receiving and reviewing comments received from agencies and the public on the Draft EIS, FAA decides not to select 12a and instead decides to select Airport 3a or Airport 4.

As mentioned above, the FAA is finalizing the agency review draft EIS. At this time we anticipate that this draft will be available in September 2013 followed by a 30-day review period. We will continue to keep you updated on the status as we get closer to this date.

The EIS team will be in Juneau and Angoon the week of June 24. We would like to meet with you and Ms. Derr in person to discuss your review of the agency review draft EIS and discuss future coordination. Please email your availability for Monday, June 24 or Wednesday, June 26.

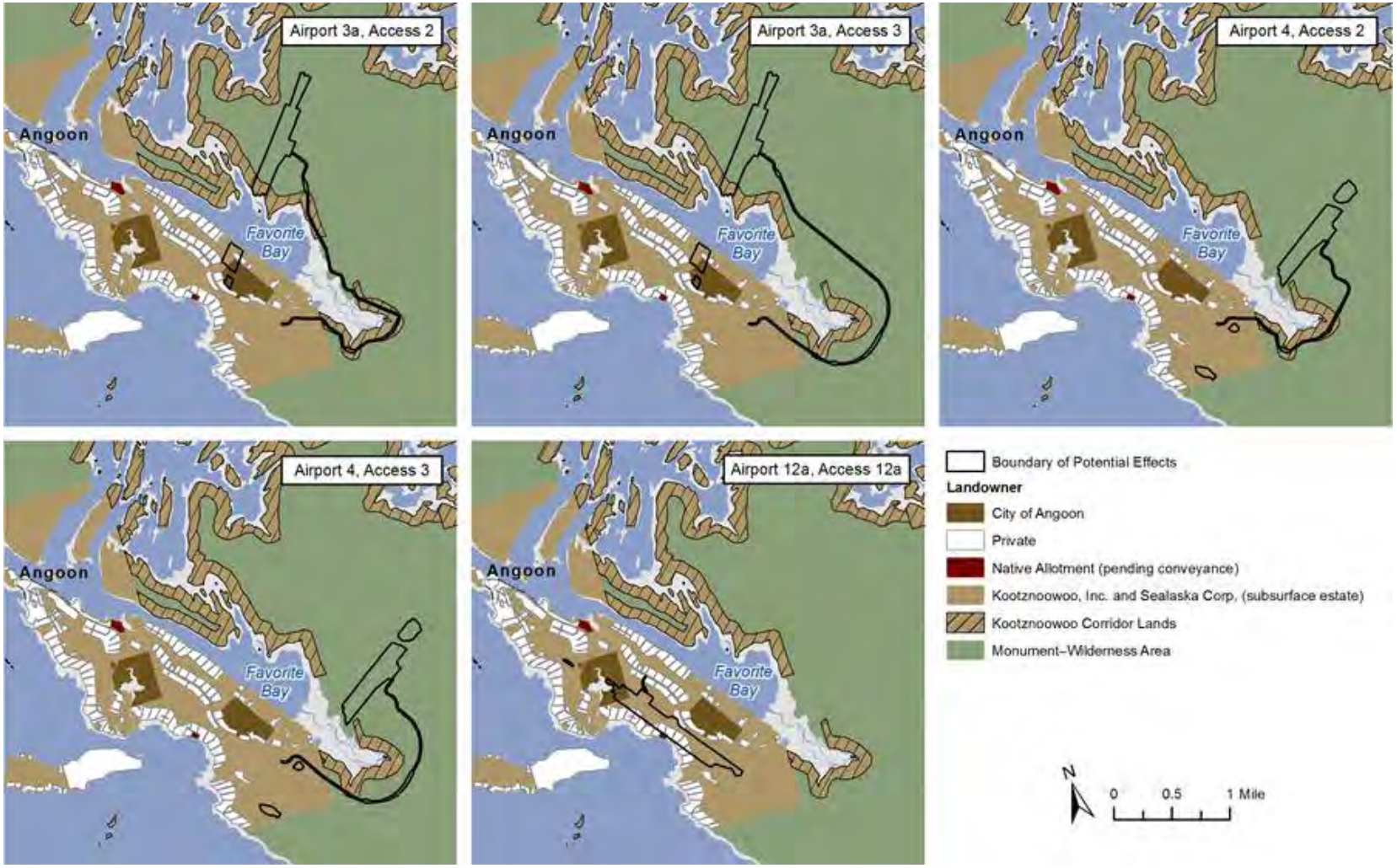
Should you have any questions, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Jon Kurland, Director
Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA



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U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Randall Vigil
US Army Corp of Engineers, Alaska District
CEPOA-RD, Juneau Field Office
P.O. Box 22270
Juneau, AK 99802-9998

Re: Angoon Airport EIS Preferred Alternative

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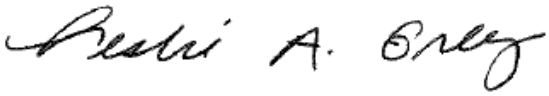
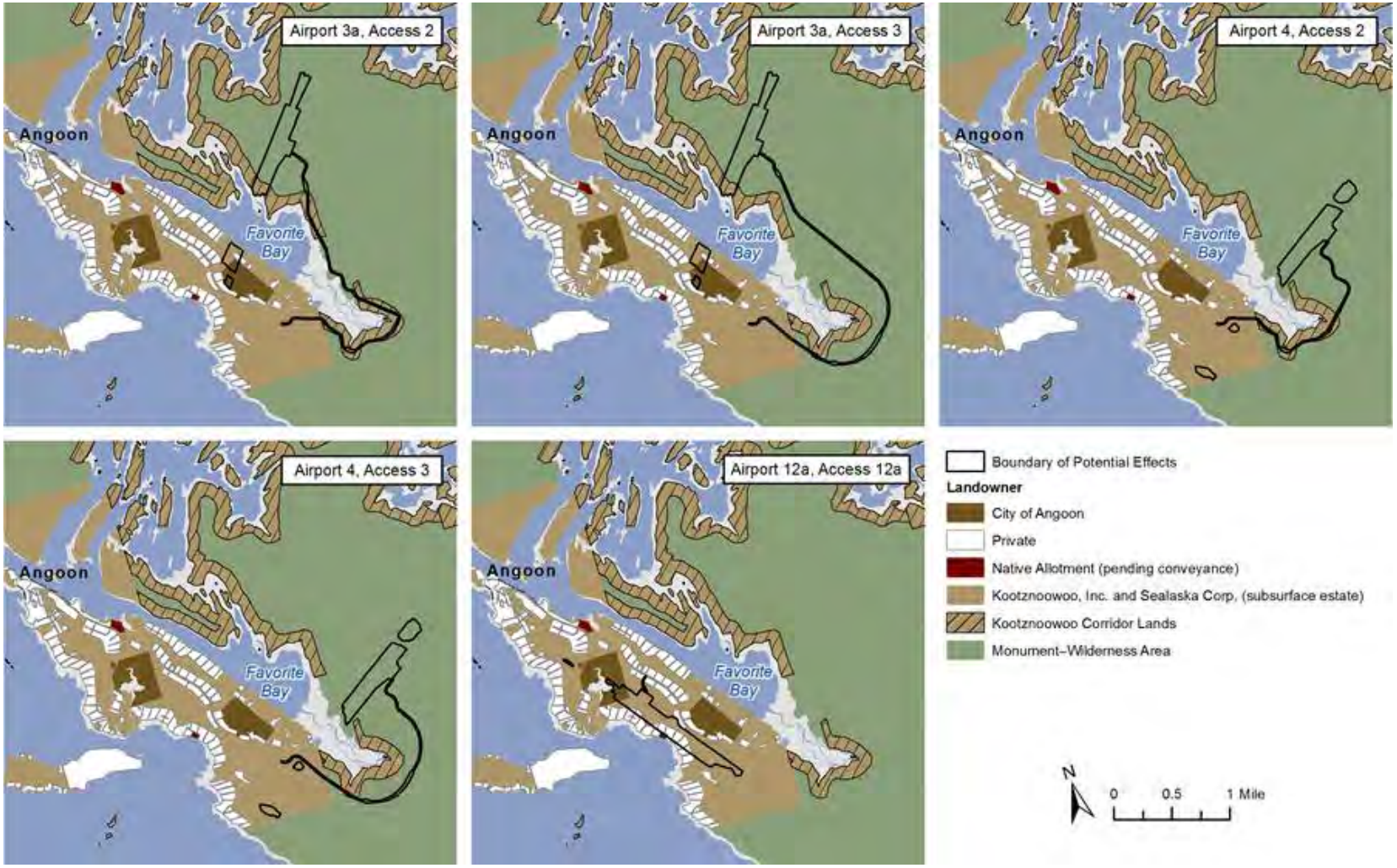


Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA



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U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Jennifer Curtis
EPA Region 10
222 West 7th Ave #19
Anchorage, Alaska 99513

Re: Angoon Airport EIS Preferred Alternative

Dear Ms. Curtis:

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The identification of the preferred alternative in the Draft EIS rather than the Final EIS alters several project milestones. Specifically, because the preferred alternative is not located in the Monument–Wilderness, the DOT&PF will not be submitting an ANILCA application with the agency review draft

EIS as had been planned. An ANILCA application would only need to be filed if, after receiving and reviewing comments received from agencies and the public on the Draft EIS, FAA decides not to select 12a and instead decides to select Airport 3a or Airport 4.

As mentioned above, the FAA is finalizing the agency review draft EIS. At this time we anticipate that this draft will be available in September 2013 followed by a 30-day review period. We will continue to keep you updated on the status as we get closer to this date.

Should you have any questions, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above.

Sincerely,

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA

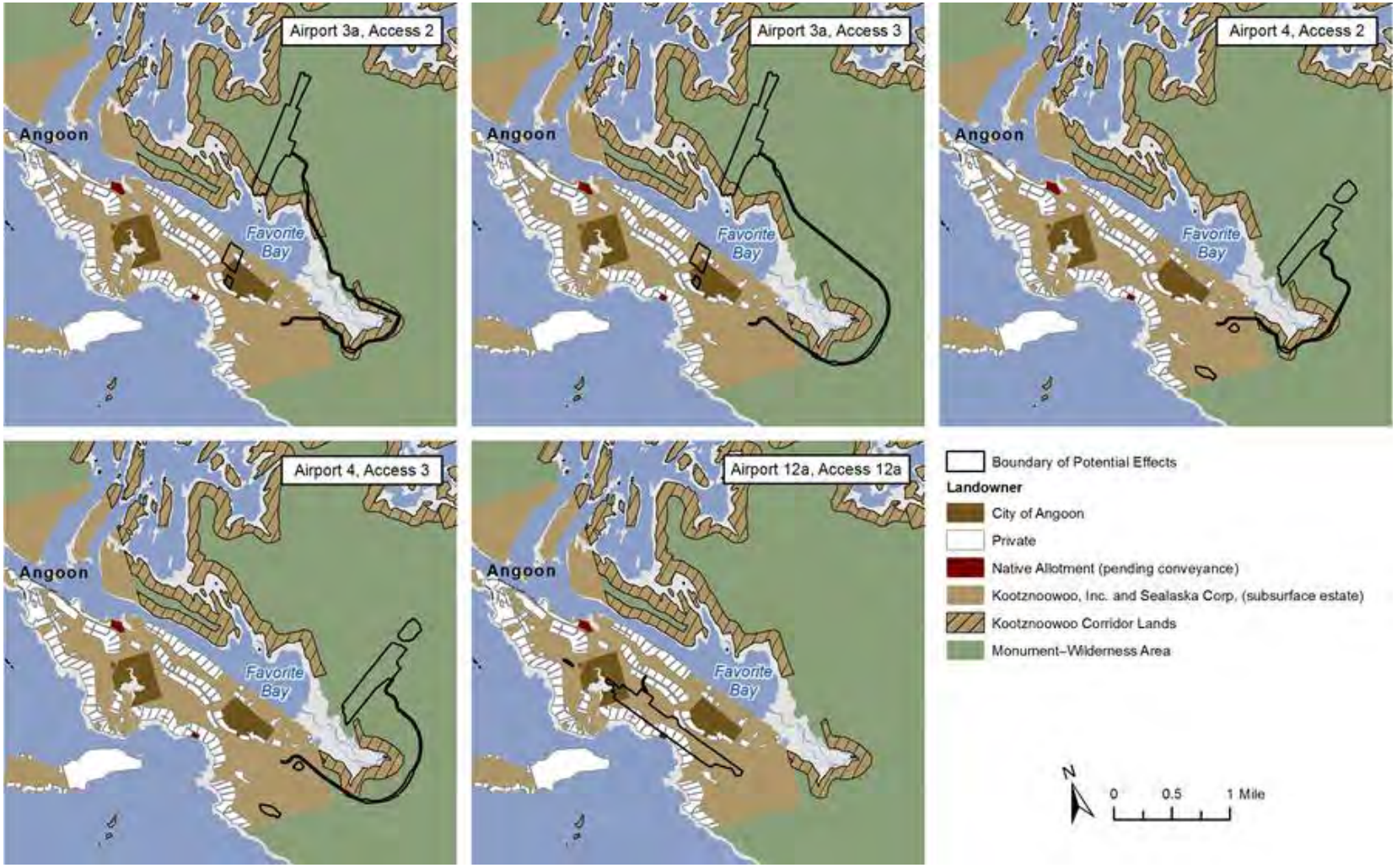


Figure 1. Alternatives analyzed in the EIS.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Matt LaCroix
EPA Region 10
222 West 7th Ave #19
Anchorage, Alaska 99513

Re: Angoon Airport EIS Preferred Alternative

Dear Mr. LaCroix:

As you know, the Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) for a proposed land-based airport for the community of Angoon in Southeast Alaska. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and public, agency, and tribal input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' (DOT&PF's) proposed action.

The intent of this letter is to inform you of the FAA's decision to identify a preferred alternative in the Draft Angoon Airport EIS. The bulk of the analysis has been done, and the FAA is in the process of finalizing the EIS for agency review. Based on the analysis completed to date, the FAA has decided to move forward with identifying Airport Alternative 12a with Access 12a as the preferred alternative. There are two key factors to this decision as follows:

1. Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303) requires transportation agencies to evaluate whether there are feasible and prudent alternatives to affecting lands determined to be 4(f) properties and demonstrate that planning has been done to avoid harm to the 4(f) property. The FAA has completed a draft 4(f) evaluation and determined that the Monument–Wilderness Area is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources.

2. Alaska National Interests Lands Conservation Act (ANILCA) Section 1104(g)(2)(B) states that each federal agency should consider "alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit." Analysis in the EIS to date indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system).

The identification of the preferred alternative in the Draft EIS rather than the Final EIS alters several project milestones. Specifically, because the preferred alternative is not located in the Monument–Wilderness, the DOT&PF will not be submitting an ANILCA application with the agency review draft

EIS as had been planned. An ANILCA application would only need to be filed if, after receiving and reviewing comments received from agencies and the public on the Draft EIS, FAA decides not to select 12a and instead decides to select Airport 3a or Airport 4.

As mentioned above, the FAA is finalizing the agency review draft EIS. At this time we anticipate that this draft will be available in September 2013 followed by a 30-day review period. We will continue to keep you updated on the status as we get closer to this date.

Should you have any questions, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above.

Sincerely,

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA

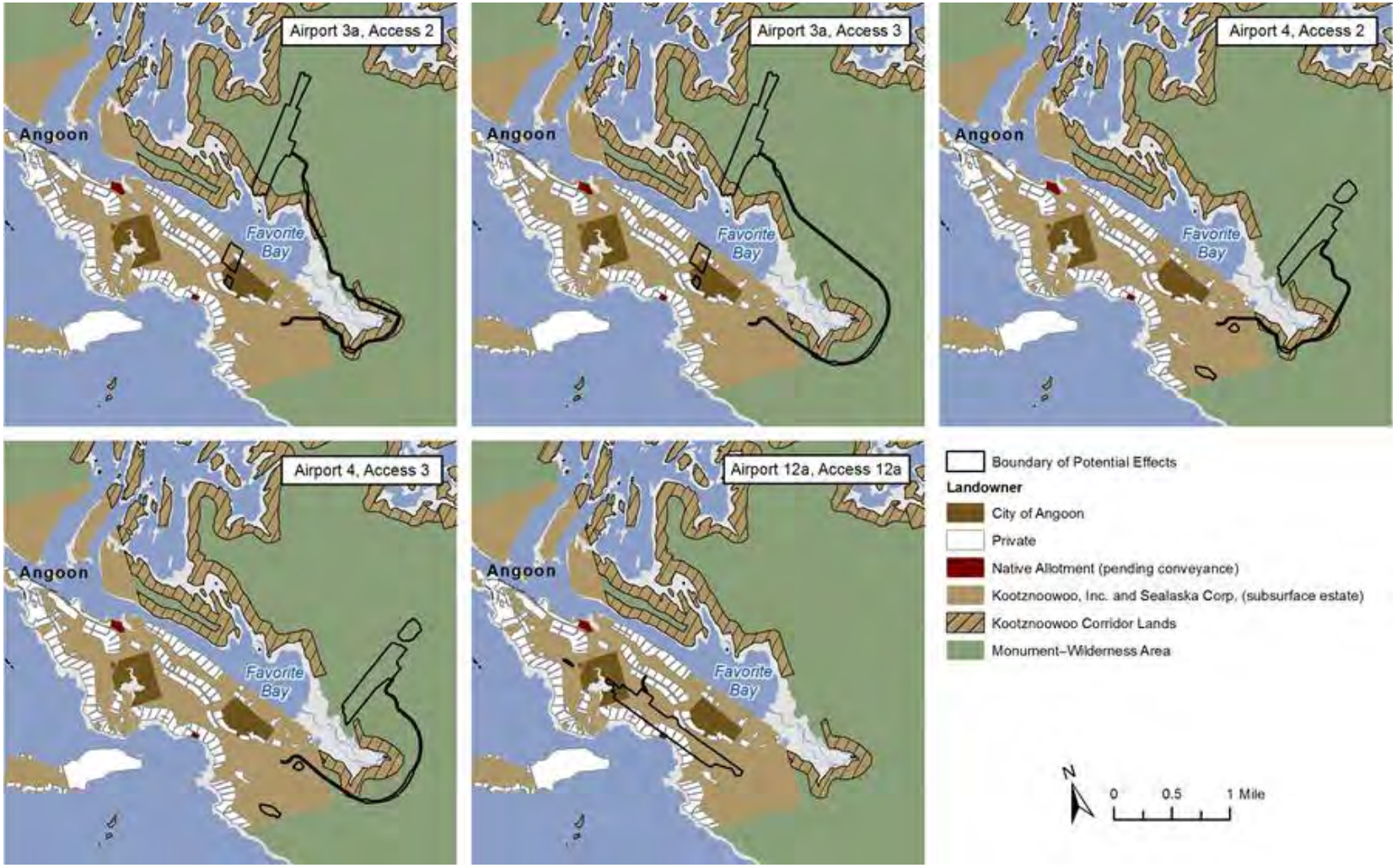


Figure 1. Alternatives analyzed in the EIS.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Richard Enriquez
USFWS
Juneau Field Office
3000 Vintage Blvd., Suite 201
Juneau, Alaska 99801

Re: Angoon Airport EIS Preferred Alternative

Dear Mr. Enriquez:

As you know, the Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) for a proposed land-based airport for the community of Angoon in Southeast Alaska. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and public, agency, and tribal input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' (DOT&PF's) proposed action.

The intent of this letter is to inform you of the FAA's decision to identify a preferred alternative in the Draft Angoon Airport EIS. The bulk of the analysis has been done, and the FAA is in the process of finalizing the EIS for agency review. Based on the analysis completed to date, the FAA has decided to move forward with identifying Airport Alternative 12a with Access 12a as the preferred alternative. There are two key factors to this decision as follows:

1. Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303) requires transportation agencies to evaluate whether there are feasible and prudent alternatives to affecting lands determined to be 4(f) properties and demonstrate that planning has been done to avoid harm to the 4(f) property. The FAA has completed a draft 4(f) evaluation and determined that the Monument–Wilderness Area is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources.

2. Alaska National Interests Lands Conservation Act (ANILCA) Section 1104(g)(2)(B) states that each federal agency should consider "alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit." Analysis in the EIS to date indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system).

The identification of the preferred alternative in the Draft EIS rather than the Final EIS alters several project milestones. Specifically, because the preferred alternative is not located in the Monument–

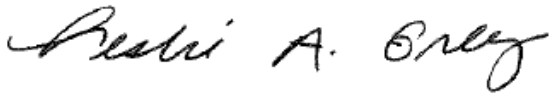
Wilderness, the DOT&PF will not be submitting an ANILCA application with the agency review draft EIS as had been planned. An ANILCA application would only need to be filed if, after receiving and reviewing comments received from agencies and the public on the Draft EIS, FAA decides not to select 12a and instead decides to select Airport 3a or Airport 4.

As mentioned above, the FAA is finalizing the agency review draft EIS. At this time we anticipate that this draft will be available in September 2013 followed by a 30-day review period. We will continue to keep you updated on the status as we get closer to this date.

The EIS team will be in Juneau and Angoon the week of June 24. We would like to meet with you in person to discuss your review of the agency review draft EIS and discuss future coordination. Please email your availability for Monday, June 24 or Wednesday, June 26.

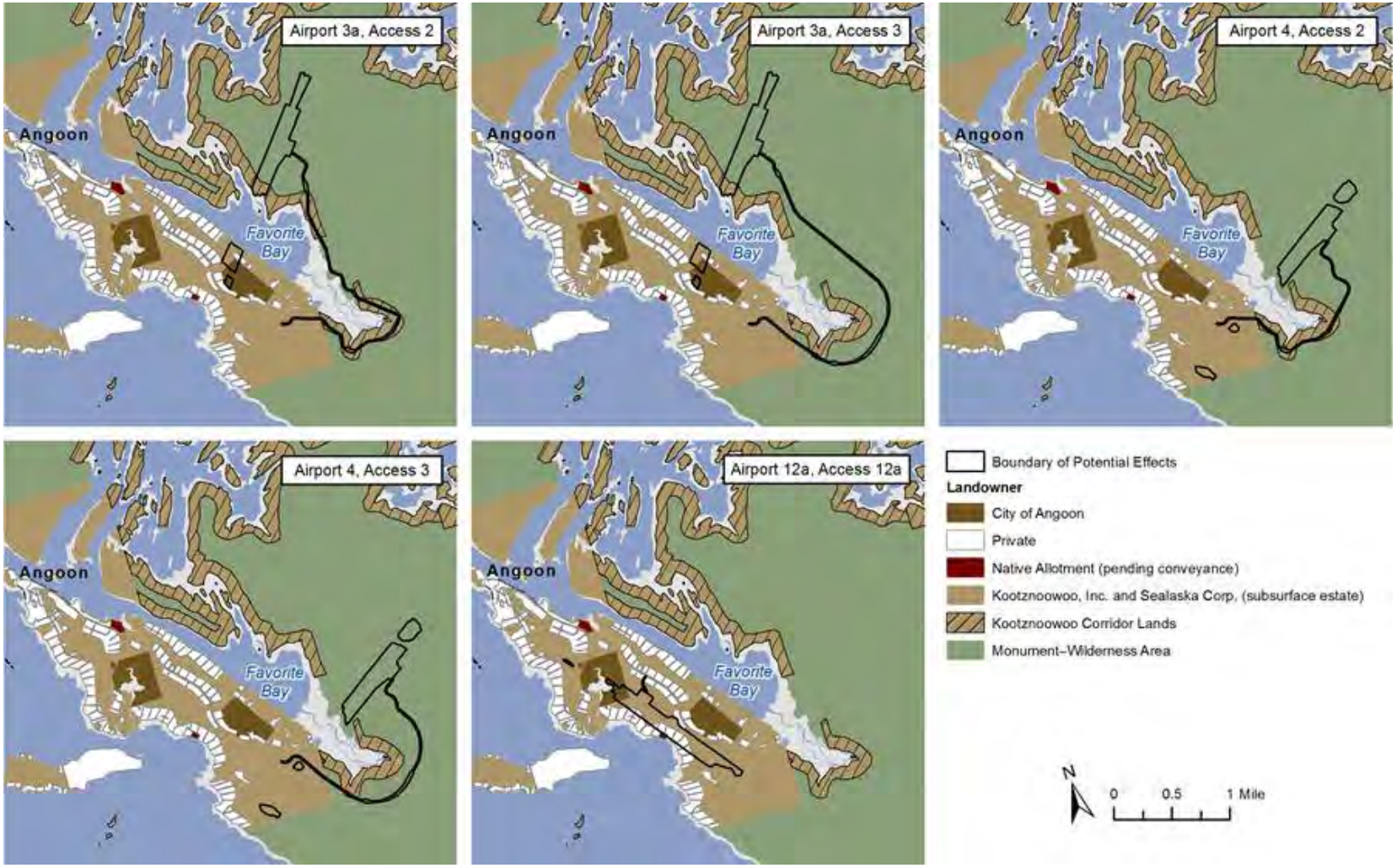
Should you have any questions, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above.

Sincerely,



Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA



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U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Beth Pendleton, Regional Forester
U.S. Forest Service, Alaska Regional Office
P.O. Box 21628
Juneau, AK 99802-1628

Re: Angoon Airport EIS Preferred Alternative

Dear Ms. Pendleton:

As you know, the Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) for a proposed land-based airport for the community of Angoon in Southeast Alaska. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and public, agency, and tribal input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' (DOT&PF's) proposed action.

The intent of this letter is to inform you of the FAA's decision to identify a preferred alternative in the Draft Angoon Airport EIS. The bulk of the analysis has been done, and the FAA is in the process of finalizing the EIS for agency review. Based on the analysis completed to date, the FAA has decided to move forward with identifying Airport Alternative 12a with Access 12a as the preferred alternative. There are two key factors to this decision as follows:

1. Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303) requires transportation agencies to evaluate whether there are feasible and prudent alternatives to affecting lands determined to be 4(f) properties and demonstrate that planning has been done to avoid harm to the 4(f) property. The FAA has completed a draft 4(f) evaluation and determined that the Monument–Wilderness Area is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources. Please note that FAA will be sending a letter to USFS within the next week regarding the determination of the Monument-Wilderness as a Section 4(f) property.
2. Alaska National Interests Lands Conservation Act (ANILCA) Section 1104(g)(2)(B) states that each federal agency should consider "alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit." Analysis in the EIS to date indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system).

The identification of the preferred alternative in the Draft EIS rather than the Final EIS alters several project milestones. Specifically, because the preferred alternative is not located in the Monument–Wilderness, the DOT&PF will not be submitting an ANILCA application with the agency review draft EIS as had been planned. An ANILCA application would only need to be filed if, after receiving and reviewing comments received from agencies and the public on the Draft EIS, FAA decides not to select 12a and instead decides to select Airport 3a or Airport 4.

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The EIS team will be in Juneau and Angoon the week of June 24. We would like to meet with your team in person to discuss your review of the agency review draft EIS and discuss future coordination. We will be in contact to set up a time for this meeting.

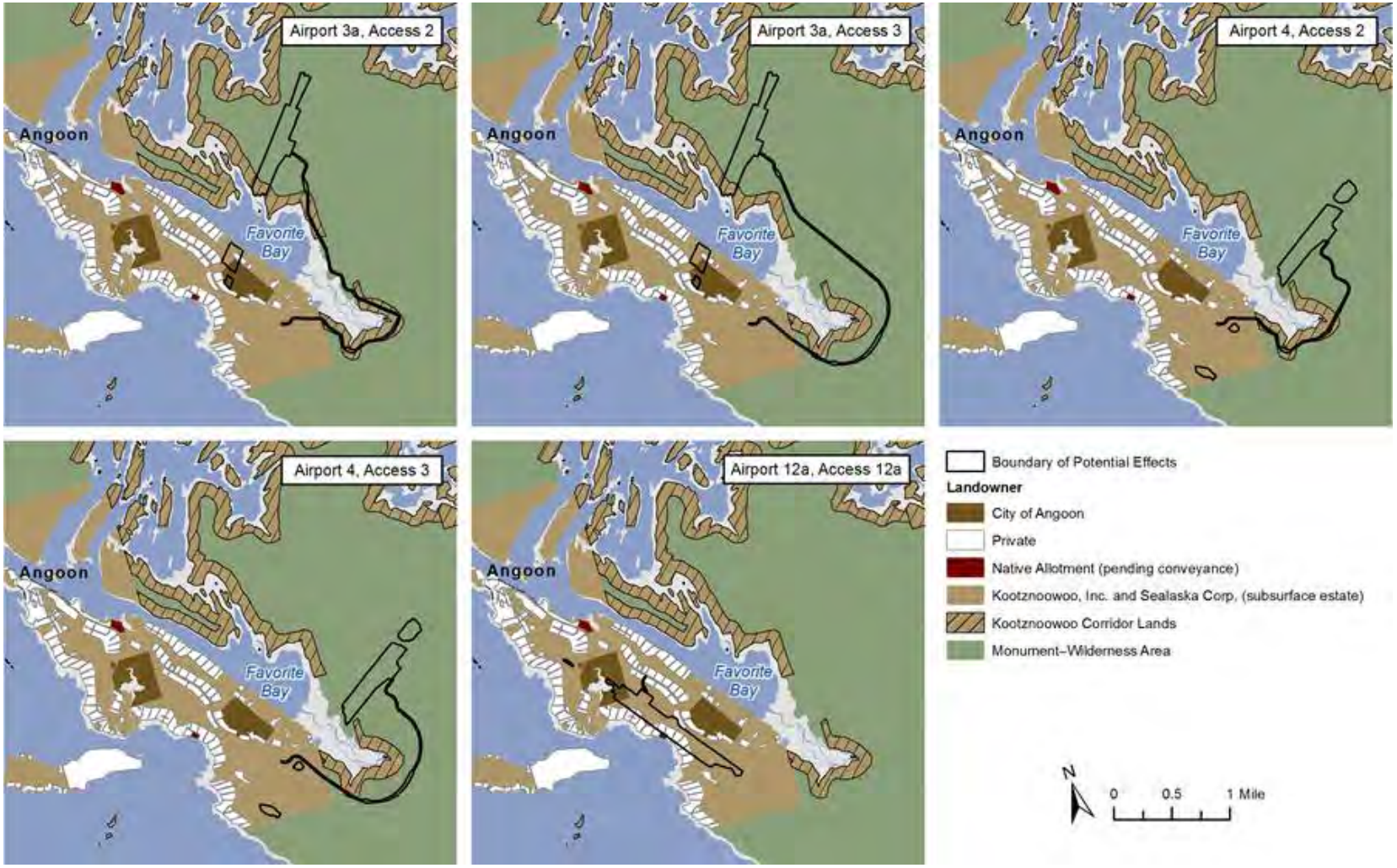
Should you have any questions, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Forrest Cole, Forest Supervisor
Chad Van Ormer, District Ranger
Jennifer Berger, Angoon Airport Project Coordinator
Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA



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U.S. Department
of Transportation
**Federal Aviation
Administration**

Alaskan Region Airports Division
AAL-600
222 West 7th Ave #14
Anchorage, AK 99513

May 28, 2013

Chiska Derr
NMFS Alaska Region
Protected Resources Division
P.O. Box 21668
Juneau, AK 99802

Re: Angoon Airport EIS Preferred Alternative

Dear Ms. Derr:

As you know, the Federal Aviation Administration (FAA) is preparing an environmental impact statement (EIS) for a proposed land-based airport for the community of Angoon in Southeast Alaska. The EIS is evaluating three alternative locations for the proposed airport and three alternatives for the access roads (Figure 1). These sites were identified through technical studies and public, agency, and tribal input as the three most viable airport locations from an aviation standpoint. Two locations (Alternatives 3a and 4) are on lands managed by the U.S. Forest Service as the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area). The third site (Alternative 12a) is located on the Angoon peninsula. The Airport Alternative 3a location is the Alaska Department of Transportation and Public Facilities' (DOT&PF's) proposed action.

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As mentioned above, the FAA is finalizing the agency review draft EIS. At this time we anticipate that this draft will be available in September 2013 followed by a 30-day review period. We will continue to keep you updated on the status as we get closer to this date.

The EIS team will be in Juneau and Angoon the week of June 24. We would like to meet with you and Ms. Savage in person to discuss your review of the agency review draft EIS and discuss future coordination. Please email your availability for Monday, June 24 or Wednesday, June 26.

Should you have any questions, please feel free to contact me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Cc: Jon Kurland, Director
Verne Skagerberg, Alaska DOT&PF
Amanda Childs, SWCA

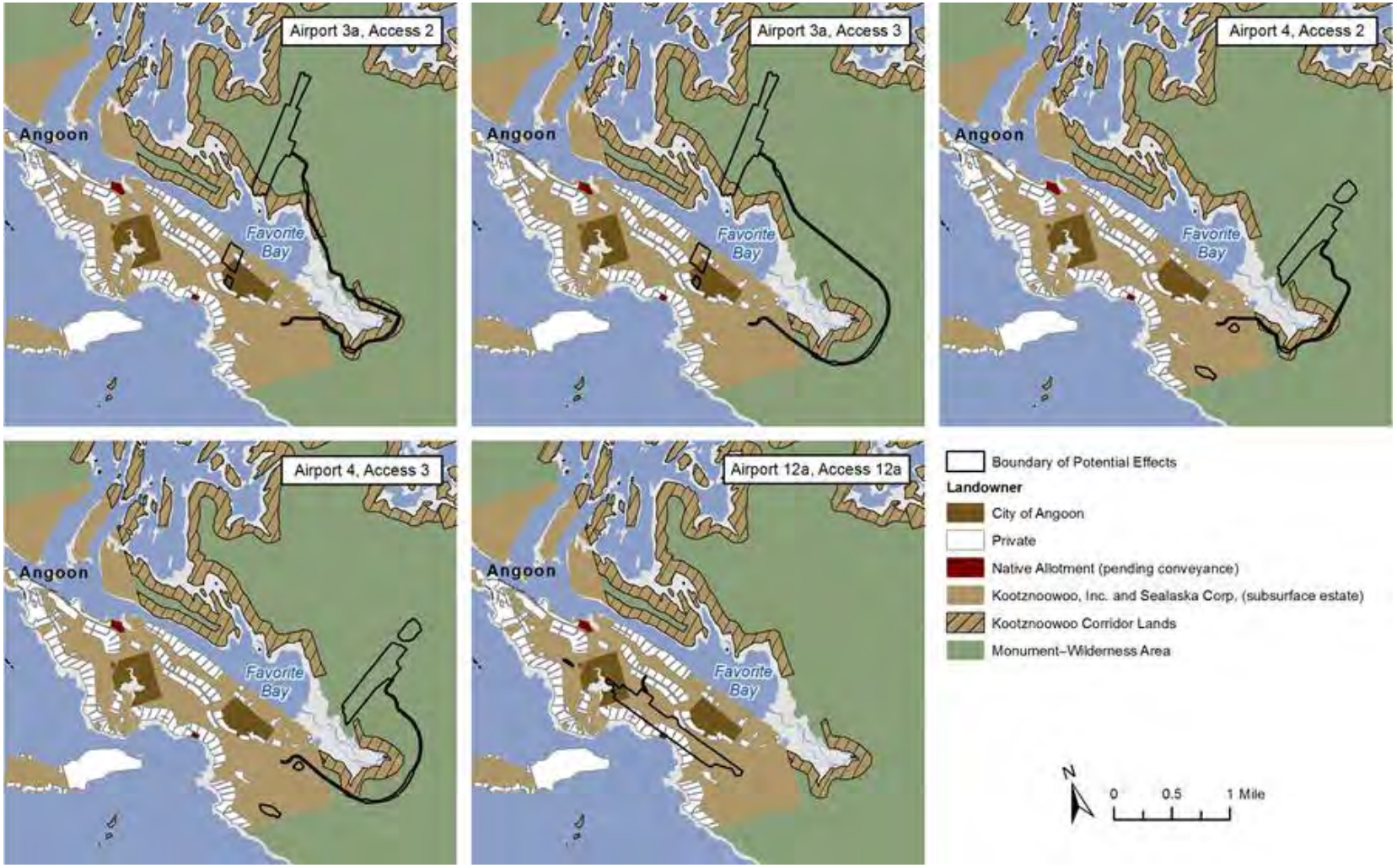


Figure 1. Alternatives analyzed in the EIS.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

July 1, 2013

Chad Van Ormer, Monument Ranger
Juneau Ranger District – Admiralty National Monument
U.S. Forest Service
8510 Mendenhall Loop Road
Juneau, AK 99801

RE: Angoon Airport Environmental Impact Statement
Section 4(f)

Dear Mr. Van Ormer:

In conjunction with the environmental impact statement (EIS) for the proposed Angoon Airport, the Federal Aviation Administration (FAA) is preparing an evaluation pursuant to Section 4(f) of the Department of Transportation Act of 1966 (Public Law 89-670) and its implementing regulations at 23 CFR 774. Section 4(f) requires that the proposed Angoon Airport avoid the use of land from publicly owned wildlife and waterfowl refuges and recreational properties, as well as certain types of historic sites, if feasible and prudent alternatives exist. The process of identifying such resources and evaluating the potential use of land from them requires consultation with the officials with jurisdiction over said resources. The FAA has identified the Kootznoowoo Wilderness Area as a publicly owned recreational property, over which the U.S. Forest Service has jurisdiction.

Section 4(f) requires that the FAA obtain your concurrence with four specific findings:

- The Kootznoowoo Wilderness Area is a publicly owned property whose primary purpose is recreation—in this case, primitive recreation.
- The Kootznoowoo Wilderness Area is a significant public recreational resource in the U.S. Forest Service system.
- The permanent incorporation of land from the Kootznoowoo Wilderness Area into an airport and access road—through easement, special use permit, long-term lease, or other instrument not involving a land exchange—would not constitute a *de minimis* use of the wilderness area.
- Section 4(f) does not apply to the archaeological site known as the Favorite Bay Garden Site (SIT-00302).

The FAA has determined that the Kootznoowoo Wilderness Area consists of federal public lands administered by the U.S. Forest Service and that primitive recreation by members of the general public is a primary purpose and goal of management of the wilderness area. Additionally, the FAA believes that the formal establishment of the wilderness area by Congress and a comparison of the recreational functions and values of the area versus the functions and values of other lands administered by the U.S. Forest Service support a finding that the wilderness area is a significant

recreational property in the U.S. Forest Service system. That is, the Kootznoowoo Wilderness Area plays an important role in meeting the U.S. Forest Service's objective of providing public recreational opportunities. The FAA also finds that, in accordance with the criteria set forth in 23 CFR 774.11(d), Section 4(f) consideration applies to all lands within the boundary of the wilderness area.

Section 4(f), at 23 CFR 774.17, establishes that *use* of a Section 4(f) property occurs when:

1. land is permanently incorporated into a transportation facility;
2. there is a temporary occupancy of land that is adverse in terms of the Section 4(f) statute's preservationist purposes; or
3. there is a constructive use of a Section 4(f) property.

Based on the evaluation conducted in conjunction with the EIS, the FAA finds that alternatives Airport 3a and 4 and their access road options would use land from the Kootznoowoo Wilderness Area through permanent incorporation of wilderness area lands into the airport and access road (see Figure 1, attached). This permanent incorporation would occur through measures that would provide the Alaska Department of Transportation & Public Facilities with sufficient property interests to implement, operate, and maintain the transportation facilities over the long term. The FAA also finds that there would be no temporary occupancy or constructive use of wilderness area lands under either of these alternatives and that the permanent incorporation of wilderness area lands into the airport and access road under either Airport 3a or 4 would adversely affect the activities, features, or attributes of the wilderness area that qualify it for Section 4(f) protection.

The FAA further finds that alternative Airport 12a and its associated access road, which are located outside of the wilderness, would not use lands of the Kootznoowoo Wilderness Area. Airport 12a would not permanently incorporate lands of the wilderness area into either the airport or access road, nor would it require temporary occupancy of wilderness area lands or result in constructive use of said lands.

With regards to the archaeological site known as the Favorite Bay Garden Site, Section 4(f) states that historic sites that are chiefly important for what can be learned through data recovery (i.e., have minimal value for preservation in place) are excepted from Section 4(f) protection (23 CFR 774.13(b)(1)). The Favorite Bay Garden Site has been determined eligible for listing on the National Register of Historic Places under Criterion D (information potential). The FAA made this determination in consultation with the U.S. Forest Service and the Alaska State Historic Preservation Officer; there was no evidence to conclude that the site warrants preservation in place. Based on this determination of eligibility, the FAA finds that the site meets the exception criteria found in the statute, and Section 4(f) does not apply to the Favorite Bay Garden Site.

In accordance with Section 4(f), we respectfully request your written concurrence with our findings as outlined above. Alternatively, if you do not agree with our findings, please provide the details of your objection in writing.

Should you require additional information, I would be happy to arrange a conference call to discuss the matter. You can reach me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above. You may also contact Sheri Ellis, who has been

assisting the FAA in preparing the Section 4(f) evaluation for the Angoon Airport project. She may be reached via phone at (801) 230-7260 or via e-mail at Sheri@certussolutionsllc.com. I look forward to hearing from you soon.

Sincerely,

Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Attachment

cc: A. Childs (SWCA)

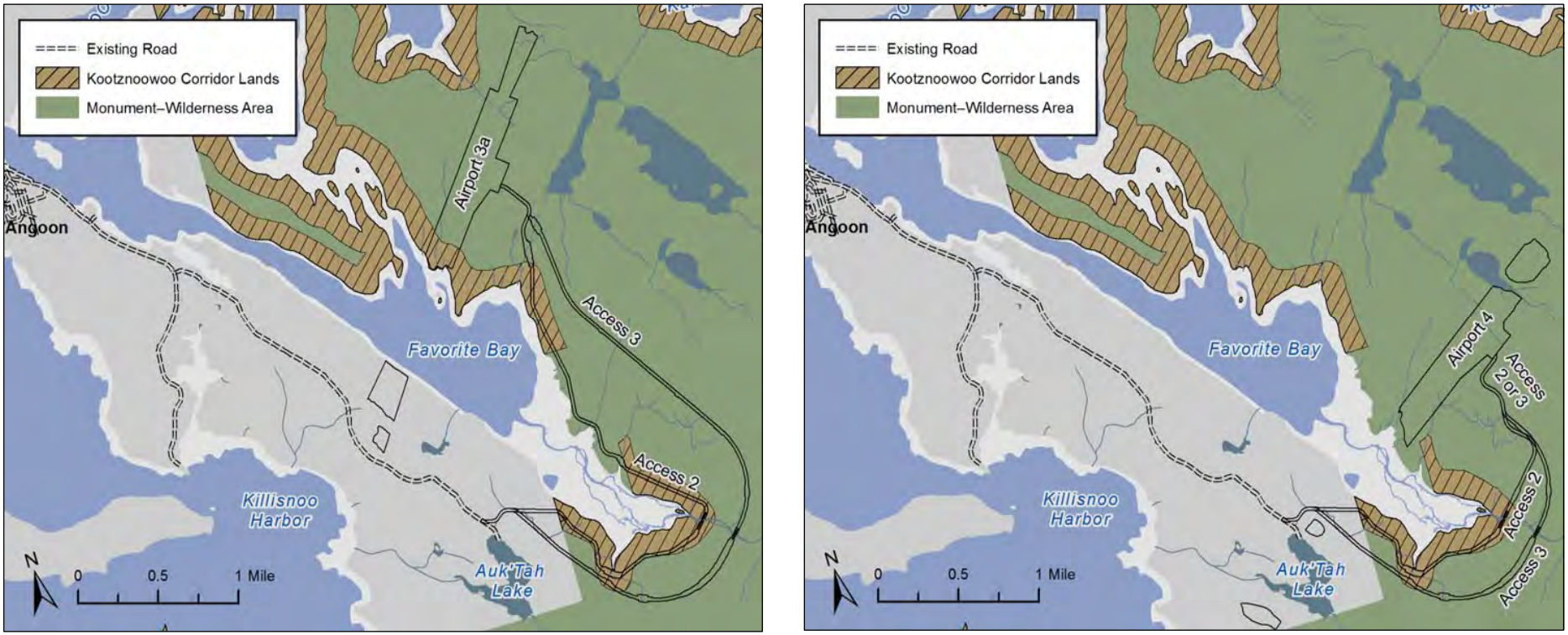


Figure 1. Locations of Airport 3a and Airport 4 with Access 2 or Access 3 showing proposed use of Section 4(f) properties. Airport 12a with Access 12a is not shown on this figure, but is located on the Angoon peninsula outside of the wilderness area.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

July 15, 2013

Judith Bittner
State Historic Preservation Officer
Office of History and Archaeology
550 West 7th Ave., Ste. 1310
Anchorage, AK 99501-3565

RE: File No. 3131-1R FAA
Angoon Airport Environmental Impact Statement

Dear Ms. Bittner:

In April 2012, the Federal Aviation Administration (FAA) submitted our determinations of eligibility (DOE) for the above-referenced undertaking in Angoon, Alaska. We received your concurrence with our determinations on late April 2012. In our DOE letter, we notified you that the FAA is implementing a phased approach to historic properties identification. We noted that at such time as the FAA had identified a preferred alternative as part of the environmental impact statement (EIS) process and had sufficient information to identify the full area of potential effects (APE), we intended to conduct additional field investigations for that alternative. The FAA recently identified our preferred alternative—Airport 12a with Access 12a—and are prepared to proceed with the additional archaeological investigations.

As you may recall from our initial consultation with your office, the FAA is considering three action alternatives and one no action alternative for a land based airport in Angoon. Two of the action alternatives (Airport 3a and Airport 4) are located primarily on lands administered by the U.S. Forest Service. The third action alternative, Airport 12a, is located on lands owned by private individuals, the City of Angoon, and the village corporation (Kootznoowoo, Inc.). In addition to consultation with you, we are engaged in consultation with these parties, as well as the Angoon Community Association—the federally recognized tribal government—regarding the preferred alternative, its potential effects on historic properties and traditional cultural properties, and the additional field studies to be conducted.

The FAA has identified the APE for the preferred alternative to include all lands that would be subject to ground disturbance, vegetation clearing, or vegetation alteration (such as thinning or topping) for construction and operation of the airport and its access road. This APE, which is depicted on the attached figure, also includes anticipated disturbance areas for materials sites. Indirect effects from visual intrusion will not extend beyond the footprint of the areas cleared for airport and access road use due to the dense nature of the spruce-hemlock forest surrounding in the area and the nature of the terrain; the airport would be only minimally visible for a short distance beyond the edge of any cleared areas. Anticipated noise effects will extend beyond the airport footprint. The FAA will assess the effects of said noise on any noise-sensitive historic properties identified to date in the area surrounding the Airport 12a site; any currently undocumented noise-sensitive historic properties identified through consultation with tribal parties and community members will be evaluated similarly.

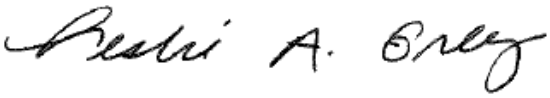
The FAA has contracted with SWCA Environmental Consultants (SWCA) to conduct the additional archaeological survey for the preferred alternative. SWCA also completed the previous survey associated

with the EIS. SWCA will conduct an intensive-level pedestrian inventory of the APE as depicted on the attached figure. Using the U.S. Forest Service Admiralty Island model for identifying areas of high probability for archaeological resources and professional judgment, SWCA will also excavate shovel probes to help identify subsurface cultural resources and confirm the boundaries of known resources in the vicinity of the APE. To the extent allowable by terrain and vegetation cover, SWCA will place shovel probes in a systematic fashion on regular intervals. Upon completion of fieldwork, SWCA will prepare a technical report summarizing the results, and the FAA will consult with you and other consulting parties regarding any new determinations of eligibility and our findings of effect.

Pursuant to our DOE letter and the criteria in 36 CFR 800.3(c)(3) and 800.4(a), we request that you review the information contained in this letter, including the attached figure, and provide us with any comments you may have regarding 1) the APE as described herein, and 2) the methods proposed to identify historic properties. Please, also notify us of any concerns you may have about the undertaking in general or any specific historic properties of which you believe the FAA should be aware.

Should you require additional information, I would be happy to arrange a conference call to discuss the matter. You can reach me via phone at (907) 271-5453, via e-mail at Leslie.Grey@faa.gov, or at the address above. I look forward to hearing from you soon.

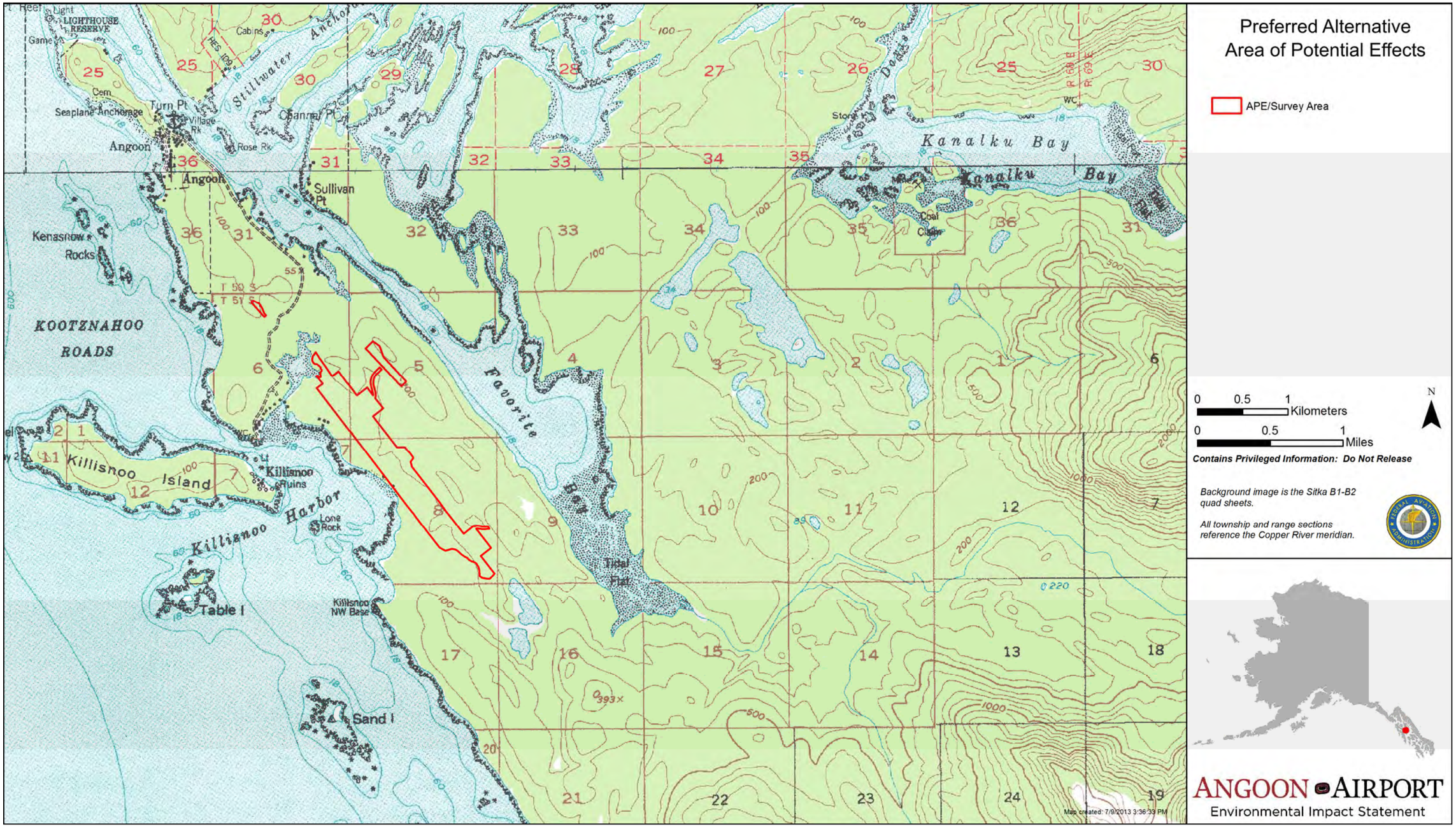
Sincerely,



Leslie Grey
FAA Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Attachment

cc: A. Childs (SWCA)
V. Skageberg (ADOT&PF)
J. Gendron (ADOT&PF)



Area of potential effects / survey area for FAA's preferred alternative—Airport 12 with Access 12a—and associated materials sites and disturbance areas.

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Natural Resources

DIVISION OF PARKS AND OUTDOOR RECREATION
Office of History and Archaeology

550 West 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565
Web: http://dnr.alaska.gov/parks/oha
Phone: 907.269.8721
Fax: 907.269.8908

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AUG 29 2013

August 26, 2013

File No.: 3130-1R FAA

Leslie A. Grey
FAA Project Manager
Angoon Airport EIS
AAL-614
Alaskan Region Airports Division
222 West 7th Avenue, #14
Anchorage, AK 99513

Subject: Angoon Airport Environmental Impact Statement

Dear Ms. Grey:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated July 15, 2013) on July 22, 2013.

Following our review of the documentation provided, we have no objections to the proposed area of potential effects (APE) as it is presently defined, with the understanding that as the project develops or changes, the APE may be amended accordingly. Additionally, we agree that the proposed methodology for further identification of historic properties is appropriate. We look forward to receiving the results of the inventory as they are available and to further consultation on the subject undertaking.

Thank you for the opportunity to comment. Please contact Shina duVall at 269-8720 or shina.duvall@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer

JEB:sad

From: Enriquez, Richard [mailto:richard_enriquez@fws.gov]
Sent: Monday, September 23, 2013 10:45 AM
To: Jamie C. M. Young
Subject: Angoon Airport EIS: Informal USFWS consultation

Jamie, this responds to your consultation request regarding construction of the Angoon Airport at Alternative 12a location. For the purposes of the Endangered Species Act (ESA) Section 7 consultation, currently there are no listed threatened or endangered species under our jurisdiction in southeast Alaska.

Two candidate species, Yellow-Billed Loon and Kittlitz's Murrelet, utilize marine waters in Southeast Alaska. Both use marine waters within 200 miles of the coast of Southeast Alaska. Yellow-billed loons nest in northern and interior Alaska, and use inside waters in Southeast Alaska primarily during migration and during winter. We do not know how far offshore the species is found during winter. Primary food includes small fish, which they catch by diving (U.S. Fish & Wildlife Service, 2009).

Kittlitz's murrelets nest on the ground in rocky habitats, typically in recently deglaciated areas, and feed on small fish (sand lance, herring, capelin), amphipods and small crustaceans in marine waters (Day et al., 1999). During the summer breeding season, Kittlitz's murrelets are found in marine waters north of Wrangell.
During the winter, they are believed to disperse to the Gulf of Alaska, but specific locations are not known (Kissling et al., 2011). We anticipate the proposed airport project will have no effect on these species.

For future reference this email consultation response for the Angoon Airport EIS preferred alternative has been assigned consultation log number 07CAJN00-2013-SL-0054. Since there are no listed species in the project area identified in the email information package I received, there will not be any adverse effects to T&E species. You should reference the log number in your environmental documents, thus if there are any questions about this consultation, we will be readily able to access our records.

These comments are offered for endangered and threatened species for which the U.S. Fish and Wildlife Service (Service) has responsibility under Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1521 et seq.) and its amendments. The above comments are specific to the Endangered Species Act and do not reflect agency concerns regarding other organisms or habitats for which the Service has legislated responsibilities.

If you have any questions, please contact me by reply email, or at (907) 780-1162.

Richard Enriquez
Conservation Planning Assistance Biologist
Juneau Fish and Wildlife Field Office
3000 Vintage Blvd. #201
Juneau, AK 99801-7100

Literature References

Day, R.H., K.J. Kuletz, and D.A. Nigro. 1999. Kittlitz's Murrelet (*Brachyramphus brevirostris*). In: A. Poole and F. Gill (eds). The birds of North America. No. 435, Philadelphia & Washington, DC: Academy of Natural Sciences and American Ornithologists' Union.

Kissling, M.L. et al. 2011. Distribution and Abundance of the Kittlitz's Murrelet (*Brachyramphus brevirostris* in selected areas of Southeastern Alaska. Marine Ornithology 39: 3-11.

U.S. Fish and Wildlife Service. 2009. Yellow-billed loon Factsheet. http://alaska.fws.gov/fisheries/endangered/pdf/ybl_factsheet.pdf. Downloaded on 29 November 2011.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports Division

Alaskan Region
222 West 7th Ave #14
Anchorage, Alaska 99513

October 28, 2013

To: Cooperating and Consulting Agencies and Tribal Governments

Re: Angoon Airport – 30-day Agency and Tribal Review of Internal Agency Draft Environmental Impact Statement

Enclosed for your review and comment is the internal agency draft environmental impact statement (EIS) for the proposed land-based Angoon Airport. FAA welcomes and appreciates your comments on any chapter and/or sections pertaining to the assessment of resources for which your organization has special expertise and jurisdiction. There are a few items concerning this draft that I would like to highlight.

This document is an internal draft that is not intended for review by the public; it is only intended for agency and tribal government review. Please do not share the EIS or its contents with persons outside of your agency or organization without my written consent.

As we communicated to you early this summer, the FAA has identified Airport 12a with Access 12a as the preferred alternative. There are several key factors to this decision as follows:

1) The FAA has determined that the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area) is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources.

2) Section 1104(g)(2)(B) of the Alaska National Interests Lands Conservation Act (ANILCA) states that federal agencies should consider “alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit.” Analysis in the EIS indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system).

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Half of the document that we're providing you is appendices. The majority of these appendices have been available to the public for some time, and we've already incorporated comments that we received on them. These are static documents that do not require further revisions. However, there are three appendices that have not been previously made available, and we welcome your comments on them. They are:

- Appendix B: Alternatives Eliminated from Detailed Analysis
- Appendix D: U.S. Department of Transportation Section 4(f) Evaluation
- Appendix N: Alaska National Interest Lands Conservation Act (ANILCA) Section 810 Evaluation

We have prepared this EIS differently than other EISs that you have reviewed in the past. It is important that you read our Reader's Guide at the beginning of the document. Please let us know if you have any questions as you review this document.

Public and agency comments are the cornerstone of a successful EIS. We use these comments to help us correct areas in the EIS where information is missing or inaccurate and expand upon our analyses and justifications for EIS conclusions, thereby making the EIS a stronger document as a whole. We encourage you to structure your comments in a manner that provides specific, clear guidance to the FAA on what the agency should do to improve the EIS. When reading the EIS, some questions that may help you provide specific feedback include:

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- Are there additional ways we can avoid or reduce effects to resources that we haven't identified?

Please submit your comments on the internal agency Draft EIS via the online comment database by November 25, 2013. Separate instructions are attached for online commenting.

Please note I will be out of the office November 18 through December 22, 2013. During this time, Mike Edelmann will be FAA's acting project manager. Should you

have any questions during your review, he can be reached at 907-271-5026 or Mike.Edelmann@faa.gov. Amanda Childs, the consultant project manager, is also available to respond to questions. Amanda can be reached by email at achilds@swca.com or 503-224-0333, extension 6256.

On behalf of FAA and the project team, thank you very much for your assistance with this project.

Sincerely,

Leslie Grey
FAA, Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Lead Contacts for Distribution of Agency and Tribal Review: The FAA has coordinated with these individuals, who have committed to distributing the internal agency review Draft EIS to the appropriate reviewers at their respective agencies and tribal governments.

Angoon Community Association – Raynelle Jack
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Kootznoowoo, Inc. – Peter Naoroz, Sharon Love
ADOT&PF – Verne Skagerberg
U.S. Forest Service – Jenn Berger
U.S. Army Corps of Engineers – Randy Vigil
U.S. Fish & Wildlife Service – Richard Enriquez
State of Alaska – Susan Magee, Jen Wing
U.S. Environmental Protection Agency – Matthew Lacroix, Jennifer Curtis
U.S. National Marine Fisheries Service – Chiska Derr

Yellow highlighting indicates the recipients of this version of the letter.

Angoon Airport Internal Agency Draft EIS (DEIS) Comments

The Angoon Airport internal agency DEIS is now available for your review and comment. Please provide comments on sections that deal with resources that you have management or regulatory authority over. Note that this is a "live," linked PDF. We encourage you to use the hyperlinks, Back to Last, and Table of Contents buttons. You can also use Adobe's Bookmark feature to navigate by section headings.

Please take a moment to read the instructions below, as they will provide you with additional guidance on how to submit your comments on the internal agency DEIS.

Obtaining the Internal Agency DEIS from the Project Website

- Click on this link: http://angoonairporteis.com/internalagencydraft.html
- Enter the username: angoonairporteis
- Enter the password: angoonairporteis2013

Commenting via the Online Comment Database

We have developed an online comment database where you can enter your comments while reviewing the internal agency DEIS. The steps are outlined below. If you have any questions or concerns regarding the **database**, please contact Jamie Young at 907.821.0404 or jyoung@swca.com. Should you have any questions on the **EIS** during your review, contact Mike Edelmann, FAA's acting project manager. He can be reached at 907-271-5026 or Mike.Edelmann@faa.gov. Amanda Childs, the consultant project manager, is also available to respond to questions on either the EIS or the database. Amanda can be reached by email at achilds@swca.com or 503-224-0333, extension 6256.

- Using your email address, a user account for the Angoon Airport Draft EIS comment database has been established for you. This database, which is described below, will allow you to comment securely online. If you have not already, you will receive an email invite to log in to the database that will include a password in a subsequent email. **It is our preference that you use the database to provide comments.** By using the database we can ensure that no comment has been lost and that all comments are appropriately responded to in a timely manner.
- To request a user account for an additional commenter from your agency, please contact **Jamie Young at jyoung@swca.com or 907.821.0404**.
- You can enter comments into the online database through-out the 30-day internal agency DEIS review period (October 28 thru November 25, 2013). Following this review period, the comment database will be closed for comment entry.

Commenting Tips

Public and agency comments are the cornerstone of a successful EIS. We use these comments to help us correct areas in the EIS where information is missing or inaccurate and expand upon our analyses and justifications for EIS conclusions, thereby making the EIS a stronger document as a whole. We encourage you to structure your comments in a manner that provides specific, clear guidance to the FAA on what the agency should do to improve the EIS. When reading the EIS, some questions that may help you provide specific feedback include:

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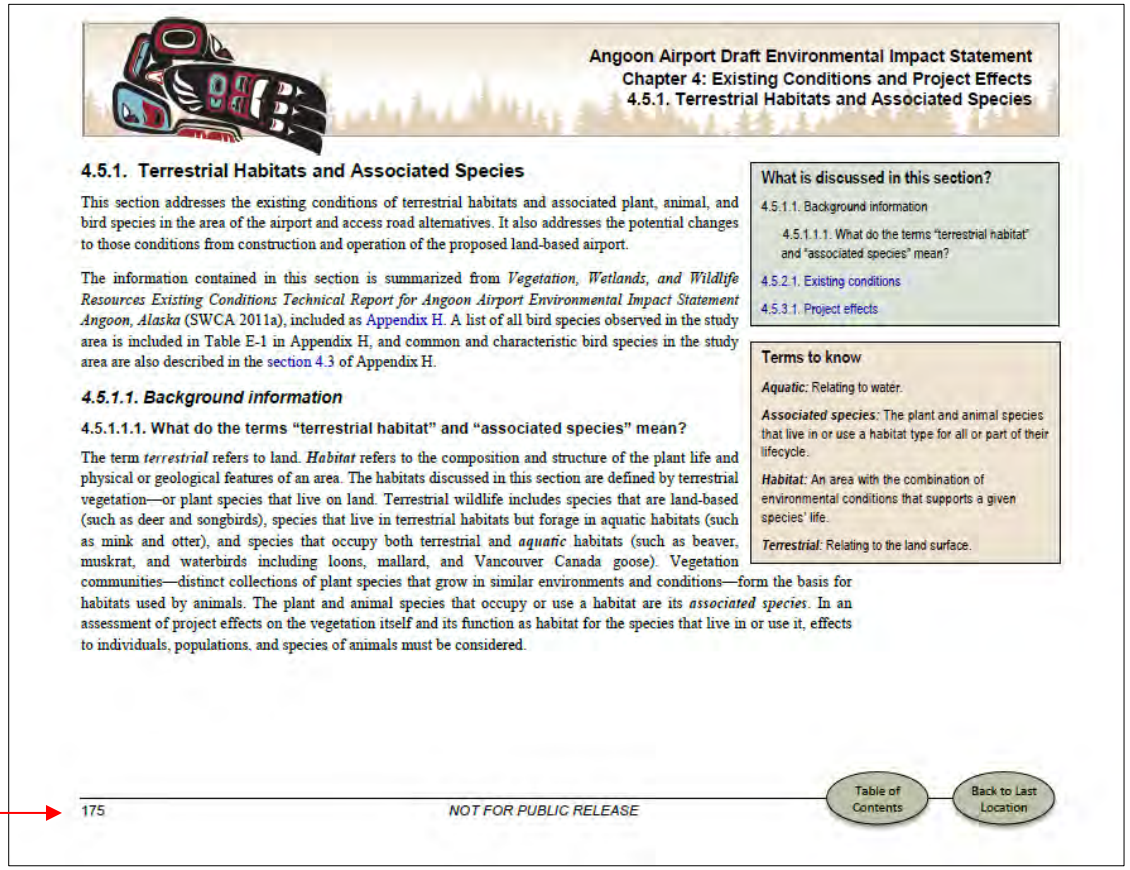
- Are there additional ways we can avoid or reduce effects to resources that we haven't identified?

Steps for Commenting via the Online Comment Database

Step 1

- Download and save the internal agency DEIS as described above.
- This document will NOT have line numbers; it will only have page numbers for reference. You will enter the page numbers into the online comment database.



Angoon Airport Draft Environmental Impact Statement
Chapter 4: Existing Conditions and Project Effects
4.5.1. Terrestrial Habitats and Associated Species

4.5.1. Terrestrial Habitats and Associated Species

This section addresses the existing conditions of terrestrial habitats and associated plant, animal, and bird species in the area of the airport and access road alternatives. It also addresses the potential changes to those conditions from construction and operation of the proposed land-based airport.

The information contained in this section is summarized from *Vegetation, Wetlands, and Wildlife Resources Existing Conditions Technical Report for Angoon Airport Environmental Impact Statement Angoon, Alaska* (SWCA 2011a), included as Appendix H. A list of all bird species observed in the study area is included in Table E-1 in Appendix H, and common and characteristic bird species in the study area are also described in the section 4.3 of Appendix H.

4.5.1.1. Background information

4.5.1.1.1. What do the terms "terrestrial habitat" and "associated species" mean?

The term *terrestrial* refers to land. *Habitat* refers to the composition and structure of the plant life and physical or geological features of an area. The habitats discussed in this section are defined by terrestrial vegetation—or plant species that live on land. Terrestrial wildlife includes species that are land-based (such as deer and songbirds), species that live in terrestrial habitats but forage in aquatic habitats (such as mink and otter), and species that occupy both terrestrial and *aquatic* habitats (such as beaver, muskrat, and waterbirds including loons, mallard, and Vancouver Canada goose). Vegetation communities—distinct collections of plant species that grow in similar environments and conditions—form the basis for habitats used by animals. The plant and animal species that occupy or use a habitat are its *associated species*. In an assessment of project effects on the vegetation itself and its function as habitat for the species that live in or use it, effects to individuals, populations, and species of animals must be considered.

What is discussed in this section?

4.5.1.1. Background information
4.5.1.1.1. What do the terms "terrestrial habitat" and "associated species" mean?
4.5.2.1. Existing conditions
4.5.3.1. Project effects

Terms to know

Aquatic: Relating to water.

Associated species: The plant and animal species that live in or use a habitat type for all or part of their lifecycle.

Habitat: An area with the combination of environmental conditions that supports a given species' life.

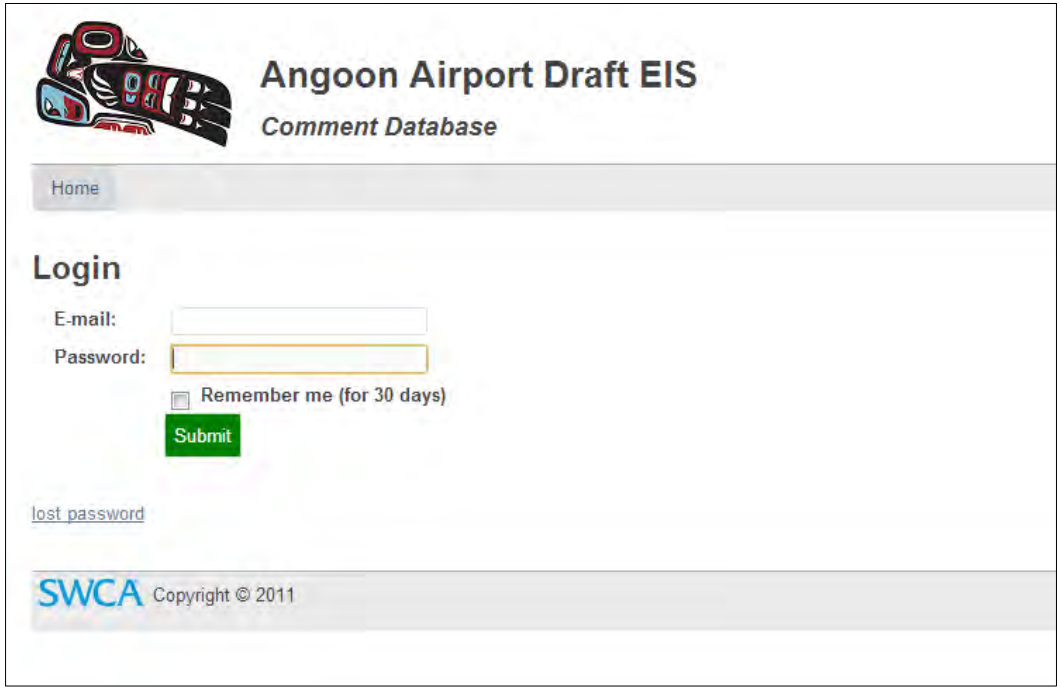
Terrestrial: Relating to the land surface.

175 NOT FOR PUBLIC RELEASE Table of Contents Back to Last Location

The internal agency DEIS will not have line numbers. You'll refer to page numbers when making comments about text.

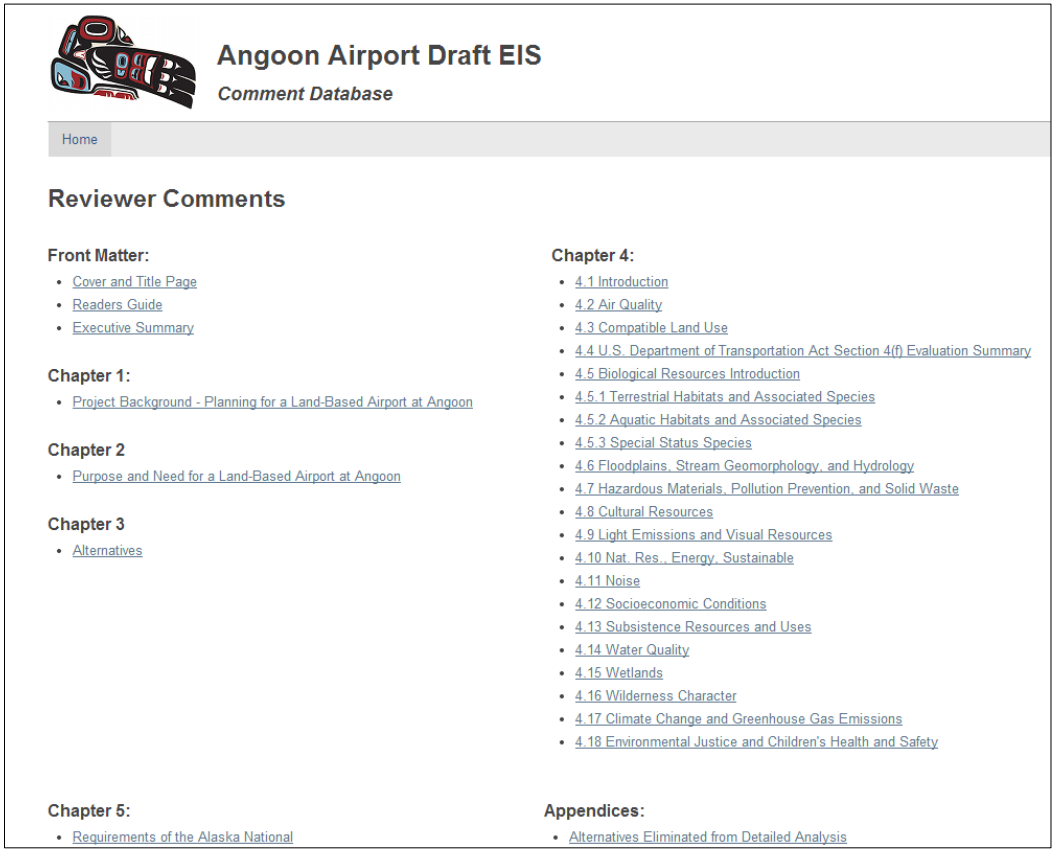
Step 2

Click on the comment database link here: Angoon Airport Draft EIS comment database. The login page will come up as shown below. Use your email address and password to log in as described above.



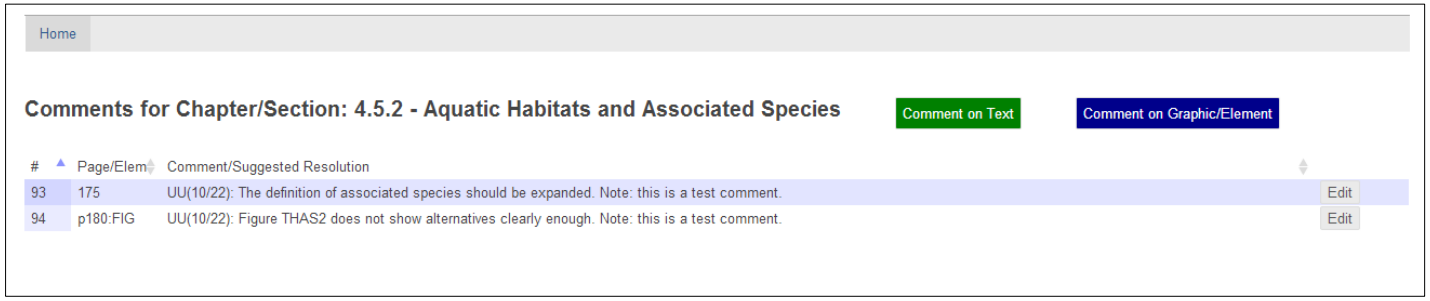
Step 3

After logging in, you'll reach the home page. Click on the link that corresponds to the sections that you are going to review. For this example, we'll use 4.2, Air Quality. Note that not all of the sections of the EIS are shown in this example image.



When you click on the name of the section/chapter you're going to review, the database table for that chapter/section will open. If no one has commented on that section, it will look like the image below.

If someone has commented already, it will look like the following image.



Step 4

There's a part of the document that I want to comment on. What do I do?

There are two broad categories for comments: comments on text and comments on graphics/elements.

- To comment on text, click the green button.
- To comment on a graphic or other element (terms to know boxes, navigation boxes, tables, figures, and sidebar boxes), click on the blue button.

How do I comment on text?

After clicking the green button, you'll see the following screen. The section number will populate automatically, and so will your name (USACE Guest, in this example) and the date and time of your entry.

You will need to fill in the page number of the text that you want to comment on.

When you are finished, click the green submit button.

How do I comment on a graphic or element?

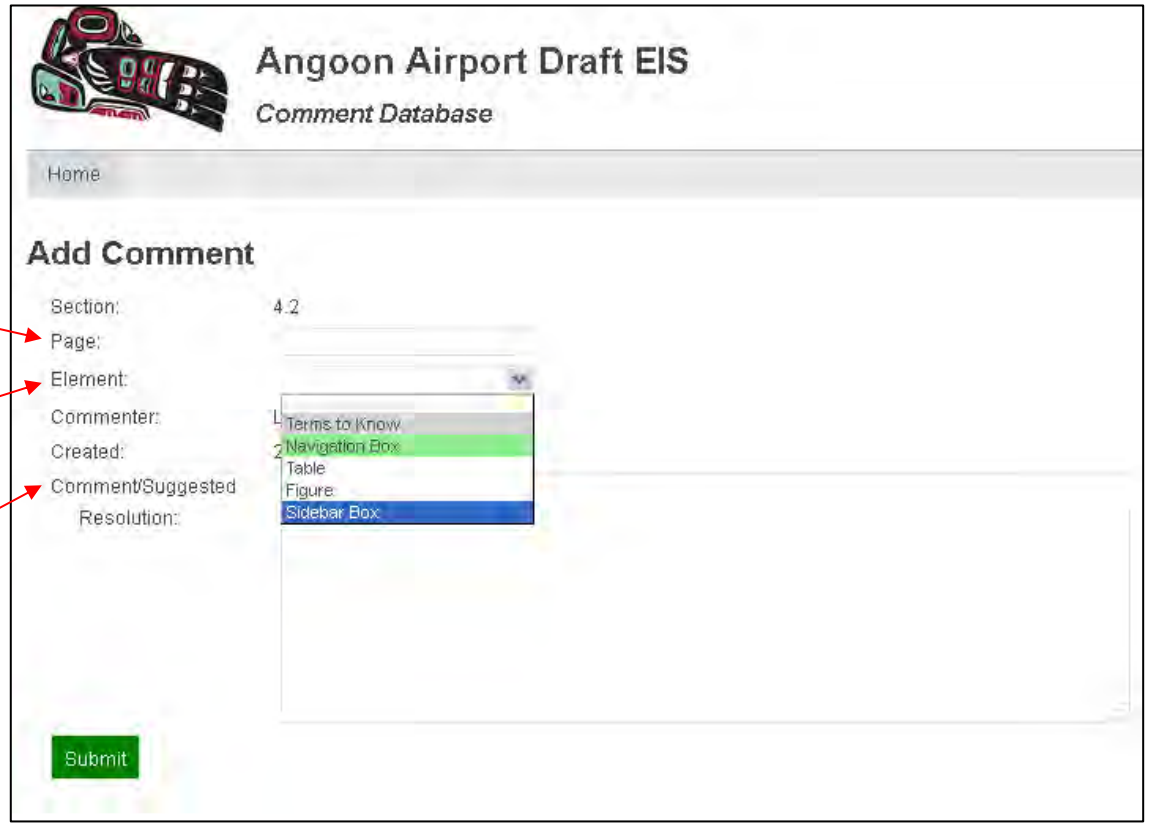
After clicking the blue button, you'll see the following screen. The section number will populate automatically, and so will your name and the date and time of your entry—note that the Commenter and Created lines are blocked in this image.

Similar to text comments, you will fill in the page number of the graphic or element, and select the element type from the pull-down menu shown below. Note that the shading in the pull-down menu corresponds to the colors of the boxes in the PDF.

Enter the page number of the terms to know box, navigation box, table, figure, or sidebar box that you're commenting on.

Select the type of element from this pull-down menu.

Enter your comment here.



When you are finished, click the green submit button.

Step 5

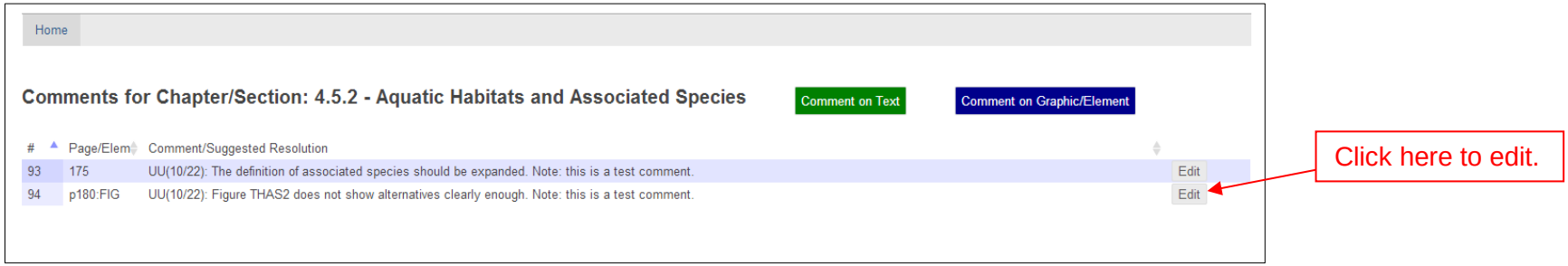
What happens after I submit a comment? What if I want to edit my comment?

After you submit a comment, you'll be able to see it on the comment table for your section. Each item in the Comment/Suggested Resolution column begins with the initials of the person who made the comment.

To edit a comment that you made, simply click on the edit button at the right. The Edit Comment screen will reopen, with the information that you have already entered. You can make any changes that you like. Please note that no other user can edit your comments, nor can you edit other user comments.

If you decide that you want to delete a comment entirely, there is a check box on the Edit Comment screen that will let you do so. Please note that no other user can delete your comments, nor can you delete other user comments.

When you are done, click on the green submit button, and you'll see your changes reflected in the comment table.



Check this box if you want to delete a comment completely.

I've entered my comments, and the 30-day review period for this document has ended. What happens now?

At the end of the 30-day review period for the internal agency DEIS, the comment database will be locked. No new comments can be entered at that time, and the FAA team will begin responding to all agency comments received.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Airports Division

Alaskan Region
222 West 7th Ave #14
Anchorage, Alaska 99513

October 28, 2013

To: Cooperating and Consulting Agencies and Tribal Governments – **Kootznoowoo, Inc.**

Re: Angoon Airport – 30-day Agency and Tribal Review of Internal Agency Draft Environmental Impact Statement

Enclosed for your review and comment is the internal agency draft environmental impact statement (EIS) for the proposed land-based Angoon Airport. FAA welcomes and appreciates your comments on any chapter and/or sections pertaining to the assessment of resources for which your organization has special expertise and jurisdiction. There are a few items concerning this draft that I would like to highlight.

This document is an internal draft that is not intended for review by the public; it is only intended for agency and tribal government review. Please do not share the EIS or its contents with persons outside of your agency or organization without my written consent.

As we communicated to you early this summer, the FAA has identified Airport 12a with Access 12a as the preferred alternative. There are several key factors to this decision as follows:

1) The FAA has determined that the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area) is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources.

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- Appendix B: Alternatives Eliminated from Detailed Analysis
- Appendix D: U.S. Department of Transportation Section 4(f) Evaluation
- Appendix N: Alaska National Interest Lands Conservation Act (ANILCA) Section 810 Evaluation

Thank you again for your help obtaining the most current mapping for the 14(c)3 parcels and Kootznoowoo, Inc.'s planned expansion of the existing materials source site. Unfortunately, we were not able to revise the sections containing information about these for this internal agency review of the Draft EIS, but we will incorporate this information into the public Draft EIS.

We have prepared this EIS differently than other EISs that you have reviewed in the past. It is important that you read our Reader's Guide at the beginning of the document. Please let us know if you have any questions as you review this document.

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Please provide your written comments on the Internal Agency Draft by November 25, 2013. Comments can be submitted the following ways:

Email: comments@angoonairporteis.com
Hard copy: Angoon Airport EIS
1220 SW Morrison, Suite 700
Portland, OR 97205
FAX: 503-224-1851

Please note I will be out of the office November 18 through December 22, 2013. During this time, Mike Edelmann will be FAA's acting project manager. Should you have any questions during your review, he can be reached at 907-271-5026 or Mike.Edelmann@faa.gov. Amanda Childs, the consultant project manager, is also available to respond to questions. Amanda can be reached by email at achilds@swca.com or 503-224-0333, extension 6256.

On behalf of FAA and the project team, thank you very much for your assistance with this project.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA, Alaskan Region Airports Division
Angoon Airport EIS Project Manager

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U.S. Fish & Wildlife Service – Richard Enriquez
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U.S. National Marine Fisheries Service – Chiska Derr

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U.S. Department
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**Federal Aviation
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Airports Division

Alaskan Region
222 West 7th Ave #14
Anchorage, Alaska 99513

October 28, 2013

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1) The FAA has determined that the Admiralty Island National Monument and Kootznoowoo Wilderness Area (Monument–Wilderness Area) is the only qualifying Section 4(f) publicly owned recreational property in the vicinity of the alternatives. Both Airport Alternatives 3a and 4 are located on Monument–Wilderness lands, leaving Airport 12a with Access 12a as the only alternative that would avoid actual use of Section 4(f) resources.

2) Section 1104(g)(2)(B) of the Alaska National Interests Lands Conservation Act (ANILCA) states that federal agencies should consider “alternative routes and modes of access, including a determination with respect to whether there is any economically feasible and prudent alternative to the routing of the [transportation] system through or within a conservation system unit.” Analysis in the EIS indicates that Airport 12a with Access 12a is an economically feasible and prudent alternative to the alternatives located on Monument–Wilderness lands (which are considered a conservation system).

Because the preferred alternative is not located in the Monument–Wilderness Area, the Alaska Department of Transportation and Public Facilities (ADOT&PF) will not be submitting an ANILCA application at this time as had been initially planned. An ANILCA application would only need to be filed if after receiving and reviewing comments received on the public Draft EIS, FAA decides not to select Airport 12a and instead decides to select Airport 3a or Airport 4.

Half of the document that we're providing you is appendices. The majority of these appendices have been available to the public for some time, and we've already incorporated comments that we received on them. These are static documents that do not require further revisions. However, there are three appendices that have not been previously made available, and we welcome your comments on them. They are:

- Appendix B: Alternatives Eliminated from Detailed Analysis
- Appendix D: U.S. Department of Transportation Section 4(f) Evaluation
- Appendix N: Alaska National Interest Lands Conservation Act (ANILCA) Section 810 Evaluation

We have prepared this EIS differently than other EISs you have reviewed in the past. It is important that you read our Reader's Guide at the beginning of the document. Please let us know if you have any questions as you review this document.

Public and agency comments are the cornerstone of a successful EIS. We use these comments to help us correct areas in the EIS where information is missing or inaccurate and expand upon our analyses and justifications for EIS conclusions, thereby making the EIS a stronger document as a whole. We encourage you to structure your comments in a manner that provides specific, clear guidance to the FAA on what the agency should do to improve the EIS. When reading the EIS, some questions that may help you provide specific feedback include:

- What is missing from this section? Are there topics we have not addressed or data and other information sources we should use?
- Is our analysis and methodology appropriate? If you believe it is not, what do you recommend and why?
- Have we properly supported our conclusions and significance determinations?
- Are there additional ways we can avoid or reduce effects to resources that we haven't identified?

Please provide your written comments on the Internal Agency Draft by November 25, 2013. Comments can be submitted the following ways:

Email: comments@angoonairporteis.com
Hard copy: Angoon Airport EIS
1220 SW Morrison, Suite 700

Portland, OR 97205
FAX: 503-224-1851

Please note I will be out of the office November 18 through December 22, 2013. During this time, Mike Edelmann will be FAA's acting project manager. Should you have any questions during your review, he can be reached at 907-271-5026 or Mike.Edelmann@faa.gov. Amanda Childs, the consultant project manager, is also available to respond to questions. Amanda can be reached by email at achilds@swca.com or 503-224-0333, extension 6256.

On behalf of FAA and the project team, thank you very much for your assistance with this project.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA, Alaskan Region Airports Division
Angoon Airport EIS Project Manager

Lead Contacts for Distribution of Agency and Tribal Review: The FAA has coordinated with these individuals, who have committed to distributing the internal agency review Draft EIS to the appropriate reviewers at their respective agencies and tribal governments.

Angoon Community Association – Raynelle Jack
City of Angoon – Lillian Woodbury
Kootznoowoo, Inc. – Peter Naoroz, Sharon Love
ADOT&PF – Verne Skagerberg
U.S. Forest Service – Jenn Berger
U.S. Army Corps of Engineers – Randy Vigil
U.S. Fish & Wildlife Service – Richard Enriquez
State of Alaska – Susan Magee, Jen Wing
U.S. Environmental Protection Agency – Matthew Lacroix, Jennifer Curtis
U.S. National Marine Fisheries Service – Chiska Derr

Yellow highlighting indicates the recipients of this version of the letter.

AMENDMENT TO

MEMORANDUM OF UNDERSTANDING BETWEEN THE UNITED STATES

FEDERAL AVIATION ADMINISTRATION AND

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Angoon Airport Environmental Impact Statement

I. INTRODUCTION AND PURPOSE

A. This Amendment to the Memorandum of Understanding (MOU) between the Federal Aviation Administration (FAA) and the Alaska Department of Transportation and Public Facilities (Sponsor) is amended by adding the language indicated in bold italics on the following pages. All other sections of the original MOU are still in effect and reflected in this amended document.

B. This Memorandum of Understanding ("MOU") provides a framework in which the United States Federal Aviation Administration ("FAA") will prepare an Environmental Impact Statement EIS) for proposed construction of the Angoon Airport. The MOU describes the relationship of the FAA and the Alaska Department of Transportation and Public Facilities ("Sponsor"), in preparing the EIS. Subject to completion of the EIS, the FAA will determine whether to proceed with the proposed airport construction. This determination will be set forth in a Record of Decision ("ROD").

C. As lead agency, the FAA, with the assistance and input from the Sponsor, will select an independent contractor ("Contractor") to prepare the EIS. The Sponsor shall be the party responsible for engaging and retaining a contractor.

D. The EIS and any related documents shall comply with the provisions of the National Environmental Policy Act of 1969 ("NEPA") and appropriate Council on Environmental Quality ("CEQ"), United States Department of Transportation ("DOT"), and FAA

environmental regulations and guidance, as well as all applicable local, state and Federal laws, as appropriate.

E. It is the purpose of this MOU to establish an understanding between the Sponsor and the FAA regarding the responsibilities of the parties and the conditions and procedures to be followed in the development and preparation of the EIS.

F. The parties hereto intend that development and preparation of the EIS as provided in this MOU will satisfy the pertinent environmental requirements of the FAA.

II. GENERAL PROVISIONS

A. As the lead agency, the FAA will be responsible for ensuring compliance with all the requirements of NEPA (42 U.S.C. 4321 et seq.), CEQ Regulations (40 C.F.R. Parts 1500- 1508), and appropriate DOT and FAA environmental orders. The procurement process shall be conducted in accordance with Alaska Statute 36.30, unless otherwise in conflict with federal requirements or prohibitions, with particular reference to 36.30.890 Federal Assistance. The FAA shall ensure that all pertinent environmental issues and impacts, and reasonable alternatives and their impacts are treated in the EIS, and shall be responsible for the scope and content of the EIS.

B. The Sponsor will engage and retain a Contractor, selected by the FAA with the assistance and input from the Sponsor, for the preparation of the EIS. The Contractor, with the approval of the FAA and Sponsor, may employ such other contractors and experts (collectively referred to as "Subcontractors"), as are required for the adequate development and preparation of the EIS.

C. The Contractor will provide, through its staff or by Subcontractor, the expertise, staffing, and technical capabilities required for the preparation of the EIS. The FAA will direct the scope of the EIS and will independently evaluate all information, environmental data and analyses submitted by the Contractor, or others, and revise or cause additional study and analyses to be performed as necessary.

D. The Contracts between the Sponsor and Contractor and between the Contractor and Subcontractors (collectively the "Contract") shall be consistent with the provisions of this MOU and shall specifically incorporate those provisions herein, which address the conduct of the Contractor. The Contract shall provide, and the Sponsor hereby represents, consistent with FAA Order 5050.4A, Paragraph 76(g), that the Contractor and any Subcontractors has not entered into and, during the lifetime of the EIS preparation, will not enter into any agreement affording the Contractor and any Subcontractors with any direct or indirect financial interest in the planning, design, construction or operation of the Project except with regard to the preparation of the EIS.

(1) Prior to beginning work on the EIS, the Contractor and any Subcontractors shall sign a "Disclosure Statement" provided by the FAA per the requirements of FAA Order 5050.4B, specifying they have no financial or other interest in the outcome of the project.

(2) The FAA shall evaluate the Disclosure Statement prior to its approval.

E. The FAA and Sponsor shall make all reasonable efforts to ensure the satisfactory and timely performance of the duties of the Contractor as specified in this MOU. The FAA agrees that the Sponsor will be reimbursed for allowable costs per FAA Order 5100.38b, not to exceed the amount available from AIP Grant.

F. The Sponsor and FAA shall:

(1) Appoint such representatives as necessary to accomplish the coordination necessary for the satisfactory preparation of the EIS. Notice to any such representative shall constitute notice to that party.

(2) Review substantive phases of preparation of the EIS as each deems necessary.

(3) Have their respective representatives attend meetings with other Federal, state, regional, and local agencies for the purpose of increasing communications

and receiving comments, as the same may be necessary, desirable, or required by law in preparation of the EIS.

(4) Facilitate the coordination of effort and the exchange of information related to the planning, design and construction of the proposed Angoon Airport, as these activities relate to the preparation of the EIS among and between the Contractor and its Subcontractors, the Sponsor and the FAA.

G. All costs incurred in connection with the employment of the Contractor and any and all Subcontractors, or other persons retained or employed by the Sponsor, shall be paid by the Sponsor upon receipt of the FAA Project Manager' s endorsement on the contractor' s invoice. The FAA agrees to reimburse the Sponsor for all FAA approved costs incurred by the Sponsor in connection with the EIS.

III. PROCEDURES

A. Under the direction of the FAA, the Contractor shall develop and submit a scope of work to the FAA for approval. The scope of work shall include detailed descriptions of all work to be performed, the methodologies proposed to perform the work, the name and qualifications of the person performing each aspect of the work, estimated hours required for completion of each aspect, the schedule for performing each aspect and a description of the internal and external review procedures to assure quality control. Also, the scope of work shall include a provision for a thorough literature search and bibliography of references and methodologies to be used in the acquisition of the environmental data and analyses and the development and preparation of the EIS. The scope of work shall include maintenance and access of a complete administrative file.

B. The FAA will forward the contract scope of work to the Sponsor for review and comment. After receiving comments from the Sponsor, and the scoping process conducted pursuant to 40 C.F.R. Sec. 1501.7, the FAA will finalize and approve the contract scope of work. The scope of work and this MOU shall establish the scope of work required of the Contractor in the development and preparation of the EIS.

C. The scope of work may be amended by the FAA from time to time as the work of the Contractor or its Subcontractors proceeds, but any amendments or changes which require the expenditure of additional funds by the Sponsor must be agreed to by the Sponsor. The Sponsor will be notified and consulted prior to any significant amendments or modifications to the scope of work.

D. Unless otherwise directed by the FAA, any and all work performed by the Contractor and its Subcontractors in preparation of the EIS shall be submitted directly to the FAA, and upon request of the FAA, to the Sponsor. The Sponsor may communicate with the Contractor and its Subcontractors during the development of the EIS, but no prior review or discussion of data or analyses developed by the Contractor or Subcontractor as related to the EIS shall be afforded the Sponsor. In no case will the Sponsor discuss, review, modify, or edit the Contractor's work or the work of its Subcontractors prior to submission to the FAA, or be provided the opportunity to do so. All suggestions for modifications or changes to such sections shall be recommended by the Sponsor only to the FAA.

E. The FAA reserves the right to review periodically and modify the work of the Contractor to ensure that requirements under NEPA and other applicable laws and regulations are satisfied. The Contractor shall submit monthly written reports on the progress of its work to the FAA, with a concurrent copy to the Sponsor. This report shall describe the present status of each aspect of the work, any problems encountered, and recommendations for modifications to the scope of work and any changes in personnel, methodology or schedules for completion.

F. As each portion of any draft or final document is completed, the FAA shall review each portion and those tasks completed there under and, after consultation with the Sponsor, shall approve, modify, comment thereon and/or direct further work with regard to such portion or tasks as necessary. Said directions and/or comments shall be made by the FAA in a timely manner, and the Contractor shall ensure incorporation of such comments into any editorial changes to the satisfaction of the FAA. Final drafts of any

documents will require FAA approval. Prior to approval, the FAA will forward final drafts to the Sponsor for review and comment. Comments from the Sponsor shall be sent to the FAA. The Contractor will make modifications only as the FAA directs regarding these comments.

G. If requested, the Contractor will provide the FAA access to and review of all procedures and underlying data used by the Contractor in developing submitted sections of the EIS, including, but not limited to, field reports, Subcontractor reports, and interviews with concerned private and public parties, whether or not such information may be contained in a draft or final EIS. The Sponsor will also have access to such procedures and underlying data. Such access by the FAA and Sponsor shall be governed by paragraph III.T hereunder.

H. To facilitate the development and preparation of the EIS, joint meetings among the FAA, Sponsor, and Contractor may be held. However, the FAA reserves the right to work directly with the Contractor for purposes of assuring objectivity in preparing reports and/or for assuring expeditious communications. The Contractor will notify the FAA and Sponsor of any substantive meetings that are scheduled and of their purpose and will provide an opportunity for the parties to attend if desired. No meeting will be held between the Contractor or Sponsor without prior notification to and approval of the FAA. A summary of all matters relating to EIS discussions in any meetings or communications between the Contractor and a party hereto without the participation of the other said party will be included in each formal monthly report submitted by the Contractor to the FAA and Sponsor. The FAA reserves the right to consult directly with other Federal, state, and local officials and agencies during the preparation of the EIS to ensure compliance with NEPA and other applicable laws and regulations. The contractor shall provide minutes of milestone meetings for review and comment by agency representatives present at the meeting prior to submitting the official minutes.

I. The FAA shall direct the full cooperation of the Contractor and its Subcontractors with respect to participating in any public workshops, hearings, or meetings as required by

the FAA to foster public familiarity and participation with respect to the assessment of impacts related to the Project.

J. The Contractor shall be responsible for the costs associated with the printing and publication of the draft and final copies of the EIS and the administrative record associated with the EIS. The Contractor shall be responsible for all costs associated with the publication of notices announcing public workshops, meetings, hearings, and the like. The Contractor shall also be responsible for costs of stenographic and clerical services, preparation of graphics and visual aids associated with any public workshops, meetings, and hearings. All such costs shall be deemed Airport Improvement Program (AIP) eligible costs under the Contract.

K. *The Contract may be amended to provide for a Subcontractor employed by the Contractor, to analyze impacts of the Project on floodplains, wetlands, and other waters of the U.S. for the EIS, to perform work necessary to support applications for permits for the Project under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act ("Permit-Related Work"). Any such amendment is subject to the following conditions:*

1. *The Subcontractor shall execute a disclosure statement in accordance with paragraph II.D reflecting its involvement in the performance of Permit-Related Work.*
2. *The Subcontractor' s responsibilities on the EIS will be limited to analyzing impacts to floodplains, wetlands, and waters of the U.S.*
3. *The Contractor shall ensure that none of its personnel participate or otherwise assist in the Permit-Related Work. Similarly, the Subcontractor shall ensure that none of its personnel performing Permit-Related Work also perform work related to the EIS.*
4. *The Subcontractor' s personnel performing Permit-Related Work may communicate regarding that work only with the FAA and the Sponsor. Neither the Contractor nor the Subcontractor' s personnel performing work on the EIS*

may share any information regarding the Project with the Subcontractor' s personnel performing Permit-Related Work without prior approval by the FAA.

5. *The Subcontractor must not proceed with any Permit-Related Work until the FAA has notified the Sponsor of the FAA' s preferred alternative(s) for the project. If the FAA notifies the Sponsor that the no-action alternative is the preferred alternative for a runway included in the Project, the Sponsor shall promptly direct the Subcontractor to cease all Permit-Related Work for that runway.*

L. At such time as the FAA, after consultation with the Sponsor, has approved the Draft EIS developed and prepared by the Contractor and its Subcontractors, the FAA shall direct the Contractor to print the contracted quantity of Draft EIS and submit the same to the FAA. The FAA shall submit an appropriate number of copies of the Draft EIS to the Sponsor. The FAA shall proceed expeditiously to comply with the provisions of NEPA.

M. In all instances involving questions as to the content or relevance of the environmental data and analyses, and evaluations and wording prepared by the Contractor, the FAA, with appropriate advice and consultation where deemed necessary by the FAA, will make the final determination on the inclusion, deletion or modification of the same in the Draft or Final EIS.

N. Upon completion of the Draft EIS, the FAA, with the Contractor's assistance, shall be responsible for organizing and conducting any public hearings.

O. The FAA will receive all comments during the Draft EIS review and comment period. This period (at least 45 days) will be initiated when the Environmental Protection Agency (EPA) publishes the "Draft EIS Notice of Availability" in the Federal Register.

P. At the close of the Draft EIS review and comment period, the FAA shall identify the issues and comments submitted which will require response in the Final EIS. The FAA will direct those comments to the Contractor for preparation of proposed responses, and shall furnish the Sponsor with copies of all comments received. The Contractor will furnish proposed responses to the FAA and Sponsor for review and comment. The

FAA, after consulting with and considering any advice from the Sponsor, shall modify the proposed responses, as it deems necessary.

Q. After receipt of comments and preparation of responses, the FAA, after consulting with and considering any advice from the Sponsor, may direct the Contractor to make changes to the text of the Draft EIS as necessary.

R. At such time as the FAA has approved the Final EIS, the FAA shall direct the Contractor to print the contracted quantity of Final EIS. The FAA shall submit an appropriate number of copies of the Final EIS to the Sponsor. The FAA shall proceed expeditiously to comply with the provisions of NEPA.

S. The FAA will receive all comments on the Final EIS during the mandatory "hold period". This period (at least 30 days) will be initiated when the EPA publishes the "Final EIS Notice of Availability" in the Federal Register.

T. The FAA, with assistance from the Contractor, will prepare and issue the FAA Record of Decision.

U. The parties recognize that statutory record disclosure requirements affect both the FAA and the Sponsor. The parties agree to develop document control procedures in the future that will provide for confidential evaluations and discussion of materials not appropriate for, and legally exempt from, public disclosure. The FAA will maintain the confidentiality of, and will not release or allow access to, any information, documents or materials which in its opinion are validly designated as confidential by the Sponsor or Contractor and which contain trade secrets, proprietary data, or commercial or financial information. Information developed under this MOU is disclosable to the public to the extent required by law. In any instance where the FAA proposes to release to the public or allow access to any information, documents or materials which the Sponsor or Contractor has designated as confidential, it shall notify the Sponsor or Contractor of its intension to do so and provide the Sponsor or Contractor the opportunity to appeal the

decision in accordance with the applicable regulations on such release or access prior to any such release or access.

IV. CESSATION AND TERMINATION

Any of the parties to this MOU may withdraw from the terms of this MOU for good cause upon 30 days written notice to the other party. During this period, the parties will actively attempt to resolve any disagreement. Termination of this MOU shall in no way impair the Sponsor' s eligibility for reimbursement for costs and obligations incurred prior to termination, including all costs, obligations and damages arising out of the Contract.

In the event of a termination of this MOA, and if the preparation of an EIS by the FAA is still required, it is agreed as follows:

(1) The FAA shall have access to all documentation, reports, analyses, and data by the Contractor and Subcontractors with confidentiality governed by paragraph III.T.

(2) The Sponsor shall no longer be responsible for the payment of costs associated with preparation of the EIS under the terminated MOA, apart from costs already incurred, invoiced, and endorsed by the FAA under the contract with the Contractor.

(3) Liability for termination shall be in accordance with paragraph II.G. hereof.

V. NO RIGHTS FOR NON-PARTIES

No rights or privileges are created or intended to be created by this MOU in anyone not a signatory of this MOU.

VI. MODIFICATION

This MOU represents the entire agreement and may be modified by the parties hereto only by written agreement by all the parties.

United States Federal Aviation Administration

Byron Huffman – Division Manager, Airports Division, Alaskan Region

11/2/13
Date

State of Alaska Department of Transportation and Public Facilities

Albert H. Clough, CPG – Regional Director, Southeast Region, ADOT&PF

10.25.2013
Date

RECORD OF CONVERSATION	Time: 12:15PM	Date: 1/30/14

TYPE ☐ In-person Conversation ☐ Meeting/Conference ☒ Telephone ☒ Incoming ☐ Outgoing ☐ E-mail Chain (summarized here due to length and to focus on relevant information; copy should accompany this ROC)

Location of In-person Conversation, Meeting, or Conference: NA

Name of Persons Contacted or in Contact with You	Organization	Telephone No.
Matt Kookesh, Jr.; Mayor	City of Angoon	907.788.3653

Subject: call discussing Jamie's email "RE: formal plans for 2 platted parks?"

Summary of Conversation

Mayor Kookesh returned Jamie's call/email regarding:

- obtaining further information on the City's use and management of the two platted park areas, and
- confirming that the City understands that the FAA determined that these platted parks are not Section 4(f) resources in the Angoon Airport EIS.

Mayor Kookesh answered that:

- other than to protect them for subsistence uses, there are no plans for these platted parks, and likely won't be for some time.
- He has reviewed pages 166-167 of the preliminary draft EIS, and the City understands that the FAA made this determination, but these lands still have meaning to the community because they were selected via the 14(c)3 process. The community did not receive all of the acreage that they requested in that process. Those lands cannot be replaced via any other process, and they represent some of the only areas within which the City can expand. The City does not want Airport 12a because it would coincide with some of their only available land base.

Jamie explained that only the avigation easements for Airports 3a and 12a (shown on pages 169 and 171) would overlap with the platted City parks. These areas would have trees removed for aviation safety, but would otherwise still be accessible to Angoon community members.

Mayor Kookesh stated that the City does not support the Airport 12a location and that the entire City Council should be included in discussions regarding the airport locations. He said that he had a teleconference with the Alaska DOT Commissioner because the City feels that the FAA is ignoring the City in regards to the airport project. The City feels that the tribe (Angoon Community Association, ACA) has been consulted more than the City. Jamie explained that the informal community visits held at the ACA building were open to all members of the public and were not tribal consultation meetings. FAA has involved the City in the same manner as the ACA and Kootznoowoo, Inc., having most recently met with all 3 entities in late June 2013 to discuss the FAA's identification of a preferred alternative, and then included the City in the internal agency review of the preliminary draft EIS.

Mayor Kookesh brought up voting for airport locations and Jamie clarified that the FAA did not request that any voting take place. Jamie said that the FAA has received and reviewed resolutions of support from both the City and the ACA regarding the proposed airport locations.

Action Required: None

Name of Person Documenting Conversation: Jamie Young, SWCA Environmental Consultants

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports
Division
222 West 7th Ave #14
Anchorage, AK 99513

In Reply Refer To:
AIP-3-02-0018-0705

February 14, 2014

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W. 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

RE: File No. 3131-1R FAA
Angoon Airport Environmental Impact Statement

Dear Ms. Bittner:

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Aviation Administration (FAA), is proposing to construct a new land-based airport for the community of Angoon on Admiralty Island in Southeast Alaska. As you may recall from our initial consultation with your office in May 2008 and follow-on correspondence in April 2012 and July 2013, the FAA is considering three action alternatives and one no action alternative for this land-based airport. Two of the action alternatives (Airport 3a and Airport 4) are located primarily on lands administered by the U.S. Forest Service (USFS). The third action alternative, Airport 12a, is located on lands owned by private individuals, the City of Angoon, and the village corporation (Kootznoowoo, Inc.). The FAA has identified Airport 12a with its associated access road as the preferred alternative. Airport 12a with Access 12a is located in Sections 5, 6, and 8, Township 51 South, Range 68 East, Copper River Meridian (U.S. Geological Survey quadrangles Sitka B-2). Pursuant to 36 Code of Federal Regulations (CFR) 800.4(d)(1), the implementing regulations of Section 106 of the National Historic Preservation Act, the FAA finds that no historic properties would be affected by the proposed project at the FAA's preferred location (Airport 12a with Access 12a).

The Project

The Project consists of a new airport and an associated access road. The Project would require ground disturbance from both temporary construction activities and long-term or permanent structures and terrain alteration. In general terms, the Project would consist of the following activities and components with the potential to affect historic properties:

- A 3,300-foot-long, 75-foot-wide paved runway

- A 150-foot-wide runway safety area centered on the runway centerline but extending 300 feet beyond each runway end
- A 75-foot-wide, roughly 150-foot-long paved taxiway
- A roughly 70,000-square-foot paved apron area with future hangar, lease lots, and passenger shelter space and vehicle parking space
- A paved airport access road comprising two 10-foot-wide travel lanes with 5-foot shoulders
- Excavation of post holes and installation of an airport perimeter fence
- Vegetation removal related to the airport and road (clearing for construction or for visibility)
- Terrain disturbance related to the airport and road (includes cutting and filling of soil, and ripping and blasting of shallow bedrock to level the ground)
- Terrain disturbance from potential extraction of construction materials such as gravel, soil, and rock from on-island materials sources
- Pavement related to the airport and road (creating smooth surfaces for airplanes and vehicles)
- Tree felling (cleared trees would be left where they fall) related to certain avigation easements (creating visually open areas for flight approach and takeoff)
- Rerouting or culverting of streams (to continue water flow that otherwise would be impeded by newly filled areas)

Area of Potential Effects

As discussed in the April 2012 and July 2013 correspondence with your office, the FAA implemented a phased approach to identifying cultural resources that could be affected by construction and operation of the airport. These phases consist of Phase 1 (preliminary studies of all three airports and their associated access road locations) and Phase 2 (intensive studies of only the FAA's preferred alternative). Following the identification of the preferred alternative, the FAA implemented Phase 2 for Airport 12a with Access 12a. The FAA has identified the direct area of potential effects (APE) for the preferred alternative to include all lands that would be subject to the above activities. Your office provided a letter of no objection to this APE in August 2013. Following our consultation with your office on the APE, the FAA identified additional areas wherein historic properties could be affected indirectly through visual intrusion, noise, and vibration. These APEs are shown on Figure 1 and Figure 2.

Historic Properties Identification Efforts

As part of the literature review conducted during the Phase 1 studies, the FAA's cultural resource consultant team reviewed the Office of History and Archaeology (OHA) citation database, Alaska Heritage Resources Survey (AHRS) records and location editor (geographic information system [GIS] site locator maps), Alaska Resources Library and Information Services data archives, and the Tongass National Forest Heritage Resources Survey data. Additionally, the FAA's cultural resource consultant reviewed the works of de Laguna (1960), Erlandson and Moss (1983), and Moss and Erlandson (1985), all of whom have conducted extensive work in

the Angoon area, as well as the broader regional works of Goldschmidt and Haas (1946) and others. The specific data resources of the OHA and AHRS records were reviewed to identify relevant documentation and information for past archaeological and ethnographic studies and previously documented archaeological sites within 1 mile of the Phase 1 Direct APE. Because the Phase 1 and 2 APEs are slightly different, the cultural resource consultant team updated the literature review search area to a 1-mile radius around the Phase 2 Direct APE. In addition, this updated search included sources not available at the time of the Phase 1 studies. The updated literature review occurred in July 2013. The results of the Phase 2 cultural resources studies conducted for Airport 12a with Access 12a are included in the enclosed report, *Cultural Resources Technical Report for the Area of Potential Effects for Airport 12a with Access 12a (Preferred Alternative)*, prepared by SWCA Environmental Consultants (SWCA). The results of the Phase 1 study were submitted to the State Historic Preservation Office (SHPO) in April 2012 and are also included as an appendix to the enclosed report.

Considerations of National Register of Historic Places Eligibility

Through the cultural resource studies, the FAA identified four cultural resource sites within the APEs for the Project. Three of these sites (SIT-00014, SIT-00056, and SIT-00749) are located wholly or partially in the Visual APE on Killisnoo Island, and one (SIT-00169) is located partially within the Vibration APE on the Angoon peninsula. Although these sites were previously documented during separate undertakings not part of the FAA's efforts, no determinations of eligibility have been made for any of the sites. For the purposes of this undertaking, the FAA has opted to forego a formal determination of eligibility and assume three sites (SIT-00014, SIT-00749, and SIT-00169) are historic properties. To allow for findings of effects relative to the potential visual intrusions and vibration effects from the Project, the FAA considered the historical significance of all sites relative to the criteria of the National Register of Historic Places (NRHP) and the sensitivity of that significance to visual or vibration effects. The review of significance is provided below, and the findings of effect follow.

Site SIT-00056 (St. Andrews Church) was also previously documented in the Visual APE; however, no evidence of the site, other than the land on which it was located, was identified by the FAA's archaeological consultant. As no physical remains of the church site were located, the FAA did not evaluate the site for impacts from the proposed undertaking.

Site SIT-00014, Killisnoo Island Village

SIT-00014 is the Killisnoo Island Village site—a historic Tlingit and Euro-American village and commercial/industrial site. The village was destroyed by a fire in 1928. This site appears to be eligible for the NRHP under Criteria A and D for the following reasons:

- The whaling operations from the village are also associated with one of the most infamous events in the history of Angoon, namely the shelling of Angoon by the U.S. Navy in 1882.
- Killisnoo Island Village is directly associated with the relocation of Aleuts from Atka during World War II.
- There is potential for both surface and subsurface archaeological deposits that could expand the understanding of the history of Killisnoo Island Village.

- The artifact assemblage has the potential to yield information dating as far back as the prehistoric period and all of the different use periods since then. In particular, the assemblage could provide information about the interactions of the different ethnic, religious, and culture groups that occupied the village both over time and at the same time.

Due to the destruction and/or demolition of all of the buildings, and the near-complete lack of building ruins, SIT-00014 does not appear to retain sufficient integrity to be eligible under Criteria B and C—that is, the site lacks sufficient integrity to convey its historical associations with any specific historical person or to reflect specific architectural or engineering types, styles, or manners of construction.

Site SIT-00169, Killisnoo Harbor Village

Site SIT-00169 is the Killisnoo Harbor Village site. It is located on the eastern shoreline of Killisnoo Harbor, south of the current Angoon ferry terminal. The first archaeological investigations of the site appear to have been conducted by de Laguna, who learned from residents of Angoon that the village had been abandoned after an epidemic, perhaps in the 1830s (de Laguna 1960). She observed garden furrows and found traces of midden in subsurface tests. In the 1970s the site was investigated and formally recorded by Sealaska Corporation, at which time the remains of two cabins, historical debris, and extensive gardens were noted (Sealaska and Wilsey & Ham 1975). Shortly thereafter, Fields and Davidson (1979) conducted a cursory examination of the area and recorded four decaying cabins, historical debris, depressions, garden plots, and crushed shell possibly indicative of midden deposits.

Based on observations of the site, it appears likely the site would qualify for the NRHP under at least Criterion D, as it has the potential to yield information important in expanding the understanding of historical land uses in the Angoon area. Because the structural remains at the site are collapsed and in ruins and do not retain integrity of design and workmanship, it is unlikely the site would qualify for listing in the NRHP under Criterion C. The FAA did not research the associations of the site relative to important historical persons or events and, therefore, is not offering an opinion on the eligibility of the site relative to Criteria A and B of the NRHP.

Site SIT-00749, Killisnoo Cemetery

SIT-00749 is a historical Aleut and Russian Orthodox cemetery (Killisnoo Cemetery) located on Killisnoo Island. The cemetery contains several dozen graves of primarily Russian Orthodox Alaska Natives. Several Aleut persons who died during their forced relocation from Atka—in the Aleutian Chain—to Killisnoo during World War II are also buried in the cemetery, as are at least a few persons of Japanese or Japanese-American descent. Grave markers and remnants of burial houses are still present, though heavily weathered. There is no evidence that the cemetery constitutes a designed landscape.

Although cemeteries are typically excluded from inclusion in the NRHP, the SIT-00749 cemetery appears likely to meet the standards for Criteria Consideration D, which addresses exceptions to the rule. Specifically, the Killisnoo Cemetery appears to be eligible for the NRHP

under Criterion A. The cemetery does not appear to meet the criteria consideration for associations with persons of "transcendent importance" or retain sufficient integrity of structural features to merit eligibility under Criteria B or C.

Under Criterion A, the cemetery is a significant site for its associations with the history of Killisnoo Island and Killisnoo Island Village. The cemetery still reflects strong associations with the various cultural and religious affiliations of Killisnoo Island's residents over time. Russian Orthodox, Aleut, Tlingit, Japanese, and Euro-American grave markers are all present and represent the small island's varied occupants. The cemetery also reflects the different periods of occupation of nearby Killisnoo Island Village, from the late 1800s to the mid-1900s. For these reasons, the cemetery site appears to be eligible for the NRHP under Criterion A and meets the criteria considerations set forth by the National Park Service (NPS) for cemetery sites.

Findings of Effect

Site SIT-00014, Killisnoo Island Village

SIT-00014, Killisnoo Island Village, is located within the Visual APE for the current undertaking. The characteristics for which SIT-00014 appears to be eligible for the NRHP are not sensitive to visual intrusion. The historical village site was not located on the eastern shore of Killisnoo Island because of its particular viewshed. Rather, all indications are that the village was located as such because of the calm waters afforded by Killisnoo Harbor. During its period of industrial and residential development, the situating of buildings does not appear to have been specifically influenced by the viewshed and was defined by available land, the island's topography, and the development of different zones (e.g., industrial and residential) to separate, at least to a certain degree, living quarters and social activities from the industrial facilities. The historical associations of the village site under Criterion A are not affected by the viewshed from the site.

The apparent eligibility of the Killisnoo Island Village site under Criterion D for its information potential is not vulnerable to changes in the viewshed of the site; the extent, nature, or quality of the data that could be recovered would be in no way affected by alteration of the landscape on lands across the harbor from the site.

Based on the reasons presented above, the anticipated landscape changes from Airport 12a would have no effect on the Killisnoo Island Village site (SIT-00014). As such, the FAA has made a finding of ***No Historic Properties Affected*** relative to site SIT-00014.

Site SIT-00169, Killisnoo Harbor Village

Site SIT-00169, Killisnoo Harbor Village, is partially located in the Vibration APE for the current undertaking. Since the soil composition in the vicinity of the site is stable and not defined by loose deposits that could allow for movement of subsurface artifacts due solely to vibration, the archaeological component of this site does not appear vulnerable to vibration effects. The structural component of site SIT-00169 consists of collapsed cabin remains. Because these structures have already collapsed and become overgrown and heavily weathered, they no longer

appear susceptible to damage or impairment from potential vibration associated with construction of the airport on adjacent lands.

Based on the reasons presented above, vibration associated with construction of the airport on adjacent lands would have no effect on the Killisnoo Harbor Village. As such, the FAA has made a finding of ***No Historic Properties Affected*** relative to site SIT-00169.

SIT-00749 Killisnoo Cemetery
Site SIT-00749, the Killisnoo Cemetery, is located in the Visual APE for the current undertaking. This site is located in a moderately dense, second-growth spruce-hemlock forest. Visibility from the cemetery grounds to the surrounding landscape is somewhat limited by the forest landscape.

Although cemeteries are often intentionally situated on the landscape to take advantage of viewsheds afforded by certain topographic features, this does not appear to be the case with the Killisnoo Cemetery. Rather, the cemetery's location appears from historical maps of the island to be as much, if not more, a matter of available land near the Killisnoo Village as a specific selection based on viewshed. Additionally, the reasons for which the Killisnoo Cemetery would be eligible for the NRHP are not specifically because of its role as a cemetery site but rather its associations with and ability to reflect the historical activities and cultures of Killisnoo Village and Killisnoo Island over time. These facets of the site's importance are not sensitive to visual intrusion from the landscape across Killisnoo Harbor. As such, the visual changes to the landscape anticipated from Airport 12a are expected to have no effect on the significance of site SIT-00749, the Killisnoo Cemetery and thus, the FAA has made a finding of ***No Historic Properties Affected*** relative to site SIT-00749.

Overall Finding of Effect

No historic properties are present in the Direct APE or the Noise APE. Historic properties are present within the Visual APE and the Vibration APE but the Project does not have any effect on the characteristics that qualify these properties for inclusion in the NRHP. Therefore, the FAA's issuance of approvals or funding for the construction and operation of an airport at the Airport 12a with Access 12a location or use of the potential materials source would result in a finding of ***No Historic Properties Affected***.

Based on our determinations of effect through this Section 106 consultation process, the FAA also intends to make a finding of No Use of Historic Properties for all of the sites under Section 4(f) of the Department of Transportation Act (as amended).

Previous Consultation Efforts

The FAA has consulted with other parties, including the Project sponsor (DOT&PF), the USFS, the Angoon Community Association, the Central Council of the Tlingit and Haida Indian Tribes of Alaska, Sealaska Corporation, Kootznoowoo, Inc., and several members of the Angoon community, as part of our efforts to identify historic properties. All consulting parties will

receive a copy of this finding of effect. Beyond the USFS, only local community members and Kootznoowoo, Inc. have provided information regarding the potential locations of historic properties and their relative importance to the community.

The FAA respectfully requests your concurrence with our findings of No Historic Properties Affected for this project. Please feel free to contact me if you have any questions or comments regarding the enclosed materials or require additional information. I can be reached at the address above or at 907-271-5453.

Sincerely,

Leslie A. Grey
FAA Project Manager
Angoon Airport Environmental Impact Statement

Enclosures:

Figures 1 and 2
Office of History and Archaeology Cover Sheet
SWCA Environmental Consultants. 2014. *Cultural Resources Technical Report for the Area of Potential Effects for Airport 12a with Access 12a (Preferred Alternative).* Anchorage, Alaska: SWCA

cc w/ enclosures:

Laurie Mulcahy, DOT&PF, Cultural Resources Manager

cc w/o enclosures:

Verne Skagerberg, DOT&PF Southeast Region, Project Manager
Jane Gendron, DOT&PF Southeast Region, Regional Environmental Manager
John Barnett, DOT&PF, Acting Regional Environmental Manager
Michael Kell, DOT&PF, Historic Archaeologist

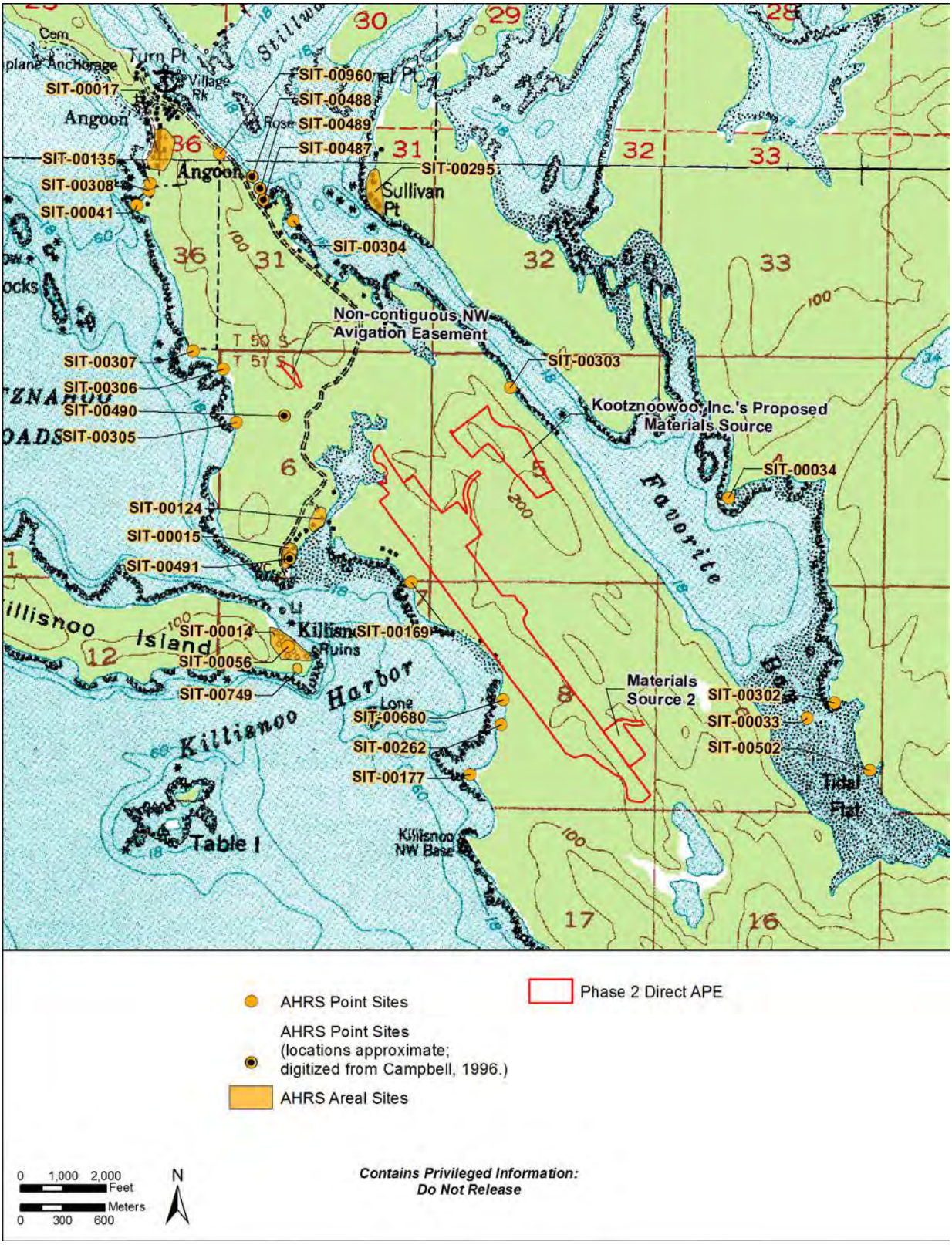

Figure 1. Phase 2 Direct APE and AHRS point sites within 1 mile of this APE.

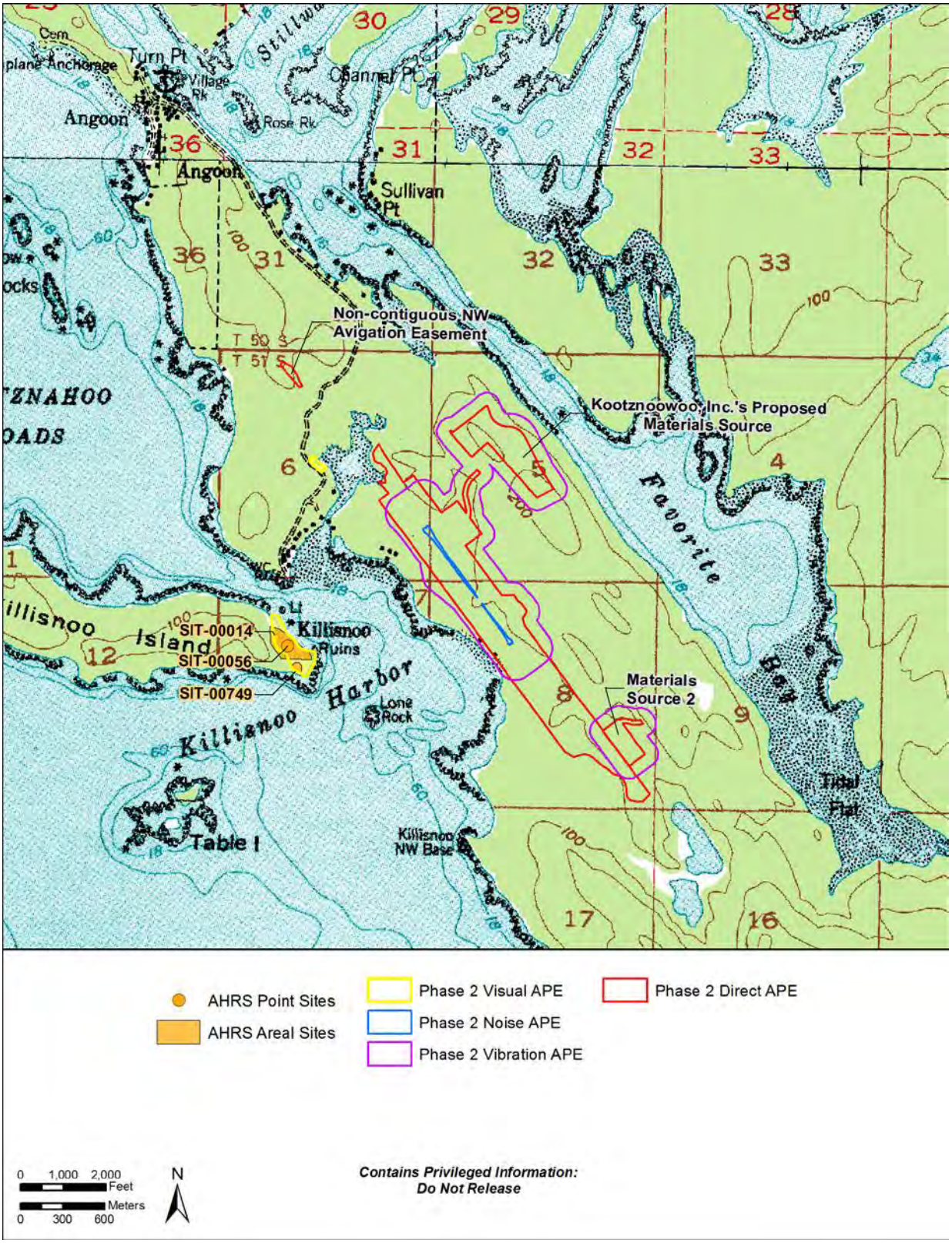

Figure 2. Phase 2 indirect APEs and AHRS recorded sites within these APEs.

United States Department of Agriculture
Forest Service
Alaska Region
Tongass National Forest
648 Mission Street
Ketchikan, AK 99901
Phone: (907) 225-3101
Fax: (907) 228-6215

File Code: 1900
Date: March 4, 2014

Leslie Grey
Angoon Airport EIS Project Manager
FAA - Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

Dear Ms. Grey:

Regarding the environmental impact statement (EIS) for the proposed Angoon Airport, I've reviewed your evaluation pursuant to Section 4(f) of the Department of Transportation Act of 1966 (Public Law 89-670).

With this letter, I concur with FAA's four specific findings:

- The Kootznoowoo Wilderness Area is a publicly owned property, for which a primary purpose is recreation.
- The Kootznoowoo Wilderness Area is a significant public recreational resource in the National Forest System.
- The permanent incorporation of land from the Kootznoowoo Wilderness Area into an airport and access road – through easement, special use permit, long-term lease, or other instrument not involving a land exchange – would not constitute a *de minimis* use (in the context of Section 4(f)) of the wilderness area.
- Section 4(f) does not apply to the archaeological site known as the Favorite Bay Garden Site (SIT-00302).

The Kootznoowoo Wilderness Area exemplifies a complex character which includes outstanding opportunities for solitude or primitive and unconfined types of recreation; untrammeled areas and natural conditions where wildlife and waterfowl may thrive, and unrestricted opportunities for subsistence.

I agree with FAA's finding that alternatives Airport 3a and 4 and their access road options would constitute "use" of land from the Kootznoowoo Wilderness Area, as defined in Section 4(f), at 23 CFR 774.17. Permanent incorporation of wilderness area lands into the airport and access road under either Airport 3a or 4 would adversely affect the activities, features, or attributes of the wilderness area that qualify it for Section 4(f) protection.

Additionally, I concur with FAA's finding that alternative Airport 12a and its associated access road, would not use lands within the Kootznoowoo Wilderness Area. Airport 12a would not permanently incorporate lands designated as wilderness into either the airport or access road, nor would it require temporary occupancy of wilderness or result in constructive use of said lands.

Should you require additional information or consultation, please feel free to contact Jennifer Berger of the Admiralty Island National Monument staff. She can be reached at (907) 789-6278 or via email at jberger@fs.fed.us . Thank you for your efforts on this project to date.

Sincerely,

FORREST COLE
Forest Supervisor

cc:
Chad VanOrmer
Jennifer Berger

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Natural Resources

DIVISION OF PARKS AND OUTDOOR RECREATION
Office of History and Archaeology

550 West 7th Avenue, Suite 1310
Anchorage, Alaska 99501-3565
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Phone: 907.269.8721
Fax: 907.269.8908

April 4, 2014

File No.: 3130-1R FAA
3330-6 SIT-00014, 3330-6 SIT-00169, 3330-6 SIT-00749

Leslie A. Grey
FAA Project Manager
Angoon Airport EIS
AAL-614
Alaskan Region Airports Division
222 West 7th Avenue, #14
Anchorage, AK 99513

Subject: Angoon Airport Environmental Impact Statement and Cultural Resources Technical Report for the Area of Potential Effects for Airport 12A with Access 12A (Preferred Alternative)

Dear Ms. Grey:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated February 14, 2014) on February 18, 2014. Following a request for additional information from this office, you provided a summary of consulting party comments on March 20, 2014. In addition, we received a summary of comments / concerns from DOT&PF Southeast Region on April 2-3, 2014.

Following our review of the documentation provided, we offer the following comments:

- Although FAA specified in the cover letter provided that they would forego formal determinations of eligibility and assume three sites eligible for the National Register of Historic Places (NRHP), we believe that the cultural resource report and summary information provided in FAA's cover letter provide sufficient support that SIT-00014, SIT-00169, and SIT-00749 are **eligible** for the NRHP. Therefore, rather than assume eligibility, we believe that SIT-00014 is eligible under criteria A and D, SIT-00169 is eligible, at a minimum, under criterion D and additional research may reveal that it is eligible under other criteria, and that SIT-00749 is eligible under criteria consideration D and criterion A.
- We recommend that the FAA provide a formal determination of eligibility for SIT-00056. If it is no longer present and no archaeological material remains, a formal determination of 'not eligible' may be appropriate. It appears that there is sufficient documentation available to make this eligibility call.
- We understand that local community members (e.g., elders and others) and Kootznoowoo, Inc. provided feedback regarding the locations of Beaver Tail Rock (SIT-00781). However, the nature or location of site is not discussed in the report nor does our office have any additional information for SIT-00781. Will it be affected by the undertaking?
- With respect to the known sites located within the indirect visual APE (SIT-00014 and SIT-00749), we believe the proposed project presents the potential for effects to these sites. We recommend that FAA apply the Criteria of Adverse Effect (36 CFR 800.5[a]) in order to assess whether the effect is adverse or not.

- A review of comments provided by other consulting parties – primarily DOT&PF – we believe that some key concerns remain unaddressed:
    - While we did not object to the APE as defined in FAA's July 2013 correspondence, it appears that other key consulting parties believe the APE has been inadequately defined. We recommend that the FAA respond to the comments provided by DOT&PF regarding the definition of the APE and provide a basis for its definition. Does the indirect APE adequately encompass the geographic area where effects may occur to historic properties?
    - The archaeological survey was conducted in mid-summer 2013 when ground-covering vegetation is at its height and surface visibility must have been somewhat limited. Does FAA believe that additional pedestrian inventory is warranted during a season of improved surface visibility?
    - A concern has been raised that the boundary of SIT-00169 has not been sufficiently defined and that it may be more extensive than the present survey reports. Does the FAA have a high level of confidence in the boundary of SIT-00169 as presently defined? Is there a potential for the site to be affected by the proposed undertaking?
    - Given the presence of cemetery sites in the vicinity, has the potential for encountering buried human remains been adequately addressed?
    - For similar reasons, would it be advisable to require archaeological monitoring during construction?
    - Has the FAA adequately considered the potential long-term indirect effects that could result from increased access in the vicinity of the project area?

Thank you for the opportunity to comment. We look forward to continued consultation on the subject undertaking. Please contact Shina duVall at 269-8720 or shina.duvall@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer
JEB:sad

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

In Reply Refer To: AIP-3-02-0018-0705

April 30, 2014

Ms. Judith Bittner
State Historic Preservation Officer
Alaska Office of History and Archaeology
550 W 7th Avenue, Suite 1310
Anchorage, AK 99501-3565

RE: File No. 3131-1R FAA
Angoon Airport Environmental Impact Statement and Cultural Resources Technical Report for the Area of Potential Effects for Airport 12a with Access 12a (Preferred Alternative) Determinations of Eligibility

Dear Ms. Bittner:

In your letter dated April 4, 2014, which was submitted in response to our consultation with your office regarding the above-referenced undertaking, you requested that the Federal Aviation Administration (FAA) make formal determinations of eligibility for the National Register of Historic Places (NRHP) for several cultural resource sites located within the area of potential effects (APE) of the project rather than merely assume eligibility for the purposes of assessing project effects. The sites in question are SIT-00014, SIT-00169, SIT-00749, and SIT-00056. This letter provides our formal determinations for these sites and requests your concurrence with them.

In our consultation letter to you dated February 14, 2014, we provided a review of NRHP eligibility considerations for sites SIT-00014, SIT-00169, and SIT-00749. We reiterate those here, with additional evaluation, along with our formal determinations regarding site eligibility. Also, as requested, we have included a more detailed evaluation of site SIT-00056 and a formal determination of eligibility for said site.

Site SIT-00014, Killisnoo Island Village

SIT-00014 is the Killisnoo Island Village site—a historic Tlingit and Euro-American village and commercial/industrial site. The village was almost entirely destroyed by a fire in 1928 and has been affected by the Whaler's Cove Lodge complex built on approximately two-thirds of the site area, but artifacts, historical objects, and a few landscape features do remain in portions of the site more inland from the lodge facility. The FAA has determined this site is eligible for the NRHP under Criteria A and D for the following reasons:

- The whaling operations from the village are associated with one of the most infamous events in the history of Angoon, namely the shelling of Angoon by the U.S. Navy in 1882.
- Killisnoo Island Village is directly associated with the relocation of Aleuts from Atka during World War II; the relocations of Alaska Natives and Japanese-Americans has been designated a significant historical theme/context by the National Park Service (NPS).

- The potential exists in portions of the site for both surface and subsurface archaeological deposits that could expand the understanding of the history of Killisnoo Island Village.
- The artifact assemblage has the potential to yield information dating as far back as the prehistoric period and all of the different use periods since then. In particular, the assemblage could provide information about the interactions of the different ethnic, religious, and culture groups that occupied the village both over time and at the same time.

Although many individuals and collections of individuals are associated with the site, the remnants of the village that do exist lack the integrity needed to convey their association with such individuals for the purposes for which said persons are historically important. As such, the FAA finds the site ineligible for the NRHP under Criterion B. Further, due to the destruction and/or demolition of all of the buildings, SIT-00014 does not appear to retain sufficient integrity to be eligible under Criterion C—that is, the site lacks sufficient integrity to convey its historical associations with any specific historical person or to reflect specific architectural or engineering types, styles, or manners of construction.

Site SIT-00056, St. Andrews Church

Site SIT-00056 is the St. Andrews Church site. The site was documented in Alaska Heritage Resources Survey (AHRS) records in 1974 through an archival exercise associated with Russian Orthodox Church buildings and sites in Alaska. No fieldwork was conducted at that time to verify the existence of the church or any archaeological remains. The documented site location is on the eastern side of Killisnoo Island, within the boundary of site SIT-00014 (the Killisnoo Island Village site). The church building was constructed during the early 1890s and used until the 1928 fire that burned the church, and the rest of the buildings in Killisnoo Island Village, to the ground.

As noted in the discussion of site SIT-00014, approximately two-thirds of the Killisnoo Island Village site, within which the St. Andrews Church was located, is now occupied by the Whaler's Cove Lodge complex. A reconnaissance of the documented location of the St. Andrews Church site during the Phase 1 field studies for the Angoon Airport project in 2009 concluded that the property on which the St. Andrews Church was located remains undeveloped as an inholding within the Whaler's Cove Lodge property; however, there are no physical remains of the church building present on that property. No artifacts were observed at the site location during the 2009 reconnaissance, but vegetation overgrowth obscured the ground surface. It should also be noted that given the long and extensive history of artifact collecting and salvage that has occurred in the Killisnoo Island Village site since the abandonment of the village after the fire, the provenience of any surface artifacts at the St. Andrews Church site should be met with skepticism. Lacking permission to conduct any subsurface probing at the site, the 2009 crew did not excavate any shovel probes to assess the potential for intact subsurface deposits.

Although St. Andrews Church played a prominent role in the lives of the Russian Orthodox in Killisnoo Island Village and was an important outpost in the battle between the Russian Orthodox Church and other religious institutions to gain converts among Alaska Natives, the site lacks the integrity needed to reflect this association or its association with important individuals. Because it does not have structural remains and standing features, the site also lacks the integrity to represent a particular architectural type or style, method of construction, or artistic design. As such, the FAA has determined that the site, independent of the Killisnoo Island Village site (SIT-00014), is not eligible for the NRHP under Criteria A, B, and C. The FAA does find, however, that the potential exists for subsurface cultural deposits, although such deposits are likely to be both sparse and shallow due to the relatively short period of time over which the church existed. Therefore, the FAA has determined that site SIT-00056, the St. Andrews Church site, is eligible for the NRHP under Criterion D, at least until proven otherwise by subsurface investigations.

Site SIT-00169, Killisnoo Harbor Village

Site SIT-00169 is the Killisnoo Harbor Village site. It is located on the eastern shoreline of Killisnoo Harbor, south of the current Angoon ferry terminal. The site includes garden furrows, the ruins of two cabins, historical artifacts, earthen depressions, and evidence of a subsurface shell midden. The structural remains at the site are collapsed and in ruins and do not retain integrity of design and workmanship.

According to the 1960 work *The Story of a Tlingit Community* by Frederica de Laguna, the village site was reportedly occupied for a relatively short period of time and appears to have been abandoned during or shortly after the 1836–1839 smallpox epidemic; the village was said to comprise only a handful of "huts" (houses) but fairly extensive gardens. The oral history collected by de Laguna about the site suggests it was not a major or historically important establishment but rather a convenient, wide spot on the shoreline of Killisnoo Harbor where individuals who chose not to live in one of the other village settlements established homes and garden plots. There is no evidence from de Laguna's work or the multiple investigations of the site over the years since then, including the assessment conducted for the current undertaking, to suggest the site is associated with important historical events or persons.

Based on the information outlined above, the FAA has determined that site SIT-00169 is eligible for the NRHP under Criterion D, as it has the potential to yield information important in expanding the understanding of historical land uses in the Angoon area, albeit over an apparently short period of time. Additionally, an analysis of the artifact assemblage could yield information that may shed additional light on the occupants of the area and any cultural, ethnic, or other reasons why they chose to live outside the larger village sites in the area. The FAA has determined that the site is not eligible for the NRHP under Criteria A, B, or C.

Site SIT-00749, Killisnoo Cemetery

SIT-00749 is a historical Aleut and Russian Orthodox cemetery (Killisnoo Cemetery) located on Killisnoo Island. The cemetery contains several dozen graves of primarily Russian Orthodox Alaska Natives. Several Aleut persons who died during their forced relocation from Atka—in the Aleutian Chain—to Killisnoo during World War II are also buried in the cemetery, as are at least a few persons of Japanese or Japanese-American descent. Grave markers and remnants of burial houses are still present, though heavily weathered. There is no evidence that the cemetery constitutes a designed landscape.

Although cemeteries are typically excluded from inclusion in the NRHP, the SIT-00749 cemetery appears likely to meeting the standards for Criteria Consideration D. Specifically, the Killisnoo Cemetery appears to be eligible for the NRHP under Criterion A. The cemetery does not appear to meet the criteria consideration for associations with persons of "transcendent importance" or retain sufficient integrity of structural features to merit eligibility under Criteria B or C.

Under Criterion A, the cemetery is a significant site for its associations with the history of Killisnoo Island and Killisnoo Island Village. The cemetery still reflects strong associations with the various cultural and religious affiliations of Killisnoo Island's residents over time. Russian Orthodox, Aleut, Tlingit, Japanese, and Euro-American grave markers are all present and represent the small island's varied occupants. The cemetery also reflects the different periods of occupation of nearby Killisnoo Island Village, from the late 1800s to the mid 1900s. For these reasons, the FAA has determined that the cemetery site is eligible for the NRHP under Criterion A and meets the criteria considerations set forth by the NPS for cemetery sites.

The FAA respectfully requests your concurrence with our determinations of eligibility for the four sites discussed herein. Please feel free to contact me if you have any questions or comments regarding the

information we have provided in support of our determinations. I can be reached at the address above or at 907-271-5453. We will be submitting under separate cover our amended findings of effect and responses to the other comments you provided in your April 4, 2014, correspondence. We look forward to continuing our consultation with your office regarding the Angoon Airport.

Sincerely,

Leslie A. Grey
FAA Project Manager
Angoon Airport Environmental Impact Statement

cc:

Laurie Mulcahy, DOT&PF, Cultural Resources Manager
Verne Skagerberg, DOT&PF Southeast Region, Project Manager
Jane Gendron, DOT&PF Southeast Region, Regional Environmental Manager
John Barnett, DOT&PF, Acting Regional Environmental Manager
Michael Kell, DOT&PF, Historic Archaeologist

References

de Laguna, Frederica. 1960. *The Story of a Tlingit Community*. Washington D.C.: United States Government Printing Office.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

May 13, 2014

Jon Kurland
NOAA Fisheries, Assistant Regional Administrator
Protected Resources Division
P.O. Box 21668
Juneau, AK 99802

Re: Section 7 Consultation for Angoon Airport Project

Dear Mr. Kurland,

Enclosed is the biological assessment (BA) for the Angoon Airport Project. The Alaska Department of Transportation and Public Facilities (ADOT&PF) proposes to build a new airport and access road in the community of Angoon on Admiralty Island in Southeast Alaska. The project will include approximately 30 barge trips to Angoon during construction. Because of the potential for ship strikes on marine mammals, this BA is provided as a request for informal consultation with NOAA Fisheries.

This BA address effects to the humpback whale (*Megaptera novaeangliae*) and Steller sea lion (*Eumetopias jubatus*). The Action Area is not located in designated critical habitat for the Steller sea lion. Based on this BA, we have determined that the project may affect but is **not likely to adversely affect** the Steller sea lion and humpback whale. The project will have **no effect** on Steller sea lion critical habitat.

The FAA will likely release the draft environmental impact statement (EIS) in August to evaluate the environmental consequences of the Airport and access road. The BA and your letter of concurrence will be included in the draft EIS.

Please feel free to contact me (271-5453, leslie.grey@faa.gov) or Leyla Arsan (279-7922 x6350, larsan@swca.com) to discuss the BA or request additional information to comply with this request for informal consultation.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA, Alaska Region Airports Division
Angoon Airport EIS Project Manager

cc: Kate Savage, NOAA Fisheries
Amanda Childs, SWCA Environmental Consultants
Leyla Arsan, SWCA Environmental Consultants

THE STATE of ALASKA
GOVERNOR SEAN PARNELL

Department of Natural Resources

DIVISION OF PARKS AND OUTDOOR RECREATION
Office of History and Archaeology

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RECEIVED
JUN 10 2014

June 9, 2014

File No.: 3130-1R FAA
3330-6 SIT-00014, 3330-6 SIT-00169, 3330-6 SIT-00749, 3360-6 SIT-00056

Leslie A. Grey
FAA Project Manager
Angoon Airport EIS
AAL-614
Alaskan Region Airports Division
222 West 7th Avenue, #14
Anchorage, AK 99513

Subject: Angoon Airport Environmental Impact Statement and Cultural Resources Technical Report for the Area of Potential Effects for Airport 12A with Access 12A (Preferred Alternative) Determinations of Eligibility

Dear Ms. Grey:

The Alaska State Historic Preservation Office (AK SHPO) received your correspondence (dated April 30, 2014) on May 12, 2014.

Following our review of the documentation provided, we offer the following comments:

- As noted in a letter from our office dated April 4, 2014, we concur that SIT-00014, SIT-00169, and SIT-00749 are **eligible** for the National Register of Historic Places (NRHP). Specifically, that SIT-00014 is eligible under criteria A and D, SIT-00169 is eligible under criterion D, and that SIT-00749 is eligible under criteria consideration D and criterion A.
- We further concur that SIT-00056 is **eligible** for the NRHP under criterion D and that additional investigations may tell us more about the extent and significance of archaeological deposits present at the site.

Thank you for the opportunity to comment. We look forward to continued consultation on the subject undertaking. Please contact Shina duVall at 269-8720 or shina.duvall@alaska.gov if you have any questions or if we can be of further assistance.

Sincerely,

Judith E. Bittner
State Historic Preservation Officer
JEB:sad

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

July 9, 2014

Leslie Grey
Angoon Airport EIS Project Manager
FAA Alaskan Region Airports Division
AAL-600
222 West 7th Ave. #14
Anchorage, AK. 99513

Re: Angoon Airport Construction Project, NMFS #AKR-2014-9380

Dear Ms. Grey:

The National Marine Fisheries Service (NMFS) has completed informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) regarding the proposed Angoon Airport Project. The Alaska Department of Transportation and Public Facilities (DOT), as the non-federal designee for the Federal Highway Administration, is proposing to build a new airport and access road in the community of Angoon on Admiralty Island in Southeast Alaska. The DOT determined that this project may affect, but is not likely to adversely affect, the endangered humpback whale (*Megaptera novaengliae*) or the endangered western Distinct Population Segment (DPS) of the Steller sea lion (*Eumetopias jubatus*).

NMFS received your request for written concurrence on May 13, 2014. Based on our analysis of the information provided to us by the DOT, NMFS concurs with your determination that this project is not likely to adversely affect humpback whales or Steller sea lions.

Description of the Proposed Action
The project includes the construction of a land-based airport and associated infrastructure. All aspects of the project will occur in terrestrial or upland habitats except for the barging of construction materials. Because the terrestrial components of the project are not expected to affect the marine environment and listed species, only the barging of materials is considered in the consultation.

An estimated total of 30 barge trips, spread throughout two construction seasons, are expected to complete construction of the Angoon airport. While a construction season typically extends from May to October, construction may occur throughout the year pending mild weather. The 1,900 ton barge, approximately 200 feet long, will likely travel from Juneau or Seattle via Clarence, Sumner, and Chatham Straits as well as Frederick Sound to the work site.

Description of the Action Area
The action area is defined in the ESA regulations (50 CFR 402.02) as the area within which all direct and indirect effects of the project will occur. The action area is distinct from and larger than the project footprint because some elements of the project may affect listed species some distance from the project footprint. The action area, therefore, extends out to a point where no measurable effects from the project are expected to occur.

Since 1997, NMFS has used generic sound exposure thresholds to determine whether an activity produces underwater and out-of-water sounds that might result in impacts to marine mammals (70 FR 1871). The current threshold for continuous noise is 120 dB re 1 μPa RMS.

While the DOT considers the action area as including the main navigation channels on the west side of Admiralty Island including Chatham Strait, for purposes of this consultation NMFS considers the action area to include all waters along the navigational routes between Juneau and Angoon and Seattle and Angoon. Within these routes, the action area includes the physical location of the barges radiating to the 120 dB isopleth for noise emanating from associated tug boats, a radius of approximately 4-6 km.

Proposed Mitigation Measures
DOT proposed the following mitigation measures as part of the action:

- Barges used for construction will follow standard BMPs for vessels to minimize the potential for oil or fuel spills, such as having an oil spill emergency plan. The only oil or fuel associated with barging of construction materials will be the fuel tanks used to operate the equipment to move the materials.
- Barges will not be grounded in kelp stands.

Listed Species
<u>Humpback Whales</u>
Humpback whales are found in all ocean basins worldwide, and typically occur in tropical and subtropical waters during the winter and migrate seasonally to high latitudes during the summer (Allen and Angliss 2013). Populations of these whales were depleted in the nineteenth and twentieth centuries due to commercial exploitation, and numbers in the North Pacific following the cessation of whaling in 1966 have been estimated as low as 1,400 (Gambell 1976) and 1,200 (Johnson and Wolman 1984). Humpback whales are currently found throughout their historic summer feeding range in the North Pacific, including coastal and inland waters around the Pacific Rim from Point Conception, California, north to the Gulf of Alaska and the Bering Sea, west through the Aleutian Islands to the Kamchatka Peninsula and the Sea of Okhotsk (Allen and Angliss 2013). Populations appear to be increasing worldwide and the best current estimate for humpback whale abundance in the North Pacific is 21,063 animals (data from 2006-08), which exceeds some estimates of pre-whaling numbers (Barlow et al. 2011).

Humpback whales are the most common large cetacean in Southeast Alaska. The abundance of humpback whales that forage throughout British Columbia and Southeast Alaska is estimated at between 3,000 and 5,000 individuals with an increasing annual population trend of 4 to 8% (Calambokidis et al. 2008; Barlow et al. 2011). Although migration timing varies among individuals, most whales depart for Hawaii in fall or winter and begin returning to Southeast Alaska in spring, with continued returns through the summer and a peak occurrence in Southeast Alaska during late summer to early fall. However, there are significant overlaps in departures and returns (Baker et al.1985; Straley 1990). In Southeast Alaska, primary prey species include euphausiids and small schooling fishes such as capelin, Pacific sand lance, walleye pollock, and Pacific herring (Wing and Kreiger 1983; Kreiger and Wing 1984, 1986; Straley 1990).

Within Southeast Alaska, humpback whales are found throughout all major waterways and in a variety of habitats, including open-ocean entrances, open-strait environments, nearshore waters, areas with strong tidal currents, and secluded bays and inlets. Annual concentrations are consistent at several locations primarily around northern southeast Alaska, with lesser historical presence in Sumner and Clarence Strait (Baker et al.1985; Straley et al. 1995; Dahlheim 2009). These patterns of occurrence likely follow the spatial and temporal changes in types, densities and distribution of prey (Bryant et al. 1981; Baker et al. 1985; Kreiger and Wing 1986; Baker et al.1992). Both fish and euphausiid densities show significant annual, seasonal, and spatial variations (Wing and Kreiger 1983) and humpbacks adjust their foraging locations to areas of high prey densities.

Western DPS Steller Sea Lions

Steller sea lions range throughout the North Pacific Ocean from Japan, east to Alaska, and south to central California (Loughlin et al. 1984). Steller sea lions, the largest of the eared seals (Otariidae), currently have a worldwide population estimated at 126,543-140,432 animals (Allen and Angliss 2012a; Allen and Angliss 2012b). Historical abundance was significantly greater with an estimated worldwide population of 245,000 to 290,000 animals in the late 1970s (1976-1980) (Loughlin et al. 1984).

There are two Steller sea lion populations in Alaska: the endangered western DPS generally occurs west of Cape Suckling; and the eastern DPS (no longer listed under the ESA) generally occurs east of Cape Suckling (144°W). Steller sea lions are not known to migrate annually, but individuals may widely disperse outside of the breeding season (late May to early July) (Allen and Angliss 2013). In Southeast Alaska, most Steller sea lions are considered to be part of the eastern DPS, although some intermingling of animals from the endangered western DPS may occur. NMFS considers waters north of Sumner Strait as the area where animals from the western DPS commonly occur (NMFS 2013). Consequently, waters around Angoon are located in an area of overlap between the two Steller sea lion DPSs (Jemison et al. 2013). We expect a majority of Steller sea lions near the project area to be eastern DPS individuals, but some western DPS individuals may be present as well.

The most recent comprehensive estimate (pups and non-pups) for the western DPS abundance in Alaska is 52,209 sea lions based on aerial surveys of non-pups conducted in June and July 2008-2011, and aerial and ground-based pup counts conducted in June and July 2009-2011 (Allen and Angliss 2013). The western DPS declined in abundance by about 70% between the late 1970s and 1990, with evidence that the decline had begun even earlier. Factors that may have contributed to this decline include 1) incidental take in fisheries, 2) legal and illegal shooting, 3) predation, 4) contaminants, 5) disease, and 6) climate change (NMFS 2008). Although Steller sea lion abundance continues to decline in the western Aleutians, numbers are thought to be increasing in the eastern part of the western DPS range (DeMaster 2011), closest to Southeast Alaska and the proposed action area.

The foraging strategy of Steller sea lions is strongly influenced by seasonality of both sea lion reproductive activities, which occur on rookeries, and the ephemeral nature of many prey species. Steller sea lions are considered opportunistic foragers and may relocate based upon seasonal prey availability. In Southeast Alaska, the sea lions forage on herring aggregations in winter, spawning fish, including herring and eulachon, in spring, and various other cephalopod and fish species throughout the year, including Atka mackerel, walleye pollock, capelin, Pacific cod, Pacific sandlance, and salmon (Merrick et al., 1997; Pitcher, 1981; Winship and Trites 2003; Sigler et al. 2009; Womble et al. 2009).

Steller sea lions are marine based predators, but rely on terrestrial rookeries and haulouts for activities such as reproduction and predator avoidance. Steller sea lion critical habitat is defined as a terrestrial zone, an aquatic zone, and an air zone that extends 3,000 feet (0.9 km) landward, seaward, and above each major rookery and major haulout. The action area does not include Steller sea lion critical habitat. The closest rookery is on the outer coast of the Alexander Archipelago. While there are a number of haulouts along the barge route, they are not within the action area.

Effects of the Action

For purposes of the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). To concur that an action may affect, but is not likely to adversely affect, listed species, NMFS must find that all of the effects of the proposed action or interrelated or interdependent actions are expected to be insignificant, discountable, or entirely beneficial. *Insignificant effects* relate to the size of the impact and should never reach the scale where a take will occur. *Discountable effects* are those that are extremely unlikely to occur. Based on best judgment, one would not 1) be able to meaningfully measure, detect, or evaluate insignificant effects; or 2) expect discountable effects to occur. *Beneficial effects* are contemporaneous positive effects with no adverse effects to listed species.

The potential effects of the proposed action on listed species include ship strike and harm or behavioral alteration due to noise. The probability of ship strike and acoustic disturbance depends upon the type, frequency, speed, and route of the marine transportation as well as the distribution of marine mammals in the area.

Ship Strike
While Steller sea lions frequent all coastlines along the action area, they are not often found in deep water channels and are therefore extremely unlikely to be struck by vessels. In the NMFS Alaska region stranding records on file since 1995, only three reports mention the possibility of ship strike/trauma as a cause of death of Steller sea lions.

An analysis of the incidence of humpback whale ship strikes in US waters between 1975 and 2002 revealed the most common vessel speed at 13 to 15 knots, followed by 16 to 18 knots and 22 to 24 knots (Jensen and Silber 2003). In Alaskan waters between 1978 and 2011, 49% of reported vessel-whale collisions (n = 75) occurred with vessels speeds greater or equal to 12 knots and 31% at speeds between 1 and 11 knots. The project barge is anticipated to travel at an average speed of 8.5 (range 5 – 10) knots, which should allow humpback whales to move out of the vessel path. The vessel type is also a significant factor in describing ship strikes. In the 89 reports of Alaskan vessel/whale collisions where the vessel type was known, only 3 reports were from cargo ships, including large container ships. No reports specifically concerned a barge collision. The areas with the highest collision densities centered around Point Adolphus in Icy Strait and around North Pass in lower Lynn Canal, both popular whale watching destinations. Chatham Strait was not included as a high risk area. Of the whale vessel collisions reported, 23% resulted in mortality, 5% were reported as alive, and the remaining 72% were of unknown outcome (Neilsen et al. 2012).

Because there is little overlap between Steller sea lions and the deep channels along the proposed barge route, the likelihood of a physical interaction between a project vessel and Steller sea lion is discountable. Because vessel traffic associated with the project will be infrequent, travel will occur at slow speeds, and ship strikes with cargo vessels in southeast Alaska are a rare occurrence, the likelihood of physical impact between a project vessel and humpback whales is also discountable.

Noise
Possible impacts to marine mammals exposed to loud underwater or in-air noise include mortality (directly from the noise, or indirectly from a reaction to the noise), injury, and disturbance ranging from severe (e.g., abandonment of vital habitat) to mild (e.g., startle response) (Thompson et al. 2013). The significance of potential impacts of noise to marine mammals is dependent on a number of factors including the magnitude of sound pressure levels, species receiving the sound, exposure type (e.g., continuous vs. pulse), duration, site characteristics, species' auditory characteristics, and individual marine mammal characteristics, (e.g., habituation, season, motivation) (Dazey et al. 2012; Ellison et al. 2012).

Steller sea lions rely on their ability to detect sound and communicate underwater for a variety of life functions, including reproduction and predator avoidance. Steller sea lions are categorized in the pinniped functional hearing group which has an estimated auditory bandwidth of 75 Hz to 75 kHz in-water, and 75 Hz to 30 kHz on land (Southall et al. 2007). Studies of Steller sea lion

auditory sensitivities have found that this species detects sounds underwater between 1 to 25 kHz (Kastelein et al. 2005), and in the air between 0.25 to 30 kHz (Mulsow and Reichmuth 2010). While Steller sea lions frequent all coastlines along the action area, they are not often found in deep water channels and are therefore not likely to be exposed to significant barge noise.

As is the case for all large baleen whales, direct information about the hearing abilities of humpback whales is not available. Researchers studying Mysticete auditory apparatus morphology hypothesized that large Mysticetes have acute infrasonic hearing (Ketten 1997). Humpback whales are categorized in the low frequency cetacean functional hearing group (Southall et al. 2007). This group has an estimated auditory bandwidth of 7 Hz to 22 kHz. Direct data on humpback whale hearing sensitivity is not available but has been estimated based on behavioral responses to sounds at various frequencies, favored vocalization frequencies, body size, ambient noise levels at favored frequencies, and cochlear morphometry.

Throughout the year, many different vessel types travel throughout the action area, including large and small cruise ships, Alaska Marine Highway ferries, tank and freight barges with tugs, freight ships, tank ships, personal and commercial fishing vessels, and recreational vessels. These vessels traverse the action area thousands of times every year (NUKA 2012). These vessels may generate significant noise. For example, sound levels from ferry vessels in Puget Sound were recorded at 179 dB re 1 μPa at 1 m (Basset 2010). Small boats, including fishing vessels, may generate noise levels between 140 and 180 dB (Hildebrand 2009; Matzner et al. 2010). The projected noise of the project vessel is unknown. The signature of an individual vessel is a function of many variables, including size, shape, speed, load, propulsion system, and bathymetry (Hildebrand 2009). Generally speaking, most (83%) of the acoustic field surrounding large vessels is the result of propeller cavitation, which is when air spaces created by the motion of propellers collapse (NOAA 2004). Relative to other large vessels, tugs with barges typically produce less near-surface sound than other ships due to the recessing of their propellers as protection against grounding. Speed may also be positively correlated with the amplitude of vessel noise (Bartlett and Wilson 2002) and the slow speed of the project barge should result in some noise reduction. Modeling of tug and barge marine transiting operations associated with a Canadian mining project estimated noise levels down to 120 dB at 4 to 6 km (Li et al. 2011). It is possible that whales may exhibit avoidance behavior at these distances from the vessel. However, many large ships navigate through the channels from Juneau and Seattle, including Chatham Strait, and noise production from these vessels may be sufficiently high to result in habituation of whales in the area. A continued increase in whale population may indicate the benign coexistence of vessel traffic and whale presence in Southeast Alaska.

Because marine traffic associated with the project is relatively infrequent, vessels associated with the project are slow moving, the total number of barge trips is small, and associated noise signatures should not result in injury or harm, impacts to humpback whales and Steller sea lions from noise disturbance associated with this project are likely to be insignificant.

Conclusion
Based on this analysis, NMFS concurs with your agency's determination that the planned action may affect, but is not likely to adversely affect, humpback whales or western DPS Steller sea lions.

Reinitiation of consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and if (1) take of listed species occurs, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter, or (4) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

Please direct any questions regarding this letter to Kate Savage at Kate.Savage@noaa.gov or (907) 586-7312.

Sincerely,

James W. Balsiger, Ph.D.
Administrator, Alaska Region

Cc: Leslie Grey, Leslie.Grey@faa.gov
Amanda Childs, achilds@swca.com
Leyla Arsan, larsan@swca.com

LITERATURE CITED

Allen, B. M., Angliss, R. P., 2013. Alaska marine mammal stock assessments, 2012, NOAA Technical Memorandum NMFS-AFSC-245, Alaska Fisheries Science Center, Seattle, Washington.

Allen, B. M., Angliss, R. P., 2012a. Stock Assessment Report: Steller sea lion (*Eumetopias jubatus*) Eastern U.S. Stock, 9.

Allen, B. M., Angliss, R. P., 2012b. Stock Assessment Report: Steller sea lion (*Eumetopias jubatus*) Western U.S. Stock, 13.

Baker, C.S., L.M. Herman, A. Perry, W.S. Lawton, J.M. Straley and J.H. Straley 1985. Population characteristics and migration of summer and late-season humpback whales (*Megaptera novaeangliae*) in southeastern Alaska. Marine Mammal Science 1: 304-323

Baker, C.S., J.M. Straley and A. Perry. 1992. Population characteristics of individually identified humpback whales in southeastern Alaska: summer and fall 1986. Fishery Bulletin, U.S. 90:429 – 437.

Barlow, J., J. Calambokidis, C.S. Baker, A.M. Burdin, P.J. Clapham, J.K. Ford, C.M. Gabriele, R. LeDuc, D.K. Mattila, T.J. Quinn, L. Rojas-Bracho, J.M. Straley, B.L. Taylor, J. Urban R., P. Wade and D. Weller. 2011. Humpback whale abundance in the North Pacific estimated by photographic capture-recapture with bias correction from simulation studies. Marine Mammal Science 27:793-818.

Bryant, P.J., Nichols, G., Bryant, T.B. and K. Miller. 1981. Krill availability and the distribution of humpback whales in Southeastern Alaska. Journal of Mammology, 62(2): 430-432.

Calambokidis, J., E.A. Falcone, T.J. Quinn, A.M. Burdin, P.J. Clapham, J.K.B. Ford, C.M. Gabriele, R. LeDuc, D. Mattila, L. Rojas-Bracho, J.M. Straley, B.L. Taylor, J. Urban R., D. Weller, B.H. Witteveen, M. Yamaguchi, A. Bendlin, D. Camacho, K. Flynn, A. Havron, J. Huggins and N. Maloney 2008. SPLASH: Structure of populations, levels of abundance and status of humpback whales in the North Pacific. Final Report for US DOC Contract No. AB133F-03-RP-0078. 57 pp.

Dahlheim, M.E., P.A.White and J.M. Waite. 2009. Cetaceans of Southeast Alaska: distribution and occurrence. Journal of Biogeography 36: 410-426.

Dazey, E., B. McIntosh, S. Brown, and K. M. Dudzinski. 2012. Assessment of underwater anthropogenic noise associated with construction activities in Bechers Bay, Santa Rosa Island, California. Journal of Environmental Protection 3:1286-1294.

DeMaster, D. P., 2011. Results of Steller sea lion surveys in Alaska, June- July 2011. Memorandum to J. Balsiger, K. Brix, L. Ratterman, and D. Seagars, December 5, 2011. Available AFSC, National Marine Mammal Laboratory, NOAA, NMFS 7600 Sand Point Way NE, Seattle WA 98115.

Ellison, W. T., B. L. Southall, C. W. Clark, and A. S. Frankel. 2012. A new context-based approach to assess marine mammal behavioral responses to anthropogenic sounds. Conservation Biology 26:21-28.

Gambell, R. A. Y., 1976. World whale stocks. Mammal Review 6, 41-53.

Hildebrand, J. 2009. Anthropogenic and natural sources of ambient noise in the ocean. Marine Ecology Progress Series 395:5-20.

Jemison, L.A., G.W. Pendleton, L.W. Fritz, K.K. Hastings, J.M. Maniscalco, A.W. Trites and T.S. Gelatt. 2013. Inter-Population Movements of Steller Sea Lions in Alaska with Implications for Population Separation. PLOS One 8, 14 p.

Jensen, A.S. and G.K. Silber. 2003. Large Whale Ship Strike Database. U.S. Department of Commerce, NOAA Technical Memorandum. NMFS-OPR-25, 37 pp

Johnson, J. H. and A.A. Wolman, 1984. The humpback whale, *Megaptera novaeangliae*. Marine Fisheries Review 46, 30-37.

Kastelein, R. A., Schie, R. v., Verboom, W. C., Haan, D. d., 2005. Underwater hearing sensitivity of a male and a female Steller sea lion (*Eumetopias jubatus*). The Journal of the Acoustical Society of America 118, 1820-1829.

Ketten, D. R., 1997. Structure and function in whale ears. Bioacoustics 8, 103-135.

Kreiger, K.J. and B.L. Wing. 1984. Hydroacoustic surveys and identification of humpback whale forage in Glacier Bay, Stephens Passage and Frederick Sound, southeastern Alaska, Summer 1983. NMFS Auke Bay Lab., Juneau, 60 p.

Kreiger, K.J. and B.L. Wing. 1986. Hydroacoustic monitoring of prey to determine humpback whale movements. NOAA Technical Memorandum NMFS F/NWC-66, NMFS Auke Bay Lab., Juneau, 62 pp.

Li, Z., A. MacGillivray and J. Wladichuk, 2011. Underwater Acoustic Modeling of Tug and Barge Noise for Estimating Effects on Marine Animals. Version 1.0. Technical report prepared for AREVA Resources Canada by JASCO Applied Sciences. Kiggavik Project Environmental Impact Statement, Tier 3 Technical Appendix 7B.

Loughlin, T.R., Rugh, D.J. and Fiscus, C.J. 1984. Northern sea lion distribution and abundance: 1956-1980. J. Wild. Manage. 48:729-740.

Matzner, S., A. Maxwell, J. Myers, K. Caviggia, J. Elster, M. Foley, M. Jones, G. Ogden, E. Sorenson, L. Zurk, J. Tagestad, A. Stephan, M. Peterson and D. Bradley. Small Vessel Contribution to Underwater Noise. Oceans 2010 MTS/IEEE Seattle. Institute of Electrical and Electronics Engineers (IEEE), Piscataway, NJ.

Merrick, R. L., Chumbley, M. K., Byrd, G. V., 1997. Diet diversity of Steller sea lions (*Eumetopias jubatus*) and their population decline in Alaska: a potential relationship. Canadian Journal of Fisheries and Aquatic Sciences 54, 1342-1348.

Mulsow, J., Reichmuth, C., 2010. Psychophysical and electrophysiological aerial audiograms of a Steller sea lion (*Eumetopias jubatus*). The Journal of the Acoustical Society of America 127, 2692-2701.

Neilson, J.L., C.M. Gabriele, A.S. Jensen, K. Jackson and J.M. Straley. 2012. Summary of Reported Whale-Vessel Collisions in Alaskan Waters. Journal of Marine Biology.

NMFS (National Marine Fisheries Service), 2013. Occurrence of Western Distinct Population Segment Steller Sea Lions East of 144° W. Longitude.

NOAA (National Oceanic and Atmospheric Administration), 2004.Shipping Noise and Marine Mammals: A Forum for Science, Management and Technology. Final Report, Arlington Virginia. 40 pp.

NOAA (National Oceanic and Atmospheric Administration), 2013. Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals.

NUKA,2012. Southeast Alaska Vessel Traffic Study. NUKA Research and Planning Group LLC, Seldovia AK. 21 pp.

Pitcher, K. W., 1981. Prey of the Steller sea lion, *Eumetopias jubatus*, in the Gulf of Alaska. Fishery Bulletin 79, 467-472.

Pitcher, K. W., P. F. Olesiuk, R. F. Brown, M. S. Lowry, S. J. Jeffries, J. L. Sease, W. L. Perryman, C. E. Stinchcomb, and L. F. Lowry. 2007. Abundance and distribution of the eastern North Pacific Steller sea lion (*Eumetopias jubatus*) population. Fishery Bulletin 105:102-115.

Sigler, M.F., D.J. Tollit, J.J. Vollenweider, J.F. Thedinga, D.J. Csepp, J.N. Womble, M.A. Wong, M.J. Rehberg, and A.W. Trites. 2009. Steller sea lion foraging response to seasonal changes in prey availability. Marine Ecology Progress Series 388:243–261.

Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene, C. R., Jr., Kastak, D., Ketten, D. R., Miller, J. H., Nachtigall, P. E., Richardson, W. J., Thomas, J. A., Tyack, P. L., 2007. Marine mammal noise exposure criteria: initial scientific recommendations. Aquatic Mammals 33, 411-521.

Straley, J.M.1990. Fall and Winter Occurrence of Humpback Whales (*Megaptera novaeangliae*) in Southeast Alaska. Report International Whaling Commission (Special Issue 12):319-323.

Straley, J., Gabriele, C. and C.S. Baker. 1995. Seasonal Characteristics of Humpback Whales (*Megaptera novaeangliae*) in Southeastern Alaska. In Proceedings of the Third Glacier Bay Science Symposium, p 229-237. Edited by D. Engstrom. 1993 National Park Service, Anchorage , AK..

Thompson, P. M., Hastie, G. D., Nedwell, J., Barham, R., Brookes, K. L., Cordes, L. S., Bailey, H., McLean, N., 2013. Framework for assessing impacts of pile-driving noise from offshore wind farm construction on a harbour seal population. Environmental Impact Assessment Review 43, 73-85.

Wing, B. L., and K. Krieger. 1983. Humpback whale prey studies in southeastern Alaska, summer 1982. Unpubl. rep., 60 p. Auke Bay Laboratory, Northwest and Alaska Fisheries Center, National Marine Fisheries Service, NOAA, P.O. Box 210155, Auke Bay, AK 99821.

Winship, A.J., and A.W. Trites. 2003. Prey consumption of Steller sea lions (*Eumetopias jubatus)* off Alaska: How much prey do they require? Fishery Bulletin 101:147–167.

Womble, J., M. Sigler, and M. Willson. 2009. Linking seasonal distribution patterns with prey availability on a central-place forager, the Steller sea lion. Journal of Biogeography 36: 439–451.

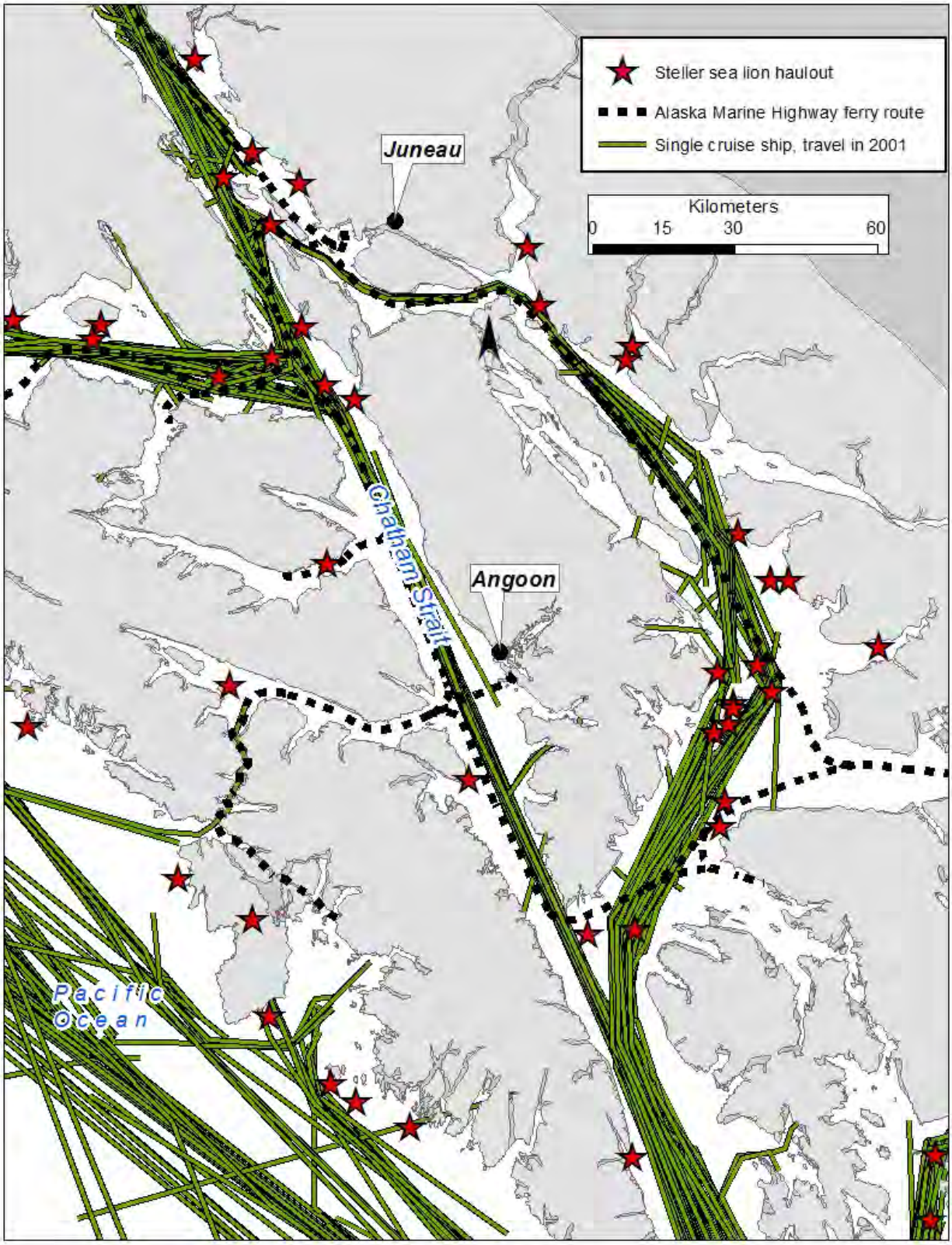

Figure 1. Marine navigational channels leading to project area and sample of vessel traffic in the area.

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 22270
JUNEAU, ALASKA 99802-2270

AUG 0 4 2014

Regulatory Division
POA-2009-1254

Ms. Leslie Grey
Federal Aviation Administration
222 West 7th Avenue, Box #14
Anchorage, Alaska 99513

Dear Ms. Grey:

This is in response to your January 9, 2014, request for a jurisdictional determination for a 163.54 - acre parcel of land described as Angoon Airport Environmental Impact Statement, Airport Alternative 12a with Access 12. It has been assigned number POA-2009-1254, Killisnoo Harbor, which should be referred to in all correspondence with us. The project site is located within Sections 5, 6, and 8, T. 51 S., R. 68 E., Copper River Meridian; USGS Quad Map Sitka B-2; Latitude 57.473° N., Longitude 134.547° W., in Angoon, Alaska.

Based on our review of the information you furnished, including the January 2014, Wetland and Waters Delineation Preliminary Jurisdictional Determination Report Angoon Airport Environmental Impact Statement Admiralty Island (PJD), prepared by SWCA Environmental Consultants, we have determined the above property contains waters of the United States (U.S.), including wetlands, under the Corps' regulatory jurisdiction. Specifically, there are: 128.43 acres of wetlands and 1.31 acres of stream on the site. These waters of the U.S. are shown on the enclosed drawing from the PJD (Figure 4) prepared by SWCA Environmental Consultants. A copy of the Approved Jurisdictional Determination form is available at www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number.

This approved jurisdictional determination is valid for five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Enclosed is a Notification of Administrative Appeal Options and Process and Request for Appeal form (see section titled "Approved Jurisdictional Determination").

DA authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at Randal.P.Vigil@usace.army.mil, by mail at the address above, or by phone at (907) 790-4491, if you have questions.

Sincerely,

Randal P. Vigil
Chief, Southeast Section

Enclosures

CF:

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jyoung@swca.com

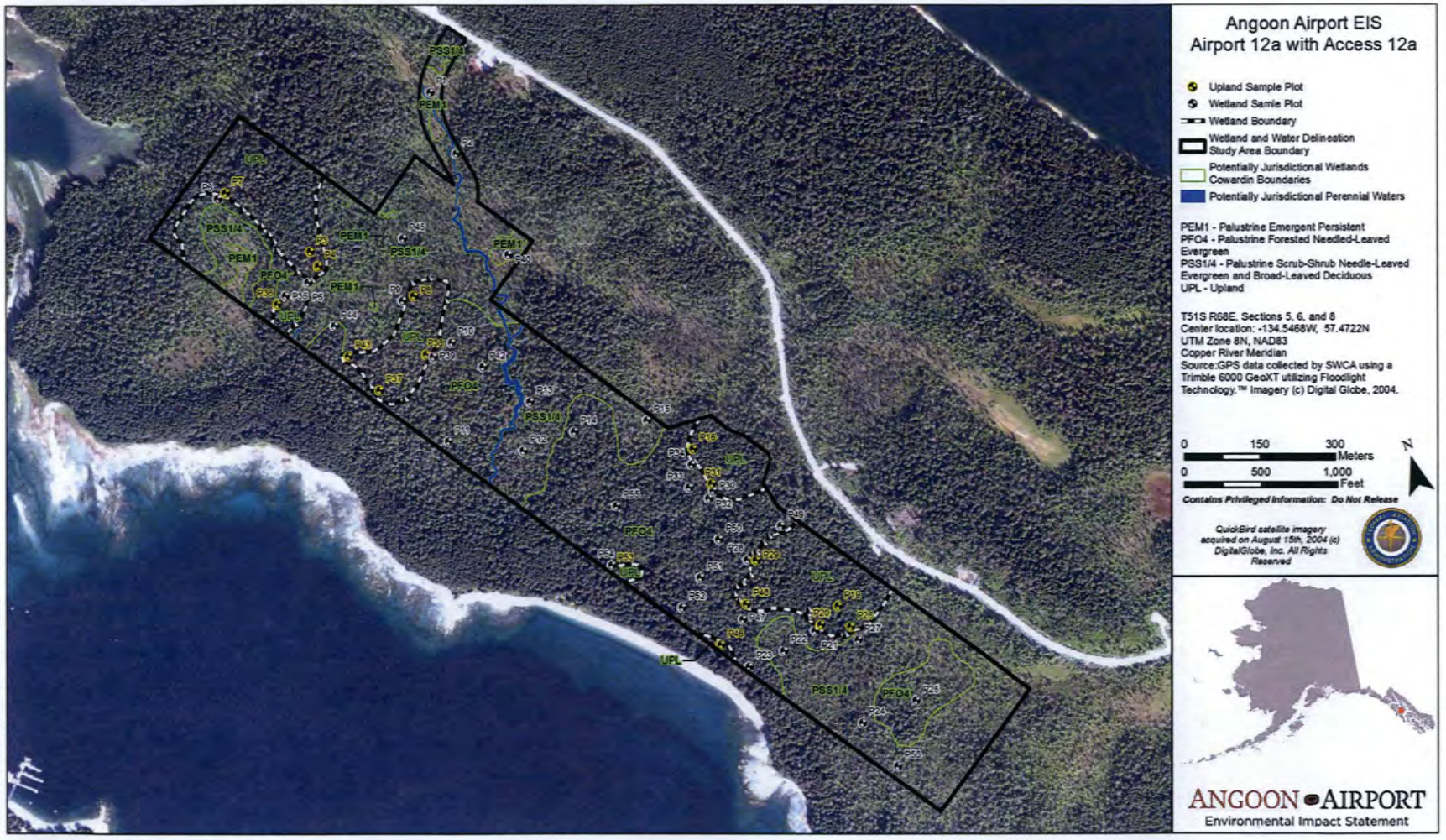

Figure 4. 2004 aerial wetland and waters delineation map.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Federal Aviation Administration	File Number: POA-2009-1254	Date: August 4, 2014

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
XX	**APPROVED JURISDICTIONAL DETERMINATION**	**D**
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Randal Vigil
Alaska District Corps of Engineers
Juneau Regulatory Field Office (CEPOA-RD-S)
PO Box 22270
Juneau, Alaska 99802-2270
(907) 790-4491

If you only have questions regarding the appeal process you may also contact:

Commander
USAED, Pacific Ocean Division
ATTN: CEPOD-PDC/Cindy Barger
Building 525
Fort Shafter, HI 96858-5440

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

APPENDIX R
MARINE MAMMAL BIOLOGICAL ASSESSMENT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

May 13, 2014

Jon Kurland
NOAA Fisheries, Assistant Regional Administrator
Protected Resources Division
P.O. Box 21668
Juneau, AK 99802

Re: Section 7 Consultation for Angoon Airport Project

Dear Mr. Kurland,

Enclosed is the biological assessment (BA) for the Angoon Airport Project. The Alaska Department of Transportation and Public Facilities (ADOT&PF) proposes to build a new airport and access road in the community of Angoon on Admiralty Island in Southeast Alaska. The project will include approximately 30 barge trips to Angoon during construction. Because of the potential for ship strikes on marine mammals, this BA is provided as a request for informal consultation with NOAA Fisheries.

This BA address effects to the humpback whale (*Megaptera novaeangliae*) and Steller sea lion (*Eumetopias jubatus*). The Action Area is not located in designated critical habitat for the Steller sea lion. Based on this BA, we have determined that the project may affect but is **not likely to adversely affect** the Steller sea lion and humpback whale. The project will have **no effect** on Steller sea lion critical habitat.

The FAA will likely release the draft environmental impact statement (EIS) in August to evaluate the environmental consequences of the Airport and access road. The BA and your letter of concurrence will be included in the draft EIS.

Please feel free to contact me (271-5453, leslie.grey@faa.gov) or Leyla Arsan (279-7922 x6350, larsan@swca.com) to discuss the BA or request additional information to comply with this request for informal consultation.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA, Alaska Region Airports Division
Angoon Airport EIS Project Manager

cc: Kate Savage, NOAA Fisheries
Amanda Childs, SWCA Environmental Consultants
Leyla Arsan, SWCA Environmental Consultants

BIOLOGICAL ASSESSMENT OF LISTED SPECIES FOR THE ANGOON AIRPORT PROJECT

Prepared for

Federal Aviation Administration
Alaska Department of Transportation and Public Facilities
Alaskan Region Airports Division
AAL-614
222 West 7th Ave #14
Anchorage, AK 99513
Leslie Grey
907-271-5453

Prepared by

SWCA Environmental Consultants
1205 East International Airport Road, Suite 103
Anchorage, Alaska 99518
Contact Person: Leyla Arsan
Phone Number: 907-279-7922

May 2014

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1. INTRODUCTION

The purpose of this biological assessment (BA) is to evaluate the extent to which the proposed Angoon Airport project may affect federally listed and candidate species or their critical habitat. The species considered in this BA are summarized in Table 1. This BA has been prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S. Code [U.S.C.] 1536 [c]).

Table 1. Species Considered in this Biological Assessment

Common Name	Federal Status	Designated Critical Habitat	Determination
Steller sea lion, Western DPS (*Eumetopias jubatus*)	Endangered	Yes, but not in action area	Not likely to adversely affect
Humpback whale (*Megaptera novaeangliae*)	Endangered	No	Not likely to adversely affect

The Alaska Department of Transportation and Public Facilities (DOT&PF) has proposed the construction of a land-based airport and airport access road for the community of Angoon in Southeast Alaska. The community of Angoon is the only permanent settlement on Admiralty Island, a large island located approximately 55 miles from Juneau and 700 miles southeast of Anchorage (Figure 1). Currently, Angoon has no land-based airport, nor roads to any other communities. The only methods of transportation to and from the community are floatplanes, boat, and the Alaska Marine Highway System (ferry). It is the largest Southeast Alaska community without a land-based airport. The purpose of the project is to improve the availability and reliability of transportation services to and from Angoon.

The FAA is the lead federal agency for the project and is preparing a draft environmental impact statement (EIS) to evaluate and disclose to the public the potential social and environmental effects of building and operating the proposed airport, as required by the National Environmental Policy Act (NEPA). From among a range of possible alternatives, the FAA has identified Airport 12a with Access 12a as the preferred alternative which is referred to as the proposed action in this BA.

Because the project will require barging of construction materials in marine waters, it has the potential to affect ESA-listed species that use these waters.

2. DESCRIPTION OF THE PROPOSED ACTION

The proposed action to construct a land-based airport and airport access road for the community of Angoon consists mainly of actions that will occur in upland or terrestrial habitats, except for the barging of construction materials. Terrestrial components of the proposed action will not affect ESA species and are not described here. The BA describes barging of materials, which is the only project action that would occur in marine waters. No in-water construction or facilities are proposed.

An estimated 30 barge trips will be required to complete construction of the Angoon Airport; it is assumed that the project will use a 1,900-ton barge. Typically a barge with this hauling capacity would be 200 feet long with a 43-foot berth (New York State Marine Highway Transportation Company, LLC 2007). Barging will occur over an estimated two construction seasons. A construction season typically occurs from May to October, but due to the mild climate in Angoon, construction could occur year-round depending on weather conditions. Materials will likely travel from Juneau or Seattle in a north-south direction, using Clarence, Sumner, and Chatham Straits, as well as Frederick Sound, as travel corridors.

2.1. Best Management Practices and Conservation Measures

Implementation of the proposed project will include conservation measures and best management practices (BMPs) to reduce or eliminate adverse effects to listed species and critical habitat. Conservation measures and BMPs for the Angoon Airport project include the following:

- Barges used for construction will follow standard BMPs for vessels to minimize the potential for oil or fuel spills (such as having an oil spill emergency plan). The only oil or fuel associated with barging of construction materials will be the fuel tanks used to operate the equipment to move the materials.
- Materials barges will not be grounded in kelp stands.

3. ACTION AREA AND ENVIRONMENTAL BASELINE

Angoon is located on the west side of Admiralty Island, one of the larger islands in Southeast Alaska. The action area consists of the main navigation channels on the west side of Admiralty Island (see Figure 1), including Chatham Strait. Barges will travel to the Angoon ferry dock from the north or south.

There are an estimated 1,489 vessels (of all varieties) traveling north-south I n Southeast Alaska annually (2011 data; Nuka Research & Planning Group 2012). Barge speeds in Southeast Alaska range from 5 to 10 knots, with an average speed of 8.5 knots (personal communication, Boyer Towing 2014). The average annual serious injury and mortality (SI/M) rate to humpback whales (*Megaptera novaeangliae*) from ship strikes in Southeast Alaska is 0.8 individuals (Allen and Angliss 2012).

Humpback whale densities in Southeast Alaska waters are high (Dahlheim et al. 2009); these species commonly use the deeper waters where barges would be traveling. Steller sea lions (*Eumetopias jubatus*) from the Western distinct population segment (DPS) may also occur in the action area. Though the boundary for this DPS is defined as populations west of 144°W, individuals frequently cross DPS boundaries and even permanently emigrate to Southeast Alaska (Jemison et al. 2013; National Marine Fisheries Service [NMFS] 2013). These species typically use habitats that are closer to shore and use open water navigation channels less frequently.

The action area does not fall within designated critical habitat for Steller sea lions, which is defined as a 20-nautical-mile buffer around all major haul-outs and rookeries, as well as associated terrestrial, air, and aquatic zones and three large offshore foraging areas (50 Code of Federal Regulations [CFR] 226.202, August 27, 1993). The closest known major rookery is White Sisters, off the west coast of Chichagof Island, which is greater than 20 nautical miles from the action area.

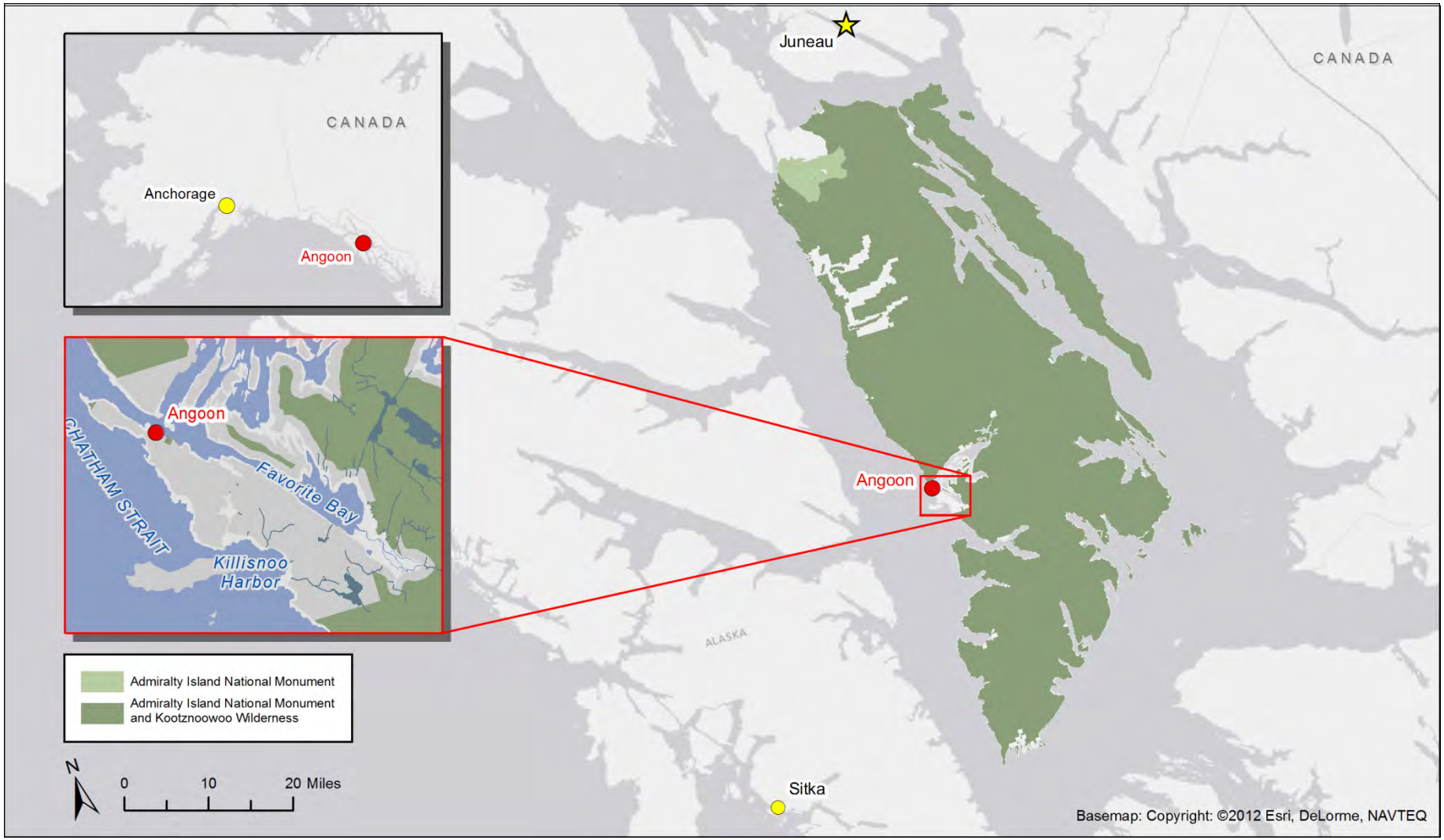

Figure 1. Location of the action area.

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4. EFFECTS ANALYSIS

As mentioned earlier, the Angoon Airport project will require approximately 30 barge trips to Angoon during the estimated two construction seasons, and the temporary increase in barge traffic in the action area will increase the risk of ship strikes on humpback whales. There are an estimated 1,489 vessels (of all varieties) traveling north-south in Southeast Alaska annually (2011 data; Nuka Research & Planning Group 2012). The additional 30 barge trips that will be required for the Angoon Airport project equal approximately 2% of the existing (2011) traffic.

Humpback whales inhabit the same Southeast Alaska waters as the 30 barges that will transport project construction materials and equipment. The average annual SI/M rate to humpback whales from ship strikes in Southeast Alaska is 0.8 individuals (Allen and Angliss 2012). If a 2% increase in existing vessel traffic equals a 2% increase in the average annual mortality rate, then 0.016 additional individuals will be injured or killed as a result of proposed project activities. Because Steller sea lions typically use habitats that are closer to shore and use open water navigation channels less frequently, they are less likely to encounter vessel strikes.

Barge speeds in Southeast Alaska range from 5 to 10 knots, with an average speed of 8.5 knots (personal communication, Boyer Towing 2014), so animals should have sufficient time and space to move out of the vessels' path.

Potential indirect effects from barge fuel leaks will be minimized by using standard BMPs for vessels, such as having an oil spill emergency plan.

5. CONCLUSION AND DETERMINATION

The project will result in an approximate 2% increase in existing vessel traffic in Southeast Alaska waters. The proposed action **may affect but is not likely to adversely affect (NLAA) humpback whales and Steller sea lions** for the following reasons:

- A 2% increase in the average annual mortality rate would equate to an additional 0.016 individuals injured or killed. This change in the baseline mortality rate is minor and discountable.
- Project actions and effects will be short term: 30 trips over two construction seasons.
- The average Southeast Alaska vessel speed of 8.5 knots should allow animals sufficient time and space to move out of vessels' path.
- Steller sea lions typically use habitats that are closer to shore and use open water navigation channels less frequently.

The project **will not affect Steller sea lion designated critical habitat** since Steller sea lion designated critical habitat does not occur in the action area.

6. LITERATURE CITED

Allen, B.M., and R.P. Angliss. 2012. Humpback Whale (*Megaptera novaeangliae*). NOAA-TM-AFSC-245. National Oceanic and Atmospheric Administration.

Boyer Towing. 2014. Barge speed in Southeast Alaska inside waters: average and range. Telephone conversation on January 28, 2014, between Jamie Young, SWCA Environmental Consultants, and Kent Halvorsen, Port Captain, Boyer Towing.

Dahlheim, Marilyn, Paula A. White, and Janice M. Waite. 2009. Cetaceans of Southeast Alaska: distribution and seasonal occurrence. *Journal of Biogeography* 36:410–426.

Jemison, L.A., G.W. Pendleton, L.W. Fritz, K.K. Hastings, J.M. Maniscalco, A.W. Trites, and T.S. Gelatt. 2013. Inter-population movements of Steller sea lions in Alaska with implications for population separation. *PLoS ONE*: 8(8) e70167. doi:10.1371/journal.pone.0070167.

National Marine Fisheries Service (NMFS). 2013. *Occurrence of Western Distinct Population Segment Steller Sea Lions East of 144° W. Longitude*. December 18, 2013. NMFS Alaska Region.

New York State Marine Highway Transportation Company, LLC. 2007. *A Vision for Commercial Marine Transportation on the Champlain Canal*. Available at: http://www.hudsoncag.ene.com/files/CAG%203-22-07%20Champlain%20Canal%20Presentation.pdf. Accessed April 25, 2014.

Nuka Research and Planning Group. 2012. *Southeast Alaska Vessel Traffic Study*. Seldovia, Alaska: Nuka Research and Planning Group.

-Amanda

From: Leyla Arsan
Sent: Monday, June 02, 2014 12:12 PM
To: Kate Savage - NOAA Federal
Cc: Amanda Childs; Leslie.Grey@faa.gov
Subject: RE: Angoon Airport BA

Hi Kate,

We do not have info specific to the barge that will be used for the Angoon Airport. However, we can provide some info on typical noise levels for barges.

Barges traveling 13 knots (3 knots faster than those expected for the Angoon Airport) would be expected to have noise levels that range from up to 150 dB re 1 µPa at a distance of <100 m from the source to 100 dB re 1 µPa at a distance of 13-34 km depending on bathymetry and substrate (Li et al. 2011). Sound pressure levels attenuate to non-discernible levels from background noise with distance from the sound source. These modeled SPLs are for Hudson Bay, an area with little vessel traffic that would affect ambient noise levels and audibility of barge noise. Audibility of Angoon vessel noise along the proposed barge route will be limited by ambient noise levels and noise from existing vessel traffic, and thus will be less than the SPLs described above for faster vessels in lesser trafficked areas.

Airborne noise associated with tugboat activity as recorded from the Port of Los Angeles ranged from 81- 84 dBA (average A-weighted noise level At 100 feet) during activities such as wharf demolition, wharf construction with pile driving, rip-rap placement, and dredging (LAHD and USACE 2007).

Both the underwater and airborne sound pressure levels expected from barge traffic are less than the acoustic threshold levels of the onset of PTS (permanent hearing threshold shifts: 230 dBpeak & 198 dB SELcum) and TTS (temporary hearing threshold shifts: 224 dBpeak & 178 dB SELcum) for humpback whales for non-impulsive sound (NOAA 2013).

Feel free to call or email with any further questions or concerns, I'm happy to talk through anything. Also, please cc this group on all ESA consultation emails. I'll be on vacation June 12-17, but this group

can respond in my absence. Thanks Kate.

Literature Cited:

Li, Z., MacGillivray, A., and Wladichuk, J. 2011. Underwater Acoustic Modeling of Tug and Barge Noise for Estimating Effects on Marine Animals. Version 1.0. Technical report prepared for AREVA Resources Canada by JASCO Applied Sciences. Kiggavik Project Environmental Impact Statement, Tier 3 Technical Appendix 7B.

Los Angeles Harbor Department (LAHD) and U.S. Army Corps of Engineers (USACE). 2007. The 23 Berth 136-147 [TraPac] Container Terminal Project Draft EIS/EIR. Appendix N: Noise. Available at: <http://www.portoflosangeles.org/EIR/TraPac/DEIR/deir_trapac.asp> http://www.portoflosangeles.org/EIR/TraPac/DEIR/deir_trapac.asp. Accessed: 5/30/14

NOAA. 2013. Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals.

Leyla Arsan

Anchorage Office Manager

Pacific Northwest Aquatic Science Lead

SWCA Environmental Consultants

1205 East International Airport Road, Suite 103, Anchorage, AK 99518

T 907.279.7922 x6350| C 503.539.6398 | F 907.279.7944

<http://www.swca.com/> www.swca.com

From: Kate Savage - NOAA Federal [mailto:kate.savage@noaa.gov]
Sent: Wednesday, May 28, 2014 10:09 AM
To: Leyla Arsan
Subject: Re: Angoon Airport BA

Hi Leyla,

Quick question: do you have any info on the noise signature of the Angoon Airport barge?

Thanks!
Kate

On Fri, May 9, 2014 at 1:32 PM, Leyla Arsan <larsan@swca.com> wrote:

Hello Kate,

Attached is the Angoon Airport Biological Assessment. We look forward to your review and response to this consultation. If you have any questions or require more information, feel free to call me anytime.

Thank you,

Leyla Arsan

Anchorage Office Manager

Pacific Northwest Aquatic Science Lead

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--

Kate Savage, DVM

Marine Mammal Specialist

Protected Resources Division

NOAA Fisheries

Juneau, AK.

(907) 586-7312

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

July 9, 2014

Leslie Grey
Angoon Airport EIS Project Manager
FAA Alaskan Region Airports Division
AAL-600
222 West 7th Ave. #14
Anchorage, AK. 99513

Re: Angoon Airport Construction Project, NMFS #AKR-2014-9380

Dear Ms. Grey:

The National Marine Fisheries Service (NMFS) has completed informal consultation under section 7(a)(2) of the Endangered Species Act (ESA) regarding the proposed Angoon Airport Project. The Alaska Department of Transportation and Public Facilities (DOT), as the non-federal designee for the Federal Highway Administration, is proposing to build a new airport and access road in the community of Angoon on Admiralty Island in Southeast Alaska. The DOT determined that this project may affect, but is not likely to adversely affect, the endangered humpback whale (*Megaptera novaengliae*) or the endangered western Distinct Population Segment (DPS) of the Steller sea lion (*Eumetopias jubatus*).

NMFS received your request for written concurrence on May 13, 2014. Based on our analysis of the information provided to us by the DOT, NMFS concurs with your determination that this project is not likely to adversely affect humpback whales or Steller sea lions.

Description of the Proposed Action
The project includes the construction of a land-based airport and associated infrastructure. All aspects of the project will occur in terrestrial or upland habitats except for the barging of construction materials. Because the terrestrial components of the project are not expected to affect the marine environment and listed species, only the barging of materials is considered in the consultation.

An estimated total of 30 barge trips, spread throughout two construction seasons, are expected to complete construction of the Angoon airport. While a construction season typically extends from May to October, construction may occur throughout the year pending mild weather. The 1,900 ton barge, approximately 200 feet long, will likely travel from Juneau or Seattle via Clarence, Sumner, and Chatham Straits as well as Frederick Sound to the work site.

Description of the Action Area
The action area is defined in the ESA regulations (50 CFR 402.02) as the area within which all direct and indirect effects of the project will occur. The action area is distinct from and larger than the project footprint because some elements of the project may affect listed species some distance from the project footprint. The action area, therefore, extends out to a point where no measurable effects from the project are expected to occur.

Since 1997, NMFS has used generic sound exposure thresholds to determine whether an activity produces underwater and out-of-water sounds that might result in impacts to marine mammals (70 FR 1871). The current threshold for continuous noise is 120 dB re 1 μPa RMS.

While the DOT considers the action area as including the main navigation channels on the west side of Admiralty Island including Chatham Strait, for purposes of this consultation NMFS considers the action area to include all waters along the navigational routes between Juneau and Angoon and Seattle and Angoon. Within these routes, the action area includes the physical location of the barges radiating to the 120 dB isopleth for noise emanating from associated tug boats, a radius of approximately 4-6 km.

Proposed Mitigation Measures
DOT proposed the following mitigation measures as part of the action:

- Barges used for construction will follow standard BMPs for vessels to minimize the potential for oil or fuel spills, such as having an oil spill emergency plan. The only oil or fuel associated with barging of construction materials will be the fuel tanks used to operate the equipment to move the materials.
- Barges will not be grounded in kelp stands.

Listed Species
<u>Humpback Whales</u>
Humpback whales are found in all ocean basins worldwide, and typically occur in tropical and subtropical waters during the winter and migrate seasonally to high latitudes during the summer (Allen and Angliss 2013). Populations of these whales were depleted in the nineteenth and twentieth centuries due to commercial exploitation, and numbers in the North Pacific following the cessation of whaling in 1966 have been estimated as low as 1,400 (Gambell 1976) and 1,200 (Johnson and Wolman 1984). Humpback whales are currently found throughout their historic summer feeding range in the North Pacific, including coastal and inland waters around the Pacific Rim from Point Conception, California, north to the Gulf of Alaska and the Bering Sea, west through the Aleutian Islands to the Kamchatka Peninsula and the Sea of Okhotsk (Allen and Angliss 2013). Populations appear to be increasing worldwide and the best current estimate for humpback whale abundance in the North Pacific is 21,063 animals (data from 2006-08), which exceeds some estimates of pre-whaling numbers (Barlow et al. 2011).

Humpback whales are the most common large cetacean in Southeast Alaska. The abundance of humpback whales that forage throughout British Columbia and Southeast Alaska is estimated at between 3,000 and 5,000 individuals with an increasing annual population trend of 4 to 8% (Calambokidis et al. 2008; Barlow et al. 2011). Although migration timing varies among individuals, most whales depart for Hawaii in fall or winter and begin returning to Southeast Alaska in spring, with continued returns through the summer and a peak occurrence in Southeast Alaska during late summer to early fall. However, there are significant overlaps in departures and returns (Baker et al.1985; Straley 1990). In Southeast Alaska, primary prey species include euphausiids and small schooling fishes such as capelin, Pacific sand lance, walleye pollock, and Pacific herring (Wing and Kreiger 1983; Kreiger and Wing 1984, 1986; Straley 1990).

Within Southeast Alaska, humpback whales are found throughout all major waterways and in a variety of habitats, including open-ocean entrances, open-strait environments, nearshore waters, areas with strong tidal currents, and secluded bays and inlets. Annual concentrations are consistent at several locations primarily around northern southeast Alaska, with lesser historical presence in Sumner and Clarence Strait (Baker et al.1985; Straley et al. 1995; Dahlheim 2009). These patterns of occurrence likely follow the spatial and temporal changes in types, densities and distribution of prey (Bryant et al. 1981; Baker et al. 1985; Kreiger and Wing 1986; Baker et al.1992). Both fish and euphausiid densities show significant annual, seasonal, and spatial variations (Wing and Kreiger 1983) and humpbacks adjust their foraging locations to areas of high prey densities.

Western DPS Steller Sea Lions

Steller sea lions range throughout the North Pacific Ocean from Japan, east to Alaska, and south to central California (Loughlin et al. 1984). Steller sea lions, the largest of the eared seals (Otariidae), currently have a worldwide population estimated at 126,543-140,432 animals (Allen and Angliss 2012a; Allen and Angliss 2012b). Historical abundance was significantly greater with an estimated worldwide population of 245,000 to 290,000 animals in the late 1970s (1976-1980) (Loughlin et al. 1984).

There are two Steller sea lion populations in Alaska: the endangered western DPS generally occurs west of Cape Suckling; and the eastern DPS (no longer listed under the ESA) generally occurs east of Cape Suckling (144°W). Steller sea lions are not known to migrate annually, but individuals may widely disperse outside of the breeding season (late May to early July) (Allen and Angliss 2013). In Southeast Alaska, most Steller sea lions are considered to be part of the eastern DPS, although some intermingling of animals from the endangered western DPS may occur. NMFS considers waters north of Sumner Strait as the area where animals from the western DPS commonly occur (NMFS 2013). Consequently, waters around Angoon are located in an area of overlap between the two Steller sea lion DPSs (Jemison et al. 2013). We expect a majority of Steller sea lions near the project area to be eastern DPS individuals, but some western DPS individuals may be present as well.

The most recent comprehensive estimate (pups and non-pups) for the western DPS abundance in Alaska is 52,209 sea lions based on aerial surveys of non-pups conducted in June and July 2008-2011, and aerial and ground-based pup counts conducted in June and July 2009-2011 (Allen and Angliss 2013). The western DPS declined in abundance by about 70% between the late 1970s and 1990, with evidence that the decline had begun even earlier. Factors that may have contributed to this decline include 1) incidental take in fisheries, 2) legal and illegal shooting, 3) predation, 4) contaminants, 5) disease, and 6) climate change (NMFS 2008). Although Steller sea lion abundance continues to decline in the western Aleutians, numbers are thought to be increasing in the eastern part of the western DPS range (DeMaster 2011), closest to Southeast Alaska and the proposed action area.

The foraging strategy of Steller sea lions is strongly influenced by seasonality of both sea lion reproductive activities, which occur on rookeries, and the ephemeral nature of many prey species. Steller sea lions are considered opportunistic foragers and may relocate based upon seasonal prey availability. In Southeast Alaska, the sea lions forage on herring aggregations in winter, spawning fish, including herring and eulachon, in spring, and various other cephalopod and fish species throughout the year, including Atka mackerel, walleye pollock, capelin, Pacific cod, Pacific sandlance, and salmon (Merrick et al., 1997; Pitcher, 1981; Winship and Trites 2003; Sigler et al. 2009; Womble et al. 2009).

Steller sea lions are marine based predators, but rely on terrestrial rookeries and haulouts for activities such as reproduction and predator avoidance. Steller sea lion critical habitat is defined as a terrestrial zone, an aquatic zone, and an air zone that extends 3,000 feet (0.9 km) landward, seaward, and above each major rookery and major haulout. The action area does not include Steller sea lion critical habitat. The closest rookery is on the outer coast of the Alexander Archipelago. While there are a number of haulouts along the barge route, they are not within the action area.

Effects of the Action

For purposes of the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). To concur that an action may affect, but is not likely to adversely affect, listed species, NMFS must find that all of the effects of the proposed action or interrelated or interdependent actions are expected to be insignificant, discountable, or entirely beneficial. *Insignificant effects* relate to the size of the impact and should never reach the scale where a take will occur. *Discountable effects* are those that are extremely unlikely to occur. Based on best judgment, one would not 1) be able to meaningfully measure, detect, or evaluate insignificant effects; or 2) expect discountable effects to occur. *Beneficial effects* are contemporaneous positive effects with no adverse effects to listed species.

The potential effects of the proposed action on listed species include ship strike and harm or behavioral alteration due to noise. The probability of ship strike and acoustic disturbance depends upon the type, frequency, speed, and route of the marine transportation as well as the distribution of marine mammals in the area.

Ship Strike
While Steller sea lions frequent all coastlines along the action area, they are not often found in deep water channels and are therefore extremely unlikely to be struck by vessels. In the NMFS Alaska region stranding records on file since 1995, only three reports mention the possibility of ship strike/trauma as a cause of death of Steller sea lions.

An analysis of the incidence of humpback whale ship strikes in US waters between 1975 and 2002 revealed the most common vessel speed at 13 to 15 knots, followed by 16 to 18 knots and 22 to 24 knots (Jensen and Silber 2003). In Alaskan waters between 1978 and 2011, 49% of reported vessel-whale collisions (n = 75) occurred with vessels speeds greater or equal to 12 knots and 31% at speeds between 1 and 11 knots. The project barge is anticipated to travel at an average speed of 8.5 (range 5 – 10) knots, which should allow humpback whales to move out of the vessel path. The vessel type is also a significant factor in describing ship strikes. In the 89 reports of Alaskan vessel/whale collisions where the vessel type was known, only 3 reports were from cargo ships, including large container ships. No reports specifically concerned a barge collision. The areas with the highest collision densities centered around Point Adolphus in Icy Strait and around North Pass in lower Lynn Canal, both popular whale watching destinations. Chatham Strait was not included as a high risk area. Of the whale vessel collisions reported, 23% resulted in mortality, 5% were reported as alive, and the remaining 72% were of unknown outcome (Neilsen et al. 2012).

Because there is little overlap between Steller sea lions and the deep channels along the proposed barge route, the likelihood of a physical interaction between a project vessel and Steller sea lion is discountable. Because vessel traffic associated with the project will be infrequent, travel will occur at slow speeds, and ship strikes with cargo vessels in southeast Alaska are a rare occurrence, the likelihood of physical impact between a project vessel and humpback whales is also discountable.

Noise
Possible impacts to marine mammals exposed to loud underwater or in-air noise include mortality (directly from the noise, or indirectly from a reaction to the noise), injury, and disturbance ranging from severe (e.g., abandonment of vital habitat) to mild (e.g., startle response) (Thompson et al. 2013). The significance of potential impacts of noise to marine mammals is dependent on a number of factors including the magnitude of sound pressure levels, species receiving the sound, exposure type (e.g., continuous vs. pulse), duration, site characteristics, species' auditory characteristics, and individual marine mammal characteristics, (e.g., habituation, season, motivation) (Dazey et al. 2012; Ellison et al. 2012).

Steller sea lions rely on their ability to detect sound and communicate underwater for a variety of life functions, including reproduction and predator avoidance. Steller sea lions are categorized in the pinniped functional hearing group which has an estimated auditory bandwidth of 75 Hz to 75 kHz in-water, and 75 Hz to 30 kHz on land (Southall et al. 2007). Studies of Steller sea lion

auditory sensitivities have found that this species detects sounds underwater between 1 to 25 kHz (Kastelein et al. 2005), and in the air between 0.25 to 30 kHz (Mulsow and Reichmuth 2010). While Steller sea lions frequent all coastlines along the action area, they are not often found in deep water channels and are therefore not likely to be exposed to significant barge noise.

As is the case for all large baleen whales, direct information about the hearing abilities of humpback whales is not available. Researchers studying Mysticete auditory apparatus morphology hypothesized that large Mysticetes have acute infrasonic hearing (Ketten 1997). Humpback whales are categorized in the low frequency cetacean functional hearing group (Southall et al. 2007). This group has an estimated auditory bandwidth of 7 Hz to 22 kHz. Direct data on humpback whale hearing sensitivity is not available but has been estimated based on behavioral responses to sounds at various frequencies, favored vocalization frequencies, body size, ambient noise levels at favored frequencies, and cochlear morphometry.

Throughout the year, many different vessel types travel throughout the action area, including large and small cruise ships, Alaska Marine Highway ferries, tank and freight barges with tugs, freight ships, tank ships, personal and commercial fishing vessels, and recreational vessels. These vessels traverse the action area thousands of times every year (NUKA 2012). These vessels may generate significant noise. For example, sound levels from ferry vessels in Puget Sound were recorded at 179 dB re 1 μPa at 1 m (Basset 2010). Small boats, including fishing vessels, may generate noise levels between 140 and 180 dB (Hildebrand 2009; Matzner et al. 2010). The projected noise of the project vessel is unknown. The signature of an individual vessel is a function of many variables, including size, shape, speed, load, propulsion system, and bathymetry (Hildebrand 2009). Generally speaking, most (83%) of the acoustic field surrounding large vessels is the result of propeller cavitation, which is when air spaces created by the motion of propellers collapse (NOAA 2004). Relative to other large vessels, tugs with barges typically produce less near-surface sound than other ships due to the recessing of their propellers as protection against grounding. Speed may also be positively correlated with the amplitude of vessel noise (Bartlett and Wilson 2002) and the slow speed of the project barge should result in some noise reduction. Modeling of tug and barge marine transiting operations associated with a Canadian mining project estimated noise levels down to 120 dB at 4 to 6 km (Li et al. 2011). It is possible that whales may exhibit avoidance behavior at these distances from the vessel. However, many large ships navigate through the channels from Juneau and Seattle, including Chatham Strait, and noise production from these vessels may be sufficiently high to result in habituation of whales in the area. A continued increase in whale population may indicate the benign coexistence of vessel traffic and whale presence in Southeast Alaska.

Because marine traffic associated with the project is relatively infrequent, vessels associated with the project are slow moving, the total number of barge trips is small, and associated noise signatures should not result in injury or harm, impacts to humpback whales and Steller sea lions from noise disturbance associated with this project are likely to be insignificant.

Conclusion
Based on this analysis, NMFS concurs with your agency's determination that the planned action may affect, but is not likely to adversely affect, humpback whales or western DPS Steller sea lions.

Reinitiation of consultation is required where discretionary federal involvement or control over the action has been retained or is authorized by law and if (1) take of listed species occurs, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this concurrence letter, or (4) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

Please direct any questions regarding this letter to Kate Savage at Kate.Savage@noaa.gov or (907) 586-7312.

Sincerely,

James W. Balsiger, Ph.D.
Administrator, Alaska Region

Cc: Leslie Grey, Leslie.Grey@faa.gov
Amanda Childs, achilds@swca.com
Leyla Arsan, larsan@swca.com

LITERATURE CITED

Allen, B. M., Angliss, R. P., 2013. Alaska marine mammal stock assessments, 2012, NOAA Technical Memorandum NMFS-AFSC-245, Alaska Fisheries Science Center, Seattle, Washington.

Allen, B. M., Angliss, R. P., 2012a. Stock Assessment Report: Steller sea lion (*Eumetopias jubatus*) Eastern U.S. Stock, 9.

Allen, B. M., Angliss, R. P., 2012b. Stock Assessment Report: Steller sea lion (*Eumetopias jubatus*) Western U.S. Stock, 13.

Baker, C.S., L.M. Herman, A. Perry, W.S. Lawton, J.M. Straley and J.H. Straley 1985. Population characteristics and migration of summer and late-season humpback whales (*Megaptera novaeangliae*) in southeastern Alaska. Marine Mammal Science 1: 304-323

Baker, C.S., J.M. Straley and A. Perry. 1992. Population characteristics of individually identified humpback whales in southeastern Alaska: summer and fall 1986. Fishery Bulletin, U.S. 90:429 – 437.

Barlow, J., J. Calambokidis, C.S. Baker, A.M. Burdin, P.J. Clapham, J.K. Ford, C.M. Gabriele, R. LeDuc, D.K. Mattila, T.J. Quinn, L. Rojas-Bracho, J.M. Straley, B.L. Taylor, J. Urban R., P. Wade and D. Weller. 2011. Humpback whale abundance in the North Pacific estimated by photographic capture-recapture with bias correction from simulation studies. Marine Mammal Science 27:793-818.

Bryant, P.J., Nichols, G., Bryant, T.B. and K. Miller. 1981. Krill availability and the distribution of humpback whales in Southeastern Alaska. Journal of Mammology, 62(2): 430-432.

Calambokidis, J., E.A. Falcone, T.J. Quinn, A.M. Burdin, P.J. Clapham, J.K.B. Ford, C.M. Gabriele, R. LeDuc, D. Mattila, L. Rojas-Bracho, J.M. Straley, B.L. Taylor, J. Urban R., D. Weller, B.H. Witteveen, M. Yamaguchi, A. Bendlin, D. Camacho, K. Flynn, A. Havron, J. Huggins and N. Maloney 2008. SPLASH: Structure of populations, levels of abundance and status of humpback whales in the North Pacific. Final Report for US DOC Contract No. AB133F-03-RP-0078. 57 pp.

Dahlheim, M.E., P.A.White and J.M. Waite. 2009. Cetaceans of Southeast Alaska: distribution and occurrence. Journal of Biogeography 36: 410-426.

Dazey, E., B. McIntosh, S. Brown, and K. M. Dudzinski. 2012. Assessment of underwater anthropogenic noise associated with construction activities in Bechers Bay, Santa Rosa Island, California. Journal of Environmental Protection 3:1286-1294.

DeMaster, D. P., 2011. Results of Steller sea lion surveys in Alaska, June- July 2011. Memorandum to J. Balsiger, K. Brix, L. Ratterman, and D. Seagars, December 5, 2011. Available AFSC, National Marine Mammal Laboratory, NOAA, NMFS 7600 Sand Point Way NE, Seattle WA 98115.

Ellison, W. T., B. L. Southall, C. W. Clark, and A. S. Frankel. 2012. A new context-based approach to assess marine mammal behavioral responses to anthropogenic sounds. Conservation Biology 26:21-28.

Gambell, R. A. Y., 1976. World whale stocks. Mammal Review 6, 41-53.

Hildebrand, J. 2009. Anthropogenic and natural sources of ambient noise in the ocean. Marine Ecology Progress Series 395:5-20.

Jemison, L.A., G.W. Pendleton, L.W. Fritz, K.K. Hastings, J.M. Maniscalco, A.W. Trites and T.S. Gelatt. 2013. Inter-Population Movements of Steller Sea Lions in Alaska with Implications for Population Separation. PLOS One 8, 14 p.

Jensen, A.S. and G.K. Silber. 2003. Large Whale Ship Strike Database. U.S. Department of Commerce, NOAA Technical Memorandum. NMFS-OPR-25, 37 pp

Johnson, J. H. and A.A. Wolman, 1984. The humpback whale, *Megaptera novaeangliae*. Marine Fisheries Review 46, 30-37.

Kastelein, R. A., Schie, R. v., Verboom, W. C., Haan, D. d., 2005. Underwater hearing sensitivity of a male and a female Steller sea lion (*Eumetopias jubatus*). The Journal of the Acoustical Society of America 118, 1820-1829.

Ketten, D. R., 1997. Structure and function in whale ears. Bioacoustics 8, 103-135.

Kreiger, K.J. and B.L. Wing. 1984. Hydroacoustic surveys and identification of humpback whale forage in Glacier Bay, Stephens Passage and Frederick Sound, southeastern Alaska, Summer 1983. NMFS Auke Bay Lab., Juneau, 60 p.

Kreiger, K.J. and B.L. Wing. 1986. Hydroacoustic monitoring of prey to determine humpback whale movements. NOAA Technical Memorandum NMFS F/NWC-66, NMFS Auke Bay Lab., Juneau, 62 pp.

Li, Z., A. MacGillivray and J. Wladichuk, 2011. Underwater Acoustic Modeling of Tug and Barge Noise for Estimating Effects on Marine Animals. Version 1.0. Technical report prepared for AREVA Resources Canada by JASCO Applied Sciences. Kiggavik Project Environmental Impact Statement, Tier 3 Technical Appendix 7B.

Loughlin, T.R., Rugh, D.J. and Fiscus, C.J. 1984. Northern sea lion distribution and abundance: 1956-1980. J. Wild. Manage. 48:729-740.

Matzner, S., A. Maxwell, J. Myers, K. Caviggia, J. Elster, M. Foley, M. Jones, G. Ogden, E. Sorenson, L. Zurk, J. Tagestad, A. Stephan, M. Peterson and D. Bradley. Small Vessel Contribution to Underwater Noise. Oceans 2010 MTS/IEEE Seattle. Institute of Electrical and Electronics Engineers (IEEE), Piscataway, NJ.

Merrick, R. L., Chumbley, M. K., Byrd, G. V., 1997. Diet diversity of Steller sea lions (*Eumetopias jubatus*) and their population decline in Alaska: a potential relationship. Canadian Journal of Fisheries and Aquatic Sciences 54, 1342-1348.

Mulsow, J., Reichmuth, C., 2010. Psychophysical and electrophysiological aerial audiograms of a Steller sea lion (*Eumetopias jubatus*). The Journal of the Acoustical Society of America 127, 2692-2701.

Neilson, J.L., C.M. Gabriele, A.S. Jensen, K. Jackson and J.M. Straley. 2012. Summary of Reported Whale-Vessel Collisions in Alaskan Waters. Journal of Marine Biology.

NMFS (National Marine Fisheries Service), 2013. Occurrence of Western Distinct Population Segment Steller Sea Lions East of 144° W. Longitude.

NOAA (National Oceanic and Atmospheric Administration), 2004.Shipping Noise and Marine Mammals: A Forum for Science, Management and Technology. Final Report, Arlington Virginia. 40 pp.

NOAA (National Oceanic and Atmospheric Administration), 2013. Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals.

NUKA,2012. Southeast Alaska Vessel Traffic Study. NUKA Research and Planning Group LLC, Seldovia AK. 21 pp.

Pitcher, K. W., 1981. Prey of the Steller sea lion, *Eumetopias jubatus*, in the Gulf of Alaska. Fishery Bulletin 79, 467-472.

Pitcher, K. W., P. F. Olesiuk, R. F. Brown, M. S. Lowry, S. J. Jeffries, J. L. Sease, W. L. Perryman, C. E. Stinchcomb, and L. F. Lowry. 2007. Abundance and distribution of the eastern North Pacific Steller sea lion (*Eumetopias jubatus*) population. Fishery Bulletin 105:102-115.

Sigler, M.F., D.J. Tollit, J.J. Vollenweider, J.F. Thedinga, D.J. Csepp, J.N. Womble, M.A. Wong, M.J. Rehberg, and A.W. Trites. 2009. Steller sea lion foraging response to seasonal changes in prey availability. Marine Ecology Progress Series 388:243–261.

Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene, C. R., Jr., Kastak, D., Ketten, D. R., Miller, J. H., Nachtigall, P. E., Richardson, W. J., Thomas, J. A., Tyack, P. L., 2007. Marine mammal noise exposure criteria: initial scientific recommendations. Aquatic Mammals 33, 411-521.

Straley, J.M.1990. Fall and Winter Occurrence of Humpback Whales (*Megaptera novaeangliae*) in Southeast Alaska. Report International Whaling Commission (Special Issue 12):319-323.

Straley, J., Gabriele, C. and C.S. Baker. 1995. Seasonal Characteristics of Humpback Whales (*Megaptera novaeangliae*) in Southeastern Alaska. In Proceedings of the Third Glacier Bay Science Symposium, p 229-237. Edited by D. Engstrom. 1993 National Park Service, Anchorage , AK..

Thompson, P. M., Hastie, G. D., Nedwell, J., Barham, R., Brookes, K. L., Cordes, L. S., Bailey, H., McLean, N., 2013. Framework for assessing impacts of pile-driving noise from offshore wind farm construction on a harbour seal population. Environmental Impact Assessment Review 43, 73-85.

Wing, B. L., and K. Krieger. 1983. Humpback whale prey studies in southeastern Alaska, summer 1982. Unpubl. rep., 60 p. Auke Bay Laboratory, Northwest and Alaska Fisheries Center, National Marine Fisheries Service, NOAA, P.O. Box 210155, Auke Bay, AK 99821.

Winship, A.J., and A.W. Trites. 2003. Prey consumption of Steller sea lions (*Eumetopias jubatus)* off Alaska: How much prey do they require? Fishery Bulletin 101:147–167.

Womble, J., M. Sigler, and M. Willson. 2009. Linking seasonal distribution patterns with prey availability on a central-place forager, the Steller sea lion. Journal of Biogeography 36: 439–451.

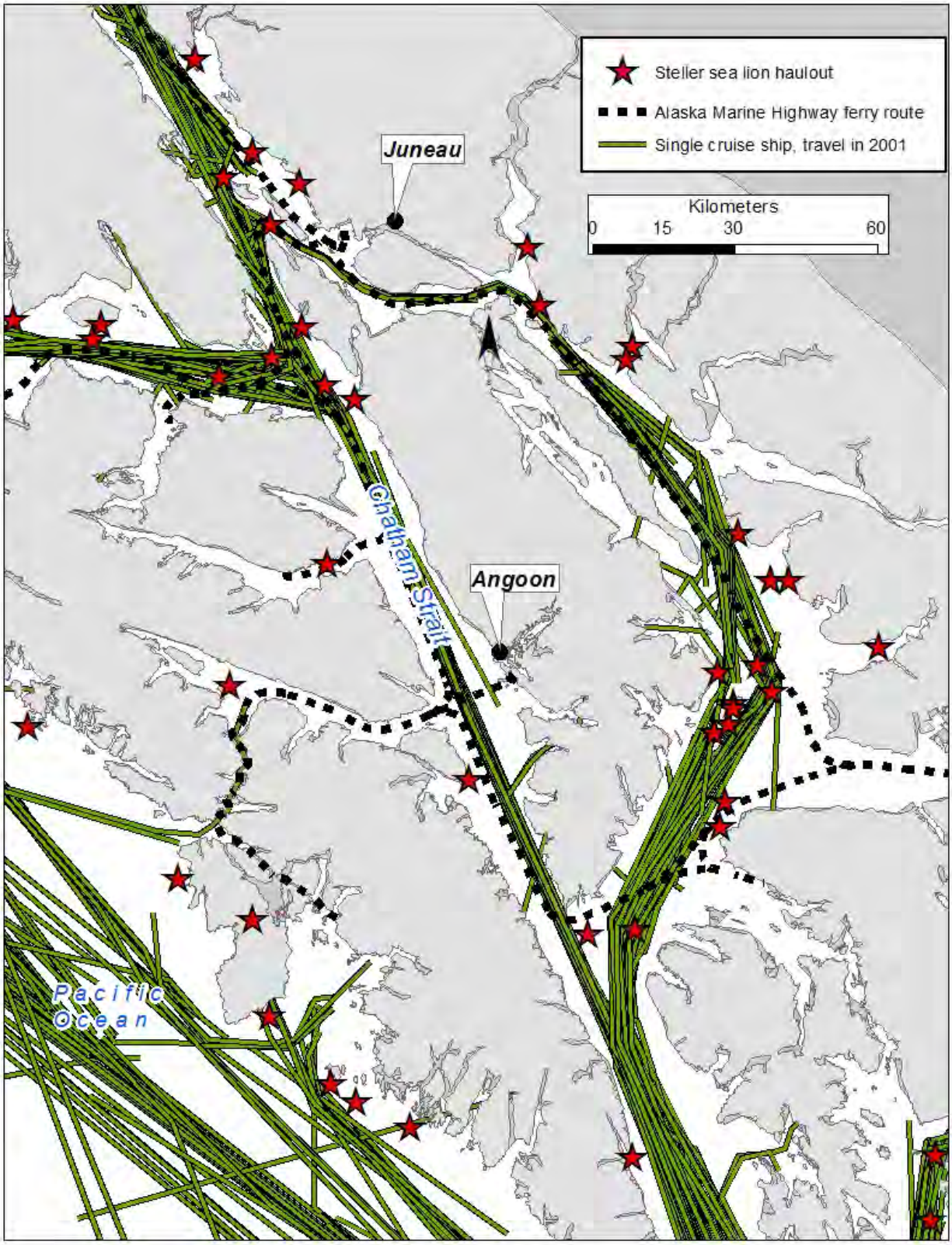

Figure 1. Marine navigational channels leading to project area and sample of vessel traffic in the area.

APPENDIX S
WETLAND DELINEATION REPORT

Note: The Section 508 amendment of the Rehabilitation Act of 1973 requires that the information in federal documents be accessible to individuals with disabilities. The FAA has made every effort to ensure that the information in the *Draft Angoon Airport Environmental Impact Statement* is accessible. However, this appendix is not fully compliant with Section 508, and readers with disabilities are encouraged to contact Leslie Grey at (907) 271-5453 or Leslie.Grey@faa.gov if they would like access to the information.

U.S. Department
of Transportation
**Federal Aviation
Administration**

AAL-614
Alaskan Region Airports Division
222 West 7th Ave #14
Anchorage, AK 99513

January 8, 2014

Randy Vigil
Juneau Regulatory Field Office
U.S. Army Corps of Engineers
8800 Glacier Highway, Suite 106
Juneau, AK 99801-8079

RE: Wetland and Waters Delineation for the Angoon Airport Environmental Impact Statement
Preliminary Jurisdictional Determination Report (JDR)
T51S, R68E, Sections 5, 6, and 8; Copper River Meridian (C.R.M.), Southeast Alaska
Site centroid = 57.4722˚N; -134.5468˚W; Study Area = 163.54 acres
Directions to Site: From the Angoon float plane dock, travel southeast on Killisnoo Road (NF-7430). Take the first gravel road to the left. Travel approximately 0.5 miles to the project site, located to the south of the gravel road.

Dear Randy:

Please find attached the preliminary JDR for the Angoon Airport Environmental Impact Statement located in Sections 5, 6, and 8 of T51S, R68E, C.R.M., on Admiralty Island in the Hoonah-Angoon Borough. This report was prepared by SWCA Environmental Consultants (SWCA) under the direction of the Federal Aviation Administration (FAA) and under contract with the Alaska Department of Transportation and Public Facilities (DOT&PF) to determine the extent of likely jurisdictional wetlands and waters in the 163.54-acre study area located in southeast Alaska, on the Sitka B-2 Alaska U.S. Geological Survey quadrangle. The study area consists of lands owned by private individuals, the City of Angoon, and Kootznoowoo, Inc. The purpose of this preliminary JDR is to define the extent of likely jurisdictional wetlands and waters in the study area for a wetland permit application for the proposed Angoon Airport.

The study area contains palustrine forested needle-leaved evergreen saturated organic (PFO4Bg), palustrine scrub-shrub needle-leaved/deciduous and broad-leaved deciduous saturated organic (PSS4/1Bg), and palustrine emergent persistent saturated organic (PEM1Bg) wetlands. In total, 128.43 acres of potentially jurisdictional wetlands were delineated in the study area. Two potentially jurisdictional perennial waters, totaling 1.31 acres, were also delineated in the study area. The wetland and waters delineation was conducted by Wetland Scientists Stacey Reed and Taya MacLean of SWCA from August 19 through August 22, 2013, and from September 14 through September 16, 2013.

The FAA will provide written land owner permission when necessary if you would like to conduct a site visit. Please let me know if you have any questions concerning the attached report, and whether you would like to schedule a site visit.

Sincerely,

Leslie A. Grey

Leslie Grey
FAA Alaskan Region Airports Division

Angoon Airport EIS Project Manager

Attachment

cc: A. Childs (SWCA)
V. Skageberg (ADOT&PF)

WETLAND AND WATERS DELINEATION PRELIMINARY JURISDICTIONAL DETERMINATION REPORT ANGOON AIRPORT ENVIRONMENTAL IMPACT STATEMENT ADMIRALTY ISLAND, T51S, R68E, SECTIONS 5, 6, AND 8, COPPER RIVER MERIDIAN, ALASKA

Prepared for
Federal Aviation Administration
Alaska Department of Transportation and Public Facilities

Prepared by
SWCA Environmental Consultants

January 2014

Wetland and Waters Delineation
Preliminary Jurisdictional Determination Report
Angoon, Admiralty Island, T51S, R68E, Sections 5, 6, and 8
Copper River Meridian, Alaska

Prepared for

Federal Aviation Administration
Alaska Department of Transportation and Public Facilities

Prepared by

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January 8, 2013

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Appendix E. Vegetation Tables ....E-Error! Bookmark not defined.

1.0 Introduction and Study Area

The purpose of this wetland and waters preliminary jurisdictional determination report (JDR) is to define the extent of likely jurisdictional wetlands and waters in the project area for the proposed Angoon Airport located near the town of Angoon on Admiralty Island in the Hoonah-Angoon Borough of Southeast Alaska (Appendix A, Figure 1). The proposed land-based airport would be a small, commercial airport and include a 3,300-foot-long paved runway and paved access road.

The following construction activities would occur if an airport was constructed:

- Vegetation removal related to the airport and road (clearing for construction or for visibility)
- Terrain disturbance related to the airport and road (includes cutting and filling of soil, and ripping and blasting of shallow bedrock to level the ground)
- Terrain disturbance from potential extraction of construction materials such as gravel, soil, and rock from on-island materials sources
- Pavement related to the airport and road (creating smooth surfaces for airplanes and vehicles)
- Tree felling (cleared trees are left where they fall) related to certain avigation easements (creating visually open areas for flight approach and takeoff)
- Rerouting or culverting of streams (to continue water flow that otherwise would be impeded by newly filled areas)

The wetland and waters delineation fieldwork was conducted by SWCA Environmental Consultants from August 19 through August 22, 2013, and from September 14 through September 16, 2013.The total study area for the wetland and waters delineation is approximately 163.54 acres and includes private, City of Angoon, and Kootznoowoo, Inc. lands (Appendix A, Figure 2). The study area included all areas where airport construction actions are proposed to fill wetlands, including terrain disturbance, pavement, and rerouting or culverting of streams. In addition, the study area was extended into vegetation removal areas for the purposes of allowing for potential changes to alignment during the environmental impact statement review process.

This report has been prepared in accordance with the U.S. Army Corps of Engineers (USACE) Alaska District Special Public Notice 2010-45 dated January 29, 2010. This wetland delineation was conducted in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Alaska Region* (*Version 2.0)* (USACE 2007) and the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

Wetlands in the study area were classified using the U.S. Fish and Wildlife Service (USFWS) National Wetlands and Deepwater Habitats Classification System (Cowardin et al. 1979).

2.0 Landscape Setting, Land Use, and Background Mapping

The study area is located on the western side of Admiralty Island, southwest of Favorite Bay and immediately north of Killisnoo Harbor of the Chatham Strait. Auk'Tah Lake is south of the study area. No saltwater resources are present in the study area, only freshwater wetlands and streams. The topography of the study area slopes down to the south, with drainage toward Killisnoo Harbor. According to the contours generated by R&M Engineering (2006) for the *Angoon Airport Master Plan* (DOT&PF 2007), the northern portion of the study area is approximately 180 feet above sea level, sloping down to approximately 25 feet above sea level in the southern portion of the study area (Appendix A, Figure 5).

The adjacent land use is undeveloped forest. There are two small recreation cabins along the Killisnoo Harbor shoreline immediately south of the study area, and one home is present immediately north of the study area. The City of Angoon water reservoir is located upslope, approximately 100 feet to the east of the study area at the end of an existing gravel road.

Palustrine forested needle-leaved evergreen wetlands with a saturated water regime (PFO4B) and palustrine scrub-shrub needle-leaved evergreen and emergent persistent wetlands with a saturated water regime (PSS4/EM1B) are mapped throughout the majority of the study area on the National Wetlands Inventory (NWI) map (Appendix A, Figure 3; USFWS 2013).

To date, a soil survey map has not yet been created for the study area.

3.0 Site Alterations

The study area is undeveloped and consists of a mix of undisturbed, high-quality mature closed canopy forest, shrubby areas, and open fens. No roads or culverts are present in the study area. A dirt all-terrain vehicle (ATV) trail extends north-south through the eastern portion of the study area. No footpaths were observed in the study area. No pollutants or other environmental hazards appear to exist on the study area.

Anecdotal evidence and observations of spring board notches indicate historical timber harvest occurred in the area, but no confirmed records could be located to ascertain the level of that harvest (Johnson 2013; SWCA Environmental Consultants 2012). It is possible that undocumented historical logging affected hydrologic patterns on the peninsula. Only larger diameter Sitka spruce (*Picea sitchensis*) trees were observed in the southern portion of the study area. Other portions of the study area contained a less mature forest canopy.

4.0 Precipitation Data and Analysis

There are no dependable weather stations for Angoon. The study area is located approximately 60 miles southwest of Juneau and approximately 41 miles northeast of Sitka. According to the Western Regional Climate Center (WRCC), the Angoon area has a generally mild maritime climate, with an average of approximately 42 inches of annual rainfall (WRCC 2010). The National Weather Service (NWS) reports an annual average rainfall of approximately 54 inches at the Juneau Airport station (NWS 2013). Table 1 below lists the recorded rainfall at the NWS Juneau Airport station for each field day and the two weeks prior to each field day. Weather observed during the field visits from August 19 through 22, 2013, was dry and generally clear or slightly overcast throughout the day (even though rainfall was recorded at the Juneau Airport station). Weather during the September 14 and 15, 2013, site visits was dry and sunny, with unusually high temperatures reaching the low 60 degrees. Periods of heavy rain were received during the September 16, 2013, field day.

According to the National Oceanic and Atmospheric Administration's (NOAA's) Global Historical Climatology Network (GHCN), the Southeast Alaska region experienced a drier than normal 2013 summer. However, if rainfall at the Juneau International Airport weather station is used as a proxy for determining whether rainfall in Angoon was within the normal range due to their similar annual rainfall, it suggests that although weather conditions were generally drier than normal in Southeast Alaska, weather conditions may have been within the normal range in the study area. Tables 2 and 3 below show the rainfall recorded at GHCN stations located in the vicinity of Angoon for 90 days prior, two weeks prior, and one week prior to fieldwork. The location for each station listed in Tables 2 and 3 is included below for reference in proximity to Angoon and the study area.

Table 1. Observed Precipitation Data at NWS Juneau Airport Station

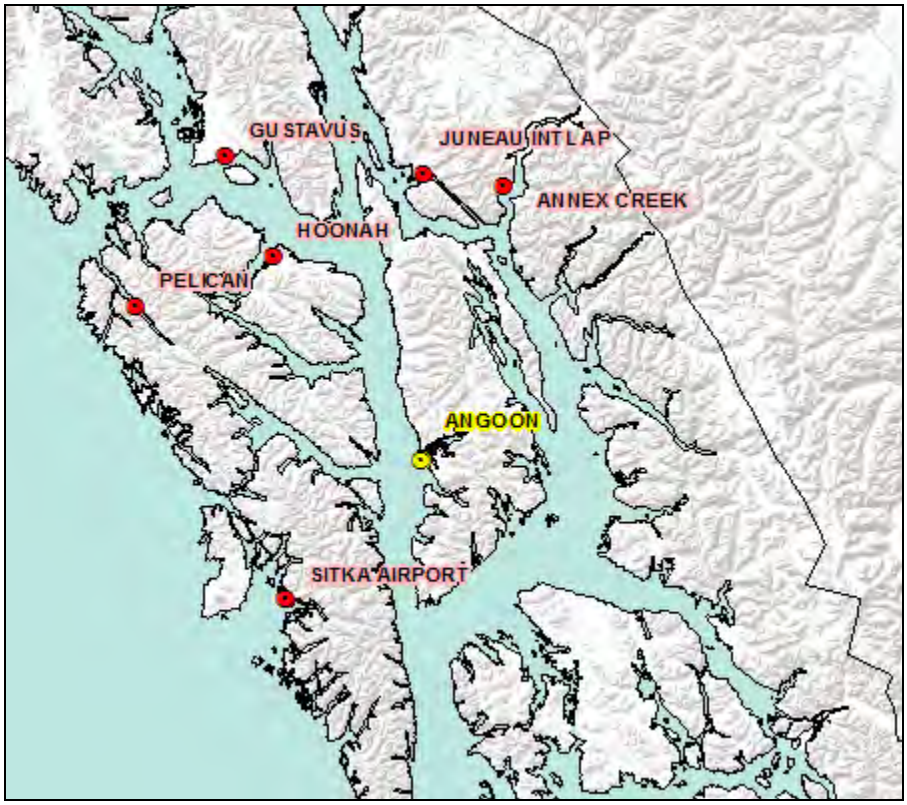
Site Visit	Precipitation Received Day Of Site Visit (inches)	Precipitation Received 2 Weeks Prior to Site Visit (inches)
August 19, 2013	0.11	2.40
August 20, 2013	0.11	2.34
August 21, 2013	0.07	2.45
August 22, 2013	Trace	2.52
September 14, 2013	0	4.66
September 15, 2013	0.10	3.65
September 16, 2013	0.17	2.45

Table 2. GHCN-Recorded Precipitation Prior to August Fieldwork (in inches)

	90 Days Prior to August 2013 Fieldwork			14 Days Prior to August 2013 Fieldwork			Week of Fieldwork (8/19–8/22)		
	Measured Rain	**Normal Rain**	**Surplus/ Deficit**	**Measured Rain**	**Normal Rain**	**Surplus/ Deficit**	**Measured Rain**	**Normal Rain**	**Surplus/ Deficit**
Annex Creek	17.82	17.81	1.18	3.32	5.57	−1.97	0.84	1.37	−0.53
Gustavus	9.23	11.87	−2.50	2.25	3.01	−0.76	0.13	0.71	−0.58
Hoonah	8.00	10.05	−2.05	1.70	2.29	−0.59	0.63	0.60	0.03
Juneau Intl Airport	12.35	12.42	−0.07	3.24	3.30	−0.06	0.29	0.77	−0.48
Pelican	14.09	19.63	−5.23	2.37	5.76	−3.39	0.62	1.45	−0.83
Sitka Airport	10.17	12.24	−2.07	2.33	3.86	−1.53	0.00	0.95	−0.95

Table 3. GHCN-Recorded Precipitation Prior to September Fieldwork

	90 Days Prior to September 2013 Fieldwork			14 Days Prior to September 2013 Fieldwork			Week of Fieldwork (9/14–9/15)		
	Measured Rain	**Normal Rain**	**Surplus/ Deficit**	**Measured Rain**	**Normal Rain**	**Surplus/ Deficit**	**Measured Rain**	**Normal Rain**	**Surplus/ Deficit**
Annex Creek	N/A	25.34	N/A	N/A	7.71	N/A	0.27	1.74	−1.47
Gustavus	10.45	13.74	−3.29	3.59	3.09	0.50	0.12	0.78	−0.66
Hoonah	8.68	12.66	−3.98	1.82	3.08	−1.26	0.09	0.78	−0.69
Juneau Intl Airport	14.03	15.46	−1.43	4.66	3.73	0.93	0.27	0.89	−0.62
Pelican	20.78	26.75	−5.97	9.37	7.86	1.51	0.12	2.02	−1.90
Sitka Airport	12.15	16.98	−4.83	3.56	4.90	−1.34	0.52	1.18	−0.66



Locations of GHCN stations.

According to the GHCN station data, weather conditions prior to the August 2013 site visits at every station in the vicinity of Angoon were below normal for that time of year. This suggests that the Angoon area was drier than normal. This was evident during the August 2013 fieldwork. The number of obligate wetland and facultative wetland vegetation species observed in the forested wetland communities was minimal. The water table at wetland plots was sometimes observed below 12 inches. Due to landscape position and the presence of hydric histosol soils, the water table would be expected to be near the surface or within 12 inches of the soil surface during the earlier portion of the growing season. Since the region had experienced drier-than-normal rainfall over the summer, wetland hydrology indicator C2 Dry-Season Water Table was used to document a water table observed between 12 and 40 inches in organic soils as meeting the wetland hydrology criterion.

According to the Regional Supplement (USACE 2007), the median beginning and ending dates of the growing season for Ecoregion No. 120, Coastal Western Hemlock–Sitka Spruce Forests, is April 29 through September 28. The site visits were conducted during the appropriate ecoregion growing season. Chapter 5 of the Regional Supplement states that the Southeast Alaska region typically lacks a significant dry period.

Precipitation data for the above tables are included for reference in Appendix B.

5.0 Wetland Delineation Methods

The wetland delineation fieldwork was conducted by Stacey Reed and Taya MacLean from August 19 through August 22, 2013, and from September 14 through September 16, 2013.

The study area was walked, and soils, vegetation, and indicators of hydrology were recorded on Alaska Regional Supplement Wetland Determination Data Forms at 56 sample plot locations (note that plots 17, 18, and 41 were not located in the study area and are not included in this report) to document representative site conditions. Paired plots documented wetland and adjacent upland transitional communities. Completed wetland determination data forms are included in Appendix C. The typical plot radius to document vegetation was 5 feet for herbaceous vegetation, 10 feet for scrub-shrub vegetation, and 30 feet for trees. Soil test pits were dug to a depth of 12 to 16 inches, or to bedrock refusal, to determine if hydric soil conditions were present. Soil probes were used to document the soil profiles below 16 inches. Several unrecorded sample plots were dug to verify hydric soil and wetland hydrology indicators throughout the study area to assist with the delineation of wetland boundaries.

Plants were identified to species using the following references: Douglas et al. 1998a, 1998b, 1999a, 1999b, 2000, 2001a, 2001b, 2002; Hitchcock et al. 1973; Hulten 1968; Klinkenberg 2013; Pojar and MacKinnon 2004; Schofield 1992; and Wilson et al. 2008.

The National Wetland Plant List (NWPL) for the Alaska Region (Lichvar 2013) was referenced in this delineation as required by the USACE. The wetland determination data forms in Appendix C and the table of vegetation observed in the study area in Appendix E use the nomenclature and the wetland indicator status of the NWPL Alaska Region list.

Soils were described with standardized color chips (X-Rite 2000) of hue, value, and chroma and by texture (sand, silt, clay, loam, muck, and peat) (Schoeneberger et al. 2002). Field indicators of hydric soils were recorded according to the indicators described in U.S. Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) 2005 and 2010.

Wetlands were classified according to Cowardin and hydrogeomorphic method (HGM) classification (Brinson 1993; Cowardin et al. 1979).

Photographs were taken at each of the plots, and representative site photographs and a photo location map are included in Appendix D. A list of vegetation (vascular plants) observed in the study area during the August and September 2013 site visits is included in Appendix E.

Potentially jurisdictional drainages with a continuous, well-defined bed and bank were walked, and drainage widths and ordinary high water mark indicators were recorded and photo-documented.

6.0 Mapping Methods

The GPS location data for the wetland boundaries, water centerlines, and sample plots locations were collected using a Trimble GeoExplorer XT mapping-grade GPS unit. Accuracy for all GPS-surveyed features is estimated at 1 meter or less based on the manufacturer's reported tolerance for the instrument and the post-processing report. Digitized mapping and cartography were completed in ArcGIS 10. The results are shown on a 2004 aerial photograph (Appendix A, Figures 4, 4a, and 4b) and on the 2006 Angoon Airport Master Plan contour base (Appendix A, Figures 5). The contours were not professionally land surveyed, and the accuracy of the contours is variable throughout the study area. Therefore, the wetland boundaries do not coincide with the contours in all areas. Wetland boundary points were collected in the field at representative locations using a Trimble GPS. Aerial photograph signatures for wetland/upland boundaries were field-verified to assist with mapping of wetland boundaries in geographic information system (GIS). Final wetland boundary mapping was completed in the office by hand digitizing using representative wetland boundaries mapped in the field along with field-verified vegetation signatures on high-resolution aerial photographs. Wetland boundaries and plot locations were not physically flagged in the field.

The boundaries of wetland Cowardin classifications (forested, scrub-shrub, emergent) were mapped by hand, based on aerial photograph interpretation and field-verification.

7.0 Description of All Wetlands, Non-Wetlands, and Waters

7.1 Wetlands

Three different palustrine (freshwater) wetland vegetation classification communities were mapped within the study area, consisting of palustrine forested needle-leaved evergreen saturated organic (PFO4Bg); palustrine scrub-shrub needle-leaved/deciduous and broad-leaved deciduous saturated organic (PSS4/1Bg); and palustrine emergent persistent saturated organic (PEM1Bg). A total of approximately 128.43 acres of potentially jurisdictional wetlands were delineated. The delineation documented slightly greater upland in the study area and more interspersed polygons of palustrine scrub-shrub and emergent-dominated communities than the NWI map.

The wetland boundaries in the study area were determined by a change in the land form from lower elevation concave wetlands (depressions within hummocks, hill slope benches, and broad concave depressions on hill slope crests) to a convex land form in uplands. A change in the vegetation community generally coincided with a change in land form from a hydrophytic-dominated understory in wetlands to a non-hydrophytic-dominated understory in uplands. Upland communities contained a closed forested canopy dominated by larger diameter Western hemlock (*Tsuga heterophylla*) and Sitka spruce and had a less diverse understory compared to the adjacent wetland areas. Uplands lacked hydric soil and hydrology indicators during the August and September site visits.

Most wetland communities were dominated by a hydrophytic vegetation community with hydric histosol soils and wetland hydrology indicators. However, a few wetland plots did not pass the hydrophytic vegetation dominance or prevalence index tests. The shrub stratums at these plots were dominated by FACU (facultative upland) communities (rusty menziesia [*Menziesia ferruginea*], Oregon crabapple [*Malus fusca*], salmonberry [*Rubus spectabilis*], and devils-club [*Oplopanax horridus*]). These FACU shrubs appeared to be shallowly rooted and growing on slightly elevated hummocks. Oregon crabapple was only observed in wetlands and behaved as a hydrophyte throughout the study area. Rusty menziesia was observed in both wetland and upland areas, and devils-club seemed to favor wetland transitional areas over upland areas. Plots that did not meet the dominance test or prevalence index for hydrophytic vegetation indicators contained saturated hydric histosol soils and primary hydrology indicators; therefore, the problematic hydrophytic vegetation indicator was checked on the data sheets for these plots according to the problematic vegetation procedures in Chapter 5 of the Regional Supplement.

A wetland/upland mosaic was observed in the south-central portion of the study area (in the vicinity of Plots 28, 50, 51, 52, and 55). Small, isolated (not continuous), steeply sloped (>25% slope) upland ridges were observed in this area that were surrounded by forested wetland (Photo 1, Appendix D). These upland ridges were not delineated because they were small, steep, and surrounded by wetland. The small uplands represented at most approximately 5% of the south-central study area, with 95% of this area being forested wetland.

Several intermittent groundwater seeps were observed within the delineated wetlands. These groundwater seep areas were not delineated separately as waters because they lacked a continuous, defined bed and bank and were sparsely vegetated (Photo 2, Appendix D). Therefore, these areas do not meet the definition of waters of the U.S. and were included in the delineated wetland areas.

7.1.1 Palustrine Forested Needle-leaved Evergreen Saturated Organic (PFO4Bg)

Representative Plots: 6, 10, 11, 14, 21, 23, 25, 27, 28, 30, 32, 33, 34, 35, 39, 42, 44, 47, 49, 50, 51, 52, 54, 55

Approximately 58.79 acres of palustrine forested needle-leaved evergreen (coniferous) wetlands with a saturated water regime and organic soils (PFO4Bg) were mapped within the study area. Wetland forested conditions appeared to extend outside the study area to the north, northwest, south, and east. Forested wetlands contained greater than 30% canopy dominated by Western hemlock with Sitka spruce as co-dominants (Photo 3, Appendix D). The typical understory within the forested wetlands consisted of oval-leaf blueberry (*Vaccinium ovalifolium*), rusty menziesia, devils-club, American skunkcabbage (*Lysichiton americanus*), lady fern (*Athyrium cyclosorum*), and fern-leaf goldthread (*Coptis asplenifolia*) (Photo 4, Appendix D). Lesser amounts of strawberry-leaf raspberry (*Rubus pedatus*) and bunchberry dogwood (*Cornus canadensis*) were observed in the palustrine forested understory communities. Buttressed Sitka spruce tree bases were common in the palustrine forested wetland areas.

Soils documented in forested wetlands were typically thick layers of saturated organic histosols (dominated by sapric rather than fibric soil material). The soil profile at most of the forested wetland plots contained greater than 16 inches of thick muck underlain by bedrock or gravels/coarse sands (Photo 5, Appendix D).

Wetland hydrology indicators consisted of surface soil saturation, and a water table within 12 inches of the soil surface was generally observed during the site visits in late August and in early September. A water table between 12 and 40 inches was observed at some of the forested wetland plots. These plots had soils that were saturated at or near the surface and met the C2 Dry-Season Water Table wetland hydrology indicator. Shallow ponding (an average of approximately 6 inches deep) was observed within micro-topographic depressions scattered throughout the forested wetland communities (Photo 6, Appendix D). Small areas of groundwater seeps and rivulets with a vegetated organic substrate were observed flowing southerly through the forested wetlands. These wetland drainages lacked continuous bed and bank, were sparsely vegetated with American skunkcabbage, had iron deposits consisting of an orange gel (Photo 7, Appendix D), and did not meet the definition of a water of the U.S.

The primary hydrology input for the forested wetlands consisted of groundwater discharging from the upslope land surface and direct precipitation. Forested wetlands belong to the slope HGM classification (Brinson 1993; NRCS 2008). Forested wetlands are connected to and drain downslope to the main perennial drainage delineated on the site.

7.1.2 Palustrine Scrub-Shrub Needle-leaved Evergreen and Broad-leaved Deciduous Saturated Organic (PSS4/1Bg)

Representative Plots: 2, 5, 9, 12, 13, 15, 18, 22, 24, 27, 35, 45, 56.

Approximately 66.66 acres of palustrine scrub-shrub needle-leaved evergreen and broad-leaved deciduous wetlands with a saturated water regime and organic soils (PSS4Bg) were mapped within the study area. Scrub-shrub wetland communities had less than 30% tree canopy cover; the majority of the scrub-shrub wetlands were broad-leaved deciduous. The broad-leaved deciduous scrub-shrub wetlands were dominated by dense thickets of Oregon crabapple, Sitka alder (*Alnus viridis*), and blueberry, with lesser amounts of devils-club, rusty menziesia, and squashberry *Viburnum edule*) (Photo 8, Appendix D). Skunkcabbage and lady fern were dominant in the herbaceous stratum of the broad-leaved deciduous communities. Scattered smaller/stunted Western hemlock and Sitka spruce trees were observed in the broad-leaved deciduous scrub-shrub communities. The Western hemlock and Sitka spruce tree canopy within the scrub-shrub communities was very open. The scrub-shrub needle-leaved evergreen communities occupied small areas in the lowest elevation areas in the north and western portions of the study area. The needle-leaved evergreen scrub-shrub areas

contained stunted Western hemlock and shore pine (*Pinus contorta*) tree growth with an open sedge-dominated understory (Photo 9, Appendix D). Many dead trees were observed in the scrub-shrub needle-leaved communities (Photo 10, Appendix D).

Soils documented in the needle-leaved evergreen areas contained a deep profile of saturated peat. Soils in the broad-leaved deciduous community contained deep saturated sapist organic (muck and mucky peat) layers. The groundwater table in the scrub-shrub communities was observed at the soil surface or within 12 inches of the soil surface during the August and September 2013 site visits. Many shallow, scattered micro-depressions within the scrub-shrub communities were ponded, with approximately 2- to 4-inch-deep pools during the August and September 2013 site visits.

Scrub-shrub communities are located in topographic depressions that intercept groundwater discharge from adjacent higher elevational uplands and forested wetlands. The scrub-shrub communities in the southeast portion of the study area lacked defined outlet channels. Scrub-shrub wetlands belong to the slope HGM classification.

7.1.3 Palustrine Emergent Persistent Saturated Organic (PEM1Bg)

Representative Plots: 1, 40

Approximately 2.98 acres of palustrine emergent persistent fens (gramoinoid fen) with a saturated water regime and organic soils (PEM1Bg) were mapped in the study area. The emergent communities were characterized as smaller depressional areas surrounded by scrub-shrub communities. Emergent fens were dominated by stunted shore pine trees with water and yellow sedge (*Carex aquatilis* and *C. flava*), scentbottle (*Piperia dilatata*), cloudberry (*Rubus chamaemorus*), sticky tofieldia (*Triantha glutinosa*), buck-bean (*Menyanthes trifoliata*), tall cotton-grass (*Eriophorum angustifolium*), and tufted leafless-bulrush (*Trichophorum caespitosum*) (Photo 11, Appendix D).

Soils in fens contained thick layers of saturated organic peats (fibrous histosols; Photo 12, Appendix D). The water table was generally at the surface or within 12 inches of the soil surface. Small, scattered pools of shallow ponding (an average of 2 inches deep; maximum 4 inches deep) were observed within the emergent communities. Soils in the fens had a sulfidic odor.

Emergent fens in the study area are located on broad concave hill slope benches and belong to the slope HGM classification. Drainage from the fens located in the northern portion of the study area discharges through a perennial stream.

7.2 Non-Wetlands (Uplands)

Representative Plots: 3, 4, 7, 8, 16, 19, 20, 26, 29, 31, 36, 37, 38, 43, 46, 48, 53

Approximately 33.80 acres of upland forest were delineated in the study area. The uplands were dominated by a mature Western hemlock and Sitka spruce closed canopy and contained a less diverse herbaceous understory than the adjacent forested wetlands. The dominant upland shrub community generally consisted of red huckleberry (*Vaccinium parvifolium*), rusty menziesia, and oval-leaf blueberry. The dominant understory consisted of bunchberry dogwood, queen's cup (*Clintonia uniflora*), heart-leaf twayblade (*Neottia cordata*), and mosses (Photo 13, Appendix D). Some upland plots were dominated by a facultative-dominated vegetation community, mainly due to the presence of a Western hemlock canopy with dense oval-leaf blueberry thickets in the understory. While these plots met the dominance test for hydrophytic vegetation, they lacked wetland hydrology and hydric soil indicators, and were determined to be upland.

Upland soils consisted of poorly decomposed, non-saturated folist organic soils (containing herbaceous matter, roots, and wood; Photo 14, Appendix D). The upland organic layers were not as decomposed as the saturated mucks and mucky peat soil profiles documented in wetlands. The upland folistic layers were shallow (less than 16 inches deep) and generally underlain by bedrock. Uplands were located on convex hill slope, a land form that does not support the concentration of water. Upland soils lacked saturation and primary and secondary wetland hydrology indicators. Upland conditions appeared to extend to the north, south, and east of the study area.

7.3 Waters

Approximately 1.31 acres of potentially jurisdictional waters were delineated in the study area.

The main drainage within the study area consists of a perennial drainage that originates in a fen located immediately off-site to the northwest. The drainage flows southerly through the study area through forest, scrub-shrub, and emergent wetland vegetation communities. The channel flows off-site to the south of the study area. The upstream portion of the channel bed was the narrowest, flowing through the fen and scrub-shrub wetland within a 1-foot -wide channel bed and 1.5-foot-tall banks (Photo 15, Appendix D). The dominant channel bed substrate in the upstream portions of the channel was muck. Downstream, the channel developed a broader bed (an average of between 6 and 8 feet wide) with an average of 2-foot-tall banks (Photo 16, Appendix D). The dominant substrate in the downstream portions of the channel was gravelly sandy loam with pockets of small cobbles (Photo 17, Appendix D). Continuous flow of a minimum 6-inch depth was observed throughout the channel during the September 14, 2013, site visit. Deeper pools contained flow up to 2 feet deep. Unvegetated lateral coarse sand bars and an abundance of large woody debris were also observed in the downstream portions of the channel bed.

The headwaters for a second potentially jurisdictional perennial water was delineated in the southwest portion of the study area. This tributary originates from a groundwater seep within palustrine forested wetland and develops a defined 3-foot-wide channel bed with 1-foot-tall banks (Photo 18, Appendix D). The dominant substrate was gravelly sandy loam. Approximately 4-inch-deep continuous flow was present in the channel during the September 14, 2013, site visit. The channel flows off-site to the south of the study area.

The ordinary high water marks for the delineated drainages coincided with the top of the stream banks. A change in the soil texture generally occurred just above the stream banks from gravelly sandy loam and cobbles in the channel bed to organic histosols in the adjacent wetland. The ordinary high water marks were also defined by the transition from the unvegetated channel bed to the adjacent vegetated wetland community. No fish were observed in any portion of the streams during the August or September 2013 site visits. The streams are riverine upper perennial unconsolidated bottom drainages with a permanent water regime (R3UBH). No gradient measurements were taken of the streams.

Streams delineated in the study area are not mapped in the Alaska Department of Fish and Game (ADF&G) *Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* (Johnson and Blanche 2012). The streams are not mapped on the Sitka B-2 U.S. Geological Survey (USGS) map (USGS 2013).

8.0 Results and Conclusions

A total of approximately 128.43 acres of potentially jurisdictional wetlands and 1.31 acres of potentially jurisdictional waters were delineated in the study area (Table 4).

Wetland conditions extend off-site to the south of the study area and are located immediately adjacent to Killisnoo Harbor (a tidally influenced traditional navigable water of the U.S.). Based on aerial photography, an

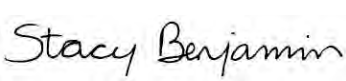
upland ridge may be present along the shoreline, separating the estuarine community from the palustrine wetlands. However, the perennial drainages delineated in the study area are non-navigable, perennial, relatively permanent waters that are directly adjacent to and drain wetlands in the study area. The drainages flow southerly and potentially flow directly into the harbor. Therefore, due to the potential hydrologic connection to Killisnoo Harbor, wetlands and drainages delineated in the study area may be determined to be jurisdictional by the Alaska District USACE.

Table 4 summarizes the acreages of wetlands, waters, and uplands delineated in the study area. Wetland vegetation types, Cowardin classification, HGM classification, representative sample plots, and the photo number for representative photographs are also summarized according to habitat type.

Table 4. Summary of Habitat Types

Habitat Type	Cowardin Class	HGM Classification	Sample Plots	Representative Photos	On-Site Acreage
Forest	PFO4Bg	Slope	6, 10, 11, 14, 21, 23, 25, 27, 28, 30, 32, 33, 34, 35, 39, 42, 44, 47, 49, 50, 51, 52, 54, 55	2, 3, 4, 5, 6, 7	58.79
Scrub-shrub	PSS4/PSS1Bg	Slope	2, 5, 9, 12, 13, 15, 18, 22, 24, 27, 35, 45, 56	8, 9, 10	66.66
Emergent	PEM1Bg	Slope	1, 40	11, 12	2.98
Total Wetland = 128.43 acres					
Unnamed main central drainage	R3SB1	None	None	15, 16, 17, 18	1.29
Unnamed western drainage	R3SB1	None	None	--	0.02
Total Waters = 1.31 acres					
Non-wetland	Upland	N/A	3, 4, 7, 8, 16, 19, 29, 31, 34, 36, 38, 41	13, 14	32.56
Total Upland = 33.80 acres					

9.0 LIST OF PREPARERS



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10.0 LITERATURE CITED

Alaska Department of Transportation and Public Facilities. 2007. *Angoon Airport Master Plan*. Available at: www.angoonairporteis.com. Accessed October 25, 2013.

Brinson, M.M. 1993. *A Hydrogeomorphic Classification for Wetlands.* Technical Report WRP-DE-4. Vicksburg, Mississippi: U.S. Army Corps of Engineers Engineer Waterways Experiment Station.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States.* FWS/OBS-79/31. U.S. Fish and Wildlife Service.

Douglas, G.W., G.B. Straley, D.V. Meidinger, and J. Pojar (editors). 1998a. *Illustrated Flora of British Columbia, Volume 1: Gymnosperms and Dicotyledons (Aceraceae through Asteraceae).* Victoria, British Columbia.: British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests.

Douglas, G.W., G.B. Straley, D.V. Meidinger, and J. Pojar (editors). 1998b. *Illustrated Flora of British Columbia, Volume 2: Dicotyledons (Balsaminaceae through Cuscutaceae).* Victoria, British Columbia: British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests.

Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 1999a. *Illustrated Flora of British Columbia, Volume 3: Dicotyledons (Diapensiaceae through Onagraceae).* Victoria, British Columbia: British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests.

Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 1999b. *Illustrated Flora of British Columbia, Volume 4: Dicotyledons (Orobanchaceae through Rubiaceae).* Victoria, British Columbia: British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests.

Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 2000. *Illustrated Flora of British Columbia, Volume 5: Dicotyledons (Salicaceae through Zygophyllaceae) and Pteridophytes.* Victoria, British Columbia: British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests.

Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 2001a. *Illustrated Flora of British Columbia, Volume 6: Monocotyledons (Acoraceae through Najadaceae)*. Victoria, British Columbia: British Columbia Ministry of Environment, Lands and Parks, and Ministry of Forests.

Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 2001b. *Illustrated Flora of British Columbia, Volume 7: Monocotyledons (Orchidaceae through Zosteraceae).* Victoria, British Columbia: British Columbia Ministry of Sustainable Resource Management and Ministry of Forests.

Douglas, G.W., D.V. Meidinger, and J. Pojar (editors). 2002. *Illustrated Flora of British Columbia, Volume 8: General Summary, Maps and Keys*. Victoria, British Columbia: British Columbia Ministry of Sustainable Resource Management and Ministry of Forests.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1.* Vicksburg, Mississippi: U.S. Army Engineer Waterways Experiment Station.

Hitchcock, C.L. and A. Cronquist. 1973. *Flora of the Pacific Northwest: An Illustrated Manual.* Seattle, Washington: University of Washington Press.

Hulten, E. 1968. Flora of Alaska and Neighboring Territories: A Manual of the Vascular Plants. Stanford, California: Stanford University Press.

Johnson, A. 2013. Discussion about past timber harvest in vicinity of proposed location of Airport 12a. Personal communication between Alvin Johnson, Angoon resident, and Stacey Reed, Wetland Scientist, SWCA Environmental Consultants, September 15, 2013.

Johnson, J., and P. Blanche. 2012. *Catalog of Waters Important for Spawning, Rearing, or Migration of Anadromous Fishes – Southeastern Region.* Special Publication No. 12-07. Anchorage: Alaska Department of Fish and Game.

Klinkenberg, Brian (editor). 2013. E-Flora BC: Electronic Atlas of the Flora of British Columbia. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. Available at: http://www.geog.ubc.ca/biodiversity/eflora/index.shtml. Accessed August–September 2013.

Lichvar, R.W. 2013. National Wetland Plant List, Website Version 3.1. Available at: http://rsgisias.crrel.usace.army.mil/NWPL/. Accessed September 2013.

National Weather Service (NWS). 2013. Juneau, Alaska climate data. Available at: http://www.nws.noaa.gov/climate/index.php?wfo=pajk. Accessed August 16, September 23, and September 25, 2013.

Natural Resources Conservation Service (NRCS). 2008. *Hydrogeomorphic Wetland Classification System: An Overview and Modification to Better Meet the Needs of the Natural Resources Conservation Services.* Technical Note No. 190-8-76. Washington, D.C.: Natural Resources Conservation Service.

Pojar, J., and A. MacKinnon. 2004. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia and Alaska. Auburn, Washington: Lone Pine Publishing.

R&M Engineering. 2006. Topographic data generated at five-foot contour intervals from stereo-pair aerial photographs taken April 2001. Prepared for the Angoon Airport Master Plan (2007). Juneau, Alaska: R&M Engineering.

Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and W.D. Broderson (editors). 2002. *Field Book for Describing and Sampling Soils, Version 2.0.* Lincoln, Nebraska: U.S. Department of Agriculture Natural Resources Conservation Service, National Soil Survey Center.

Schofield, W.B. 1992. *Some Common Mosses of British Columbia*. 2nd ed. Royal British Columbia Museum, Victoria, Canada.

SWCA Environmental Consultants. 2012. *Cultural Resources Existing Conditions Technical Report for Angoon Airport Environmental Impact Statement.* Prepared for Federal Aviation Administration and Alaska Department of Transportation and Public Facilities. Salt Lake City, Utah: SWCA.

U.S. Army Corps of Engineers (USACE). 2007. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0)*. ERDC/EL TR-07-24. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

———. 2010. *Consultant-Supplied Jurisdictional Determination Reports*. Alaska District Special Public Notice 2010-45 dated January 29, 2010.Corps of Engineers Regulatory Program. Anchorage: USACE, Alaska District.

U.S. Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS). 2005. *Field Indicators of Hydric Soils in Alaska, A User Guide*. Compiled by J.P. Moore, edited by P. Taber. Available at: ftp://ftp-fc.sc.egov.usda.gov/AK/soils/AKFieldIndicators.pdf. Accessed October 2013.

———. 2010. *Field Indicators of Hydric Soils in the United States, Version 7.0.* Edited by L.M. Vasilas, G.W. Hurt, and C.V. Noble. Available at: ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/FieldIndicators_v7.pdf. Accessed October 2013.

U.S. Geological Survey (USGS). 2013. Sitka B-2 1:63,360 topographic quadrangle. Reston, Virginia: USGS.

U.S. Fish and Wildlife Service (USFWS). 2013. National Wetlands Inventory map. Available at: http://www.fws.gov/wetlands/Data/State-Downloads.html.

Western Regional Climate Center (WRCC). 2010. Period of record monthly climate summary: 9/1/1949 to 2/28/2011. Available at: http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ak0310. Accessed October 23, 2013.

Wilson, B.L., R. Brainerd, D. Lytjen, B. Newhouse, and N. Otting. 2008. *Field Guide to the Sedges of the Pacific Northwest.* Corvallis: Oregon State University Press.

X-Rite. 2000. Year 2000 revised washable edition, Munsell soil color charts. Grand Rapids, Michigan: X-Rite.

Appendices

A. Maps
B. Precipitation Data
C. Wetland Determination Data Sheets
D. Ground-Level Site Photographs
E. List of Vegetation Observed On-site

Please see accompanying PDF for all appendices

APPENDIX A. MAPS

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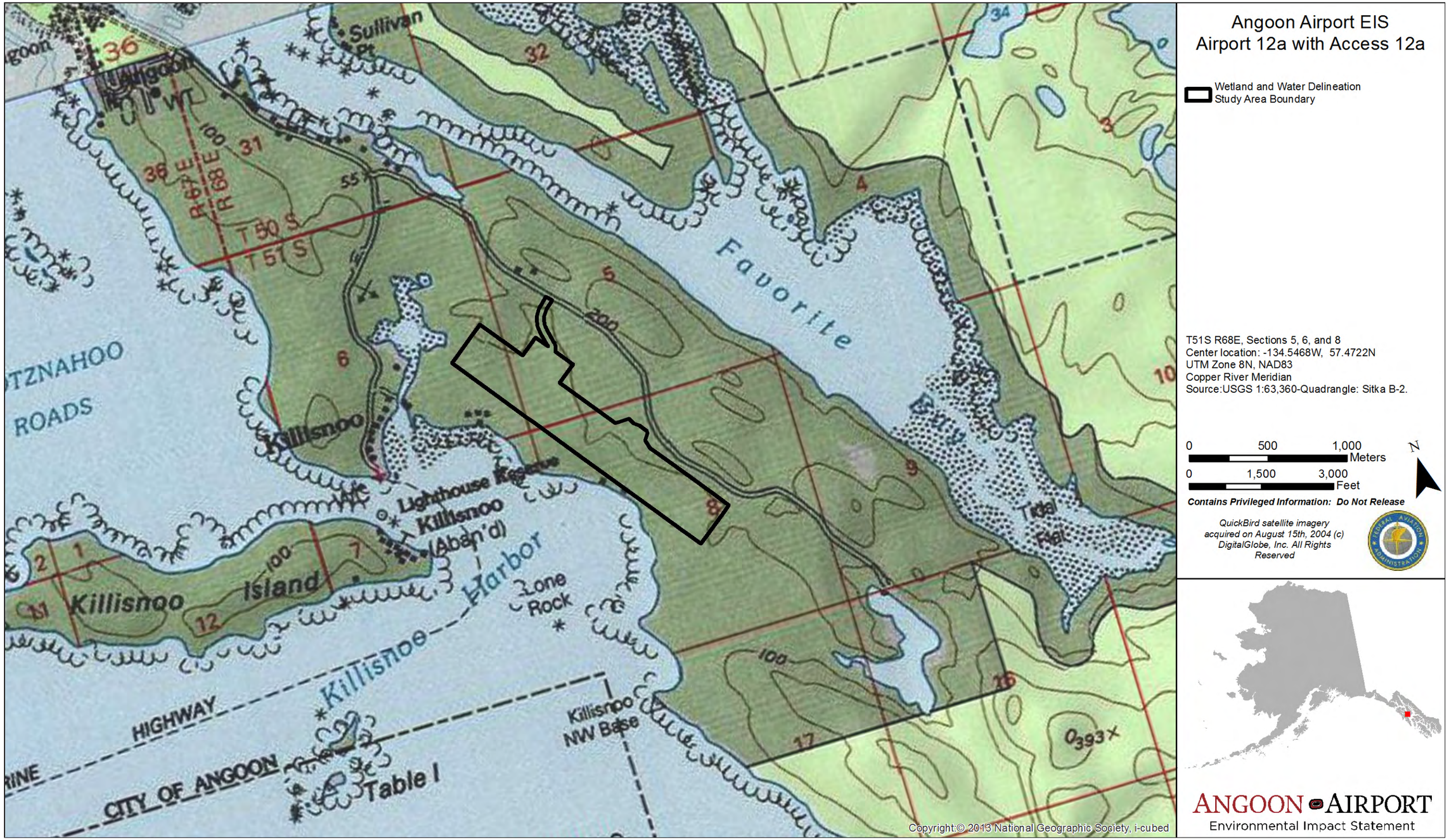

Figure 1. Site location map.

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Figure 2. Parcel map.

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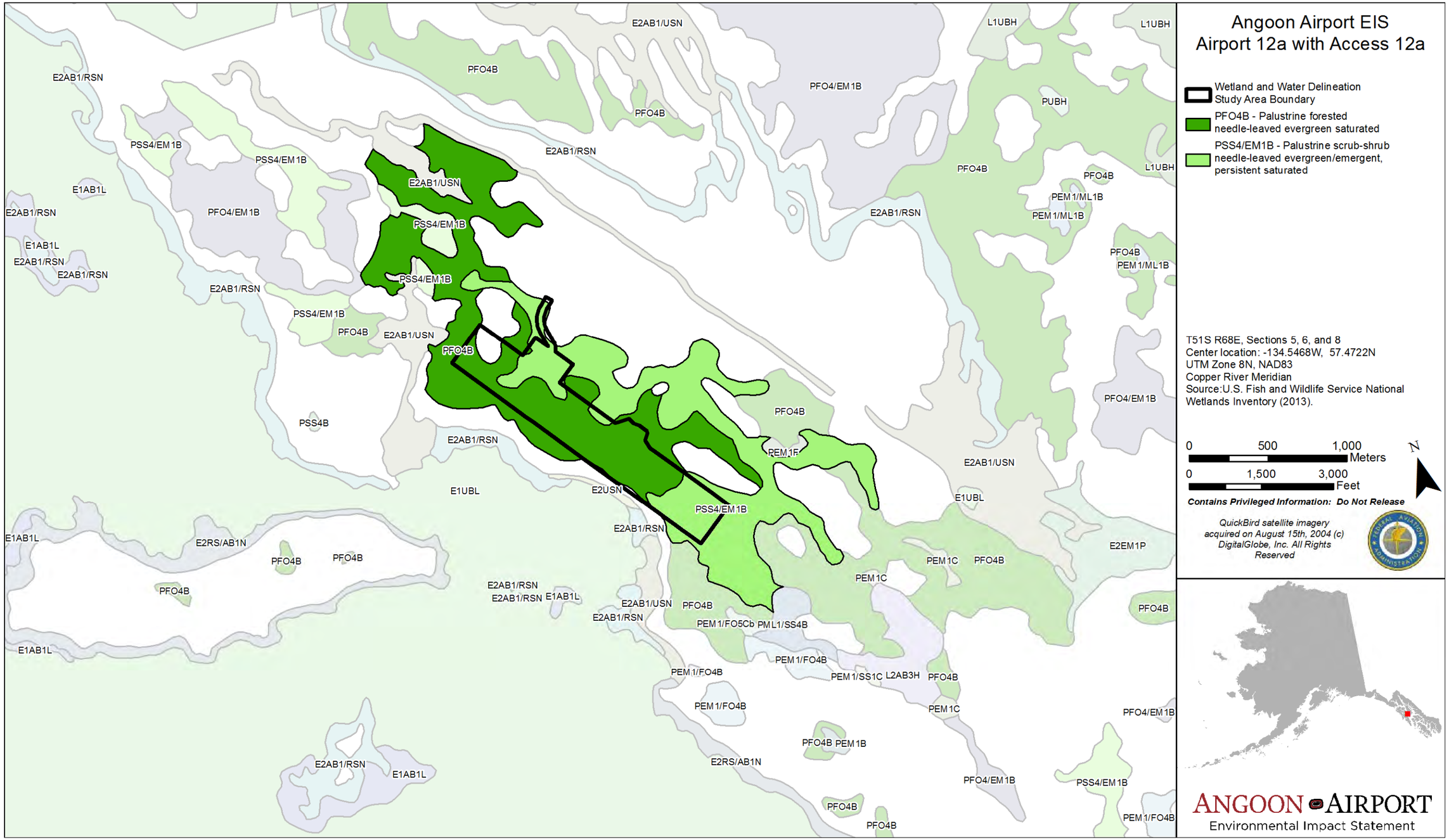

Figure 3. National Wetlands Inventory map.

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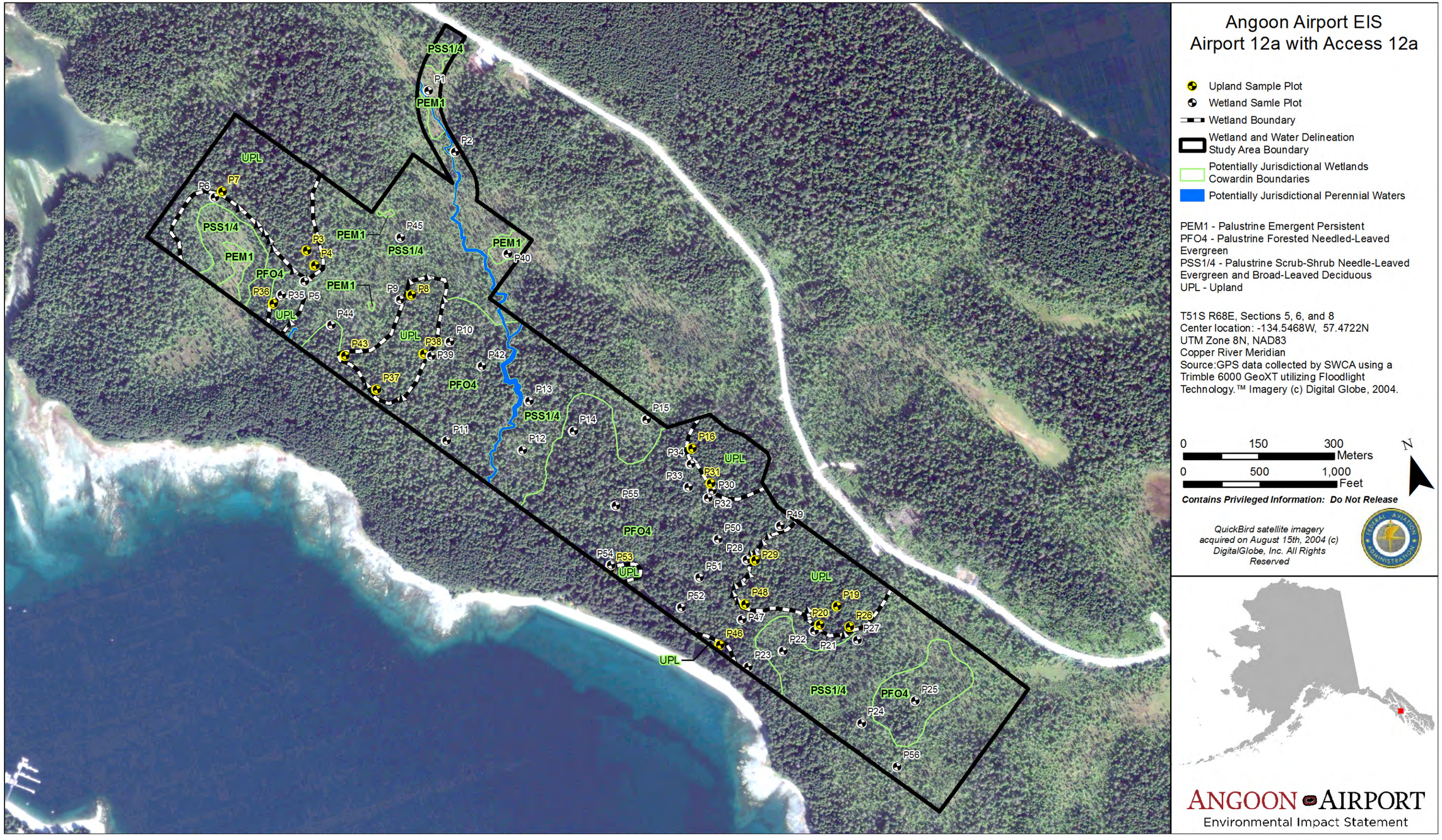

Figure 4. 2004 aerial wetland and waters delineation map.

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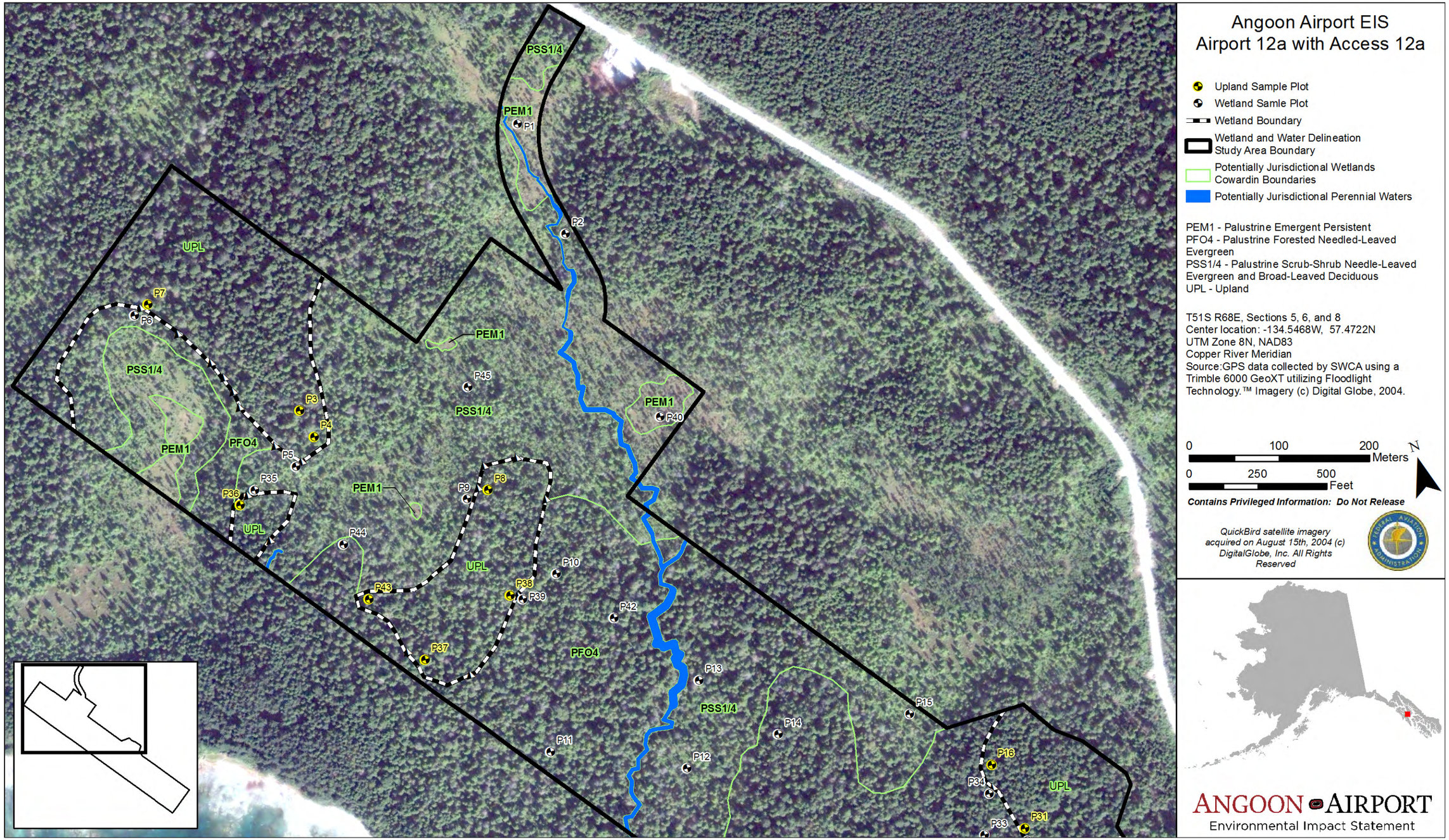

Figure 4a. Enlargement of NW wetland and waters delineation map.

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Figure 4b. Enlargement of SE wetland and waters delineation map.

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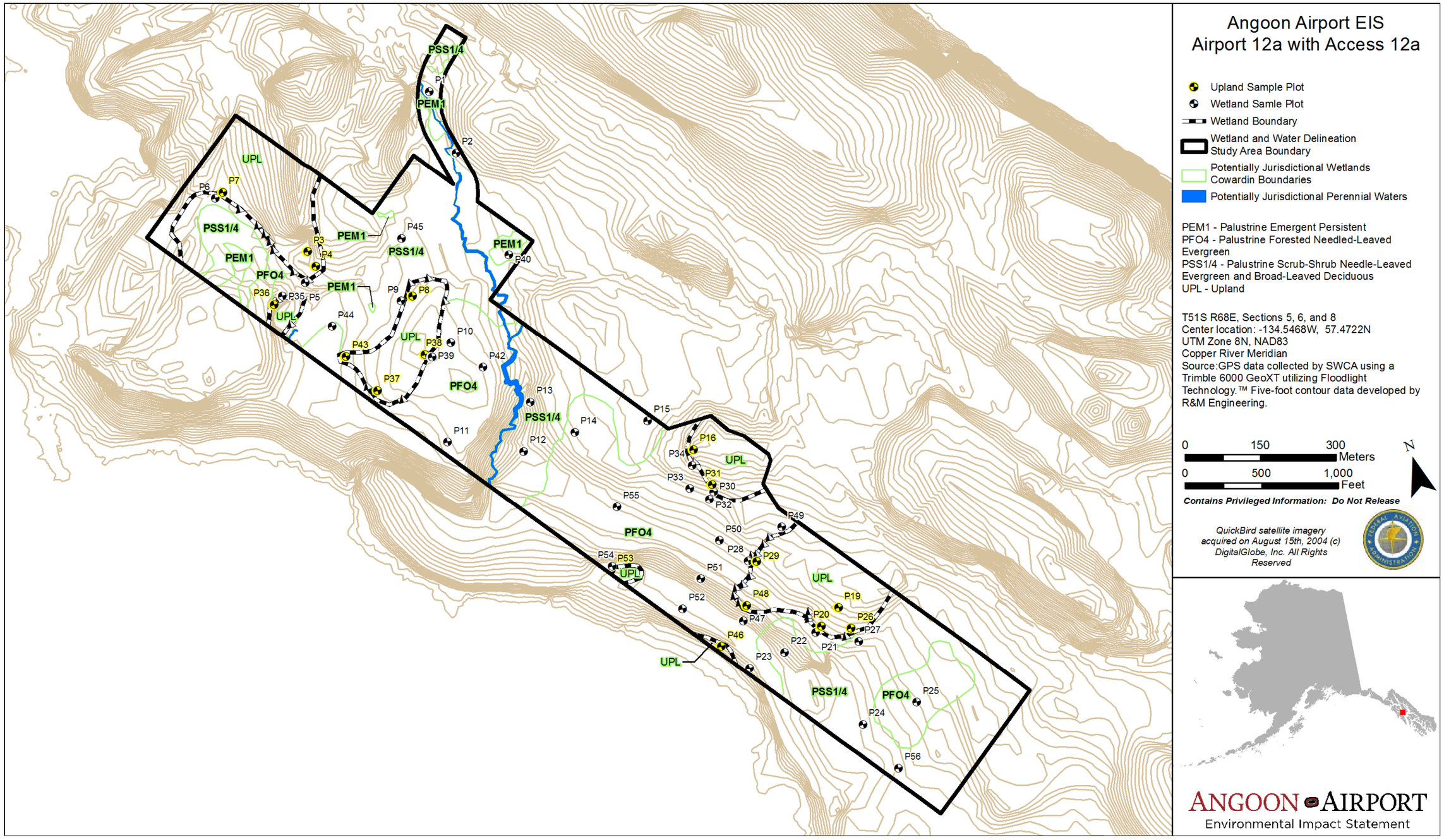

Figure 5. 2006 contour wetland and waters delineation map.

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APPENDIX B. PRECIPITATION DATA

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ANGOON, ALASKA (500310)

Period of Record Monthly Climate Summary

Period of Record : 9/ 1/1949 to 2/28/2011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	31.9	36.8	40.9	47.1	53.4	58.8	62.0	61.5	56.6	48.4	39.9	34.3	47.6
Average Min. Temperature (F)	23.5	27.1	29.7	33.9	39.8	45.6	49.8	49.8	45.2	39.1	32.3	27.3	36.9
Average Total Precipitation (in.)	3.39	2.70	2.42	2.21	1.92	1.90	2.26	3.76	4.89	7.71	4.79	4.04	42.00
Average Total SnowFall (in.)	16.6	12.7	8.1	2.0	0.0	0.0	0.0	0.0	0.0	0.3	6.0	15.4	61.2
Average Snow Depth (in.)	7	8	4	1	0	0	0	0	0	0	1	4	2

Percent of possible observations for period of record.
Max. Temp.: 81% Min. Temp.: 80.9% Precipitation: 83.7% Snowfall: 85.2% Snow Depth: 85.3%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Daily)

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CDAK47 PAJK 201127
CLIJNU
AKZ025-202300-
CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
325 AM AKDT TUE AUG 20 2013


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...THE JUNEAU CLIMATE SUMMARY FOR AUGUST 19 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013


WEATHER ITEM   OBSERVED TIME   RECORD YEAR NORMAL DEPARTURE LAST
                VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                   NORMAL
.................................................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         60    336 PM  80    1977  63     -3       66
  MINIMUM         49    420 AM  34    1947  49      0       44
  AVERAGE         55                        56     -1       55

PRECIPITATION (IN)
  YESTERDAY        0.11          1.50 1991   0.18  -0.07     0.00
  MONTH TO DATE    3.06                      3.18  -0.12     4.23
  SINCE JUN 1     10.70                     11.02  -0.32    16.29
  SINCE JAN 1     39.07                     30.62   8.45    36.03

DEGREE DAYS
 HEATING
  YESTERDAY       10                         9      1       10
  MONTH TO DATE   98                       156    -58      179
  SINCE JUN 1    534                       722   -188      879
  SINCE JUL 1    320                       407    -87      485

 COOLING
```

YESTERDAY	0	0	0	0
MONTH TO DATE	0	0	0	0
SINCE JUN 1	9	2	7	1
SINCE JAN 1	9	2	7	1

.....

WIND (MPH)

HIGHEST WIND SPEED 13 HIGHEST WIND DIRECTION SE (130)
HIGHEST GUST SPEED 16 HIGHEST GUST DIRECTION E (90)
AVERAGE WIND SPEED 5.4

SKY COVER

POSSIBLE SUNSHINE MM
AVERAGE SKY COVER 1.0

WEATHER CONDITIONS

THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.
LIGHT RAIN
FOG

RELATIVE HUMIDITY (PERCENT)

HIGHEST	93	1200 AM
LOWEST	72	1200 PM
AVERAGE	83	

.....

THE JUNEAU CLIMATE NORMALS FOR TODAY

	NORMAL	RECORD	YEAR
MAXIMUM TEMPERATURE (F)	62	83	1977
MINIMUM TEMPERATURE (F)	49	39	1973

SUNRISE AND SUNSET

AUGUST 20 2013.....SUNRISE 532 AM AKDT SUNSET 830 PM AKDT
AUGUST 21 2013.....SUNRISE 534 AM AKDT SUNSET 827 PM AKDT

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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AMOUNT OF DAYLIGHT TODAY  (HOUR:MIN)........14:58
GAIN/LOSS SINCE YESTERDAY (HOUR:MIN:SEC)....-0:04:53
```

The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

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Climatological Report (Daily)

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CDAK47 PAJK 211129
CLIJNU
AKZ025-212300-
CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
326 AM AKDT WED AUG 21 2013


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...THE JUNEAU CLIMATE SUMMARY FOR AUGUST 20 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013


WEATHER ITEM   OBSERVED TIME   RECORD YEAR NORMAL DEPARTURE LAST
                VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                   NORMAL
.................................................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         57    414 PM  83    1977  62     -5       68
  MINIMUM         52    407 AM  39    1973  49      3       50
  AVERAGE         55                        55      0       59

PRECIPITATION (IN)
  YESTERDAY        0.11          1.38 2011   0.20  -0.09     0.00
  MONTH TO DATE    3.17                      3.38  -0.21     4.23
  SINCE JUN 1     10.81                     11.22  -0.41    16.29
  SINCE JAN 1     39.18                     30.82   8.36    36.03

DEGREE DAYS
 HEATING
  YESTERDAY       10                        10      0        6
  MONTH TO DATE  108                       166    -58      185
  SINCE JUN 1    544                       732   -188      885
  SINCE JUL 1    330                       417    -87      491

 COOLING
```

YESTERDAY	0	0	0	0
MONTH TO DATE	0	0	0	0
SINCE JUN 1	9	2	7	1
SINCE JAN 1	9	2	7	1

.....

WIND (MPH)

HIGHEST WIND SPEED 15 HIGHEST WIND DIRECTION E (100)
HIGHEST GUST SPEED 18 HIGHEST GUST DIRECTION E (100)
AVERAGE WIND SPEED 7.5

SKY COVER

POSSIBLE SUNSHINE MM
AVERAGE SKY COVER 1.0

WEATHER CONDITIONS

THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.
LIGHT RAIN
FOG

RELATIVE HUMIDITY (PERCENT)

HIGHEST	100	400 AM
LOWEST	80	200 PM
AVERAGE	90	

.....

THE JUNEAU CLIMATE NORMALS FOR TODAY

	NORMAL	RECORD	YEAR
MAXIMUM TEMPERATURE (F)	62	78	1977
MINIMUM TEMPERATURE (F)	48	38	1960

SUNRISE AND SUNSET

AUGUST 21 2013.....SUNRISE 534 AM AKDT SUNSET 827 PM AKDT
AUGUST 22 2013.....SUNRISE 536 AM AKDT SUNSET 824 PM AKDT

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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AMOUNT OF DAYLIGHT TODAY  (HOUR:MIN)........14:53
GAIN/LOSS SINCE YESTERDAY (HOUR:MIN:SEC)....-0:04:54
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The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

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Climatological Report (Daily)

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CLIJNU
AKZ025-222300-
CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
325 AM AKDT THU AUG 22 2013


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...THE JUNEAU CLIMATE SUMMARY FOR AUGUST 21 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013


WEATHER ITEM   OBSERVED TIME   RECORD YEAR NORMAL DEPARTURE LAST
                VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                   NORMAL
.................................................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         59    539 PM  78    1977  62     -3       58
  MINIMUM         51    343 AM  38    1960  48      3       52
  AVERAGE         55                        55      0       55

PRECIPITATION (IN)
  YESTERDAY        0.07          1.37 2000   0.19  -0.12      T
  MONTH TO DATE    3.24                      3.57  -0.33     4.23
  SINCE JUN 1     10.88                     11.41  -0.53    16.29
  SINCE JAN 1     39.25                     31.01   8.24    36.03

DEGREE DAYS
 HEATING
  YESTERDAY       10                        10      0       10
  MONTH TO DATE  118                       176    -58      195
  SINCE JUN 1    554                       742   -188      895
  SINCE JUL 1    340                       427    -87      501

 COOLING
```

YESTERDAY	0	0	0	0
MONTH TO DATE	0	0	0	0
SINCE JUN 1	9	2	7	1
SINCE JAN 1	9	2	7	1

.....

WIND (MPH)

HIGHEST WIND SPEED 14 HIGHEST WIND DIRECTION E (90)
HIGHEST GUST SPEED 17 HIGHEST GUST DIRECTION E (110)
AVERAGE WIND SPEED 7.9

SKY COVER

POSSIBLE SUNSHINE MM
AVERAGE SKY COVER 1.0

WEATHER CONDITIONS

THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.
LIGHT RAIN
FOG

RELATIVE HUMIDITY (PERCENT)

HIGHEST	100	200 AM
LOWEST	77	200 PM
AVERAGE	89	

.....

THE JUNEAU CLIMATE NORMALS FOR TODAY

	NORMAL	RECORD	YEAR
MAXIMUM TEMPERATURE (F)	62	79	1979
MINIMUM TEMPERATURE (F)	48	38	1954

SUNRISE AND SUNSET

AUGUST 22 2013.....SUNRISE 536 AM AKDT SUNSET 824 PM AKDT
AUGUST 23 2013.....SUNRISE 538 AM AKDT SUNSET 822 PM AKDT

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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AMOUNT OF DAYLIGHT TODAY  (HOUR:MIN)........14:48
GAIN/LOSS SINCE YESTERDAY (HOUR:MIN:SEC)....-0:04:54
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The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

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Climatological Report (Daily)

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CDAK47 PAJK 161152
CLIJNU
AKZ025-162300-
CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
350 AM AKDT MON SEP 16 2013


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...THE JUNEAU CLIMATE SUMMARY FOR SEPTEMBER 15 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013


WEATHER ITEM   OBSERVED TIME   RECORD YEAR NORMAL DEPARTURE LAST
               VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                 NORMAL
.................................................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         64    416 PM  72    2010  56      8       50
  MINIMUM         39    456 AM  30    2006  45     -6       47
  AVERAGE         52                        50      2       49

PRECIPITATION (IN)
  YESTERDAY        0.10          0.90 1992   0.29  -0.19     0.13
  MONTH TO DATE    3.75                      4.08  -0.33     7.09
  SINCE SEP 1      3.75                      4.08  -0.33     7.09
  SINCE JAN 1     44.66                     37.25   7.41    46.48

DEGREE DAYS
 HEATING
  YESTERDAY       13                         15     -2       16
  MONTH TO DATE  143                        202    -59      217
  SINCE SEP 1    143                        202    -59      217
  SINCE JUL 1    578                        737   -159      840

 COOLING
```

YESTERDAY	0	0	0	0
MONTH TO DATE	0	0	0	0
SINCE SEP 1	0	0	0	0
SINCE JAN 1	9	2	7	1

.....

WIND (MPH)

HIGHEST WIND SPEED	16	HIGHEST WIND DIRECTION	E (70)
HIGHEST GUST SPEED	21	HIGHEST GUST DIRECTION	E (80)
AVERAGE WIND SPEED	4.3		

SKY COVER
POSSIBLE SUNSHINE MM
AVERAGE SKY COVER 0.8

WEATHER CONDITIONS
THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.
LIGHT RAIN
FOG
FOG W/VISIBILITY <= 1/4 MILE

RELATIVE HUMIDITY (PERCENT)

HIGHEST	100	200 AM
LOWEST	48	200 PM
AVERAGE	74	

.....

THE JUNEAU CLIMATE NORMALS FOR TODAY

	NORMAL	RECORD	YEAR
MAXIMUM TEMPERATURE (F)	56	70	2010
MINIMUM TEMPERATURE (F)	44	29	1969

SUNRISE AND SUNSET

SEPTEMBER 16 2013.....	SUNRISE	631 AM AKDT	SUNSET	714 PM AKDT
SEPTEMBER 17 2013.....	SUNRISE	633 AM AKDT	SUNSET	711 PM AKDT

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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AMOUNT OF DAYLIGHT TODAY  (HOUR:MIN)........12:43
GAIN/LOSS SINCE YESTERDAY (HOUR:MIN:SEC)....-0:05:02
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The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

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Climatological Report (Daily)

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CDAK47 PAJK 171134
CLIJNU
AKZ025-172300-
CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
332 AM AKDT TUE SEP 17 2013


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...THE JUNEAU CLIMATE SUMMARY FOR SEPTEMBER 16 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013


WEATHER ITEM   OBSERVED TIME   RECORD YEAR NORMAL DEPARTURE LAST
                VALUE   (LST)  VALUE       VALUE  FROM      YEAR
                                                   NORMAL
.................................................................
TEMPERATURE (F)
 YESTERDAY
  MAXIMUM         58   1202 PM  70    2010  56      2       53
  MINIMUM         50   1159 PM  29    1969  44      6       47
  AVERAGE         54                         50      4       50

PRECIPITATION (IN)
  YESTERDAY        0.17          1.51 2000   0.30  -0.13     0.10
  MONTH TO DATE    3.92                      4.38  -0.46     7.19
  SINCE SEP 1      3.92                      4.38  -0.46     7.19
  SINCE JAN 1     44.83                     37.55   7.28    46.58

DEGREE DAYS
 HEATING
  YESTERDAY       11                         15     -4       15
  MONTH TO DATE  154                        217    -63      232
  SINCE SEP 1    154                        217    -63      232
  SINCE JUL 1    589                        752   -163      855

 COOLING
```

YESTERDAY	0	0	0	0
MONTH TO DATE	0	0	0	0
SINCE SEP 1	0	0	0	0
SINCE JAN 1	9	2	7	1

.....

WIND (MPH)

HIGHEST WIND SPEED	23	HIGHEST WIND DIRECTION	SE (120)
HIGHEST GUST SPEED	28	HIGHEST GUST DIRECTION	SE (120)
AVERAGE WIND SPEED	13.2		

SKY COVER

POSSIBLE SUNSHINE MM

AVERAGE SKY COVER 0.9

WEATHER CONDITIONS

THE FOLLOWING WEATHER WAS RECORDED YESTERDAY.

LIGHT RAIN

FOG

RELATIVE HUMIDITY (PERCENT)

HIGHEST	100	700 AM
LOWEST	71	500 PM
AVERAGE	86	

.....

THE JUNEAU CLIMATE NORMALS FOR TODAY

	NORMAL	RECORD	YEAR
MAXIMUM TEMPERATURE (F)	55	70	1995
MINIMUM TEMPERATURE (F)	44	31	1973

SUNRISE AND SUNSET

SEPTEMBER 17 2013.....SUNRISE 633 AM AKDT SUNSET 711 PM AKDT

SEPTEMBER 18 2013.....SUNRISE 635 AM AKDT SUNSET 708 PM AKDT

- INDICATES NEGATIVE NUMBERS.

R INDICATES RECORD WAS SET OR TIED.

MM INDICATES DATA IS MISSING.

T INDICATES TRACE AMOUNT.

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&&
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AMOUNT OF DAYLIGHT TODAY  (HOUR:MIN)........12:38
GAIN/LOSS SINCE YESTERDAY (HOUR:MIN:SEC)....-0:05:02
```

The U.S. Naval Observatory (USNO) computes astronomical data. Therefore, the NWS does not record, certify, or authenticate astronomical data. Computed times of sunrise, sunset, moonrise, moonset; and twilight, moon phases and other astronomical data are available from USNO's Astronomical Applications Department (http://www.usno.navy.mil). See http://www.usno.navy.mil/USNO/astronomical-applications/astronomical-information-center/litigation for information on using these data for legal purposes.

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Climatological Report (Monthly)

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CXAK57 PAJK 011427
CLMAJK

CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
630 AM AKDT SAT JUN 1 2013

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...THE JUNEAU CLIMATE SUMMARY FOR THE MONTH OF MAY 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013

WEATHER         OBSERVED          NORMAL  DEPART  LAST YEAR`S
                 VALUE   DATE(S)  VALUE   FROM    VALUE  DATE(S)
                                          NORMAL
..............................................................
TEMPERATURE (F)
RECORD
 HIGH              82   05/27/1947
 LOW               25   05/01/1972
                        05/11/1965
                        05/02/1956
HIGHEST            73   05/28        70       3       59  05/24
LOWEST             30   05/20        32      -2       35  05/15
                        05/07
AVG. MAXIMUM     56.1              56.6    -0.5     48.9
AVG. MINIMUM     39.8              40.6    -0.8     40.5
MEAN             48.0              48.6    -0.6     44.7
DAYS MAX >= 90      0               0.0     0.0        0
DAYS MAX <= 32      0               0.0     0.0        0
DAYS MIN <= 32      4               1.6     2.4        0
DAYS MIN <= 0       0               0.0     0.0        0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM         9.20   1992
 MINIMUM         0.84   2004
TOTALS           5.33              3.40    1.93     5.73
DAILY AVG.       0.17              0.11    0.06     0.18
DAYS >= .01        18              16.3     1.7       26
DAYS >= .10        12               9.3     2.7       16
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DAYS >= .50	4		1.6	2.4	3
DAYS >= 1.00	1		0.3	0.7	0
GREATEST					
24 HR. TOTAL	1.10	05/31 TO 05/31			05/07 TO 05/08

SNOWFALL (INCHES)					
RECORDS					
TOTAL	1.2	1964			
24 HR TOTAL	0.7	05/02/1945 TO 05/03/1945			
SNOW DEPTH	0	05/31/2002			
TOTALS	T		0.0	0.0	T
SINCE 7/1	83.8		86.7	-2.9	134.3
SNOWDEPTH AVG.	0		MM	MM	0
DAYS >= TRACE	1		0.0	1.0	2
DAYS >= 1.0	0		0.0	0.0	0
GREATEST					
SNOW DEPTH	0	MM			0 MM
24 HR TOTAL	T	05/19 TO 05/19			05/15 TO 05/15

/DEGREE_DAYS				
HEATING TOTAL	519	508	11	619
SINCE 7/1	8536	8036	500	8184
COOLING TOTAL	0	0	0	0
SINCE 1/1	0	0	0	0

FREEZE DATES		
RECORD		
EARLIEST	08/24/1969	
LATEST	06/13/1965	
EARLIEST	09/30	
LATEST	05/12	

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WIND (MPH)			
AVERAGE WIND SPEED	8.2		
RESULTANT WIND SPEED/DIRECTION	3/135		
HIGHEST WIND SPEED/DIRECTION	39/120	DATE	05/01
HIGHEST GUST SPEED/DIRECTION	50/120	DATE	05/01

SKY COVER	
POSSIBLE SUNSHINE (PERCENT)	MM
AVERAGE SKY COVER	0.70
NUMBER OF DAYS FAIR	6
NUMBER OF DAYS PC	6
NUMBER OF DAYS CLOUDY	19

AVERAGE RH (PERCENT) 76

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	1
HEAVY RAIN	0	RAIN	6

LIGHT RAIN	20	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	1
HEAVY SNOW	0	SNOW	1
LIGHT SNOW	1	SLEET	1
FOG	17	FOG W/VIS <= 1/4 MILE	2
HAZE	0		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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...WET AND COOL START TO MAY GIVES WAY TO SUMMERLIKE WEATHER LATER IN THE MONTH...

THE MONTH OF MAY FEATURED A WIDE RANGE OF WEATHER CONDITIONS IN JUNEAU. WARM AND SUNNY CONDITIONS OCCURRED BETWEEN THE 5TH AND 9TH AND DURING THE LAST 10 DAYS OF THE MONTH. CONDITIONS WERE COOLER AND WETTER THAN NORMAL IN BETWEEN THESE DRY SPELLS. THIS RESULTED IN WHAT TURNED OUT TO BE A GENERALLY NEAR NORMAL MAY IN TERMS OF TEMPERATURE. MOST OF THE PRECIPITATION FELL DURING THE FIRST FEW DAYS OF THE MONTH...THE MIDDLE OF THE MONTH...AND THE LAST COUPLE DAYS OF MAY. EASTERLY OFFSHORE FLOW WAS THE PREDOMINANT WEATHER PATTERN IN THE LATTER HALF OF THE MONTH. HOWEVER...THE HEAVIEST 24 HOUR RAINFALL EVENT OCCURRED ON THE LAST DAY OF THE MONTH AS A WEATHER SYSTEM MOVED EAST INTO THE AREA FROM CANADA. THE SYSTEM DROPPED 1.10 INCHES OF RAIN AT THE AIRPORT. THIS BROKE THE DAILY RAINFALL RECORD OF 0.91 INCHES SET IN 1948. THE TOTAL PRECIPITATION FOR THE MONTH ENDED AT 5.33 INCHES...WHICH WAS 1.93 INCHES ABOVE NORMAL. THIS WAS ALL IN THE FORM OF RAIN EXCEPT FOR ICE PELLETS THAT MIXED IN WITH RAIN SHOWERS ON THE 19TH.

THE STRONGEST WIND REPORTED AT THE AIRPORT WAS 50 MPH ON THE 1ST OF THE MONTH. THE JUNEAU FEDERAL BUILDING ALSO RECEIVED ITS STRONGEST WIND OF THE MONTH ON THIS DAY AS A 48 MPH GUST WAS REPORTED AROUND MIDDAY. A STRONG FRONT MOVING ACROSS SOUTHEAST ALASKA CREATED THESE STRONG WINDS.

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Monthly)

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CXAK57 PAJK 011241
CLMAJK

CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
302 AM AKDT MON JUL 1 2013

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...THE JUNEAU CLIMATE SUMMARY FOR THE MONTH OF JUNE 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013

WEATHER         OBSERVED          NORMAL  DEPART  LAST YEAR`S
                 VALUE   DATE(S)  VALUE   FROM    VALUE  DATE(S)
                                          NORMAL
.................................................................
TEMPERATURE (F)
RECORD
 HIGH              86   06/13/1969
 LOW               31   06/03/1971
                        06/13/1965
                        06/07/1955
HIGHEST            85   06/16        77       8       82  06/23
LOWEST             37   06/03        38      -1       41  06/10
                                                         06/05
                                                         06/03
AVG. MAXIMUM     67.4              62.2     5.2     57.5
AVG. MINIMUM     47.9              46.9     1.0     45.8
MEAN             57.7              54.6     3.1     51.7
DAYS MAX >= 90      0               0.0     0.0        0
DAYS MAX <= 32      0               0.0     0.0        0
DAYS MIN <= 32      0               0.0     0.0        0
DAYS MIN <= 0       0               0.0     0.0        0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM         6.69   2012
 MINIMUM         1.08   1946
TOTALS           3.19              3.24   -0.05     6.69
DAILY AVG.       0.11              0.11    0.00     0.22
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DAYS >= .01	17	15.8	1.2	24
DAYS >= .10	6	8.0	-2.0	15
DAYS >= .50	2	2.0	0.0	5
DAYS >= 1.00	0	0.2	-0.2	1
GREATEST				
24 HR. TOTAL	0.85	06/05 TO 06/05	1.85	06/29 TO 06/30

SNOWFALL (INCHES)

RECORDS				
TOTAL	0.0 MM			
24 HR TOTAL	0.0 MM			
SNOW DEPTH	0 MM			
TOTALS	0.0	0.0	0.0	0.0
SINCE 7/1	83.8	86.7	-2.9	134.3
SNOWDEPTH AVG.	0	MM	MM	0
DAYS >= TRACE	0	0.0	0.0	0
DAYS >= 1.0	0	0.0	0.0	0
GREATEST				
SNOW DEPTH	0 MM			0 MM
24 HR TOTAL	0.0 MM			0.0 MM

DEGREE_DAYS

HEATING TOTAL	214	315	-101	394
SINCE 7/1	8750	8351	399	8578
COOLING TOTAL	7	1	6	1
SINCE 1/1	7	1	6	1

FREEZE DATES

RECORD		
EARLIEST	08/24/1969	
LATEST	06/13/1965	
EARLIEST	10/01	09/30
LATEST	05/21	05/12

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WIND (MPH)

AVERAGE WIND SPEED	6.1		
RESULTANT WIND SPEED/DIRECTION	2/210		
HIGHEST WIND SPEED/DIRECTION	25/130	DATE	06/26
HIGHEST GUST SPEED/DIRECTION	36/320	DATE	06/17

SKY COVER

POSSIBLE SUNSHINE (PERCENT)	MM
AVERAGE SKY COVER	0.80
NUMBER OF DAYS FAIR	0
NUMBER OF DAYS PC	13
NUMBER OF DAYS CLOUDY	16

AVERAGE RH (PERCENT) 73

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	MIXED PRECIP	0
HEAVY RAIN	1	RAIN	6
LIGHT RAIN	19	FREEZING RAIN	0
LT FREEZING RAIN	0	HAIL	0
HEAVY SNOW	0	SNOW	0
LIGHT SNOW	0	SLEET	0
FOG	12	FOG W/VIS <= 1/4 MILE	2
HAZE	0		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

...NEAR RECORD WARMTH AND THREE THUNDERSTORM DAYS IN JUNE...

JUNE 2013 WAS THE SECOND WARMEST JUNE SINCE 1943. THE MONTHLY AVERAGE TEMPERATURE WAS 57.9 DEGREES...WHICH WAS JUST 0.1 DEGREE SHY OF THE ALL-TIME RECORD HIGH MONTHLY AVERAGE TEMPERATURE OF 58.0 DEGREES SET BACK IN 2004. NONETHELESS...THE MONTHLY AVERAGE TEMPERATURE THIS JUNE WAS ABOUT 3.3 DEGREES WARMER THAN NORMAL. THE DAILY HIGH TEMPERATURE RECORDS WERE BROKEN ON THE 15TH AND THE 16TH...WHEN TEMPERATURE ROSE TO 83 AND 85 DEGREES ON THOSE DAYS...RESPECTIVELY. THERE WERE 2 DAYS THIS MONTH WHEN HIGH TEMPERATURES SOARED ABOVE 80 DEGREES. THERE WERE 9 DAYS WHEN HIGH TEMPERATURES ROSE TO THE 70S. THE WARMEST DAY OF THE MONTH WAS ON THE 16TH...WITH A HIGH TEMPERATURE OF 85 DEGREES. THE COLDEST DAY OF THE MONTH WAS ON THE 3RD...WITH A LOW TEMPERATURE OF 37 DEGREES.

THERE WERE THREE THUNDERSTORM DAYS...AND THEY OCCURRED ON THE 17TH...24TH...AND 25TH...RESPECTIVELY. THE PRECIPITATION FOR THE MONTH ENDED AT 3.19 INCHES...WHICH WAS NEAR NORMAL.

THE THUNDERSTORM ON THE 17TH ALSO BROUGHT STRONG WIND GUSTS TO THE JUNEAU AREA. THE STRONGEST WIND GUST AT THE AIRPORT WAS 36 MPH FROM THE NORTHWEST...AND THIS OCCURRED ON THE 17TH. THE STRONGEST WIND GUST AT THE DOUGLAS BOAT HARBOR WAS 36 MPH FROM THE NORTHEAST...AND THIS ALSO OCCURRED ON THE 17TH.

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Climatological Report (Monthly)

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CXAK57 PAJK 011206
CLMAJK

CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
354 AM AKDT THU AUG 1 2013

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...THE JUNEAU CLIMATE SUMMARY FOR THE MONTH OF JULY 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013

WEATHER         OBSERVED          NORMAL  DEPART  LAST YEAR`S
                 VALUE   DATE(S)  VALUE   FROM    VALUE  DATE(S)
                                          NORMAL
.................................................................
TEMPERATURE (F)
RECORD
 HIGH              90   07/07/1975
 LOW               36   07/08/1950
HIGHEST            81   07/29        78       3       76  07/26
LOWEST             41   07/14        43      -2       38  07/12
AVG. MAXIMUM     64.9              63.9     1.0     61.3
AVG. MINIMUM     50.4              50.0     0.4     48.5
MEAN             57.7              56.9     0.8     54.9
DAYS MAX >= 90      0               0.0     0.0        0
DAYS MAX <= 32      0               0.0     0.0        0
DAYS MIN <= 32      0               0.0     0.0        0
DAYS MIN <= 0       0               0.0     0.0        0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM        10.36   1997
 MINIMUM         1.15   1972
TOTALS           4.45              4.60   -0.15     5.37
DAILY AVG.       0.14              0.15   -0.01     0.17
DAYS >= .01        16              17.7    -1.7       18
DAYS >= .10        10              10.9    -0.9       10
DAYS >= .50         3               2.9     0.1        3
DAYS >= 1.00        1               0.6     0.4        1
GREATEST
 24 HR. TOTAL    1.36   07/08 TO 07/08           07/09 TO 07/10
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SNOWFALL (INCHES)
RECORDS
 TOTAL            0.0   2002
 24 HR TOTAL      0.0   MM
 SNOW DEPTH         0   MM
TOTALS            0.0               0.0     0.0      0.0
SINCE 7/1         0.0               0.0     0.0      0.0
SNOWDEPTH AVG.      0                MM      MM        0
DAYS >= TRACE       0               0.0     0.0        0
DAYS >= 1.0         0               0.0     0.0        0
GREATEST
 SNOW DEPTH         0   MM                            0  MM
 24 HR TOTAL      0.0   07/31 TO 07/31           07/31 TO 07/31

DEGREE_DAYS
HEATING TOTAL     222               251     -29      306
 SINCE 7/1        222               251     -29      306
COOLING TOTAL       2                 1       1        0
 SINCE 1/1          9                 2       7        1

FREEZE DATES
RECORD
 EARLIEST     08/24/1969
 LATEST       06/13/1965
EARLIEST                        09/30
LATEST                          05/12
.................................................

WIND (MPH)
AVERAGE WIND SPEED              6.1
RESULTANT WIND SPEED/DIRECTION   2/118
HIGHEST WIND SPEED/DIRECTION    24/130    DATE  07/08
HIGHEST GUST SPEED/DIRECTION    32/110    DATE  07/07

SKY COVER
POSSIBLE SUNSHINE (PERCENT)   MM
AVERAGE SKY COVER           0.80
NUMBER OF DAYS FAIR            2
NUMBER OF DAYS PC              6
NUMBER OF DAYS CLOUDY         23

AVERAGE RH (PERCENT)     81

WEATHER CONDITIONS. NUMBER OF DAYS WITH
THUNDERSTORM              0     MIXED PRECIP               0
HEAVY RAIN                3     RAIN                       6
LIGHT RAIN               18     FREEZING RAIN              0
LT FREEZING RAIN          0     HAIL                       0
HEAVY SNOW                0     SNOW                       0
LIGHT SNOW                0     SLEET                      0
FOG                      13     FOG W/VIS <= 1/4 MILE      0
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HAZE 0

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

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...JULY WAS PRETTY NORMAL FOR TEMPERATURES AND PRECIPITATION...

THE MONTH OF JULY HELD VERY FEW SURPRISES IN CLIMATE DATA. EVEN WITH 7 DAYS OF TEMPERATURES OVER 70 DEGREES AND ONLY 7 DAYS OF HIGH TEMPERATURES LESS THAN 60 DEGREES THE AVERAGE TEMPERATURE FOR THE MONTH WAS STILL ONLY 57.7 DEGREES. THIS IS ONLY 0.8 DEGREES ABOVE NORMAL FOR THE MONTH. HIGH TEMPERATURES AVERAGED 63.9 DEGREES WITH LOWS AVERAGING 49.9 DEGREES. BOTH OF THESE AVERAGES ARE JUST SLIGHTLY ABOVE NORMAL AT PLUS 1 DEGREE AND PLUS 0.5 DEGREES RESPECTIVELY. THE MAXIMUM TEMPERATURE FOR THE MONTH WAS 81 DEGREES OCCURRING ON THE 29TH WITH A MINIMUM OF 41 DEGREES OCCURRING ON THE 14TH. LOW TEMPERATURES WERE AT OR ABOVE 50 DEGREES ON ALL BUT 8 DAYS. THERE WAS ONLY ONE TEMPERATURE RECORD BROKEN DURING JULY WITH A NEW HIGH MINIMUM TEMPERATURE OF 51 DEGREES ON THE 19TH.

THE PRECIPITATION TOTAL FOR JULY WAS 4.45 INCHES WHICH IS 0.15 INCHES BELOW AVERAGE FOR THE MONTH. THERE WERE 12 DAYS IN JULY WITH NO PRECIPITATION RECORDED. THERE WERE THUNDERSTORMS REPORTED ON THE 13TH WHICH IS FAIRLY RARE FOR JUNEAU. THE GREATEST 24 HOUR RAINFALL HAPPENED ON THE 8TH WITH 1.36 INCHES RECORDED.

THE WINDS AVERAGED 6.1 MPH IN JULY WITH A PREDOMINATE EAST TO SOUTHEAST DIRECTION OCCURRING ON 19 DAYS. SOUTHWEST WINDS OCCURRED ON 9 DAYS. THE MAXIMUM WIND SPEED OCCURRED ON JULY 7TH WITH A SOUTHEAST WIND OF 32 MPH. THE MAXIMUM WIND SPEED REPORTED AT THE FEDERAL BUILDING IN DOWNTOWN JUNEAU WAS ON THE 9TH WITH A SOUTHEAST WIND OF 36 MPH.

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Climatological Report (Monthly)

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CXAK57 PAJK 011515
CLMAJK

CLIMATE REPORT
NATIONAL WEATHER SERVICE JUNEAU, AK
715 AM AKDT SUN SEP 1 2013

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...THE JUNEAU CLIMATE SUMMARY FOR THE MONTH OF AUGUST 2013...

CLIMATE NORMAL PERIOD 1981 TO 2010
CLIMATE RECORD PERIOD 1943 TO 2013

WEATHER         OBSERVED          NORMAL  DEPART  LAST YEAR`S
                 VALUE   DATE(S)  VALUE   FROM    VALUE  DATE(S)
                                          NORMAL
.................................................................
TEMPERATURE (F)
RECORD
 HIGH              84   08/16/2004
                        08/10/2004
 LOW               27   08/25/1948
HIGHEST            78   08/12        76       2       72  08/14
LOWEST             43   08/29        40       3       38  08/30
AVG. MAXIMUM     65.4              62.7     2.7     61.1
AVG. MINIMUM     50.4              49.0     1.4     48.1
MEAN             57.9              55.9     2.0     54.6
DAYS MAX >= 90      0               0.0     0.0        0
DAYS MAX <= 32      0               0.0     0.0        0
DAYS MIN <= 32      0               0.0     0.0        0
DAYS MIN <= 0       0               0.0     0.0        0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM        11.02   2006
 MINIMUM         0.56   1979
TOTALS           4.90              5.73   -0.83     7.59
DAILY AVG.       0.16              0.18   -0.02     0.24
DAYS >= .01        15              19.1    -4.1       16
DAYS >= .10        12              12.5    -0.5       14
DAYS >= .50         3               3.8    -0.8        6
DAYS >= 1.00        2               1.0     1.0        2
GREATEST
 24 HR. TOTAL    1.26   08/17 TO 08/18           08/27 TO 08/28
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SNOWFALL (INCHES)
RECORDS
 TOTAL            0.0
 24 HR TOTAL      0.0
 SNOW DEPTH         0
TOTALS            0.0              0.0     0.0      0.0
SINCE 7/1         0.0              0.0     0.0      0.0
SNOWDEPTH AVG.      0              0.0     0.0        0
DAYS >= TRACE       0              0.0     0.0        0
DAYS >= 1.0         0              0.0     0.0        0
GREATEST
 SNOW DEPTH         0                                 0
 24 HR TOTAL      0.0   08/31 TO 08/31          08/31 TO 08/31


DEGREE_DAYS
HEATING TOTAL     213              284     -71      317
 SINCE 7/1        435              535    -100      623
COOLING TOTAL       0                0       0        0
 SINCE 1/1          9                2       7        1

FREEZE DATES
RECORD
 EARLIEST     08/24/1969
 LATEST       06/13/1965
EARLIEST                       09/30
LATEST                         05/12
...............................................

WIND (MPH)
AVERAGE WIND SPEED              6.4
RESULTANT WIND SPEED/DIRECTION   2/106
HIGHEST WIND SPEED/DIRECTION    21/120    DATE  08/18
HIGHEST GUST SPEED/DIRECTION    28/070    DATE  08/31

SKY COVER
POSSIBLE SUNSHINE (PERCENT)   MM
AVERAGE SKY COVER           0.80
NUMBER OF DAYS FAIR            5
NUMBER OF DAYS PC              7
NUMBER OF DAYS CLOUDY         19

AVERAGE RH (PERCENT)     82

WEATHER CONDITIONS. NUMBER OF DAYS WITH
THUNDERSTORM              0     MIXED PRECIP               0
HEAVY RAIN                1     RAIN                       8
LIGHT RAIN               17     FREEZING RAIN              0
LT FREEZING RAIN          0     HAIL                       0
HEAVY SNOW                0     SNOW                       0
LIGHT SNOW                0     SLEET                      0
FOG                      22     FOG W/VIS <= 1/4 MILE      0
HAZE                      0
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-  INDICATES NEGATIVE NUMBERS.
R  INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T  INDICATES TRACE AMOUNT.
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...AUGUST WAS WARMER AND DRIER THAN NORMAL...

TEMPERATURES WERE MILD DURING THE MONTH OF AUGUST WITH 17 DAYS REACHING ABOVE NORMAL VALUES OF 64 DEGREES OR WARMER...TEN OF THOSE DAYS REACHED 70 DEGREES OR MORE. RANKING THIS AUGUST THE 8TH WARMEST AVERAGE TEMPERATURE ON RECORD. WARMEST DAY WAS ON THE 12TH WITH THE MERCURY TOPPING OUT AT 78 DEGREES.

RAIN FELL 17 OF THE 31 DAYS OF THE MONTH...15 DAYS BEING MEASURABLE. THE 18TH AND 31ST MEASURED OVER AN INCH OF RAINFALL. THE HIGHEST AMOUNT WAS ON THE 18TH WITH 1.18 INCHES...WHICH BROKE THE RECORD OF 0.94 INCHES PREVIOUS SET IN 1970. RECORD BREAKING RAIN WAS ALSO MEASURED AT THE FORECAST OFFICE ON THE 18TH WITH 2.73 INCHES FALLING INTO THE BUCKET. DESPITE RAINING OVER HALF THE MONTH AND HAVING RECORD RAINFALL...THE MONTHLY TOTAL WAS .83 INCHES BELOW NORMAL. RANKING THIS AUGUST THE 42ND DRIEST ON RECORD.

WINDS AVERAGED 6 MPH FOR THE MONTH. ONLY THREE DAYS AVERAGED OVER 10 MPH THESE OCCURRED ON THE 17TH...18TH AND 31ST. WINDS WERE PREDOMINATELY OUT OF THE EAST TO SOUTHEAST. THE LIGHTER WIND DAYS WERE MOSTLY OUT OF THE SOUTHWEST AT 5 MPH OR LESS. THE PEAK WIND RECORDED AT THE JUNEAU AIRPORT WAS ON THE 31ST WITH 28 MPH OUT OF THE EAST.

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Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

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CXAK56 PAJK 251245
CF6AJN
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: JUNEAU
MONTH: SEPTEMBER
YEAR: 2013
LATITUDE: 58 22 N
LONGITUDE: 134 35 W

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	57	54	56	3	9	0	1.30	0.0	0	9.1	15	80	M	M	10	1	19	80
2	69	51	60	7	5	0	0.00	0.0	0	3.1	10	270	M	M	8	1	13	270
3	67	49	58	6	7	0	0.04	0.0	0	4.1	14	70	M	M	9	12	17	100
4	56	53	55	3	10	0	0.74	0.0	0	17.3	28	120	M	M	10	1	37	120
5	60	53	57	5	8	0	0.04	0.0	0	7.8	13	100	M	M	10	1	18	60
6	60	52	56	4	9	0	0.10	0.0	0	10.1	21	90	M	M	10	1	23	90
7	63	56	60	8	5	0	0.74	0.0	0	16.4	31	100	M	M	10	1	40	100
8	61	49	55	3	10	0	0.33	M	0	7.6	32	120	M	M	10	1	39	120
9	62	46	54	3	11	0	0.00	0.0	0	3.6	10	70	M	M	8	1	13	70
10	56	43	50	-1	15	0	0.30	0.0	0	3.8	15	100	M	M	9	12	19	90
11	64	51	58	7	7	0	T	0.0	0	8.9	21	100	M	M	9		26	90
12	62	50	56	5	9	0	0.06	0.0	0	3.9	10	240	M	M	8	12	14	270
13	61	42	52	2	13	0	T	0.0	0	4.1	12	230	M	M	8	1	14	240
14	61	44	53	3	12	0	0.00	0.0	0	2.4	10	240	M	M	7	1	12	240
15	64	39	52	2	13	0	0.10	0.0	0	4.3	16	70	M	M	8	12	21	80
16	58	50	54	4	11	0	0.17	0.0	0	13.2	23	120	M	M	9	1	28	120
17	53	49	51	1	14	0	0.35	0.0	0	13.5	21	110	M	M	8	1	25	110
18	53	48	51	1	14	0	0.17	0.0	0	10.2	18	130	M	M	10		24	130
19	50	46	48	-1	17	0	0.91	0.0	0	1.9	9	250	M	M	10	1	10	260
20	56	48	52	3	13	0	1.05	0.0	0	13.9	31	120	M	M	10	1	39	120
21	51	47	49	0	16	0	0.42	0.0	0	15.7	29	110	M	M	10	1	34	110
22	53	45	49	0	16	0	0.10	0.0	0	10.2	21	130	M	M	10	1	27	130
23	56	46	51	2	14	0	T	0.0	0	14.6	26	130	M	M	9		34	120
24	55	37	46	-2	19	0	0.00	0.0	0	3.6	12	100	M	M	5	1	13	100
SM	1408	1148			277	0	6.92		0.0	203.3				M		215		
AV	58.7	47.8								8.5	FASTST		M	M	9		MAX(MPH)	
								MISC ---->		#	32	120				#	40	100

NOTES:
LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

STATION: JUNEAU
MONTH: SEPTEMBER
YEAR: 2013
LATITUDE: 58 22 N
LONGITUDE: 134 35 W

[TEMPERATURE DATA]

AVERAGE MONTHLY: 53.2
DPTR FM NORMAL: 2.6
HIGHEST: 69 ON 2
LOWEST: 37 ON 24

[PRECIPITATION DATA]

TOTAL FOR MONTH: 6.92
DPTR FM NORMAL: 0.11
GRTST 24HR 1.74 ON 31- 1

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

SYMBOLS USED IN COLUMN 16

1 = FOG OR MIST
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 0
MIN 0 OR BELOW: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 17
0.10 INCH OR MORE: 14
0.50 INCH OR MORE: 5
1.00 INCH OR MORE: 2

[HDD (BASE 65)]

TOTAL THIS MO. 277
DPTR FM NORMAL -67
TOTAL FM JUL 1 712
DPTR FM NORMAL -167

CLEAR (SCALE 0-3) 0
PTCLDY (SCALE 4-7) 6
CLOUDY (SCALE 8-10) 18

[CDD (BASE 65)]

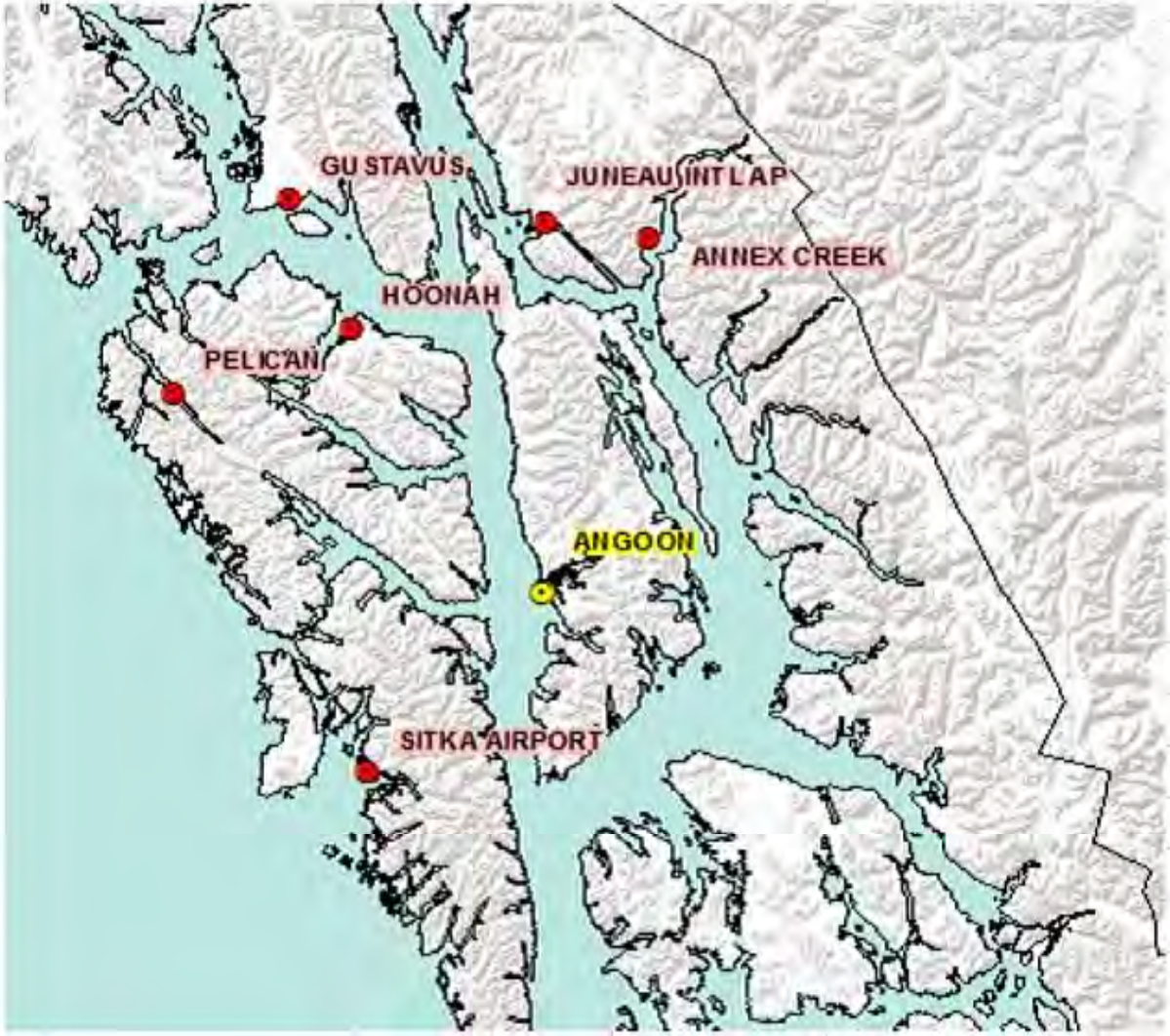
TOTAL THIS MO. 0
DPTR FM NORMAL 0
TOTAL FM JAN 1 9
DPTR FM NORMAL 7

[PRESSURE DATA]

HIGHEST SLP M ON M
LOWEST SLP 28.95 ON 22

[REMARKS]

90-Days Prior to Fieldwork			14-Days Prior to Fieldwork			Week of	
Measured Rain	Normal Rain	Surplus/Defecit	Measured Rain	Normal Rain	Surplus/Defecit	Measured Rain	Norma
17.82	17.81	1.18	3.32	5.57	-1.97	0.84	
9.23	11.87	-2.50	2.25	3.01	-0.76	0.13	
8.00	10.05	-2.05	1.70	2.29	-0.59	0.63	
12.35	12.42	-0.07	3.24	3.30	-0.06	0.29	
14.09	19.63	-5.23	2.37	5.76	-3.39	0.62	
10.17	12.24	-2.07	2.33	3.86	-1.53	0.00	



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APPENDIX C. WETLAND DETERMINATION DATA FORMS

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WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Hoonah Angoon Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P1**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): depression w/ hummocks

Local relief (concave, convex, none): concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.479153 Long: -134.548296 Datum: NAD 1983

Soil Map Unit Name: NWI classification: (on-site) PEM

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus contorta*	4%	Yes	FAC
2. *Tsuga mertensiana*	2%	Yes	FAC
3.			
4.			
Total Cover:	6%		
50% of total cover:	3%	20% of total cover:	1%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium oxycoccos*	5%	Yes	OBL
2. *Rhododendron groenlandicum*	5%	Yes	FAC
3. *Pinus contorta*	3%	Yes	FAC
4. *Tsuga heterophylla*	1%	No	FAC
5.			
6.			
Total Cover:	14%		
50% of total cover:	7%	20% of total cover:	3%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex aquatilis*	20%	Yes	OBL
2. *Piperia dilatata*	20%	Yes	FACW
3. *Triantha glutinosa*	10%	Yes	FACW
4. *Menyanthes trifoliata*	10%	Yes	OBL
5. *Carex flava*	10%	Yes	OBL
6. *Trichophorum caespitosum*	10%	Yes	OBL
7. *Eriophorum angustifolium*	8%	No	OBL
8. *Coptis trifolia*	3%	No	FAC
9. *Calamagrostis canadensis*	2%	No	FAC
10. *Equisetum variegatum*	1%	No	FACW
Total Cover:	94%		
50% of total cover:	47%	20% of total cover:	19%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	1%
% Cover of Wetland Bryophytes (Where applicable)	5	Total Cover of Bryophytes	5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 11 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	63	x 1 =	63
FACW species	31	x 2 =	62
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	114 (A)		185 (B)

Prevalence Index = B/A = 1.62

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P1**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-29+	10YR 2/1	100					peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 8	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Scattered shallow ponding to surface in depressionas around hummocks.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Hoonah Angoon Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P2**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Bottomlands w/hummocks

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.477963 Long: -134.548037 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	30%	Yes	FAC
2.			
3.			
4.			
Total Cover:	30%		
50% of total cover:	15%	20% of total cover:	6%
Sapling/Shrub Stratum			
1. *Malus fusca*	20%	Yes	FACU
2. *Menziesia ferruginea*	15%	Yes	FACU
3. *Oplopanax horridus*	5%	No	FACU
4. *Vaccinium alaskaense*	5%	No	FAC
5. *Vaccinium oxycoccos*	3%	No	OBL
6. *Viburnum edule*	2%	No	FACU
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%
Herb Stratum			
1. *Lysichiton americanus*	25%	Yes	OBL
2. *Carex aquatilis*	20%	Yes	OBL
3. *Cornus canadensis*	15%	No	FACU
4. *Coptis aspleniifolia*	15%	No	FAC
5. *Heracleum maximum*	5%	No	FACU
6. *Sanguisorba canadensis*	5%	No	FACW
7. *Symphyotrichum subspicatum*	5%	No	FAC
8. *Podagrostis aequivalvis*	3%	No	OBL
9. *Equisetum arvense*	2%	No	FAC
10. *Comarum palustre*	1%	No	OBL
Total Cover:	96%		
50% of total cover:	48%	20% of total cover:	19%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	4%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	52	x 1 =	52
FACW species	5	x 2 =	10
FAC species	57	x 3 =	171
FACU species	62	x 4 =	248
UPL species	0	x 5 =	0
Column Totals:	176 (A)		481 (B)

Prevalence Index = B/A = 2.73

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P2**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes X	No ___	Depth (inches):	8	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches):	Surface	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Hoonah Angoon Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P3**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.477043 Long: -134.553700 Datum: NAD 1983

Soil Map Unit Name: NWI classification:

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes	No	X
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium alaskaense*	35%	Yes	FAC
2. *Menziesia ferruginea*	35%	Yes	FACU
3. *Vaccinium parvifolium*	5%	No	FACU
4.			
5.			
6.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus canadensis*	10%	Yes	FACU
2. *Rubus pedatus*	3%	Yes	FAC
3. *Streptopus amplexifolius*	3%	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	16%		
50% of total cover:	8%	20% of total cover:	3%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	84%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	53	x 3 =	159
FACU species	53	x 4 =	212
UPL species	0	x 5 =	0
Column Totals:	106 (A)		371 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P3**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14		100					organics	
14-15	2.5Y 3/1	100					muck	
15-17	2.5Y 4/1	100					si	
17-18	2.5Y 3/1	100					muck	
18-24	7.5YR 4/6	100					l	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Non-hydric spodosol

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>24	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches):	>24	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Hoonah Angoon Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P4**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): Convex Slope (%): <3

Subregion: Southeast Alaska Lat: Long: Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes X	No	
Hydric Soil Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Wetland Hydrology Present?	Yes	No X	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%
Sapling/Shrub Stratum			
1. *Oplopanax horridus*	25%	Yes	FACU
2. *Vaccinium alaskaense*	15%	Yes	FAC
3. *Menziesia ferruginea*	5%	No	FACU
4. *Rubus spectabilis*	5%	No	FACU
5. *Rubus parviflorus*	5%	No	FACU
6.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%
Herb Stratum			
1. *Athyrium cyclosorum*	40%	Yes	FAC
2. *Gymnocarpium dryopteris*	5%	No	FACU
3. *Streptopus amplexifolius*	5%	No	FACU
4. *Prenanthes alata*	5%	No	NOL
5. *Cornus canadensis*	3%	No	FACU
6. *Coptis aspleniifolia*	1%	No	FAC
7.			
8.			
9.			
10.			
Total Cover:	59%		
50% of total cover:	30%	20% of total cover:	12%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	42%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	71	x 3 =	213
FACU species	53	x 4 =	212
UPL species	5	x 5 =	25
Column Totals:	129 (A)		450 (B)

Prevalence Index = B/A = 3.49

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P4**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-26	7.5YR 3/4	100					organics	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: bedrock

Depth (inches): 26

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Poorly decomposed organics (folist).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes ___	No X	Depth (inches):	>26
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches):	>26

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw
Slightly moist at 26 inches, but no saturation or water table.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Hoonah Angoon Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P5**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.476522 Long: -134.554067 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2. *Picea sitchensis*	5%	Yes	FACU
3.			
4.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Sapling/Shrub Stratum			
1. *Malus fusca*	20%	Yes	FACU
2. *Menziesia ferruginea*	10%	Yes	FACU
3. *Oplopanax horridus*	5%	No	FACU
4. *Viburnum edule*	2%	No	FACU
5.			
6.			
Total Cover:	37%		
50% of total cover:	19%	20% of total cover:	7%

Herb Stratum			
1. *Athyrium cyclosorum*	20%	Yes	FAC
2. *Lysichiton americanus*	20%	Yes	OBL
3. *Cornus canadensis*	5%	No	FACU
4. *Rubus pedatus*	5%	No	FAC
5. *Coptis aspleniifolia*	5%	No	FAC
6. *Tiarella trifoliata*	3%	No	FAC
7. *Streptopus amplexifolius*	2%	No	FACU
8. *Galium triflorum*	1%	No	FAC
9.			
10.			
Total Cover:	61%		
50% of total cover:	31%	20% of total cover:	12%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	39%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	49	x 3 =	147
FACU species	49	x 4 =	196
UPL species	0	x 5 =	0
Column Totals:	118 (A)		363 (B)

Prevalence Index = B/A = 3.08

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

Menziesia ferruginea and other shrub species appear to be growing on slightly elevated hummocks. Direct hydrology observed during the dry season.

SOIL

Sampling Point: **P5**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

No bedrock.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes X	No ___	Depth (inches):	7	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches):	Surface	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P6**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.478430 Long: -134.556114 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	35%	Yes	FAC
2.			
3.			
4.			
Total Cover:	35%		
50% of total cover:	18%	20% of total cover:	7%
Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	25%	Yes	FAC
2. *Menziesia ferruginea*	25%	Yes	FACU
3. *Oplopanax horridus*	20%	Yes	FACU
4. *Rubus spectabilis*	10%	No	FACU
5.			
6.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%
Herb Stratum			
1. *Maianthemum dilatatum*	20%	Yes	FAC
2. *Gymnocarpium dryopteris*	10%	Yes	FACU
3. *Cornus canadensis*	10%	Yes	FACU
4. *Rubus pedatus*	5%	No	FAC
5. *Tiarella trifoliata*	5%	No	FAC
6. *Equisetum fluviatile*	5%	No	OBL
7.			
8.			
9.			
10.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	45%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	170 (A)		575 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

Menziesia ferruginea and other shrub species appear to be growing on slightly elevated hummocks. Direct hydrology observed during the dry season.

SOIL

Sampling Point: **P6**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 15	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access 12 Borough/City: Hoonah Angoon Sampling Date: 8/19/2013

Applicant/Owner: ADOT&PF Sampling Point: **P7**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): Convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.478497 Long: -134.555820 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	35%	Yes	FAC
2. *Picea sitchensis*	5%	No	FACU
3.			
4.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	35%	Yes	FAC
2. *Oplopanax horridus*	15%	Yes	FACU
3. *Rubus spectabilis*	5%	No	FACU
4.			
5.			
6.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Herb Stratum			
1. *Coptis aspleniifolia*	15%	Yes	FAC
2. *Rubus pedatus*	15%	Yes	FAC
3. *Cornus canadensis*	15%	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	45%		
50% of total cover:	23%	20% of total cover:	9%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 55%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	140 (A)		460 (B)

Prevalence Index = B/A = 3.29

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P7**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-27+	7.5YR 3/4	100					organics	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

Poorly decomposed throughout. Folist.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>27	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches):	>27	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Dry throughout.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P8**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): Convex Slope (%): 15-20

Subregion: Southeast Alaska Lat: 57.475742 Long: -134.550786 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	55%	Yes	FAC
2.			
3.			
4.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Sapling/Shrub Stratum			
1. *Vaccinium parvifolium*	30%	Yes	FACU
2. *Menziesia ferruginea*	25%	Yes	FACU
3. *Vaccinium alaskaense*	25%	Yes	FAC
4.			
5.			
6.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Herb Stratum			
1. *Cornus canadensis*	10%	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	15%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	75%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	145 (A)		500 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P8**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/1	100					organics	
20-25	7.5YR 3/4	100					organics-wood	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >25	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches): >25	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Dry throughout

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P9**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.475716 Long: -134.551213 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	20%	Yes	FAC
2. *Picea sitchensis*	5%	Yes	FACU
3.			
4.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium ovalifolium*	25%	Yes	FAC
2. *Vaccinium alaskaense*	25%	Yes	FAC
3. *Menziesia ferruginea*	20%	Yes	FACU
4. *Vaccinium parvifolium*	15%	No	FACU
5.			
6.			
Total Cover:	85%		
50% of total cover:	43%	20% of total cover:	17%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	20%	Yes	OBL
2. *Streptopus amplexifolius*	8%	Yes	FACU
3. *Cornus canadensis*	5%	No	FACU
4. *Rubus pedatus*	5%	No	FAC
5. *Athyrium cyclosorum*	5%	No	FAC
6. *Equisetum fluviatile*	3%	No	OBL
7.			
8.			
9.			
10.			
Total Cover:	46%		
50% of total cover:	23%	20% of total cover:	9%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	9%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	45%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	23	x 1 =	23
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	53	x 4 =	212
UPL species	0	x 5 =	0
Column Totals:	156 (A)		475 (B)

Prevalence Index = B/A = 3.04

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P9**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 10	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P10**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Old stream terrace

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.474742 Long: -134.550029 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	65%	Yes	FAC
2.			
3.			
4.			
Total Cover:	65%		
50% of total cover:	33%	20% of total cover:	13%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	35%	Yes	FACU
2. *Vaccinium ovalifolium*	20%	Yes	FAC
3. *Rubus spectabilis*	10%	No	FACU
4. *Vaccinium parvifolium*	10%	No	FACU
5. *Oplopanax horridus*	5%	No	FACU
6.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Herb Stratum			
1. *Lysichiton americanus*	10%	Yes	OBL
2. *Athyrium cyclosorum*	10%	Yes	FAC
3. *Cornus canadensis*	5%	No	FACU
4. *Coptis aspleniifolia*	3%	No	FAC
5. *Streptopus amplexifolius*	3%	No	FACU
6. *Gymnocarpium dryopteris*	3%	No	FACU
7. *Tiarella trifoliata*	2%	No	FAC
8. *Rubus pedatus*	2%	No	FAC
9.			
10.			
Total Cover:	38%		
50% of total cover:	19%	20% of total cover:	8%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	62%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	102	x 3 =	306
FACU species	71	x 4 =	284
UPL species	0	x 5 =	0
Column Totals:	183 (A)		600 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P10**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 2/1	100					muck	
14-18	10YR 3/2	100					co sa	cobbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- X Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 18

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Shovel refusal at 18" bgs (bedrock or old stream bed?).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 12	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P11**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Depression

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.473058 Long: -134.551087 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	50%	Yes	FAC
2.			
3.			
4.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%

Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	60%	Yes	FAC
2. *Menziesia ferruginea*	5%	No	FACU
3.			
4.			
5.			
6.			
Total Cover:	65%		
50% of total cover:	33%	20% of total cover:	13%

Herb Stratum			
1. *Cornus canadensis*	5%	Yes	FACU
2. *Neottia cordata*	1%	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	6%		
50% of total cover:	3%	20% of total cover:	1%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	94%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	110	x 3 =	330
FACU species	11	x 4 =	44
UPL species	0	x 5 =	0
Column Totals:	121 (A)		374 (B)

Prevalence Index = B/A = 3.09

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P11**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 2.5/2	100					peat	
20-22+	10G 3/1	100					sacl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Slight sulfur odor

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 21	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P12**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.472506 Long: -134.548761 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	20%	Yes	FAC
2.			
3.			
4.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	35%	Yes	FAC
2. *Picea sitchensis*	35%	Yes	FACU
3. *Vaccinium ovalifolium*	10%	No	FAC
4. *Oplopanax horridus*	5%	No	FACU
5. *Menziesia ferruginea*	5%	No	FACU
6.			
Total Cover:	90%		
50% of total cover:	45%	20% of total cover:	18%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Athyrium cyclosorum*	30%	Yes	FAC
2. *Lysichiton americanus*	30%	Yes	OBL
3. *Tiarella trifoliata*	3%	No	FAC
4. *Gymnocarpium dryopteris*	2%	No	FACU
5. *Coptis aspleniifolia*	2%	No	FAC
6. *Streptopus amplexifolius*	1%	No	FACU
7.			
8.			
9.			
10.			
Total Cover:	68%		
50% of total cover:	34%	20% of total cover:	14%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 32%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	48	x 4 =	192
UPL species	0	x 5 =	0
Column Totals:	178 (A)		522 (B)

Prevalence Index = B/A = 2.93

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P12**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24+	10YR 2/1	100					peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	X	No	Depth (inches):	2
Water Table Present?	Yes	X	No	Depth (inches):	Surface
Saturation Present? (includes capillary fringe	Yes	X	No	Depth (inches):	Surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P13**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Slightly convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.473314 Long: -134.548071 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium alaskaense*	35%	Yes	FAC
2. *Rubus spectabilis*	15%	Yes	FACU
3. *Menziesia ferruginea*	15%	Yes	FACU
4. *Oplopanax horridus*	15%	Yes	FACU
5.			
6.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus canadensis*	5%	Yes	FACU
2. *Rubus pedatus*	3%	Yes	FAC
3. *Streptopus amplexifolius*	2%	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	90%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 38% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	53	x 3 =	159
FACU species	52	x 4 =	208
UPL species	0	x 5 =	0
Column Totals:	105 (A)		367 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

Shrubs appear to be growing on slightly elevated hummocks. Direct hydrology observed during dry season.

SOIL

Sampling Point: **P13**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	100					mucky peat	
24-26	10YR 3/3						cosa	cobbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

Shovel refusal at 26" bgs due to parent material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 24	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P14**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Slightly convex Slope (%): 3-5

Subregion: Southeast Alaska Lat: 57.472568 Long: -134.546962 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	65%	Yes	FAC
2.			
3.			
4.			
Total Cover:	65%		
50% of total cover:	33%	20% of total cover:	13%

Sapling/Shrub Stratum			
1. *Oplopanax horridus*	25%	Yes	FACU
2. *Vaccinium alaskaense*	25%	Yes	FAC
3. *Menziesia ferruginea*	25%	Yes	FACU
4. *Rubus spectabilis*	5%	No	FACU
5.			
6.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Herb Stratum			
1. *Lysichiton americanus*	10%	Yes	OBL
2. *Athyrium cyclosorum*	10%	Yes	FAC
3. *Coptis aspleniifolia*	10%	Yes	FAC
4. *Cornus canadensis*	10%	Yes	FACU
5. *Streptopus amplexifolius*	5%	No	FACU
6. *Rubus pedatus*	5%	No	FAC
7. *Tiarella trifoliata*	1%	No	FAC
8.			
9.			
10.			
Total Cover:	51%		
50% of total cover:	26%	20% of total cover:	10%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 49%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 63% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	116	x 3 =	348
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	196 (A)		638 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P14**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 14	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P15**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.472384 Long: -134.544529 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	10%	Yes	FAC
2.			
3.			
4.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%

Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	50%	Yes	FAC
2. *Tsuga heterophylla*	5%	No	FAC
3. *Menziesia ferruginea*	5%	No	FACU
4. *Vaccinium parvifolium*	5%	No	FACU
5. *Vaccinium vitis-idaea*	3%	No	FAC
6.			
Total Cover:	68%		
50% of total cover:	34%	20% of total cover:	14%

Herb Stratum			
1. *Cornus canadensis*	10%	Yes	FACU
2. *Rubus pedatus*	5%	Yes	FAC
3. *Orthilia secunda*	1%	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	16%		
50% of total cover:	8%	20% of total cover:	3%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	84%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	73	x 3 =	219
FACU species	21	x 4 =	84
UPL species	0	x 5 =	0
Column Totals:	94 (A)		303 (B)

Prevalence Index = B/A = 3.22

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P15**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 2/1	100					mucky peat	
15-17	10YR 4/2	100					grsicl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- X Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 17

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 15	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P16**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): Convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.471658 Long: -134.543350 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	80%	Yes	FAC
2.			
3.			
4.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Vaccinium parvifolium*	10%	Yes	FACU
3. *Vaccinium ovalifolium*	5%	No	FAC
4. *Tsuga heterophylla*	2%	No	FAC
5.			
6.			
Total Cover:	37%		
50% of total cover:	19%	20% of total cover:	7%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Clintonia uniflora*	20%	Yes	NOL
2. *Cornus canadensis*	20%	Yes	FACU
3. *Rubus pedatus*	10%	No	FAC
4. *Maianthemum dilatatum*	5%	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	40%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	5%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	102	x 3 =	306
FACU species	50	x 4 =	200
UPL species	20	x 5 =	100
Column Totals:	172 (A)		606 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P16**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/4	100					organics	
12-18	10YR 2/1	100					muck	
18-30	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Folist soil - no water table.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>30	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches):	>30	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P17**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillside

Local relief (concave, convex, none): Slightly convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.463827 Long: -134.529413 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks: NOT IN STUDY AREA

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	85%	Yes	FAC
2.			
3.			
4.			
Total Cover:	85%		
50% of total cover:	43%	20% of total cover:	17%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	5%	Yes	FACU
2. *Vaccinium ovalifolium*	5%	Yes	FAC
3.			
4.			
5.			
6.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%

Herb Stratum			
1. *Cornus canadensis*	2%	Yes	FACU
2. *Streptopus amplexifolius*	1%	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	3%		
50% of total cover:	2%	20% of total cover:	1%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	97%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	8	x 4 =	32
UPL species	0	x 5 =	0
Column Totals:	98 (A)		302 (B)

Prevalence Index = B/A = 3.08

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P17**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 3/4	100					organics	
12-13	10YR 4/1	100					scl	gravels

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 13

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>12	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches):	>12	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Slightly moist throughout.

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12A with Access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/20/2013

Applicant/Owner: ADOT&PF Sampling Point: **P18**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion: Southeast Alaska Lat: 57.464302 Long: -134.529371 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks: NOT IN STUDY AREA

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium ovalifolium*	35%	Yes	FAC
2. *Menziesia ferruginea*	10%	Yes	FACU
3. *Vaccinium parvifolium*	5%	No	FACU
4. *Picea sitchensis*	1%	No	FACU
5.			
6.			
Total Cover:	51%		
50% of total cover:	26%	20% of total cover:	10%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus canadensis*	5%	Yes	FACU
2. *Rubus pedatus*	5%	Yes	FAC
3. *Maianthemum dilatatum*	2%	No	FAC
4. *Neottia cordata*	1%	No	FACU
5. *Veratrum viride*	1%	No	FAC
6.			
7.			
8.			
9.			
10.			
Total Cover:	14%		
50% of total cover:	7%	20% of total cover:	3%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	86%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	58	x 3 =	174
FACU species	22	x 4 =	88
UPL species	0	x 5 =	0
Column Totals:	80 (A)		262 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P18**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 3/4	100					organics	
10-27	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 27

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 26	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): 13	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P19**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 5

Subregion: Southeast Alaska Lat: 57.468198 Long: -134.540279 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	50%	Yes	FAC
2. *Picea sitchensis*	20%	Yes	FACU
3.			
4.			
Total Cover:	70%		
50% of total cover:	35%	20% of total cover:	14%

Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	35%	Yes	FAC
2. *Vaccinium parvifolium*	25%	Yes	FACU
3. *Menziesia ferruginea*	15%	Yes	FACU
4. *Tsuga heterophylla*	2%	No	FAC
5.			
6.			
Total Cover:	77%		
50% of total cover:	39%	20% of total cover:	15%

Herb Stratum			
1. *Cornus canadensis*	15%	Yes	FACU
2. *Coptis aspleniifolia*	5%	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 5%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes 75%
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	92	x 3 =	276
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	167 (A)		576 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P19**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	7.5YR 3/4	100					organics	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 13

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >13	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches): >13	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P20**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Slightly convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.467970 Long: -134.540999 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	45%	Yes	FAC
2. *Picea sitchensis*	20%	Yes	FACU
3.			
4.			
Total Cover:	65%		
50% of total cover:	33%	20% of total cover:	13%

Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	40%	Yes	FAC
2. *Menziesia ferruginea*	10%	No	FACU
3. *Vaccinium parvifolium*	10%	No	FACU
4. *Rubus spectabilis*	2%	No	FACU
5.			
6.			
Total Cover:	62%		
50% of total cover:	31%	20% of total cover:	12%

Herb Stratum			
1. *Cornus canadensis*	10%	Yes	FACU
2. *Rubus pedatus*	5%	Yes	FAC
3. *Neottia cordata*	5%	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 50%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes 30%
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	57	x 4 =	228
UPL species	0	x 5 =	0
Column Totals:	147 (A)		498 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P20**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-21	7.5YR 3/4	100					organics	
21-26	10YR 3/2	100					grsal	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 26

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___	
Water Table Present?	Yes ___	No X	Depth (inches): >26	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches): >26	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Mineral soils moist at bedrock. Organic layer poorly decomposed and dry.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P21**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.467892 Long: -134.541245 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	60%	Yes	FAC
2. *Picea sitchensis*	15%	Yes	FACU
3.			
4.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium ovalifolium*	25%	Yes	FAC
2. *Menziesia ferruginea*	20%	Yes	FACU
3. *Oplopanax horridus*	20%	Yes	FACU
4. *Rubus spectabilis*	10%	No	FACU
5.			
6.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Coptis aspleniifolia*	5%	Yes	FAC
2. *Gymnocarpium dryopteris*	5%	Yes	FACU
3. *Maianthemum dilatatum*	5%	Yes	FAC
4. *Rubus pedatus*	3%	No	FAC
5. *Cornus canadensis*	3%	No	FACU
6. *Athyrium cyclosorum*	3%	No	FAC
7. *Tiarella trifoliata*	2%	No	FAC
8. *Streptopus amplexifolius*	2%	No	FACU
9.			
10.			
Total Cover:	28%		
50% of total cover:	14%	20% of total cover:	6%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	72%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	103	x 3 =	309
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	178 (A)		609 (B)

Prevalence Index = B/A = 3.42

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

Shrubs appear to be growing on slightly elevated hummock. Direct hydrology observed during the dry season.

SOIL

Sampling Point: **P21**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR 3/4	100					organics	
8-20	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 20

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 18
Saturation Present? (includes capillary fringe	Yes	X	No		Depth (inches): 8

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P22**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.467710 Long: -134.542424 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	5%	Yes	FAC
2.			
3.			
4.			
Total Cover:	5%		
50% of total cover:	3%	20% of total cover:	1%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus fusca*	30%	Yes	FACU
2. *Alnus viridis*	20%	Yes	FAC
3. *Rubus spectabilis*	5%	No	FACU
4. *Oplopanax horridus*	2%	No	FACU
5.			
6.			
Total Cover:	57%		
50% of total cover:	29%	20% of total cover:	11%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	65%	Yes	OBL
2. *Athyrium cyclosorum*	15%	No	FAC
3. *Coptis aspleniifolia*	2%	No	FAC
4. *Gymnocarpium dryopteris*	2%	No	FACU
5. *Rubus pedatus*	2%	No	FAC
6. *Maianthemum dilatatum*	2%	No	FAC
7. *Streptopus amplexifolius*	2%	No	FACU
8. *Tiarella trifoliata*	1%	No	FAC
9.			
10.			
Total Cover:	91%		
50% of total cover:	46%	20% of total cover:	18%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	0	x 2 =	0
FAC species	47	x 3 =	141
FACU species	41	x 4 =	164
UPL species	0	x 5 =	0
Column Totals:	153 (A)		370 (B)

Prevalence Index = B/A = 2.42

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P22**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 5	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Scattered 1/4-inch deep ponding in adjacent depression near plot.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P23**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.467622 Long: -134.543682 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?**	**Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____		
Wetland Hydrology Present?	Yes **X**	No ____		

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	35%	Yes	FACU
2. *Tsuga heterophylla*	20%	Yes	FAC
3.			
4.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Menziesia ferruginea*	15%	Yes	FACU
3. *Vaccinium alaskaense*	15%	Yes	FAC
4. *Tsuga heterophylla*	5%	No	FAC
5.			
6.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Athyrium cyclosorum*	15%	Yes	FAC
2. *Lysichiton americanus*	10%	Yes	OBL
3. *Maianthemum dilatatum*	5%	No	FAC
4. *Gymnocarpium dryopteris*	3%	No	FACU
5. *Tiarella trifoliata*	2%	No	FAC
6. *Rubus pedatus*	2%	No	FAC
7.			
8.			
9.			
10.			
Total Cover:	37%		
50% of total cover:	19%	20% of total cover:	7%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	63%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	64	x 3 =	192
FACU species	73	x 4 =	292
UPL species	0	x 5 =	0
Column Totals:	147 (A)		494 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P23**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					muck	
16-19	10YR 3/2	60					cosa	
	mixed sand	40						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 19

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 12	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P24**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.466069 Long: -134.540629 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus viridis*	20%	Yes	FAC
2. *Menziesia ferruginea*	15%	Yes	FACU
3. *Rubus spectabilis*	15%	Yes	FACU
4. *Vaccinium ovalifolium*	15%	Yes	FAC
5. *Oplopanax horridus*	10%	No	FACU
6. *Tsuga heterophylla*	5%	No	FAC
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Athyrium cyclosorum*	15%	Yes	FAC
2. *Veratrum viride*	5%	Yes	FAC
3. *Lysichiton americanus*	5%	Yes	OBL
4. *Streptopus amplexifolius*	5%	Yes	FACU
5. *Maianthemum dilatatum*	5%	Yes	FAC
6. *Cornus canadensis*	3%	No	FACU
7. *Coptis aspleniifolia*	3%	No	FAC
8. *Rubus pedatus*	1%	No	FAC
9.			
10.			
Total Cover:	42%		
50% of total cover:	21%	20% of total cover:	8%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	58%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 70% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	84	x 3 =	252
FACU species	48	x 4 =	192
UPL species	0	x 5 =	0
Column Totals:	137 (A)		449 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Also 5% *Picea sitchensis* in shrub layer.

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P24**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 3/4	100					organics /duff	
5-20	10YR 2/1	100					muck	
20-34	10YR 4/1	100					sacl	small cobbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 34

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 16
Saturation Present? (includes capillary fringe	Yes	X	No		Depth (inches): Surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P25**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Concave Slope (%): 5

Subregion: Southeast Alaska Lat: 57.466171 Long: -134.538708 Datum: NAD 1983

Soil Map Unit Name: _____ NWI classification: PFO

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No _____	**Is the Sampled Area within a Wetland?** **Yes X** **No** _____
Hydric Soil Present?	Yes **X**	No _____	
Wetland Hydrology Present?	Yes **X**	No _____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	20%	Yes	FAC
2. *Picea sitchensis*	20%	Yes	FACU
3.			
4.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium alaskaense*	25%	Yes	FAC
2. *Menziesia ferruginea*	25%	Yes	FACU
3. *Oplopanax horridus*	10%	No	FACU
4. *Tsuga heterophylla*	5%	No	FAC
5. *Rubus spectabilis*	5%	No	FACU
6.			
Total Cover:	70%		
50% of total cover:	35%	20% of total cover:	14%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	20%	Yes	OBL
2. *Athyrium cyclosorum*	10%	Yes	FAC
3. *Coptis aspleniifolia*	5%	No	FAC
4. *Tiarella trifoliata*	5%	No	FAC
5. *Maianthemum dilatatum*	2%	No	FAC
6. *Streptopus amplexifolius*	2%	No	FACU
7. *Luzula multiflora*	1%	No	FACU
8.			
9.			
10.			
Total Cover:	45%		
50% of total cover:	23%	20% of total cover:	9%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	55%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	72	x 3 =	216
FACU species	63	x 4 =	252
UPL species	0	x 5 =	0
Column Totals:	155 (A)		488 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

_____ Prevalence Index is≤3.0[1]

_____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** _____

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P25**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 11	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P26**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 15

Subregion: Southeast Alaska Lat: 57.467780 Long: -134.540069 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	45%	Yes	FAC
2. *Picea sitchensis*	30%	Yes	FACU
3.			
4.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Menziesia ferruginea*	10%	Yes	FACU
2. *Vaccinium ovalifolium*	10%	Yes	FAC
3. *Oplopanax horridus*	5%	Yes	FACU
4.			
5.			
6.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rubus pedatus*	2%	Yes	FAC
2. *Cornus canadensis*	2%	Yes	FACU
3. *Streptopus amplexifolius*	1%	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	5%		
50% of total cover:	3%	20% of total cover:	1%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 95%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 38% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	57	x 3 =	171
FACU species	48	x 4 =	192
UPL species	0	x 5 =	0
Column Totals:	105 (A)		363 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P26**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/4	100					organic	
18-20	10YR 3/3	100					scl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 20

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>20	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches):	>20	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P27**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillside bench

Local relief (concave, convex, none): Concave Slope (%): 5-10

Subregion: Southeast Alaska Lat: Long: Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	20%	Yes	FAC
2. *Picea sitchensis*	5%	Yes	FACU
3.			
4.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%

Sapling/Shrub Stratum			
1. *Rubus spectabilis*	20%	Yes	FACU
2. *Alnus viridis*	20%	Yes	FAC
3. *Vaccinium ovalifolium*	10%	Yes	FAC
4.			
5.			
6.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%

Herb Stratum			
1. *Athyrium cyclosorum*	15%	Yes	FAC
2. *Lysichiton americanus*	5%	Yes	OBL
3. *Cornus canadensis*	2%	No	FACU
4. *Maianthemum dilatatum*	2%	No	FAC
5. *Rubus pedatus*	1%	No	FAC
6.			
7.			
8.			
9.			
10.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	75%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	68	x 3 =	204
FACU species	27	x 4 =	108
UPL species	0	x 5 =	0
Column Totals:	100 (A)		317 (B)

Prevalence Index = B/A = 3.17

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P27**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-25+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 13	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P28**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Concave Slope (%): 15-20

Subregion: Southeast Alaska Lat: 57.469463 Long: -134.542699 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	50%	Yes	FACU
2. *Tsuga heterophylla*	20%	Yes	FAC
3.			
4.			
Total Cover:	70%		
50% of total cover:	35%	20% of total cover:	14%

Sapling/Shrub Stratum			
1. *Oplopanax horridus*	40%	Yes	FACU
2. *Vaccinium ovalifolium*	10%	No	FAC
3. *Menziesia ferruginea*	5%	No	FACU
4. *Tsuga heterophylla*	5%	No	FAC
5.			
6.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Herb Stratum			
1. *Athyrium cyclosorum*	15%	Yes	FAC
2. *Lysichiton americanus*	10%	Yes	OBL
3. *Rubus pedatus*	5%	No	FAC
4. *Tiarella trifoliata*	3%	No	FAC
5. *Gymnocarpium dryopteris*	3%	No	FACU
6. *Streptopus amplexifolius*	2%	No	FACU
7. *Maianthemum dilatatum*	2%	No	FAC
8.			
9.			
10.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 60%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	170 (A)		590 (B)

Prevalence Index = B/A = 3.47

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P28**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-29	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 29

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 10	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P29**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 25

Subregion: Southeast Alaska Lat: 57.469410 Long: -134.542421 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	35%	Yes	FAC
2. *Picea sitchensis*	35%	Yes	FACU
3.			
4.			
Total Cover:	70%		
50% of total cover:	35%	20% of total cover:	14%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	25%	Yes	FACU
2. *Vaccinium ovalifolium*	25%	Yes	FAC
3.			
4.			
5.			
6.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%

Herb Stratum			
1. *Cornus canadensis*	5%	Yes	FACU
2. *Rubus pedatus*	5%	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 90%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	130 (A)		455 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P29**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/4	100					organics	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 18

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >18	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches): >18	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P30**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.470831 Long: -134.543127 Datum: NAD 1983

Soil Map Unit Name: NWI classification:

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

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** **Yes X** **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	45%	Yes	FAC
2. *Picea sitchensis*	10%	No	FACU
3.			
4.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Menziesia ferruginea*	25%	Yes	FACU
2. *Vaccinium ovalifolium*	25%	Yes	FAC
3. *Tsuga heterophylla*	5%	No	FAC
4. *Rubus spectabilis*	2%	No	FACU
5.			
6.			
Total Cover:	57%		
50% of total cover:	29%	20% of total cover:	11%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rubus pedatus*	5%	Yes	FAC
2. *Cornus canadensis*	5%	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 90%

% Cover of Wetland Bryophytes (Where applicable) Total Cover of Bryophytes

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	42	x 4 =	168
UPL species	0	x 5 =	0
Column Totals:	122 (A)		408 (B)

Prevalence Index = B/A = 3.34

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P30**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 17

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 8	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): 16	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Organics were very moist throughout. Concave flark depression / bench on hillside.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P31**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion: Southeast Alaska Lat: 57.470956 Long: -134.543097 Datum: NAD 1983

Soil Map Unit Name: NWI classification: Upland

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	40%	Yes	FAC
2. *Picea sitchensis*	10%	Yes	FACU
3.			
4.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Menziesia ferruginea*	20%	Yes	FACU
2. *Vaccinium parvifolium*	15%	Yes	FACU
3. *Vaccinium ovalifolium*	10%	No	FAC
4. *Oplopanax horridus*	10%	No	FACU
5. *Rubus spectabilis*	5%	No	FACU
6.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Clintonia uniflora*	10%	Yes	NOL
2. *Cornus canadensis*	5%	Yes	FACU
3. *Rubus pedatus*	3%	No	FAC
4. *Coptis aspleniifolia*	3%	No	FAC
5. *Neottia cordata*	2%	No	FACU
6. *Streptopus amplexifolius*	2%	No	FACU
7.			
8.			
9.			
10.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 75%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 17% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	56	x 3 =	168
FACU species	69	x 4 =	276
UPL species	10	x 5 =	50
Column Totals:	135 (A)		494 (B)

Prevalence Index = B/A = 3.66

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P31**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	7.5YR 3/4	100					organics	
15-21	10YR 2/1	100					muck	
21-25	10YR 3/2	100					sacl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 25

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >25	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes ___	No X	Depth (inches): >25	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Mineral soils were moist. Organic layer dry.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P32**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): 5

Subregion: Southeast Alaska Lat: 57.471008 Long: -134.543853 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	20%	Yes	FAC
2.			
3.			
4.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Menziesia ferruginea*	15%	Yes	FACU
3. *Malus fusca*	10%	Yes	FACU
4.			
5.			
6.			
Total Cover:	45%		
50% of total cover:	23%	20% of total cover:	9%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Athyrium cyclosorum*	20%	Yes	FAC
2. *Lysichiton americanus*	15%	Yes	OBL
3. *Coptis aspleniifolia*	5%	No	FAC
4. *Rubus pedatus*	5%	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	45%		
50% of total cover:	23%	20% of total cover:	9%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 55%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	110 (A)		345 (B)

Prevalence Index = B/A = 3.14

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- X Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

Shrubs appear to be growing on slightly elevated hummock. Direct hydrology observed during dry season.

SOIL

Sampling Point: **P32**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-29+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 29

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 15	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P33**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): 15

Subregion: Southeast Alaska Lat: 57.471008 Long: -134.543853 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	60%	Yes	FAC
2. *Picea sitchensis*	15%	Yes	FACU
3.			
4.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	15%	Yes	FACU
2. *Vaccinium ovalifolium*	15%	Yes	FAC
3. *Oplopanax horridus*	5%	No	FACU
4.			
5.			
6.			
Total Cover:	35%		
50% of total cover:	18%	20% of total cover:	7%

Herb Stratum			
1. *Athyrium cyclosorum*	10%	Yes	FAC
2. *Lysichiton americanus*	10%	Yes	OBL
3. *Rubus pedatus*	3%	No	FAC
4. *Maianthemum dilatatum*	2%	No	FAC
5. *Streptopus amplexifolius*	1%	No	FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	26%		
50% of total cover:	13%	20% of total cover:	5%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	74%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	36	x 4 =	144
UPL species	0	x 5 =	0
Column Totals:	136 (A)		424 (B)

Prevalence Index = B/A = 3.12

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P33**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-23+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 13	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Mineral soils were moist. Organic layer dry.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/21/2013

Applicant/Owner: ADOT&PF Sampling Point: **P34**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope bench

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.471392 Long: -134.543547 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	50%	Yes	FAC
2. *Picea sitchensis*	25%	Yes	FACU
3.			
4.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Sapling/Shrub Stratum			
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Vaccinium ovalifolium*	5%	Yes	FAC
3.			
4.			
5.			
6.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%

Herb Stratum			
1. *Athyrium cyclosorum*	15%	Yes	FAC
2. *Tiarella trifoliata*	5%	No	FAC
3. *Maianthemum dilatatum*	5%	No	FAC
4. *Streptopus amplexifolius*	2%	No	FACU
5. *Gymnocarpium dryopteris*	2%	No	FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	29%		
50% of total cover:	15%	20% of total cover:	6%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 71%

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	49	x 4 =	196
UPL species	0	x 5 =	0
Column Totals:	129 (A)		436 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

____ Prevalence Index is≤3.0[1]

____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P34**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-22	10YR 2/1	100					muck	
22-27	10YR 3/3	100					sal	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 27

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 20	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe	Yes X	No ___	Depth (inches): 13	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P35**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.476416 Long: -134.554927 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	15%	Yes	FAC
2.			
3.			
4.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus fusca*	15%	Yes	FACU
2. *Menziesia ferruginea*	5%	No	FACU
3. *Tsuga heterophylla*	5%	No	FAC
4. *Rubus parviflorus*	5%	No	FACU
5. *Oplopanax horridus*	3%	No	FACU
6.			
Total Cover:	33%		
50% of total cover:	17%	20% of total cover:	7%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Athyrium cyclosorum*	55%	Yes	FAC
2. *Lysichiton americanus*	20%	Yes	OBL
3. *Tiarella trifoliata*	3%	No	FAC
4. *Streptopus amplexifolius*	2%	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	20%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	78	x 3 =	234
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	128 (A)		374 (B)

Prevalence Index = B/A = 2.92

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P35**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-29	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 10	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 3	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P36**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 5

Subregion: Southeast Alaska Lat: 57.476313 Long: -134.555260 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	50%	Yes	FAC
2. *Picea sitchensis*	25%	Yes	FACU
3.			
4.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Menziesia ferruginea*	10%	Yes	FACU
2. *Vaccinium parvifolium*	10%	Yes	FACU
3. *Vaccinium ovalifolium*	5%	Yes	FAC
4.			
5.			
6.			
Total Cover:	25%		
50% of total cover:	13%	20% of total cover:	5%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus canadensis*	5%	Yes	FACU
2. *Neottia cordata*	5%	Yes	FACU
3. *Maianthemum dilatatum*	1%	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	11%		
50% of total cover:	6%	20% of total cover:	2%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 89%

% Cover of Wetland Bryophytes ____ (Where applicable) Total Cover of Bryophytes ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 29% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	56	x 3 =	168
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	111 (A)		388 (B)

Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P36**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	7.5YR 3/4	100					organics	
20-30+	10YR 2/1						muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Soils were dry- no water table.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>30	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>30	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P37**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 10

Subregion: Southeast Alaska Lat: 57.474302 Long: -134.552812 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	65%	Yes	FAC
2. *Picea sitchensis*	15%	No	FACU
3.			
4.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	10%	Yes	FACU
2. *Vaccinium ovalifolium*	5%	Yes	FAC
3.			
4.			
5.			
6.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Herb Stratum			
1. *Moneses uniflora*	3%	Yes	FACU
2. *Cornus canadensis*	2%	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	5%		
50% of total cover:	3%	20% of total cover:	1%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	5%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	90%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	100 (A)		330 (B)

Prevalence Index = B/A = 3.30

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P37**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 3/4	100					organics	
10-11	10YR 5/2						si	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Dense silt

Depth (inches): 11

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >11	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >11	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P38**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 5

Subregion: Southeast Alaska Lat: 57.474672 Long: -134.550964 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	65%	Yes	FAC
2. *Picea sitchensis*	15%	No	FACU
3.			
4.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	25%	Yes	FACU
2. *Vaccinium ovalifolium*	20%	Yes	FAC
3. *Vaccinium alaskaense*	10%	No	FAC
4.			
5.			
6.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Herb Stratum			
1. *Cornus canadensis*	3%	Yes	FACU
2. *Neottia cordata*	2%	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	5%		
50% of total cover:	3%	20% of total cover:	1%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	95%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	140 (A)		465 (B)

Prevalence Index = B/A = 3.32

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P38**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-24	7.5YR 3/4	100					organics	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 24

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Organic soils were dry and poorly decomposed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>24	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>24	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P39**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toe slope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.474595 Long: -134.550763 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	40%	Yes	FAC
2.			
3.			
4.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium ovalifolium*	25%	Yes	FAC
2. *Menziesia ferruginea*	25%	Yes	FACU
3.			
4.			
5.			
6.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	30%	Yes	OBL
2. *Cornus canadensis*	5%	No	FACU
3. *Rubus pedatus*	5%	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	60%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	130 (A)		360 (B)

Prevalence Index = B/A = 2.77

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P39**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100					muck	
16-18	10YR 3/2						sal	cobbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks

Restrictive Layer (if present):
Type: Bedrock
Depth (inches): 18

Hydric Soil Present? Yes X No ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes X	No ___	Depth (inches):	10	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	Surface	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P40**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Terrace

Local relief (concave, convex, none): Concave Slope (%): _____

Subregion: Southeast Alaska Lat: 57.475941 Long: -134.547345 Datum: NAD 1983

Soil Map Unit Name: _____ NWI classification: PEM

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No _____	**Is the Sampled Area within a Wetland?** **Yes X** **No** _____
Hydric Soil Present?	Yes **X**	No _____	
Wetland Hydrology Present?	Yes **X**	No _____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus contorta*	10%	Yes	FAC
2.			
3.			
4.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%
Sapling/Shrub Stratum			
1. *Malus fusca*	3%	Yes	FACU
2. *Menziesia ferruginea*	3%	Yes	FACU
3.			
4.			
5.			
6.			
Total Cover:	6%		
50% of total cover:	3%	20% of total cover:	1%
Herb Stratum			
1. *Trichophorum caespitosum*	40%	Yes	OBL
2. *Carex flava*	35%	Yes	OBL
3. *Menyanthes trifoliata*	5%	No	OBL
4. *Eriophorum angustifolium*	5%	No	OBL
5. *Triantha glutinosa*	5%	No	FACW
6. *Equisetum fluviatile*	5%	No	OBL
7. *Carex livida*	3%	No	OBL
8. *Vaccinium vitis-idaea*	2%	No	FAC
9. *Coptis trifolia*	1%	No	FAC
10.			
Total Cover:	101%		
50% of total cover:	51%	20% of total cover:	20%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	93	x 1 =	93
FACW species	5	x 2 =	10
FAC species	13	x 3 =	39
FACU species	6	x 4 =	24
UPL species	0	x 5 =	0
Column Totals:	117 (A)		166 (B)

Prevalence Index = B/A = 1.42

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

_____ Prevalence Index is ≤3.0[1]

_____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** _____

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P40**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-34+		100					peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): Surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 8/22/2013

Applicant/Owner: ADOT&PF Sampling Point: **P41**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 20

Subregion: Southeast Alaska Lat: 57.462603 Long: -134.527551 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks: NOT IN STUDY AREA

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	70%	Yes	FAC
2. *Picea sitchensis*	10%	No	FACU
3.			
4.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	10%	Yes	FACU
2. *Vaccinium ovalifolium*	10%	Yes	FAC
3.			
4.			
5.			
6.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Herb Stratum			
1. *Cornus canadensis*	3%	Yes	FACU
2. *Clintonia uniflora*	2%	Yes	NOL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	5%		
50% of total cover:	3%	20% of total cover:	1%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	95%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	23	x 4 =	92
UPL species	2	x 5 =	10
Column Totals:	105 (A)		342 (B)

Prevalence Index = B/A = 3.26

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P41**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/4	100					organics	
16-18	10YR 4/1	100					grsal	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 18

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >18	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >18	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 9/14/2013

Applicant/Owner: ADOT&PF Sampling Point: **P42**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Depression between hummock

Local relief (concave, convex, none): Slightly convex Slope (%): 3

Subregion: Southeast Alaska Lat: 57.474153 Long: -134.549251 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	55%	Yes	FAC
2. *Picea sitchensis*	10%	No	FACU
3.			
4.			
Total Cover:	65%		
50% of total cover:	33%	20% of total cover:	13%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	20%	Yes	FACU
2. *Vaccinium alaskaense*	15%	Yes	FAC
3.			
4.			
5.			
6.			
Total Cover:	35%		
50% of total cover:	18%	20% of total cover:	7%

Herb Stratum			
1. *Cornus canadensis*	20%	Yes	FACU
2. *Rubus pedatus*	10%	Yes	FAC
3. *Lysichiton americanus*	5%	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	35%		
50% of total cover:	18%	20% of total cover:	7%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	55%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	135 (A)		445 (B)

Prevalence Index = B/A = 3.30

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Menziesia ferruginea growing on slightly elevated hummock.

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P42**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 17

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	X	No	___	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): Surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 9/14/2013

Applicant/Owner: ADOT&PF Sampling Point: **P43**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Slightly convex Slope (%): 3-5

Subregion: Southeast Alaska Lat: 57.475045 Long: -134.553488 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** Yes ____ No **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	40%	Yes	FAC
2. *Picea sitchensis*	10%	Yes	FACU
3.			
4.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium alaskaense*	20%	Yes	FAC
2. *Vaccinium parvifolium*	15%	Yes	FACU
3. *Menziesia ferruginea*	5%	No	FACU
4.			
5.			
6.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus canadensis*	5%	Yes	FACU
2. *Rubus pedatus*	2%	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	7%		
50% of total cover:	4%	20% of total cover:	1%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	93%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	62	x 3 =	186
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	97 (A)		326 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P43**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	7.5YR 3/4	100					organics	
11-14	10YR4/1	100					grsil	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 14

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>14	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>14	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Very moist below 8 inches. Soils were dry above 8 inches.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 9/14/2013

Applicant/Owner: ADOT&PF Sampling Point: **P44**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toeslope

Local relief (concave, convex, none): Concave Slope (%): 3

Subregion: Southeast Alaska Lat: 57.475641 Long: -134.553644 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	35%	Yes	FAC
2. *Picea sitchensis*	5%	No	FACU
3.			
4.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Sapling/Shrub Stratum			
1. *Vaccinium ovalifolium*	35%	Yes	FAC
2. *Menziesia ferruginea*	5%	No	FACU
3.			
4.			
5.			
6.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Herb Stratum			
1. *Rubus pedatus*	15%	Yes	FAC
2. *Cornus canadensis*	2%	No	FACU
3. *Lysichiton americanus*	2%	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	19%		
50% of total cover:	10%	20% of total cover:	4%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	81%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	0	x 2 =	0
FAC species	85	x 3 =	255
FACU species	12	x 4 =	48
UPL species	0	x 5 =	0
Column Totals:	99 (A)		305 (B)

Prevalence Index = B/A = 3.08

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P44**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-19	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 19

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 3	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Approximately 4 inch deep ponding in wetland near plot.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 9/14/2013

Applicant/Owner: ADOT&PF Sampling Point: **P45**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.476781 Long: -134.550592 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus contorta*	10%	Yes	FAC
2. *Tsuga heterophylla*	10%	Yes	FAC
3.			
4.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Malus fusca*	15%	Yes	FACU
2. *Oplopanax horridus*	5%	Yes	FACU
3.			
4.			
5.			
6.			
Total Cover:	20%		
50% of total cover:	10%	20% of total cover:	4%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	15%	Yes	OBL
2. *Athyrium cyclosorum*	15%	Yes	FAC
3. *Carex mertensii*	15%	Yes	FACW
4. *Menyanthes trifoliata*	5%	No	OBL
5. *Carex livida*	5%	No	OBL
6.			
7.			
8.			
9.			
10.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	45%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25
FACW species	15	x 2 =	30
FAC species	35	x 3 =	105
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	95 (A)		240 (B)

Prevalence Index = B/A = 2.53

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P45**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	7.5YR 3/4	100					peat	
17-25+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 5	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Approximately 2 inch deep scattered ponding in wetland near plot.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P46**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope (ridge)

Local relief (concave, convex, none): Convex Slope (%): 5-10

Subregion: Southeast Alaska Lat: 57.468140 Long: -134.544364 Datum: NAD 1983

Soil Map Unit Name: NWI classification: None

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes ____	No **X**	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Hydric Soil Present?	Yes ____	No **X**	
Wetland Hydrology Present?	Yes ____	No **X**	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	45%	Yes	FACU
2. *Tsuga heterophylla*	15%	Yes	FAC
3.			
4.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Vaccinium ovalifolium*	10%	Yes	FAC
3. *Rubus spectabilis*	5%	No	FACU
4. *Menziesia ferruginea*	5%	No	FACU
5.			
6.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Cornus canadensis*	20%	Yes	FACU
2. *Maianthemum dilatatum*	20%	Yes	FAC
3. *Gymnocarpium dryopteris*	15%	Yes	FACU
4. *Streptopus amplexifolius*	5%	No	FACU
5. *Rubus pedatus*	5%	No	FAC
6.			
7.			
8.			
9.			
10.			
Total Cover:	65%		
50% of total cover:	33%	20% of total cover:	13%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	35%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column Totals:	165 (A)		610 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P46**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR3/4	100					organics	
18-28	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Slightly moist 18-28 inches, but no water table. Surface organics were poorly decomposed folist (wood, roots).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): >28	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >28	**Yes** ___	**No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P47**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.468462 Long: -134.543430 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	20%	Yes	FACU
2. *Tsuga heterophylla*	15%	Yes	FAC
3.			
4.			
Total Cover:	35%		
50% of total cover:	18%	20% of total cover:	7%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Rubus spectabilis*	5%	No	FACU
3. *Cornus alba*	5%	No	FAC
4.			
5.			
6.			
Total Cover:	30%		
50% of total cover:	15%	20% of total cover:	6%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	25%	Yes	OBL
2. *Athyrium cyclosorum*	15%	Yes	FAC
3. *Rubus pedatus*	5%	No	FAC
4. *Coptis aspleniifolia*	5%	No	FAC
5. *Tiarella trifoliata*	2%	No	FAC
6. *Maianthemum dilatatum*	2%	No	FAC
7.			
8.			
9.			
10.			
Total Cover:	54%		
50% of total cover:	27%	20% of total cover:	11%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	15%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	31%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	25	x 1 =	25
FACW species	0	x 2 =	0
FAC species	49	x 3 =	147
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	119 (A)		352 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P47**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-25+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	X	No	___	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): Surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Approx. 1/4-1/2" deep ponding in wetland near plot.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P48**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion: Southeast Alaska Lat: 57.468707 Long: -134.543164 Datum: NAD 1983

Soil Map Unit Name: NWI classification:

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

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes X	No	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	40%	Yes	FAC
2. *Picea sitchensis*	15%	Yes	FACU
3.			
4.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Vaccinium ovalifolium*	25%	Yes	FAC
2. *Menziesia ferruginea*	20%	Yes	FACU
3. *Oplopanax horridus*	10%	No	FACU
4. *Rubus spectabilis*	5%	No	FACU
5.			
6.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Maianthemum dilatatum*	10%	Yes	FAC
2. *Cornus canadensis*	10%	Yes	FACU
3. *Rubus spectabilis*	4%	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	24%		
50% of total cover:	12%	20% of total cover:	5%

Plot size (radius, or length x width) 5 ft radius % Bare Ground 1%

% Cover of Wetland Bryophytes (Where applicable) Total Cover of Bryophytes 75%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	64	x 4 =	256
UPL species	0	x 5 =	0
Column Totals:	139 (A)		481 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes No X

Remarks: *identifies indicator status is tentative

No *Lysichiton americanus* or other FACW or OBL vegetation species near plot.

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P48**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	7.5YR 3/4	100					organics	
17-29	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)
Surface organics were not saturated; therefore does not meet A1.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 28	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 20	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P49**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion: Southeast Alaska Lat: 57.469866 Long: -134.541300 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	20%	Yes	FACU
2. *Tsuga heterophylla*	20%	Yes	FAC
3.			
4.			
Total Cover:	40%		
50% of total cover:	20%	20% of total cover:	8%
Sapling/Shrub Stratum			
1. *Vaccinium alaskaense*	35%	Yes	FAC
2. *Menziesia ferruginea*	10%	No	FACU
3. *Vaccinium parvifolium*	10%	No	FACU
4.			
5.			
6.			
Total Cover:	55%		
50% of total cover:	28%	20% of total cover:	11%
Herb Stratum			
1. *Lysichiton americanus*	55%	Yes	OBL
2. *Rubus pedatus*	15%	No	FAC
3. *Cornus canadensis*	5%	No	FACU
4. *Coptis aspleniifolia*	3%	No	FAC
5. *Streptopus amplexifolius*	2%	No	FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	80%		
50% of total cover:	40%	20% of total cover:	16%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	0	x 2 =	0
FAC species	73	x 3 =	219
FACU species	47	x 4 =	188
UPL species	0	x 5 =	0
Column Totals:	175 (A)		462 (B)

Prevalence Index = B/A = 2.64

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

FACU shrubs on slightly elevated hummocks.

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P49**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-22+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 10	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P50**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): 5-7

Subregion: Southeast Alaska Lat: 57.469960 Long: -134.543405 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	30%	Yes	FAC
2. *Picea sitchensis*	30%	Yes	FACU
3.			
4.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Vaccinium alaskaense*	15%	Yes	FAC
3. *Menziesia ferruginea*	5%	No	FACU
4. *Rubus spectabilis*	5%	No	FACU
5.			
6.			
Total Cover:	45%		
50% of total cover:	23%	20% of total cover:	9%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rubus pedatus*	5%	Yes	FAC
2. *Lysichiton americanus*	5%	Yes	OBL
3. *Athyrium cyclosorum*	5%	Yes	FAC
4. *Coptis aspleniifolia*	4%	No	FAC
5. *Maianthemum dilatatum*	2%	No	FAC
6. *Cornus canadensis*	2%	No	FACU
7.			
8.			
9.			
10.			
Total Cover:	23%		
50% of total cover:	12%	20% of total cover:	5%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	77%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	61	x 3 =	183
FACU species	62	x 4 =	248
UPL species	0	x 5 =	0
Column Totals:	128 (A)		436 (B)

Prevalence Index = B/A = 3.41

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P50**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	7.5YR 3/4	100					organics	
7-25+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks

Restrictive Layer (if present):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 16	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 7	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P51**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): 3

Subregion: Southeast Alaska Lat: 57.469403 Long: -134.544367 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	15%	Yes	FACU
2. *Tsuga heterophylla*	15%	Yes	FAC
3.			
4.			
Total Cover:	30%		
50% of total cover:	15%	20% of total cover:	6%
Sapling/Shrub Stratum			
1. *Oplopanax horridus*	20%	Yes	FACU
2. *Vaccinium alaskaense*	15%	Yes	FAC
3. *Rubus spectabilis*	10%	Yes	FACU
4. *Vaccinium parvifolium*	5%	No	FACU
5.			
6.			
Total Cover:	50%		
50% of total cover:	25%	20% of total cover:	10%
Herb Stratum			
1. *Lysichiton americanus*	25%	Yes	OBL
2. *Athyrium cyclosorum*	25%	Yes	FAC
3. *Coptis aspleniifolia*	8%	No	FAC
4. *Rubus pedatus*	5%	No	FAC
5. *Cornus canadensis*	5%	No	FACU
6. *Tiarella trifoliata*	2%	No	FAC
7. *Maianthemum dilatatum*	2%	No	FAC
8.			
9.			
10.			
Total Cover:	72%		
50% of total cover:	36%	20% of total cover:	14%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	45%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	25	x 1 =	25
FACW species	0	x 2 =	0
FAC species	72	x 3 =	216
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	152 (A)		461 (B)

Prevalence Index = B/A = 3.03

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P51**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-29+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 8	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P52**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Toeslope bench

Local relief (concave, convex, none): Concave Slope (%): 3

Subregion: Southeast Alaska Lat: 57.468985 Long: -134.545236 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	40%	Yes	FACU
2. *Tsuga heterophylla*	35%	Yes	FAC
3.			
4.			
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Sapling/Shrub Stratum			
1. *Oplopanax horridus*	25%	Yes	FACU
2. *Menziesia ferruginea*	3%	No	FACU
3. *Vaccinium parvifolium*	3%	No	FACU
4.			
5.			
6.			
Total Cover:	31%		
50% of total cover:	16%	20% of total cover:	6%

Herb Stratum			
1. *Athyrium cyclosorum*	25%	Yes	FAC
2. *Lysichiton americanus*	30%	Yes	OBL
3. *Tiarella trifoliata*	10%	No	FAC
4. *Gymnocarpium dryopteris*	3%	No	FACU
5. *Maianthemum dilatatum*	2%	No	FAC
6.			
7.			
8.			
9.			
10.			
Total Cover:	70%		
50% of total cover:	35%	20% of total cover:	14%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	30%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	0	x 2 =	0
FAC species	72	x 3 =	216
FACU species	74	x 4 =	296
UPL species	0	x 5 =	0
Column Totals:	176 (A)		542 (B)

Prevalence Index = B/A = 3.08

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P52**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-26+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

X Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks

Restrictive Layer (if present):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
X Dry-Season Water Table (C2)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	___	No	X	Depth (inches): ___
Water Table Present?	Yes	X	No	___	Depth (inches): 16
Saturation Present? (includes capillary fringe)	Yes	X	No	___	Depth (inches): 11

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P53**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Ridge

Local relief (concave, convex, none): Convex Slope (%): <3

Subregion: Southeast Alaska Lat: 57.470022 Long: -134.547130 Datum: NAD 1983

Soil Map Unit Name: NWI classification:

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

Are Vegetation ,Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

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

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

Hydrophytic Vegetation Present?	Yes	No	X
Hydric Soil Present?	Yes	No	X
Wetland Hydrology Present?	Yes	No	X

Is the Sampled Area within a Wetland? **Yes** **No** X

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	30%	Yes	FACU
2. *Tsuga heterophylla*	30%	Yes	FAC
3.			
4.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Sapling/Shrub Stratum			
1. *Menziesia ferruginea*	5%	Yes	FACU
2. *Menziesia ferruginea*	5%	Yes	FACU
3. *Vaccinium ovalifolium*	5%	Yes	FAC
4.			
5.			
6.			
Total Cover:	15%		
50% of total cover:	8%	20% of total cover:	3%

Herb Stratum			
1. *Cornus canadensis*	8%	Yes	FACU
2. *Maianthemum dilatatum*	2%	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	10%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	80%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	37	x 3 =	111
FACU species	48	x 4 =	192
UPL species	0	x 5 =	0
Column Totals:	85 (A)		303 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **No** X

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P53**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-27	7.5YR 3/4	100					organics	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 27

Hydric Soil Present? **Yes** ___ **No** X

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___	
Water Table Present?	Yes ___	No X	Depth (inches):	>27	**Wetland Hydrology Present?**
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):	>27	**Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Slightly moist throughout. No saturation or water table.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P54**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope bench

Local relief (concave, convex, none): Concave Slope (%): 3

Subregion: Southeast Alaska Lat: 57.470075 Long: -134.547064 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Picea sitchensis*	15%	Yes	FACU
2. *Tsuga heterophylla*	15%	Yes	FAC
3.			
4.			
Total Cover:	30%		
50% of total cover:	15%	20% of total cover:	6%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Oplopanax horridus*	15%	Yes	FACU
2. *Rubus spectabilis*	4%	No	FACU
3. *Vaccinium parvifolium*	3%	No	FACU
4.			
5.			
6.			
Total Cover:	22%		
50% of total cover:	11%	20% of total cover:	4%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Lysichiton americanus*	25%	Yes	OBL
2. *Athyrium cyclosorum*	15%	Yes	FAC
3. *Tiarella trifoliata*	2%	No	FAC
4. *Gymnocarpium dryopteris*	2%	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	44%		
50% of total cover:	22%	20% of total cover:	9%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	31%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	25%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	25	x 1 =	25
FACW species	0	x 2 =	0
FAC species	32	x 3 =	96
FACU species	39	x 4 =	156
UPL species	0	x 5 =	0
Column Totals:	96 (A)		277 (B)

Prevalence Index = B/A = 2.89

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P54**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-30+	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 10	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): Surface	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Entered by: sar QC by: cmw

Approx. 2" deep ponding in wetland near plot.

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Ketchikan Gateway Borough Sampling Date: 9/15/2013

Applicant/Owner: ADOT&PF Sampling Point: **P55**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Hillslope

Local relief (concave, convex, none): Convex Slope (%): 5-10

Subregion: Southeast Alaska Lat: 57.471071 Long: -134.546331 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PFO

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tsuga heterophylla*	25%	Yes	FAC
2. *Picea sitchensis*	10%	Yes	FACU
3.			
4.			
Total Cover:	35%		
50% of total cover:	18%	20% of total cover:	7%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rubus spectabilis*	25%	Yes	FACU
2. *Oplopanax horridus*	15%	Yes	FACU
3. *Vaccinium ovalifolium*	15%	Yes	FAC
4. *Menziesia ferruginea*	5%	No	FACU
5.			
6.			
Total Cover:	60%		
50% of total cover:	30%	20% of total cover:	12%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Athyrium cyclosorum*	20%	Yes	FAC
2. *Lysichiton americanus*	10%	Yes	OBL
3. *Tiarella trifoliata*	8%	No	FAC
4. *Coptis aspleniifolia*	5%	No	FAC
5. *Rubus pedatus*	2%	No	FAC
6.			
7.			
8.			
9.			
10.			
Total Cover:	45%		
50% of total cover:	23%	20% of total cover:	9%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	55%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	140 (A)		455 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P55**

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-25	10YR 2/1	100					muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: Bedrock

Depth (inches): 25

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 16	**Wetland Hydrology Present?**	
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 5	**Yes** X	**No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

WETLAND DETERMINATION DATA FORM – Alaska Region

Project/Site: Angoon Airport 12a with access to 12 Borough/City: Hoonah Angoon Sampling Date: 9/16/2013

Applicant/Owner: ADOT&PF Sampling Point: **P56**

Investigator(s): Stacey Reed and Taya MacLean Landform (hillside, terrace, hummocks, etc.): Bench on hillslope

Local relief (concave, convex, none): Concave Slope (%): <3

Subregion: Southeast Alaska Lat: 57.465138 Long: -134.539918 Datum: NAD 1983

Soil Map Unit Name: NWI classification: PSS

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

Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

Hydrophytic Vegetation Present?	Yes **X**	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No** ____
Hydric Soil Present?	Yes **X**	No ____	
Wetland Hydrology Present?	Yes **X**	No ____	

Remarks:

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

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus contorta*	5%	Yes	FAC
2. *Tsuga heterophylla*	5%	Yes	FAC
3.			
4.			
Total Cover:	10%		
50% of total cover:	5%	20% of total cover:	2%

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus viridis*	15%	Yes	FAC
2. *Tsuga mertensiana*	15%	Yes	FAC
3. *Vaccinium alaskaense*	15%	Yes	FAC
4. *Picea sitchensis*	10%	No	FACU
5. *Tsuga heterophylla*	15%	Yes	FAC
6. *Rhododendron groenlandicum*	5%	No	FAC
Total Cover:	75%		
50% of total cover:	38%	20% of total cover:	15%

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carex species*	70%	Yes	OBL to FACU
2. *Calamagrostis canadensis*	8%	No	FAC
3. *Lysichiton americanus*	5%	No	OBL
4. *Athyrium cyclosorum*	3%	No	FAC
5. *Nephrophyllidium crista-galli*	2%	No	OBL
6. *Tiarella trifoliata*	2%	No	FAC
7. *Angelica genuflexa*	2%	No	FACW
8. *Coptis aspleniifolia*	2%	No	FAC
9. *Cornus canadensis*	2%	No	FACU
10. *Agrostis species*	2%	No	FAC?
Total Cover:	98%		
50% of total cover:	49%	20% of total cover:	20%
Plot size (radius, or length x width)	5 ft radius	% Bare Ground	0%
% Cover of Wetland Bryophytes (Where applicable)		Total Cover of Bryophytes	0%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	7	x 1 =	7
FACW species	2	x 2 =	4
FAC species	90	x 3 =	270
FACU species	12	x 4 =	48
UPL species	0	x 5 =	0
Column Totals:	111 (A)		329 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

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

Remarks: *identifies indicator status is tentative

Also 5% *Menziesia ferruginea* in shrub stratum.

Entered by: sar QC by: cmw

SOIL

Sampling Point: **P56**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-25	7.5YR 3/2	100					peat	
25-30+	10YR 2/1	100					mucky peat	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: s = sand; si = silt; c = clay; l = loam or loamy; co = coarse; f = fine; vf = very fine; + = heavy (more clay); - = light (less clay)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes	X	No		Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches): Surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Entered by: sar QC by: cmw

APPENDIX D. GROUND-LEVEL SITE PHOTOGRAPHS

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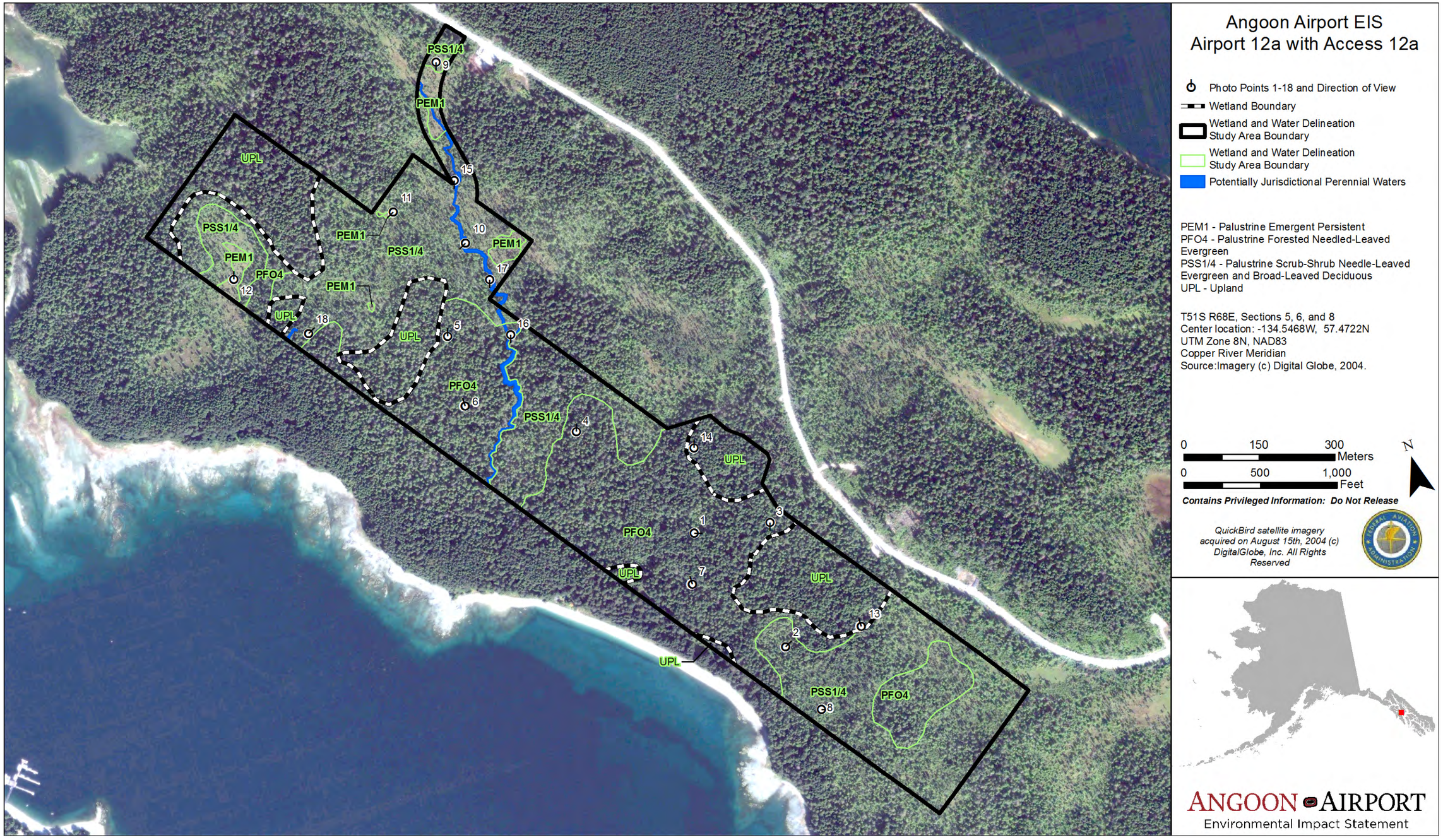

Photo location map.

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Photo 1. View of isolated upland ridge in wetland/ upland mosaic area.

Photo 2. View of wetland drainage feature.

Photo 3. View of palustrine forested wetland community.

Photo 4. View of palustrine forested wetland community.

Photo 5. View of organic muck at wetland Plot 10.

Photo 6. View of scattered, isolated ponding in forested wetland.

Photo 7. View of iron deposits in wetland.

Photo 8. View of palustrine scrub-shrub broad-leaved deciduous wetland community.

Photo 9. View of palustrine scrub-shrub needle-leaved evergreen wetland community.

Photo 10. View of palustrine scrub-shrub wetland community.

Photo 11. View of palustrine emergent wetland community.

Photo 12. View of peat soils in palustrine emergent fen community.

Photo 13. View of upland community.

Photo 14. View of upland soils at Plot 16.

Photo 15. View of upstream portions of narrow perennial drainage flowing through fen.

Photo 16. View of downstream portion of perennial drainage.

Photo 17. View of the main perennial drainage that flows southerly through the site

Photo 18. View of headwaters of perennial drainage located in the southwestern portion of the study area.

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APPENDIX E. VEGETATION TABLES

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Angoon Airport 12A with Access 12 Table of Vascular Vegetation Observed On-Site 8/19-8/22/2013 (Plots 1-41) and 9/14-9/16/2013 (Plots 42-56)		
Common Name	Scientific Name	Wetland Indicator Status
WETLAND VEGETATION		
Rocky Mountain maple	*Acer glabrum*	FACU
common yarrow	*Achillea millefolium*	FACU
Red Baneberry	*Actaea rubra*	FAC
mountain alder, Sitka alder	*Alnus viridis*	FAC
kneeling angelica	*Angelica genuflexa*	FACW
Western Lady Fern	*Athyrium cyclosorum*	FAC
bluejoint	*Calamagrostis canadensis*	FAC
white marsh marigold	*Caltha leptosepala*	OBL
giant mountain aster, Canada aster	*Canadanthus modestus*	FAC
water sedge, leafy tussock sedge	*Carex aquatilis*	OBL
sedge	*Carex species*	OBL to FACU
yellow sedge, yellow-green sedge	*Carex flava*	OBL
livid sedge	*Carex livida*	OBL
Umbell's Bittercress	*Cardamine umbellata*	FACW
Northwest Territory sedge	*Carex utriculata*	OBL
purple marshlocks	*Comarum palustre*	OBL
fern-leaf goldthread	*Coptis aspleniifolia*	FAC
three-leaf goldthread	*Coptis trifolia*	FAC
Red Osier	*Cornus alba*	FAC
bunchberry dogwood, Canadian bunchberry	*Cornus canadensis*	FACU
round-leaf sundew	*Drosera rotundifolia*	OBL
spikerush species	*Eleocharis species*	OBL to FACW
black crowberry	*Empetrum nigrum*	FAC
field horsetail	*Equisetum arvense*	FAC
water horsetail	*Equisetum fluviatile*	OBL
variegated scouring-rush	*Equisetum variegatum*	FACW
tall cotton-grass	*Eriophorum angustifolium*	OBL
fragrant bedstraw	*Galium triflorum*	FAC
western oakfern, northern oak fern	*Gymnocarpium dryopteris*	FACU
common cowparsnip, American cow-parsnip	*Heracleum maximum*	FACU
meadow barley	*Hordeum brachyantherum*	FACW
common woodrush	*Luzula multiflora*	FACU
American skunkcabbage, yellow-skunk-cabbage	*Lysichiton americanus*	OBL
false lily of the valley, two-leaf false Solomon's-seal	*Maianthemum dilatatum*	FAC
Oregon crabapple	*Malus fusca*	FACU
rusty menziesia, fool's-huckleberry	*Menziesia ferruginea*	FACU
buck-bean	*Menyanthes trifoliata*	OBL
seep monkey-flower	*Mimulus guttatus*	OBL
Heart-Leaf Twayblade	*Neottia cordata*	FACU
deer-cabbage	*Nephrophyllidium crista-galli*	OBL
devil's-club	*Oplopanax horridus*	FACU
sidebells wintergreen	*Orthilia secunda*	FACU
Sitka spruce	*Picea sitchensis*	FACU
lodgepole pine	*Pinus contorta*	FAC
Scentbottle	*Piperia dilatata*	FACW

Angoon Airport 12A with Access 12 Table of Vascular Vegetation Observed On-Site 8/19-8/22/2013 (Plots 1-41) and 9/14-9/16/2013 (Plots 42-56)		
Common Name	Scientific Name	Wetland Indicator Status
slender bog orchid	*Platanthera stricta*	FACW
Arctic False Bent	*Podagrostis aequivalvis*	OBL
western bracken fern, northern bracken fern	*Pteridium aquilinum*	FACU
Rusty Labrador-Tea	*Rhododendron groenlandicum*	FAC
cloudberry	*Rubus chamaemorus*	FACW
strawberry-leaf raspberry	*Rubus pedatus*	FAC
salmonberry, salmon raspberry	*Rubus spectabilis*	FACU
Canadian burnet	*Sanguisorba canadensis*	FACW
clasping twistedstalke	*Streptopus amplexifolius*	FACU
Douglas aster, leafy-bract American-aster	*Symphyotrichum subspicatum*	FAC
three-leaf foamflower	*Tiarella trifoliata*	FAC
tufted leafless-bulrush	*Trichophorum caespitosum*	OBL
sticky tofieldia, sticky false asphodel	*Triantha glutinosa*	FACW
western hemlock	*Tsuga heterophylla*	FAC
mountain hemlock	*Tsuga mertensiana*	FAC
Alaska blueberry	*Vaccinium alaskaense*	FAC
oval-leaf blueberry	*Vaccinium ovalifolium*	FAC
small cranberry	*Vaccinium oxycoccos*	OBL
red huckleberry	*Vaccinium parvifolium*	FACU
bog blueberry, alpine blueberry	*Vaccinium uliginosum*	FAC
lingonberry, northern mountain-cranberry	*Vaccinium vitis-idaea*	FAC
green false hellebore, American false hellebore	*Veratrum viride*	FAC
squashberry	*Viburnum edule*	FACU
UPLAND VEGETATION		
Rocky Mountain maple	*Acer glabrum*	FACU
common yarrow	*Achillea millefolium*	FACU
Red Baneberry	*Actaea rubra*	FAC
Western Lady Fern	*Athyrium cyclosorum*	FAC
queen's cup, bride's bonnet	*Clintonia uniflora*	NOL
fern-leaf goldthread	*Coptis aspleniifolia*	FAC
Red Osier	*Cornus alba*	FAC
bunchberry dogwood, Canadian bunchberry	*Cornus canadensis*	FACU
black crowberry	*Empetrum nigrum*	FAC
western oakfern, northern oak fern	*Gymnocarpium dryopteris*	FACU
false lily of the valley, two-leaf false Solomon's-seal	*Maianthemum dilatatum*	FAC
rusty menziesia, fool's-huckleberry	*Menziesia ferruginea*	FACU
single-delight	*Moneses uniflora*	FACU
devil's-club	*Oplopanax horridus*	FACU
Sitka spruce	*Picea sitchensis*	FACU
western rattlesnakeroot	*Prenanthes alata*	NOL
Nootka rose	*Rosa nutkana*	FACU
western thimble-berry	*Rubus parviflorus*	FACU
strawberry-leaf raspberry	*Rubus pedatus*	FAC
salmonberry, salmon raspberry	*Rubus spectabilis*	FACU
red elderberry	*Sambucus racemosa*	FACU
Sitka Mountain-Ash	*Sorbus sitchensis*	FACU

Angoon Airport 12A with Access 12 Table of Vascular Vegetation Observed On-Site 8/19-8/22/2013 (Plots 1-41) and 9/14-9/16/2013 (Plots 42-56)		
Common Name	Scientific Name	Wetland Indicator Status
clasping twistedstalke	*Streptopus amplexifolius*	FACU
western hemlock	*Tsuga heterophylla*	FAC
Alaska blueberry	*Vaccinium alaskaense*	FAC
oval-leaf blueberry	*Vaccinium ovalifolium*	FAC
red huckleberry	*Vaccinium parvifolium*	FACU

Wetland Indicator Status and taxonomy for the Alaska Region per the National Wetland Plant List.
Accessed 7/12/2013: http://rsgisias.crrel.usace.army.mil/NWPL/

WETLAND INDICATOR STATUS - Alaska Region	
OBL	Obligate Wetland – Plant that almost always is a hydrophyte, rarely in uplands.
FACW	Facultative Wetland - Plant that usually is a hydrophyte but occasionally found in uplands.
FAC	Facultative – Plant that commonly occurs as either a hydrophyte or non-hydrophyte.
FACU	Facultative Upland - Plant that occasionally is a hydrophyte but usually occurs in uplands.
UPL	Upland - Plant that rarely is a hydrophyte, almost always in uplands.
NOL	Not Listed - Plants that are not on the list and assumed to be UPL.

From: Jamie C. M. Young
Sent: Thursday, March 20, 2014 3:25 PM
To: Randy Vigil (randal.p.vigil@usace.army.mil)
Cc: Stacy N. Benjamin; Stacey Reed; Amanda Childs; Leslie Grey (Leslie.Grey@faa.gov); Lara Bjork
Subject: Angoon Airport EIS: clarification regarding connectivity of waters

Hello Randy,
At your request, I'm writing to clarify that it is our best professional judgment that the waters delineated in the "*Wetland and Waters Delineation, Preliminary JD Report, Angoon Airport EIS*" are hydrologically connected to Killisnoo Harbor, which is a marine water body located on the western shore of Admiralty Island, off of Chatham Strait.

Section 8.0 (pages 10-11) clarifies that the "Wetland conditions extend off-site to the south of the study area and are located immediately adjacent to Killisnoo Harbor (a tidally influenced traditional navigable water of the U.S.). Based on aerial photography, an upland ridge may be present along the shoreline, separating the estuarine community from the palustrine wetlands. However, the perennial drainages delineated in the study area are non-navigable, perennial, relatively permanent waters that are directly adjacent to and drain wetlands in the study area. The drainages flow southerly and potentially flow directly into the harbor. Therefore, due to the potential hydrologic connection to Killisnoo Harbor, wetlands and drainages delineated in the study area may be determined to be jurisdictional by the Alaska District USACE."

Please let us know, if you need any further information or clarification.
Thank you for your time!

Jamie C. M. Young
Natural Resources Specialist

SWCA Environmental Consultants
4435 E. Canvasback Ave.
Post Falls, ID 83854
P 208.262.9323 | C 907.821.0404 | F 907.279.7922

Visit Our Website: http://www.swca.com

Please consider the environment before printing this email

Jamie

Jamie C. M. Young
Natural Resources Specialist

SWCA Environmental Consultants
C 907.821.0404 | F 907.279.7922

Visit Our Website: http://www.swca.com

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DEPARTMENT OF THE ARMY
ALASKA DISTRICT, U.S. ARMY CORPS OF ENGINEERS
REGULATORY DIVISION
P.O. BOX 22270
JUNEAU, ALASKA 99802-2270

AUG 0 4 2014

Regulatory Division
POA-2009-1254

Ms. Leslie Grey
Federal Aviation Administration
222 West 7th Avenue, Box #14
Anchorage, Alaska 99513

Dear Ms. Grey:

This is in response to your January 9, 2014, request for a jurisdictional determination for a 163.54 - acre parcel of land described as Angoon Airport Environmental Impact Statement, Airport Alternative 12a with Access 12. It has been assigned number POA-2009-1254, Killisnoo Harbor, which should be referred to in all correspondence with us. The project site is located within Sections 5, 6, and 8, T. 51 S., R. 68 E., Copper River Meridian; USGS Quad Map Sitka B-2; Latitude 57.473° N., Longitude 134.547° W., in Angoon, Alaska.

Based on our review of the information you furnished, including the January 2014, Wetland and Waters Delineation Preliminary Jurisdictional Determination Report Angoon Airport Environmental Impact Statement Admiralty Island (PJD), prepared by SWCA Environmental Consultants, we have determined the above property contains waters of the United States (U.S.), including wetlands, under the Corps' regulatory jurisdiction. Specifically, there are: 128.43 acres of wetlands and 1.31 acres of stream on the site. These waters of the U.S. are shown on the enclosed drawing from the PJD (Figure 4) prepared by SWCA Environmental Consultants. A copy of the Approved Jurisdictional Determination form is available at www.poa.usace.army.mil/Missions/Regulatory/JurisdictionalDeterminations.aspx under the above file number.

This approved jurisdictional determination is valid for five (5) years from the date of this letter, unless new information supporting a revision is provided to us before the expiration date. Enclosed is a Notification of Administrative Appeal Options and Process and Request for Appeal form (see section titled "Approved Jurisdictional Determination").

DA authorization is required if you propose to place dredged and/or fill material into waters of the U.S., including wetlands and/or perform work in navigable waters of the U.S.

Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including jurisdictional wetlands (33 U.S.C. 1344). The Corps defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for structures or work in or affecting navigable waters of the U.S. (33 U.S.C. 403). Section 10 waters are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified by the Alaska District.

Nothing in this letter excuses you from compliance with other Federal, State, or local statutes, ordinances, or regulations.

Please contact me via email at Randal.P.Vigil@usace.army.mil, by mail at the address above, or by phone at (907) 790-4491, if you have questions.

Sincerely,

Randal P. Vigil
Chief, Southeast Section

Enclosures

CF:

sreed@swca.com
jyoung@swca.com

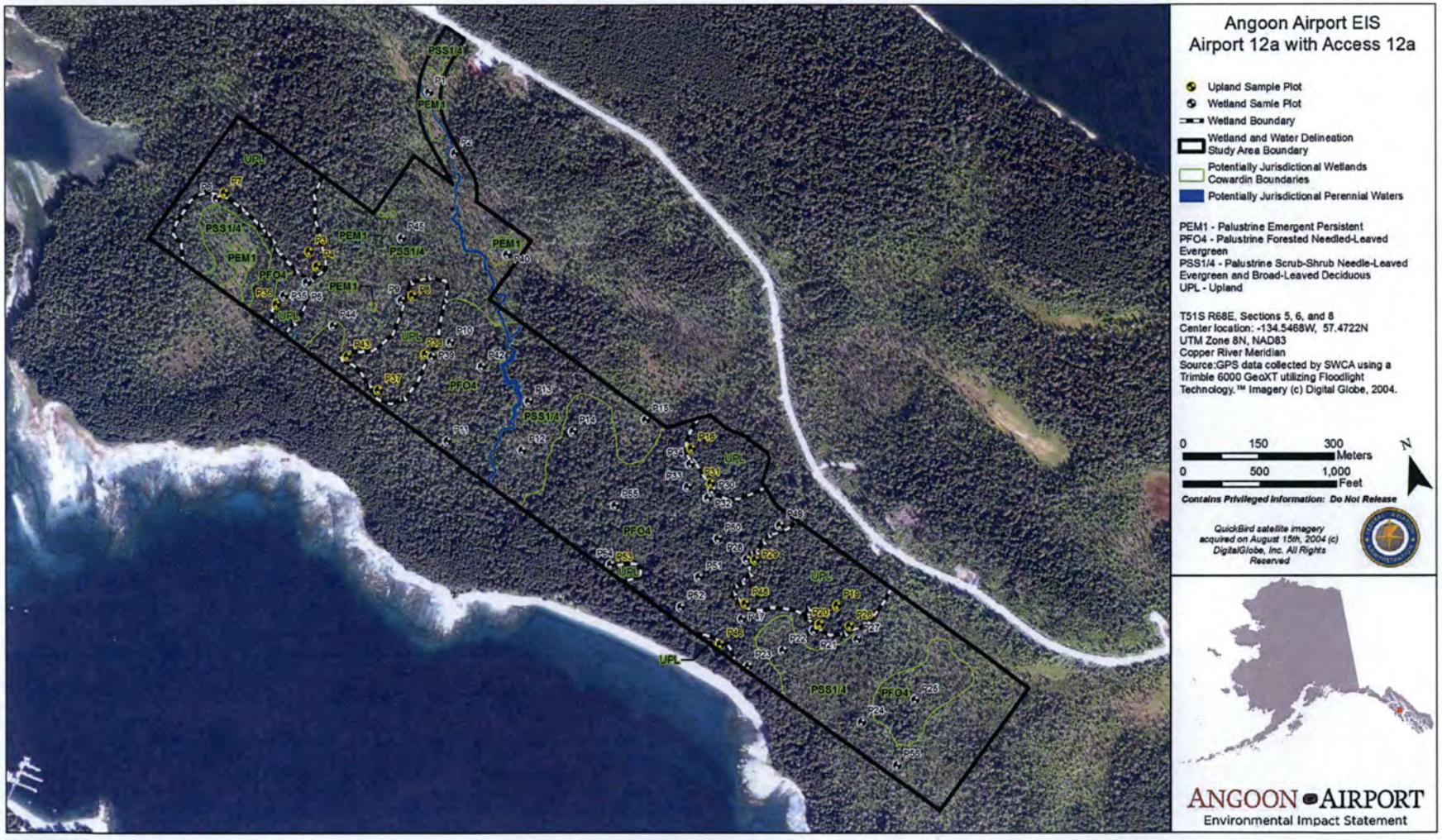

Figure 4. 2004 aerial wetland and waters delineation map.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Federal Aviation Administration	File Number: POA-2009-1254	Date: August 4, 2014

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
XX	**APPROVED JURISDICTIONAL DETERMINATION**	**D**
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Randal Vigil
Alaska District Corps of Engineers
Juneau Regulatory Field Office (CEPOA-RD-S)
PO Box 22270
Juneau, Alaska 99802-2270
(907) 790-4491

If you only have questions regarding the appeal process you may also contact:

Commander
USAED, Pacific Ocean Division
ATTN: CEPOD-PDC/Cindy Barger
Building 525
Fort Shafter, HI 96858-5440

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number: