CASCADE CREEK LLC

CASCADE CREEK HYDROELECTRIC PROJECT

FERC No. 12495

DRAFT RECREATION RESOURCES STUDY REPORT

FEBRUARY 2011

Prepared by:

Kleinschmidt

Energy & Water Resource Consultants

CASCADE CREEK, LLC

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DEFINITION OF TERMS, ACRONYMS, AND ABBREVIATIONS

ADA	Americans With Disabilities Act
ADEC	Alaska Department of Environmental Conservation
ADFG	Alaska Department of Fish and Game
ADOL	Alaska Department of Labor
ADNR	Alaska Department of Natural Resources
ADOT	Alaska Department of Transportation
af	Acre-foot, the amount of water needed to cover one acre to a depth of one foot.
ALP	Alternative Licensing Process
APE	Area of Potential Effect. For the purposes of this Recreation Report, the area of potential effect is defined as the waterbodies and immediate surrounding lands of Swan Lake, Falls Lake, and Cascade Creek; the near-shore area of Thomas Bay in the vicinity of the proposed powerhouse; and the transmission line corridor.
CCLLC	Cascade Creek LLC
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	Best Management Practices
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
CFS	Cubic-Feet per Second
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
DLA	Draft License Application
DOI	US Department of Interior
EL	Elevation
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FPA	Federal Power Act
FPC	Federal Power Commission
GBNPP	Glacier Bay National Park and Preserve
GIS	Geographic Information Systems
GWh	Gigawatt-hour (equals one million kilowatt-hours)
Hp	Horsepower
Installed Capacity	The nameplate MW rating of a generator or group of generators
Interested Parties	The broad group of individuals and entities that may have an interest in a proceeding
kW	Kilowatt

kWh	kilowatt-hour
kV	Kilovolts
LUD	Land Use Designation
MOA	Memorandum of Agreement
MSL	Mean Sea Level
MW	Megawatt
MWh	Megawatt-hour
NGO	Non-Governmental Organization
NEPA	National Environmental Policy Act
NGO	Non-governmental organization
NMFS or NOAA Fisheries	National Marine Fisheries Service
NOAA	National Oceanic & Atmospheric Administration
NOI	Notice of Intent
NPS	National Park Service
NRI	Nationwide Rivers Inventory
PDEA	Preliminary Draft Environmental Assessment
PME	Protection, Mitigation, and Enhancement
PRD	Petersburg Ranger District
Project	FERC Project No. 12495, Cascade Creek Project
project area	The area within the proposed FERC project boundary. The project area includes Swan Lake, the power conduit, the powerhouse complex, and the transmission line corridor.
project boundary	The boundary line defined in the project license issued by FERC that surrounds those areas necessary for safe and efficient operation and maintenance of the Project or for other specified project purposes.
project vicinity	The general geographic area in which the Project is located; generally a 20 mile radius of the proposed Project
RD	Ranger District
Run-of-river	A hydroelectric project that uses the flow of a stream with little or no reservoir capacity for storing water such that, at any given time, flow immediately downstream of the Project is equal to inflow to the project reservoir.
SCORP	State Comprehensive Outdoor Recreation Plan
SD	Scoping Document
Tailrace	Channel through which water is discharged from the powerhouse turbines.
TLRMP	Tongass Land and Resource Management Plan
TNF	Tongass National Forest
USACOE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

CASCADE CREEK LLC

CASCADE CREEK HYDROELECTRIC PROJECT
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DRAFT RECREATION RESOURCES STUDY REPORT

1.0 INTRODUCTION

In February, 2008, Cascade Creek Limited Liability Corporation (CCLLC) received a Preliminary Permit for the Cascade Creek Hydroelectric Project (FERC No. 12495) (Project) from the Federal Energy Regulatory Commission (FERC). The Project would be located approximately 100 miles south of Juneau and 100 miles north of Ketchikan, Alaska (City of Petersburg, 2000). The city of Petersburg, located on Mitkof Island, is the closest population center.

With the exception of portions of the transmission corridor, the proposed project area[1] is contained within Power Site Classification No. 9, established by Order of the Secretary of the Department of the Interior on August 20, 1921. The lands within Power Site Classification No. 9 have been ordered (Secretarial Order Interpretation No. 174, August 20, 1931) to be construed as describing the following area:

> All lands below the 1,650 foot contour above sea level which drain into Swan Lake, located in the Cascade Creek Basin about 2.5 miles inland from the east shore of Thomas Bay, Alaska; all lands south of Cascade Creek within one mile of the middle of said creek, and all lands north of Cascade Creek within one-eighth of a mile of the middle of said creek, extending from Swan Lake to the shore of Thomas Bay. Mouth of creek is in approximately Lat. 57°N., Long. 132° 7' W.

This Power Site Classification occurs within the Tongass National Forest. In its 2003 Final Supplemental Environmental Impact Statement for the Tongass Land and Resource Management Plan (TLRMP) Revision, the USFS acknowledges the Power Site Classification designation and indicates the drainage is "withdrawn from other management considerations" (USFS, 2003). While hydropower production is the primary allowed use, recreation is an acknowledged and existing, secondary use of the project area. Project construction and operation has the potential to affect recreational use of the existing Swan Lake, Falls Lake and

[1] Area enclosed within the project boundary

Cascade Creek and near shore areas of Thomas Bay in the vicinity of the proposed Project (Figure 1-1).

The Project would consist of an intake structure and an outlet control structure at Swan Lake, a power conduit consisting of a mostly unlined 12 foot diameter tunnel, a steel penstock leading to a powerhouse located at tidewater on Thomas Bay, and a 23-mile-long combined undersea and overland transmission line predominantly sited within existing corridors. Installed capacity of the Project would be approximately 70 megawatts (MW). A lake siphon at Swan Lake would be housed in a subterranean concrete intake control structure. An outlet control structure would consist of a small, low-head weir covered in native rock approximately 6 feet high above the lowest elevation of the lake outlet. The weir would include a crest gate that could be lowered during extreme high flows to maintain lake levels at or below the natural high level – by allowing flows to pass downstream. An unlined, 12-ft-diameter, low pressure tunnel and penstock power conduit would deliver water to the powerhouse from the lake siphon. A 9-ft-diameter buried steel penstock would extend from the lower tunnel portal to the powerhouse housing three turbine generating units approximately 200 feet from tidewater on Thomas Bay.

The powerhouse tailrace would be constructed as a low gradient, natural rock/cobble/boulder channel exiting the powerhouse in a southern direction for approximately 300 ft, and then turning west to for approximately 150 ft to Thomas Bay. Design would include a barrier falls or structure to deter anadromous fish attraction. The proposed transmission line will consist of overland transmission, predominantly within existing corridors, and undersea cables. The transmission line will extend approximately 23 miles, crossing Thomas Bay as a submarine line, continuing overland across the Patterson Delta, mostly within an existing transmission line corridor, crossing Frederick Sound to the south as an undersea cable, and becoming an overhead line on Mitkof Island to the existing substation southwest of the city of Petersburg.

There will be no road access to the proposed hydroelectric facility location as the site is isolated from the nearest town of Petersburg. Access for both construction and long-term operation and maintenance of the Project will be by boat, barge, or aircraft. The Applicant proposes to construct a new marine access facility on Thomas Bay, immediately adjacent to the powerhouse site. A new dock would be approximately 290 ft long on a fixed pier with a 60-ft-long ramp down to a 60-ft by 30-ft float stationed to piling. The dock and adjacent barge landing

ramp would provide direct access to the site during construction and operations. The Applicant intends to make the new dock available to the public once it constructs the Project, barring any legal obstacles or stipulations from the USFS. This new dock has the potential to provide the public safe landing and access for any upland use.

Two proposed housing units would be located within the powerhouse footprint to house workers during construction of the Project. The houses would remain after construction for use by plant operators and maintenance crews. The proposed housing buildings would be separate from other structures and would be surrounded by proposed and existing vegetative screening. Localized transportation from the housing units to the powerhouse site would be by vehicle or by foot. Vegetative screening and natural materials will shield, conceal, or otherwise minimize the prominence of the project features on the natural environment. The 200 ft setback will provide a vegetation screen of project structures from Thomas Bay. The tailrace design will incorporate a naturalized channel and a bank to eliminate direct view of the powerhouse from the tailrace.

CCLLC proposes to operate the Project within Swan Lake's normal, seasonal lake fluctuations to avoid effects to the lake and shoreline. Project operations will bypass a portion of Cascade Creek, and reduce flow to the Creek.

CCLLC is proposing the following enhancement measures for recreational resources at Cascade Creek:

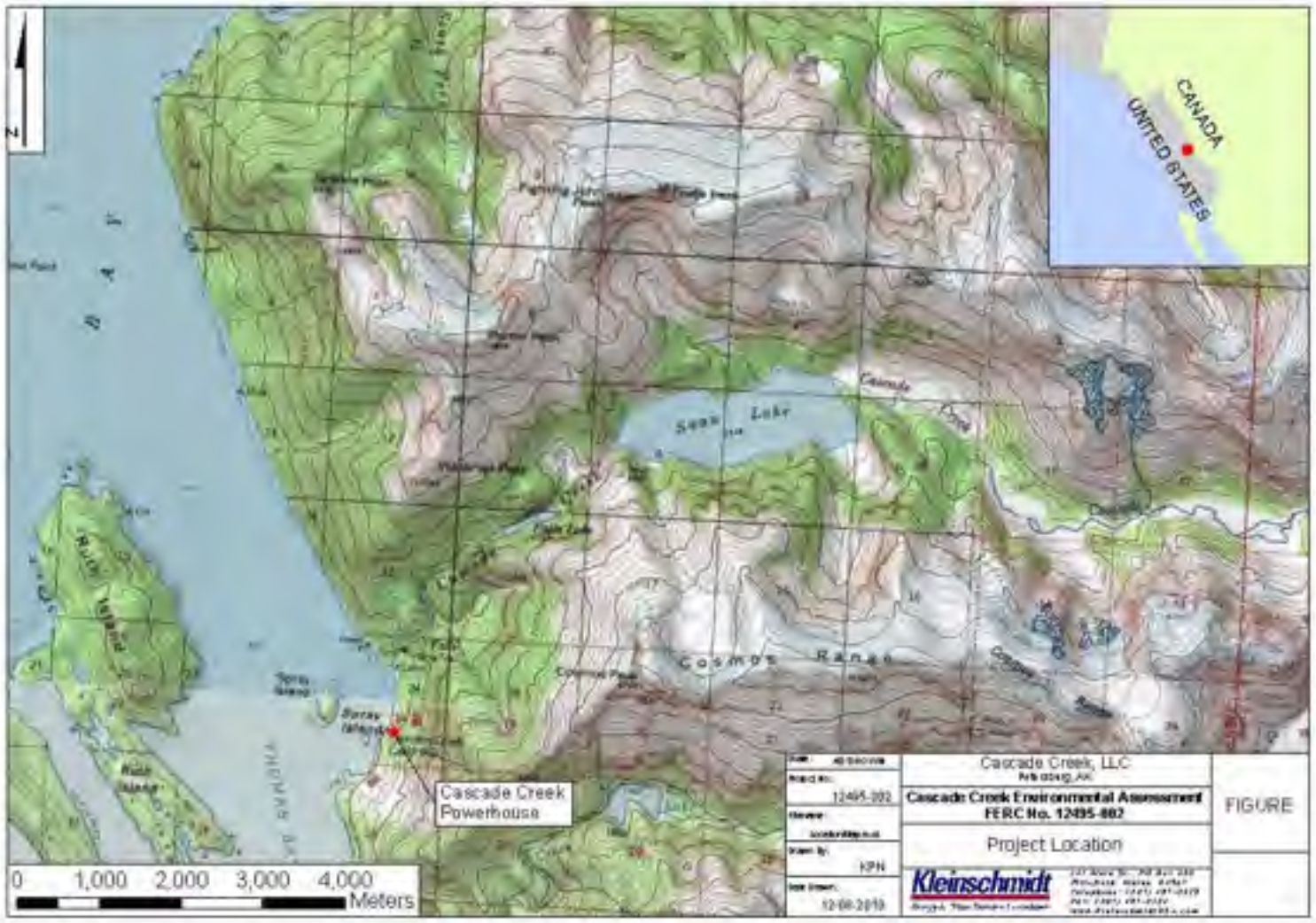
- Develop a Recreational Use Monitoring Plan to provide periodic assessment of public and commercial use of the project area;
- Provide for a new USFS Cabin within the Thomas Bay vicinity;
- Design and implement trail upgrades in consultation with the USFS; and
- Develop project infrastructure such as docks available to the public.

The PAD, SD1, SD2 and scoping and agency meetings identified potential recreational use issues for which existing available information was insufficient. This study was conducted to provide additional information related to the potential effects of the Project. Project stakeholders, including Alaska state and federal resource agencies, indicated the potential for project effects on recreational resources within the Cascade Creek/Swan Lake drainage,

contained within the Power Site Classification 9, and near-shore areas of Thomas Bay. This report provides an evaluation of the following issues:

- Potential effects of project construction and operation on recreational use of Swan Lake, the USFS Swan Lake Cabin, and Thomas Bay and the near-shore USFS Cascade Creek and Spurt Cove cabins; including associated public and commercial sightseeing, hiking, boating, fishing, hunting, camping, and related activities.
- The potential need for new recreation facilities and/or public access at the Project to meet current and future (over the term of any new license) demand, including any barrier-free access needs.
- Potential effects of construction noise (blasting, tunneling, hauling, truck idling) to residents and visitors.
- Potential visual effects of project structures - new powerhouse, intake and outlet structure, tailrace, transmission corridor, and support facilities.
- Potential visual effects of modified water flow over Cascade Creek waterfalls.

Figure 1-1. Proposed Project Location



2.0 GOALS AND OBJECTIVES OF THE STUDY

The goals and objectives of this study and report are as follows:

Goal 1: *Develop an inventory of existing and potential future recreational resources within the project area and immediate vicinity including Swan Lake, Falls Lake, Cascade Creek, and Thomas Bay in the vicinity of the proposed Project.*

This will be accomplished by meeting the following objectives:

a. Identify existing regional and project vicinity recreation sites and inventory the services and amenities offered at each (Section 4.0).

b. Identify existing lands adjacent to the project boundary available for public access and recreation (Section 5.0).

c. Identify existing available lands for future potential recreation development (Section 9.0).

Goal 2: *Evaluate existing and potential future recreation use of existing recreation resources within the area potentially affected by the Project.*

This will be accomplished by meeting the following objectives:

a. Estimate use of existing available project area recreation sites using existing USFS data (overnight visits to USFS cabins/shelters at the outfall of Cascade Creek, at Swan Lake, at Falls Lake, and within the viewshed of the Project); Outfitter/Guide Surveys (commercial day and overnight use of Thomas Bay, Swan Lake, Cascade Creek trail, Falls Lake, and the viewshed of the Project); Resident Boater/Pilot Surveys (regional private day and overnight use of Thomas Bay and Swan Lake, Cascade Creek trail, Falls Lake, and the viewshed of the Project as attained via private boat or float plane) (Section 6.0).

b. Estimate future potential recreational use of existing recreation sites in the project area using population projections; the Alaska Statewide Comprehensive Outdoor Recreation Plan (SCORP), the Tongass National Forest Land and Resource Management Plan (TLRMP), and other management plans; the USFS Data Survey and Sampling Procedures to Quantify Recreation Use of National Forests in Alaska; and other secondary data, as appropriate (Section 9.0).

Goal 3: *Solicit information on the public's preferences and perception of recreational and visual resources in the project area.*

This will be accomplished by meeting the following objective:

a. Identification of user needs and preferences, including perceptions of visual quality at recreation sites and in the proposed Project viewshed, through administration of an Outfitter/Guide Survey and Resident Boater/Pilot Survey (Section 8.0).

Goal 4: *Identify the potential effects of project construction and operation on recreational uses and visual resources within the affected areas.*

This will be accomplished by meeting the following objectives:

a. Identification of user opinions, including perceptions of potential changes in the aesthetics within in the proposed project viewshed, through administration of an Outfitter/Guide Survey and Resident Boater/Pilot Survey (Section 7.0).

b. Qualitative assessment of existing recreation use short-term effects resulting from temporary and limited construction activities and long-term effects resulting from a change in the project area environment by the presence of generating facilities (Section 7.0).

c. Analysis of the project features, function and operations for compliance with the purpose and intent of applicable Forest Plan Land Use Designations (LUDs) (Section 8.0)[2].

[2] Identified LUDs in the APE are: Semi-Remote Recreation, Old Growth Habitat, Modified Landscape, Scenic Viewshed and TUS (transportation and utility corridor)

3.0 METHODOLOGY

Data collection and analysis focused on obtaining information on existing recreation sites and facilities both in the region, in the project vicinity (20 mile radius of the proposed Project) and within the immediate vicinity (Swan Lake, Falls Lake, Cascade Creek, near shore Thomas Bay and the transmission line corridor). This effort also solicited recreational user perceptions and preferences. Primary data collection included Outfitter/Guide and Resident Boater/Pilot Surveys. Secondary data collection included information from the USFS and other state and federal agencies; the Alaska SCORP, the TLRMP, and other management plans; tourism data; and other relevant literature.

3.1 Literature Review and Data Search

To address the data needs for Goal 1 and Goal 2 of the study (recreation inventory and use), CCLLC conducted a literature review and data search to develop a complete list of recreational resources and opportunities within the region, the project vicinity, and the project area. In conjunction, this research collected existing information on recreational use of these resources. Primary sources included:

- USFS TLRMP and Amendment;
- USFS Petersburg Ranger District (PRD) Station Records;
- USGS maps and existing GIS data;
- Tourism and recreational atlases, brochures, guidebooks, and websites;
- Commercial recreation advertisements and websites;
- Alaska Department of Fish and Game (ADFG) harvest records for fish & game in the project area;
- USFS Recreation Facility Master Plan; and the
- USFS Tongass National Forest website, among other sources.

3.2 Recreation Site Inventory

Recreational resources in the study area were identified, inventoried and evaluated through a desktop analysis based on GIS and hard-copy resource maps; USFS,

public agency and private service provider information, as discussed above; USFS, agency, and tourism websites; and other appropriate data sources (See Section 11.0). Recreation sites and opportunities are discussed in a regional context (i.e. major national parks and forests) within the project vicinity, and directly adjacent to the project boundary. Project vicinity recreation opportunities were quantified and described in detail (Section 4.0). Emphasis was placed on opportunities provided by the following project vicinity recreation areas:

1) TNF within the viewshed of the Project;
2) Thomas Bay within the viewshed of the Project;
3) Frederick Sound within the viewshed of the Project; and
4) USFS Visual Priority Travel Routes and Use Areas (VRPUA).

The recreation sites adjacent to the proposed project boundary were also inventoried (Section 5.0). They include (Figure 3-1):

1) Swan Lake Cabin
2) Falls Lake Shelter
3) Cascade Creek Trail
4) Cascade Creek Cabin
5) Spurt Cove Cabin

Recreation opportunities specific to Swan Lake, Falls Lake, Cascade Creek, and Thomas Bay were identified using information from USFS, ADFG, and other agencies, guide and outfitter publications and interviews, and site observations of the study area, as necessary. Potential recreation facilities/access that the Project may provide (e.g. new dock on Thomas Bay) was also identified.

Figure 3-1. Overview Map of Recreation Facilities within the Project area and immediate vicinity

Source: USFS, 2010d, modified

3.3 Outfitter/Guide Survey

According to the USFS Data Survey and Sampling Procedures for Quantifying Recreational Use of Alaska's National Forests (Fay, *et. al*., 2010):

Recent research (Dugan et al. 2009) has demonstrated that business interviews can provide low-cost and fairly comprehensive estimates of total revenue from nature-based tourism activities occurring on or near the Tongass National Forest. In theory, all commercial activity that takes place on the Tongass or Chugach National Forest is associated with a special use permit. However, the compilation and analysis of permit data is difficult and some activity may be occurring without the required permits. We suggest that business

interviews can be used as a reliable way to track overall recreation and tourism activity over time in communities close to Alaska national forests, and could be benchmarked against periodic survey data on forest users. The business interview approach takes advantage of the fact that in the Tongass region, essentially all recreation activities of certain types (e.g., bear viewing) take place on national forest land.

The outfitter/guide mailing list developed by CCLLC consisted of cruise-ship and charter boat tour companies, air charter tour companies, and outfitter/guide companies operating in the Project vicinity. Additionally, CCLLC included individuals holding USFS Special Use Permits (SUP) for commercial activities within the project vicinity.

CCLLC designed its Outfitter/Guide Survey based on the Recreation Study Plan objectives, example tour operator surveys distributed in Alaska and nationally, and USFS Data Survey and Sampling Procedures for Quantifying Recreational Use of Alaska's National Forests (Fay, *et. al*., 2010), among other sources. Questions targeted average annual commercial use, commercial services characteristics, patron characteristics, revenues and business owner demographic information, preferences and opinions of recreational use of the project area and immediate vicinity. The survey included comparative sets of photographs presenting existing conditions and photo renderings of anticipated post construction conditions of each major project facility. CCLLC administered its Outfitter/Guide Survey/Interview to determine:

1) number and duration of trips to the project area and immediate vicinity;

2) specific facilities or features targeted for commercial trips;

3) total number of people participating in commercial trips to the project area and immediate vicinity by month;

4) revenue received from people participating in trips to the project area and immediate vicinity;

5) opinions on potential effects to recreational use of the project area and immediate vicinity by project construction and operations;

6) opinions on potential effects to the aesthetics of the project area and immediate vicinity by project construction and operations; and

7) company information such as location and years in business.

Copies of the mail survey and telephone screener survey are provided in Appendix A

Mail Surveys

Surveys were distributed using a modification of the Total Design Method (Dillman, 2000). The survey instrument was mailed to the entire outfitter list on October 7, 2010 and to the SUP holders on October 25. The survey included a cover letter with instructions to complete and return the form in the provided self-addressed, postage-paid envelope. One week after the initial mailing, a reminder/thank you postcard was sent to all outfitters/guides and SUP holders on the mailing list. Two weeks after the mailing of the postcard, a second copy of the survey instrument, cover letter, and self-addressed, postage-paid envelope was sent to those outfitters/guides and SUP holders who had not yet responded.

Because of the possibility of additional commercial recreation activity being undertaken by registered boaters/pilots that were not previously identified as a commercial outfitter/guide or as a SUP holder, the Outfitter/Guide Survey was also mailed to the entire boater/pilot mailing list on October 12, 2010. This mailing was a one-time effort with no follow up post-cards, reminders, or subsequent survey mailings as commercial recreational use was not the primary expected use for this mailing list.

Phone Interviews

Follow-up phone calls to non-respondents to mail survey effort were conducted between November 8 through November 26, 2010 with phone call efforts concentrated between the hours of 10:00 am and 12:00 pm local time. An initial contact call was made with two subsequent follow up calls made within 4 - 6 days each, if no correspondence was received.

CCLLC developed a screener survey to determine survey applicability to non-respondent outfitters/guides and to serve as a non-response bias check. The screener survey asked whether the outfitter/guide provided services in the project area and immediate vicinity. If outfitters/guides indicated that they did provide

such services and were willing to participate in the survey effort, the Outfitter/Guide survey was administered by the interviewer with slight modifications, as necessary, to conform to time constraints, verbal acuity, and ability to convey information (i.e. before and after viewshed renderings). Outfitters/guides who indicated that they did provide services in the project area or immediate vicinity but were not willing to participate or who indicated they did not provide services in the area of potential effect were asked to answer a few questions on the screener survey regarding location of operation and the types of services provided.

During the initial non-respondent contact and any agreed upon follow-up phone interview (whether conducted concurrently with the initial contact or as a separate telephone interview), the owner of the outfitter business was targeted. In the absence of an owner being available, the manager was targeted for correspondence.

Response Rates

The initial outfitter/guide mailing list consisted of 99 businesses and individuals that were identified as potentially operating in the project area and immediate vicinity. Outfitters who were no longer in business or those who were mis-identified as providing transportation/recreation services in the Thomas Bay/Cascade Creek/Swan Lake area on the initial outfitter list were removed from the list, along with any surveys returned as undeliverable. As a result, the total number of outfitters included in the study was 63. Of these, 23 completed surveys were returned and 2 phone survey interviews conducted for an overall response rate of approximately 40 percent. In addition, eight surveys were received from boater/pilots indicating that they provided commercial recreation opportunities in the project area and immediate vicinity. The 8 additional responses were added to the 25 other responses.

This response rate is considered acceptable and twice that which has been reported for other Outfitter/Guide Surveys distributed in Alaska (McDowell Group, 2000). This is especially well considering the volume of information we

requested from the outfitters and the proprietary nature of the revenue and expenditure information requested.

Follow-up calls were made to contact the 38 non-respondents on the outfitter/guide mailing list to conduct the screener and/or Outfitter/Guide Survey as a means to attempt a comprehensive census of the population and to evaluate non-response bias. However, non-respondents to the mail survey were also not responsive to the attempts to conduct the screener and/or Outfitter/Guide Survey via phone interview. As such, no quantifiable assessment of non-response bias could be conducted.

As with other Alaska Outfitter/Guide Surveys (McDowell Group, 2000), we assume that those who did respond to the Outfitter/Guide Survey were likely to be those with a high interest in the effects of the proposed Project and a good knowledge of the tourism industry in the study area. Non-respondents were assumed to be those with less vested interest in the potential effects of the Project, those less knowledgeable in recreation and tourism, or those individuals who do not operate in the project area and immediate vicinity.

3.4 Resident Boater/Pilot Survey

As acknowledged in the USFS Data Survey and Sampling Procedures for Quantifying Recreational Use of Alaska's National Forests (Fay, *et al*., 2010):

> *Estimating visitor numbers and collecting information on visitor attitudes in Alaska national forests is especially challenging because of the dispersed access to the forests by a relatively small number of visitors. Both the Tongass and Chugach National Forests are millions of acres with miles of saltwater coastline and numerous lakes that allow almost infinite boat and float plane access points. At the same time, few road access points and trailheads exist to concentrate visitors. This dispersed access makes conducting visitor intercept surveys either high cost owing to the large number of intercept sites needed to provide an adequate sample, or less reliable, owing to a smaller number of intercept sites resulting in an inadequate sample*.

To address the issue of dispersed private use and lack of vehicular access to project area, CCLLC assumed the primary means of access for non-commercial recreation use was by private boat or plane. Accordingly, CCLLC targeted registered boaters and private pilots within local communities to provide information regarding use levels, recreation activity seasons, and opinions on the potential effects of project construction and operation on the recreation experience and visual quality of the project area. CCLLC obtained a mailing list of registered boats and float planes in the Petersburg, Wrangell and Kake areas from state records and distributed the Resident Boater/Pilot Survey to these individuals

The Resident Boater/Pilot Survey was designed based on the Recreation Study objectives. It incorporated aspects of similar boater surveys administered in the area such as the Boating in Alaska Survey administered by the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation (AKPOR) (AKPOR, 2010) and the Whittier Small Boat Harbor Survey administered by the US Army Corps of Engineers (USACE) (USACE, 2007), among other sources. As with the Outfitter/Guide Survey, the Resident Boater/Pilot Survey included questions characterizing recreational use of the project area and immediate vicinity, expenditures, and recreator preferences and opinion, as well as socio-demographic characteristics. The survey included comparative sets of photographs presenting existing conditions and photo renderings of anticipated post-construction conditions of each major project facility. The Resident Boater/Pilot Survey was administered to determine:

1) number of trips to the project area and immediate vicinity per month and length of stay in the project vicinity;

2) group size

3) recreation activities;

4) scenic attributes and detriments;

5) quality of recreation areas/facilities;

6) expenditures; and

7) demographic information such as residence, age, and income.

Site specific questions were asked to address:

1) preferences for additional recreation facilities and/or access;

2) opinions of scenic and recreation attributes in the project area and immediate vicinity;

3) opinions of seasonally variable water flows in Cascade Creek; and

4) effects of project structures on visual quality in viewsheds including Thomas Bay, Swan Lake, and Cascade Creek.

A copy of the mail survey is provided in Appendix A.

Mail Surveys

The Resident Boater/Pilot Surveys were administered as a mail return survey following a modified Tailored Design Method (Dillman, 2000). An initial contact postcard was sent to the entire boater/pilot mailing list on October 19. The Resident Boater/Pilot Survey was mailed to the entire boater/pilot mailing list on October 20. Two weeks after the mailing of the initial Resident Boater/Pilot Survey, a second copy of the survey, cover letter, and self-addressed postage-paid return envelope was sent to non-respondents.

Response Rates

Residents misidentified on the initial registered boater and registered pilot lists as residing permanently in Petersburg, Kake or Wrangell were removed from the population, along with other surveys returned as undeliverable. As a result, the total population of resident boaters and pilots included in the study was 1,232. Of these, 284 Resident Boater/Pilot Surveys were returned for an overall response rate of approximately 23 percent.

This response rate is considered acceptable and in line with other recent survey efforts conducted by the state of Alaska to quantify public recreation and visitation in the state (McDowell Group, 2008). Collection of data was not attempted from non-respondents. Privacy issues preclude the state's distribution

of telephone or other contact information. As such, no quantifiable assessment of non-response bias was made.

3.5 Survey Data Analysis

As a means of quality control and consistent with standard data management practice, all of the original completed surveys received from both user groups (outfitters/ guides and resident boaters/pilots) were photocopied and survey responses were numerically coded on the copied survey data sheets. All surveys were subjected to a thorough editing process to resolve any issues with missing data, ambiguous responses, refusals, outliers, or other potential respondent errors. Any issues in interpretation of data or problems that occurred during the process were addressed. All coded data was double data entered in the SPSS Data Entry software module.

The data were prepared and processed using SPSS Data Entry software, data verification procedures, and computerized data cleaning routines within the SPSS software package to identify and correct out-of-range codes, incorrect skip patterns and internal inconsistencies within a data record prior to finalizing a clean data set for each survey type for data analysis. The survey responses were analyzed in SPSS for basic frequencies and means for questions concerning respondent demographics, respondent opinions and preferences, and expenditures. These results are presented in Section 6.0 and in Section 7.0.

Survey results are subject to recall bias. Recall bias occurs when respondents have difficulty correlating their activity to the time period requested. Recall bias typically produces overestimation of recreation participation. Respondents tend to round upward when recalling recreation participation. They may apply average participation from a "typical" year rather than the requested time frame, may unintentionally report preferred rates of participation rather than actual participation, and/or may inadvertently extend the time frame (Tarrant, et. al, 1993). Recall bias is unlikely to be a factor in outfitter/guide reported commercial use as these businesses keep records detailing trips and number of customers. It may have an effect on public boater/pilot reported use.

3.6 Current Recreation Use Estimates

The USFS provided recreation use data for Cascade Creek, Swan Lake, and Spurt Cove cabins. Additional use was estimated from the Outfitter/Guide and Resident Boater/Pilot survey data, as discussed below. Use estimates derived from survey data are reported in recreation visitor days (RVD). RVD as defined by the USFS is 12 hours of recreational use (for example, one individual recreating for 12 hrs or 12 individuals recreating for 1 hr) (USFS, 2009b).

Outfitter/Guide Use Estimates

Outfitter/Guide respondents were asked to identify how many visits they made to Thomas Bay, Swan Lake, and Falls Lake/Cascade Creek for commercial recreation purposes in the previous 12 months (October 2009 through September 2010). The survey also asked Outfitter/Guide respondents to indicate the average length of all trips (in total hours) they make to the project area and immediate vicinity and the average group size for such trips.

Total estimated use by Outfitters/Guides by recreation location was calculated by the following equation:

$$\text{Total Use (in RVD)} = \sum_{x=1}^{n} \left\{ [(\text{Number of reported trip days per month}) * (\text{average trip length}) / 12 \text{ hours}] \right\} * \left\{ \text{average group size per trip} \right\}$$

While the Outfitter/Guide Survey solicited information regarding the total number of customers served per month at each of the three locations, the reported average group size was used in the RVD calculation. This may have resulted in overestimation as there is likely seasonal group size variation that may not be fully captured by the reported average group size per trip.

Resident Boater/Pilot Use Estimates

Resident boater and pilot use estimates were calculated in a similar manner as outfitters and guides; however, respondent use reports were assumed to be a

representation of personal use by the responding individual, as compared with the reported visitation by outfitters and guides which includes all commercial customers per reported trip. As there is no direct access to the project area aside from boats and planes, aside from commercial outfitter/guide customers, resident boater/pilot are assumed to have the only means to access the project area and immediate vicinity for recreational use. As such, potential resident boater/pilot use estimates were extrapolated up to the entire population of registered boaters and pilots to capture the total population of potential resident visitations.

There were a total of 725 resident boaters/pilots identified on the state list as residing in Petersburg, 455 were reportedly from Wrangell, and 49 had addresses in Kake. Use estimates were extrapolated to community population to account for the fact that Petersburg residents reported higher average use levels than those of Wrangell and Kake. Average use (estimated as the mean of calculated RVDs per month) per community was then multiplied by the total number of resident boater/pilots in each community. Total estimated use by Resident Boaters/Pilots by recreation location was calculated by the following equation:

$$\text{Total Use (in RVD)} = \left\{ \bar{x} \left[(\text{Number of reported trip days per month} * \text{average trip length}) / 12 \text{ hours} \right] \right\} * \left\{ \text{Total \# of boater/pilots per city} \right\}$$

Reported use for boaters and pilots were converted to average RVDs per month and location and extrapolated to the population (per Pollock, *et. al.* (1994).

3.7 Future Recreation Use Estimates

Population growth is the major driver of participation in outdoor recreation (Cordell, 2004). Cordell *et al*. (2004) reports "Population has been, is, and will be the major driver of outdoor recreation participation growth in this country." As recreation activity is dependent upon a variety of other factors with a significant level of uncertainty associated with them (e.g. leisure time, discretionary income, new technologies) predicting future recreational use over the next 25-50 years is approximate.

Estimated projections of future recreation use were developed based on projected population increases. Population growth projections over the next 25 years was obtained in 5 year increments from the Alaska Department of Labor (ADL, 2010), for the Wrangell Petersburg Census Area. To extend participation projections to the term of the license for the Project, the average growth rate was estimated for the 25 year period (2010 – 2034) and applied to the additional 25 years (2034 – 2059). Growth rates over the 5 year increments were applied to recreation use estimates developed from the Outfitter/Guide and Resident Boater/Pilot survey data.

4.0 REGIONAL RECREATION OPPORTUNITIES

Alaska is home to 322 million acres of public lands available for recreation, with about 168 million acres of Alaska specifically managed for wildland recreation. The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) has placed approximately 105 million acres[3] of federal lands in Alaska in the nation's conservation, wilderness, and recreation systems, wild and scenic rivers, forests, wildlife refuges, and parks. A total of approximately 82.4 million acres of federal lands and approximately 400,000 acres of state lands are designated as wilderness (APOR, 2009). The ANILCA also provided for use of motorized vehicles and construction of cabins, fisheries and aquaculture facilities, and other structures in these wilderness areas, in recognition of the unique conditions in Alaska (USFWS, 1980; Willis, 1985).

Much of the recreation activity in the state of Alaska are outdoor pursuits such as hiking, fishing, bird/wildlife watching, backpacking, and foraging, which are identified in the 2009 Alaska Statewide Comprehensive Outdoor Recreation Plan (SCORP) as the most popular activities in which residents of Alaska participate (APOR, 2009).

4.1 Southeast Alaska

Southeast Alaska supports approximately 10 million acres of forestland, over 1,000 islands and has approximately 10,000 miles of shoreline (Miller, 2008). Federal lands comprise about 95 percent of all of southeast Alaska, with about 80 percent belonging to the TNF and a predominant portion of the rest of the land belonging to Glacier Bay National Park and Preserve (GBNPP) (USFS, 2008a).

Most of Alaska's southeast region is administered by the USFS as part of the TNF, the lands of which, while not managed exclusive for recreation, are available to the general public for recreation purposes. The NPS manages 3.3 million acres and three park units, including the GBNPP. The ADNR, Division of Parks and Outdoor Recreation (APOR) manages about 80,000 acres and 34 park units, including 16 marine parks in southeast Alaska (APOR, 2009). The ADFG manages two state wildlife refuges, two critical habitat areas, and a wildlife sanctuary (Stan Price State Wildlife Sanctuary) in

[3] 43,600,000 acres of NPS lands; 53,720,000 acres of National Wildlife Refuge System lands; 2,200,000 acres of National Conservation/Recreation Area lands; and 5,500,000 acres of National Forest System lands

southeast Alaska (APOR, 2009; ADFG, 2011a). The Alaska Division of Forestry manages 286,000 acres in the Haines State Forest, which provides opportunities for hunting, fishing, camping, hiking, and winter recreation, among other activities (ADF, 2010).

Recreation opportunities of the southeast Alaska region are largely provided by the GBNPP, Admiralty Island National Monument, and the TNF (Figure 4-1).

Figure 4-1. Regional Recreation Opportunities.

4.1.1 Glacier Bay National Park and Preserve

The GBNPP lies west of Juneau, Alaska on the mainland approximately 145 miles northwest of the project area and are accessible only by plane or boat (NPS, 2010c). The combined lands of GBNPP include 3.3 million acres (3.283 million acres within the national park and 57,800 acres within the preserve) which receive approximately 450,000 visitors annually (NPS, 2000; NPS, 2010e).

Many visitors to the GBNPP arrive as passengers on board cruise ships, tour boats, charter boats, or their own private vessels (NPS, 2010a). Visitors may also stay overnight in the Park at Glacier Bay Lodge at Bartlett Cove or outside of the Park in the nearby town of Gustavus. Lodging is available in the Preserve at several private commercial cabins and at a USFS public use cabin. Camping is available at the Bartlett Cove campground with backcountry camping available throughout the GNBPP, though some areas are closed to campers due to animal activity or resource protection.

Sport hunting and trapping are permitted on preserve lands, but not within the Park. There are approximately 57,800 acres of land open to hunting grounds in the Preserve, accessible through Dry Bay, Alaska located at the northwest end of the GNBPP (NPS, 1989). In addition, there are thirty privately operated, commercial fishing camps in the Preserve offering boats, vehicles, and fishing equipment (NPS, 2010c).

Visitors to the GBNPP also participate in sea kayaking with over 700 miles of shoreline within the GBNPP (NPS, 2010e). Guided kayak tours and rentals are available within the Park and camping kayakers are required to attend an NPS orientation prior to departure (NPS, 2010f). White water rafting or kayaking is available on the Alsek and Tatshenshini Rivers.

Guided boat and land tours, mountaineering, trail and back-country hiking, and wildlife viewing, including whale watching are also available within the GBNPP. There are four maintained hiking trails in GBNPP. The Forest Loop Trail traverses temperate rainforest and the beach area of Bartlett Cove. The Bartlett River Trail covers approximately 4 miles roundtrip through spruce and

hemlock forest, an intertidal lagoon, ending at the Bartlett River estuary. The Beach Trail extends along the shoreline south of the docks in Bartlett, and the Barlett Lake Trail extends 8 miles roundtrip from the Bartlett River Trail to Bartlett Lake (NPS, 2010h). Backcountry and off-trail hiking and mountaineering opportunities also occur throughout the GBNPP (NPS, 2010d).

4.1.2 Tongass National Forest

Stretching the entire length of the southeast Alaskan coastline and comprising approximately 77 percent of region's land, the TNF is the largest national forest in the United States (Readicker-Henderson, 2006). About 35 percent or 5.9 million acres of the TNF is congressionally-designated Wilderness, which includes 17 separate Wilderness Areas, discussed in Section 4.1.5 below (USFS, 2011a). The majority of lands within the TNF are open to hunting, fishing, and other mostly non-motorized recreation activities; although some areas are off limits such as wildlife sanctuaries or residential areas.

The TNF provides users a variety of recreational opportunities and wilderness experiences. These activities are accommodated by the 150 rustic cabins, 28 shelters, and 15 campgrounds located throughout the TNF, as well as multiple roadless lands and over 100 hiking trails within the TNF (USFS, 2008a; USFS, 2010a). Generally, most formal recreational facilities are only accessible via boat or plane, although some cabins are on local community road systems. Specifically, the Alaska Marine Highway provides access through the Inside Passage and serves the TNF; however, due to historic and current timber management in the TNF, there are also a number of roads throughout the forest. The two major roads into the TNF are the Klondike Highway (Route 2) which leads into Skagway and the Haines Highway (Route 7) which leads into Haines, Alaska (USFS, 2008a).

The fishing opportunities within the TNF are seemingly endless and are supported by a vast number of freshwater lakes, creeks, and streams as well as coastal saltwater fishing opportunities. Forest-wide, the USFS classifies approximately 27,387 acres of river as providing recreational opportunities

(USFS, 2008a). For example, Prince of Wales Island accounts for only a portion of the TNF and yet has over 9,000 miles of stream and 46,000 acres of lakes supporting both anadromous and resident fish (USFS, 2011a). . The popular sport fish available in the TNF include king, coho, pink, sockeye, and chum salmon; Dolly Varden; cutthroat, rainbow, brook, and steelhead trout; Pacific cod, sablefish, walleye, rockfish, sculpin, dogish, Pacific halibut, turbot, and sole (USFS, 2011a). Both canoeing and kayaking opportunities are also available in the TNF. In the Petersburg area alone, there are approximately 442 miles of recognized ocean routes for extended canoe and kayak trips (USFS, 2011a).

In general, all game species of Alaska can be hunted or trapped in the TNF, including brown and grizzly bear, mountain goat, sitka black-tailed deer, elk, moose, beaver, coyote, red fox, lynx, marten, mink and weasel, muskrat, river otter, squirrel and marmot, wolf, and wolverine (ADFG, 2011Ab). Other land-based recreation opportunities including hiking, picnicking, and wildlife viewing are also available in the TNF. There are approximately 106 formal hiking trails in the TNF. They range from short day hikes to extended back-packing trips. The trails are scattered throughout the TNF in Misty Fiords, Prince of Wales, Ketchikan, Wrangell, Petersburg, Kake, Sitka, Hoonah, and Admiralty Island (USFS, 2011a). In addition, there are approximately 22 formal picnic areas in the TNF (USFS, 2005). Picnic areas may include a variety of facilities such as picnic tables, trash receptacles, shelters, outhouses, potable water and fire rings. Wildlife viewing is available throughout the TNF, however there are four recognized bear-viewing areas: Anan Creek, Fish Creek, Margaret Creek, and Pack Creek (USFS, 2011a). Other wildlife such as birds, fish, and mountain goat can also be observed at Summit Lake, Mendenhall Glacier, Steep Creek Fish Viewing, Suntaheen Creek Fishpass, Pavlof Marsh, Starrigavan Bird Viewing Platform, Blind Slough, Stikine River Flats, and Ward Lake (USFS, 2011b).

In the winter, the TNF offers visitors a number of cross-country ski trails, snowmobile trails, and snowshoeing opportunities. Generally, winter time activities are closely associated with the Eagle Glacier Memorial, Dan Moller,

John Muir, Peterson Lake, Winfall Lake, and Ravens Roost USFS cabins (USFS, 2011a).

4.1.3 Admiralty Island National Monument

Admiralty Island National Monument (AINM) covers almost 1 million acres within the TNF and is managed by the USFS. The eastern coast of AINM is located approximately 50 miles northwest of the project area. The island encompasses old growth rain forest, alpine tundra, and rugged coastline. A portion of the Monument is designated as the Kootznoowoo Wilderness (KW), which covers approximately 937,000 acres and contains 14,293 acres of fresh water lakes and streams and 825 miles or shoreline (USFS, 2010c; USFS, 2010g). Admiralty Island is accessible by boat, plane or the Oliver Inlet Tram. The Tram is capable of hauling gear such as kayaks and canoes.

Fishing opportunities on the Island include both freshwater and saltwater. Eleven freshwater lakes on the Island provide opportunities for cutthroat trout, Dolly Varden, steelhead trout and rainbow trout. Saltwater fish harvested in the AINM include various species of salmon: coho, Chinook, sockeye, pink and chum (USFS, 2010h). Hunting for Sitka black-tailed deer, brown bear and small game such as beaver is popular in the AINM.

Most hiking trails on the Island are in the lakes region and are used for portaging. There are no maintained trails for long-distance hikes (USFS, 2010d). There are 14 USFS cabins located on Admiralty Island for overnight visitors. Backcountry camping is also available (USFS, 2010d).

Admiralty Island is home to an estimated 1,500 brown bears; more than all the lower 48 states combined. It also supports harbor seals, Stellar sea lions, humpback whales, and Sitka black-tailed deer populations. Visitors may view the brown bears during the summer at the Pack Creek Brown Bear Viewing Area. The Stan Price Bear Sanctuary, which includes the Pack Creek Brown Bear Viewing Area, is the only national wildlife sanctuary in southeast Alaska (USFS, 2010c; ADFG, 2011a).

Sea kayaking is available along the coastal shoreline of the Island and in Seymour Canal for experienced individuals or with a guide. The Cross Admiralty Canoe Route is also a popular recreational activity on the Island. The trailhead begins in Mole Harbor, the east end of Mitchell Bay and is approximately 32 miles long. The Canoe Route links seven of the eleven mountain lakes of Admiralty Island. There are seven USFS shelters and five USFS cabins available along the canoe trail for paddlers (USFS, 2010d).

4.1.4 Misty Fiords National Monument

Misty Fiords National Monument encompasses 2,294,343 acres in total and is located within the TNF. Of lands included in the National Monument, almost all (2,142,243 acres) have been designated as wilderness, making it the largest wilderness area within the TNF (USFS, 2011d). Misty Fiords is located on the southern tip of the Alaska Panhandle approximately 130 miles southeast of the Project. Coastal temperate rainforest characterizes the area. Misty Fiords provides visitors with a variety of recreational opportunities including fishing, hunting, hiking, boating, camping, beach combing and wildlife viewing. Of the 151 USFS cabins in the TNF, there are 13 located in Misty Fiords and 5 of the total 28 shelters in the TNF are within Misty Fiords (USFS, 2011a). The cabins and shelters are located in remote areas that are only accessible by boat or floatplane.

The fishing opportunities at Misty Fiords include both freshwater and saltwater. In coastal areas and bays, such as Alava Bay, there are public mooring buoys available for fishing boats (USFS, 2011a). The freshwater lakes of Misty Fiords like Manzanita Lake and Hugh Lake provide freshwater fishing opportunities for cutthroat trout, Dolly Varden, sockeye salmon, and land-locked salmon (USFS, 2011a). Hunting is also allowed at Misty Fiords and game species include Sitka black-tail deer, mountain goat, brown and black bear, beaver, mink, and marten (USFS, 2011a). Hunting and wildlife viewing opportunities abound, although areas specifically identified for these activities in Misty Fiords include Manzanita Lake, Alava Bay, Checats Lake, Ella Lake and Wilson Lake (USFS, 2011a).

Sea kayaking is also a popular recreational activity in Misty Fiords. In addition to the numerous coves and inlets located on the fiord, a 150 mile sea kayak route occurs along the shoreline of Revillagigedo Island (USFS, 2011e). In Misty Fiords, there are approximately 11 formal hiking trails that provide hikers with over 20 miles of trail ranging in length from 0.5 to 4.8 miles (USFS, 2011a). The trails are scattered throughout Misty Fiords, although most are associated with existing USFS cabins and shelters that follow lakes and coves.

4.1.5 Wilderness Areas

Wilderness areas in the region include those contained within other specially designated and managed areas, such as the Kootzwoonoo Wilderness within the Admiralty Island National Monument, the Misty Fiords Wilderness contained within the Misty Fiords National Monument, and additional wilderness areas contained within the TNF listed below (Wilderness.net, 2010; USFS, 2011c):

- Chuck River Wilderness – 74,900 acres
- Coronation Wilderness – 19,232 acres
- Endicott River Wilderness – 98,729 acres
- Karta River Wilderness – 39,894 acres
- Kuiu Wilderness – 60,581 acres
- Maurelle Islands Wilderness – 4,937 acres
- Petersburg Creek-Duncan Salt Chuck Wilderness – 46,849 acres
- Pleasant, Lemesurier and Indian Islands – 23,151 acres
- Russell Fiord Wilderness – 348,701 acres
- South Baranof Island Wilderness – 319,568 acres
- South Prince of Wales Wilderness – 90,968 acres
- South Etolin Wilderness - 83,619 acres
- Stikine - LeConte Wilderness – 448,926 acres
- Tebenkof Bay Wilderness – 66,812 acres
- Tracy Arm-Fords Terror Wilderness – 653,179 acres
- Warren Wilderness – 11,181 acres
- West Chichagof-Yakobi Wilderness – 265,286 acres

The Petersburg Creek-Duncan Salt Chuck Wilderness, Stikine - LeConte Wilderness, and Tracy Arm-Fords Terror Wilderness are all located within 20 miles of the project area and are discussed in greater detail in Section 4.2.

Other regional wilderness areas not contained within the TNF include the Forrester Island Wilderness and the Saint Lazaria Wilderness. Forrester Island Wilderness is a small 2,832 acres island that is located to the southwest of Prince of Whales Island (UOM, 2011a). Forrester Island was established as a wildlife refuge in 1912 and later designated as Wilderness in 1970 by the USFWS (UOM, 2011a). In 1980, Forrester Island was included in the Gulf of Alaska Unit of the Alaska Maritime National Wildlife Refuge (UOM, 2011a). Forrester Island provides nesting habitat to 13 species of seabirds (UOM, 2011a). In addition, marine mammals such as sea lions may be observed hauling out along Forrester Island.

There is no motorized equipment or mechanical transport allowed on Forrester Island, and visits must be planned and approved through the Alaska Maritime National Wildlife Refuge (UOM, 2011a). Sport salmon fishing typically occurs along the eastern side of Forrester Island and commercial sea cucumber and red urchin harvests occur throughout waters surrounding the wilderness area (ADNR, 2008).

Saint Lazaria Wilderness (Saint Lazaria) is an even smaller island (65 acres) and is located in Sitka Sound between Kruzof and Baranof Islands (UOM, 2011b). Saint Lazaria was established as a wildlife refuge in 1909 and was later designated as Wilderness in 1970 by the USFWS (UOM, 2011b). The island serves as an important nesting area for seabirds such as petrels, tufted puffins, murres, pelagic cormorants, and glaucous-winged gulls (USFWS, 2011). These species can be observed from the water by sea kayak, although people are not allowed to land on the island in order to avoid disturbing burrowing seabirds (UOM, 2011b).

4.2 Project Vicinity Recreation Opportunities

Outdoor recreation opportunities in the project vicinity, an approximately 20 mile radius surrounding the project area, occur primarily on national forest lands in the TNF (Figure 4-2). The project vicinity, which includes the surrounding TNF lands, Thomas Bay and the communities of Petersburg, and Wrangell, and Kake provide a wide array of

recreation opportunities that are generally traditional outdoor pursuits such as fishing, hunting, boating, kayaking/canoeing, hiking, cross-country skiing, snowshoeing, wildlife watching, sightseeing, and camping.

Recreational opportunities within the TNF and the project vicinity include camping at USFS cabins and shelters, and a private campground, freshwater and saltwater fishing, hunting, boating, cruises, wildlife viewing, and hiking. Each type of recreational activity available in the project vicinity is described in greater detail below.

Figure 4-2. Recreation Facilities in the Project Vicinity

4.2.1 Angling Opportunities

There are at least twelve documented freshwater fishing sites and five saltwater sites within the project vicinity (Table 4-1). It is likely that there are lesser known fishing opportunities undocumented by USFS or ADFG. Like Swan Lake, the majority of the project vicinities' fishing sites are remote and are only accessible by boat (via hiking trail) or float plane. Specifically, Colp and Scenery Lakes are only accessible by hiking wilderness trails that follow the associated Colp Lake Trail, and Scenery Creek with trailheads accessible by boat and/or float plane (USFS, 2009). DeBoer Lake is accessible only by float plane, and has remote features and species similar to Swan Lake.

The ADFG reports a total of between 47,406 and 61,372 angling days annually from 2003 through 2008 (Table 4-2). Recreational use data for Thomas Bay specifically was only delineated in 2008, with a total of 1,176 angling days participated in by an estimated 473 total anglers. Comparatively speaking, Thomas Bay received the lowest recreational use for angling activities compared with other areas in the project vicinity and surrounding area, accounting for only 2.7 percent of total angling use reported in 2008. For those areas within the project vicinity specifically (areas around Petersburg, Frederick Sound, and Thomas Bay), angling use of Thomas Bay accounted for approximately 8 percent of the total project vicinity use.

Table 4-1. Project Vicinity Freshwater and Saltwater Fishing Opportunities

Name of river, lake, or creek	Location in relation to the project area	Access	Fish
Freshwater Fishing Sites			
Petersburg Creek	17 miles west to the mouth of Petersburg Creek.	Boat and float plane access only.	Salmon: Chum, Coho, Pink, Sockeye, Dolly Varden Trout: Cutthroat, Rainbow, Steelhead.
Petersburg Lake	19 miles west; in Petersburg.	Boat and cabin on site. Access by float plane (ice out) or helicopter (frozen.) Access by boat or floatplane to trailhead, then 4.5 miles by trail up Petersburg Creek (Petersburg Lake Trail).	Salmon: Chum, Coho, Pink, Sockeye, Dolly Varden Trout: Cutthroat, Rainbow, Steelhead.
Twelvemile Creek	12.5 miles northwest; on northern tip of Lindenberg Peninsula.	Boat access only.	No waterbody specific information available.
Colp Lake	14.7 miles west; on western coast of Lindenberg Peninsula.	Access to trailhead by boat or float plane, then 2.4 miles by trail up Five Mile Creek (Colp Lake Trail).	No waterbody specific information available.
Fivemile Creek	13 miles west to mouth of Fivemile Creek; on western coast of Lindenberg Peninsula.	Boat access only.	No waterbody specific information available.
Scenery Creek	4 miles north to mouth of Scenery Creek; near Thomas Bay.	Boat and float plane access only.	No waterbody specific information available.
Scenery Lake	4 miles northeast; near Thomas Bay.	Boat and float plane (ice out) or helicopter (frozen) access only.	No waterbody specific information available.
Muddy River	9 miles southwest to the mouth of the Muddy River; near Frederick Sound.	Boat access only.	No waterbody specific information available.

Name of river, lake, or creek	Location in relation to the project area	Access	Fish
Patterson River	5 miles southwest to the mouth of the Patterson River; near Frederick Sound.	Boat access only.	No waterbody specific information available.
Farragut River	18 miles northwest to the mouth of the Farragut River; near Farragut Bay.	Boat access only.	King Salmon
Spurt Lake	5 miles northwest	Access by boat or float plane to trailhead then 1.5 miles up the Spurt Lake Trail	Cutthroat Trout
De Boer Lake	8 miles northwest; mainland Alaska.	Boat and cabin on site. Float plane (ice out) or helicopter (frozen) access only.	Rainbow Trout
Saltwater Coastal Sites			
Petersburg Harbor	17 miles southwest.	Boat or float plane access only.	Salmon: King. Coho, Dolly Varden Other: Halibut
Cape Strait	12.5 miles northwest; on northern tip of Lindenberg Peninsula.	Boat or float plane access only.	Salmon: King, Coho Other: Halibut
Beacon Point	15 miles west; on western coast of Lindenberg Peninsula.	Boat or float plane access only.	King Salmon
Frederick Point/Sound	Frederick Point is approximately 17 miles southwest on Kupreanof Island.	Boat or float plane access only.	Salmon: Chum, Coho, King, Pink, Dolly Varden Other: Halibut, Rockfish
Thomas Bay	At mouth of Cascade Creek.	Cabins on site (Spurt Cove and Cascade Creek). Boat or float plane access only.	King Salmon and Halibut.

*Distances based on air miles.

Source: (DeLorme, 2010); (ADFG, 2010i); (USFS, 2009b)

Table 4-2. Total Angling Days (2003 – 2008) for the Project Vicinity

	Total Angling Days Annually				
	2003	**2004**	**2005**	**2006**	**2008**
SALTWATER					
Thomas Bay					1,176
Terminal Harvest Area near Petersburg (in Wrangell Narrows) - Boat	1,789	3,404	2,474	11,902	8,452
Frederick Sound near Petersburg - Boat	7,576	9,181	7,440	2,732	1,363
Petersburg Road System - Shoreline	693	2,330	778	701	
Rest of Petersburg Area - Boat	2,928	5,385	5,929	6,471	2,663
Wrangell Narrows - Boat	7,439	8,332	9,174		7,559
Wrangell Area - Boat				1,771	7,705
Other Wrangell Area - Boat				12,027	
Kake Area - Boat	1,650	2,231	1,779	510	7,559
Sumner Strait - Boat			881		4,660
Other Boat	2,380	4,355	2,463	4,679	1,691
Other Shoreline	537	1,840	1,629	601	1,744
Saltwater Total	**25,478**	**37,058**	**32,547**	**41,394**	**43,396**
FRESHWATER					
Blind Slough (in Wrangell Narrows)	3,990	3,438	2,469	2,591	2,393
Petersburg Creek	1,647	2,230	614	1,050	1,051
Other Streams	4,262	3,890	2,627	3,297	3,352
Other Lakes	1,065	1,103	1,590	1,188	2,192
Freshwater Total	**10,964**	**10,661**	**7,300**	**8,126**	**8,988**
Grand Total	**47,406**	**58,380**	**47,147**	**57,646**	**61,372**

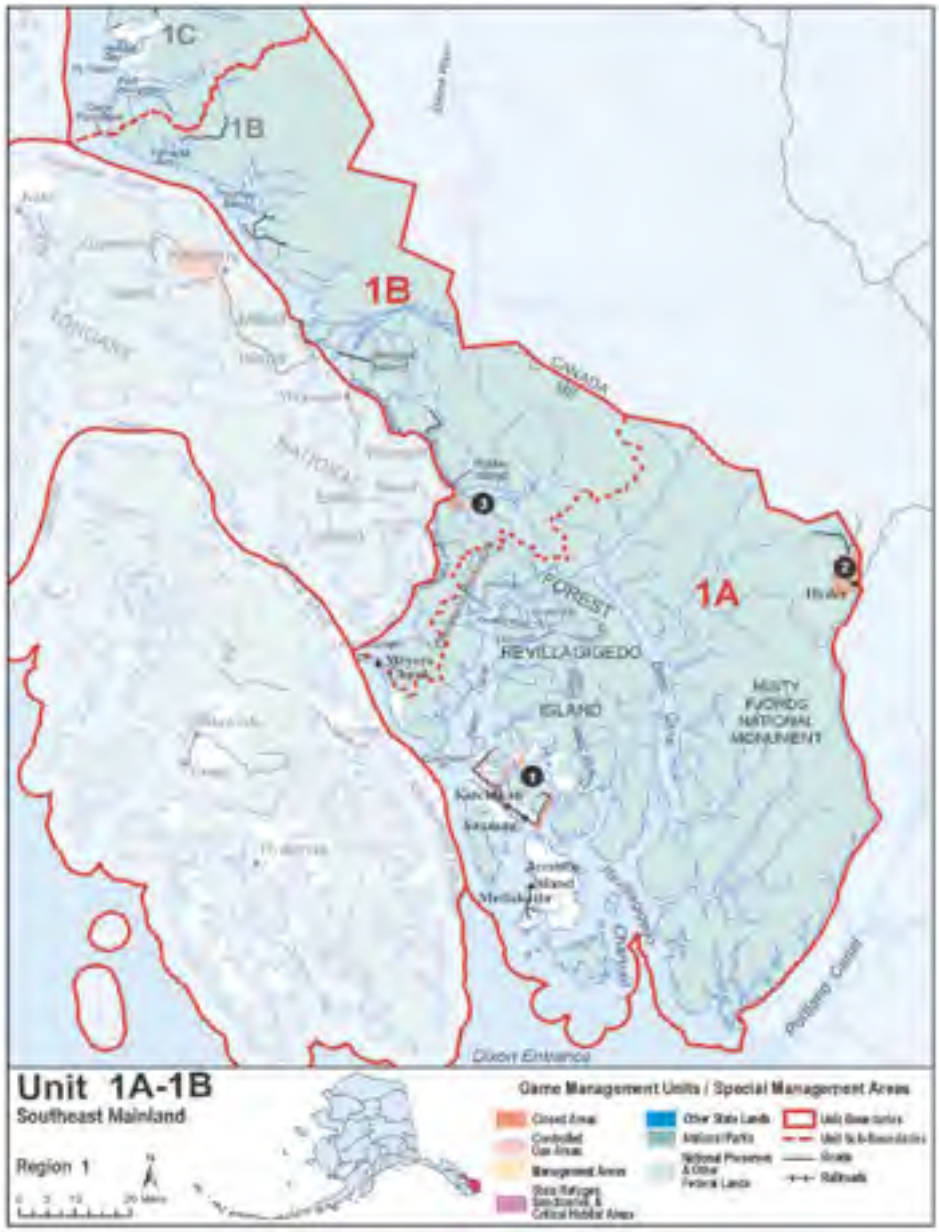
Note: 2007 data were unavailable

4.2.2 Hunting Opportunities

The project vicinity includes lands within the TNF that the ADFG manages for hunting, including game management units (GMU) 3, 1B, and 1C. The Petersburg-Wrangell GMU 3 extends from the Coronation Islands and Ernest Sound in the south to the community of Kake in the north. The GMU 3 also includes the communities of Petersburg and Wrangell and portions of Frederick Sound. The game species available for hunting in GMU 3 include brown bear, elk, moose deer, and black bear. Hunting for these species involves specific seasonal and non-resident restrictions. Additionally, a portion of GMU 3 is restricted to specific hunting methods. A strip one-fourth mile wide on each side of the Mitkof Highway from the Petersburg city limits to the Crystal Lake Campground is closed to the taking of big game, except wolves (ADFG, 2010j).

The Southeast Mainland GMU 1 includes the sub-unit GMU 1B, in which the proposed Project is located. GMU 1B extends across the mainland from Frederick Sound in the west to the Canadian border and from Farragut Bay in the north to Ernest Sound in the south (Figure 4-3). Game species occurring in GMU 1B include, brown bear, grizzly bear, mountain goat, moose, elk, deer, and black bear. The Anan Creek Closed Area is the only restricted area within GMU 1B. This area is closed to the taking of black and brown bears (ADFG, 2010j).

Figure 4-3. ADFG Game Management Unit 1B



Source: ADFG, 2010j

GMU 1C is also part of the Southeast Mainland GMU 1 and is located to the north of the Project. This sub-unit extends from the ocean to the Canadian border and from Cape Fanshaw in the south to Glacier Bay National Park in the north. Species available for hunting in this GMU include brown, black and grizzly bear; mountain goat; moose; elk; and deer, although the GMU 1C has a fair amount of restricted areas compared with other sub-units within GMU 1. The Douglas Island Management Area also has various restrictions in certain locations such as limitations on the hunting and trapping of wolves and deer conservation provisions (ADFG, 2010j).

4.2.3 Hiking Trails

Public use hiking trails are available throughout the TNF and are key to providing access to additional remote recreation opportunities at remote lakes, and hunting. There are six USFS maintained hiking trails located within approximately 20 miles of the project area in the TNF (USFS, 2010l; USFS, 2010m).

- **Spurt Lake Trail** - The Spurt Lake Trail trailhead can be reached by boat or floatplane, beginning on the shore of Thomas Bay, approximately 5 miles northwest of the project area. The trailhead is also accessible by a 0.25 mile spur trail from the USFS Spurt Cove Cabin. The Spurt Lake Trail is approximately 1.5 miles in length and rated as "more difficult" due to its steep profile. The Trail begins on the shore of Thomas Bay, about 0.25 miles northeast of the Spurt Cove Cabin. The Trail follows the base of a vertical rock wall and traverses through mature forest and semi-open muskeg to Spurt Lake where visitors can fish for cutthroat trout from a small boat provided by the USFS.
- **Raven Trail** - This Trail is located in Petersburg, approximately 18.5 miles southwest from the project area. The trail is open year-round and is a part of a larger complex of cross-country ski trails. The Trail begins near the Petersburg water tower and ends at the USFS Ravens Roost Cabin. The Ravens Trail has a rating of "more difficult" due to its steep profile. The Trail is also accessible by hiking or skiing 5 miles up the Twin Ridge Ski Trail from the Twin Creek Road. The Raven Trail traverses through forested areas, open, subalpine, meadow, and muskeg. An overlook approximately one mile into the trail offers views of Frederick Sound, Wrangell Narrows and the mainland.

- **Petersburg Lake Trail** - The Petersburg Lake Trail is mostly located in the Petersburg Creek – Duncan Salt Chuck Wilderness (PCW) on Kupreanof Island, approximately 17.5 miles southwest from the project area. Two trailheads are available: one is only accessible by boat or float plane under favorable tide conditions and continues 6.5 miles to Petersburg Lake; the other begins at the Kupreanof Island State Boat Dock and follows Petersburg Creek to end after 10.5 miles at the Petersburg Lake Cabin. The beginning of the trail at the dock follows an old road bed for 800 feet, continues uphill 4 miles along Petersburg Creek, where it is intercepted by the high tide trailhead, and continues through forested areas and muskeg for 6.5 miles to Petersburg Lake and Cabin.
- **Petersburg Mountain Trail** - The Petersburg Mountain Trail begins at the same location as the Petersburg Lake Trail (Kupreanof State Boat Dock) and follows an old road bed which parallels the shore. Approximately 1.5 miles from the trailhead, the Trail leaves the road bed and begins climbing steadily up the mountain through mature forest. This stretch extends for approximately 1.5 miles to the saddle where the trail becomes indiscernible (hikers must follow the blue trail markers to the peak). An anchored cable near the summit assists the climb. This Trail is rated as the "most difficult".
- **Colp Lake Trail** - The Colp Lake Trail provides access to Colp Lake from the mouth of Fivemile Creek in Frederick Sound, approximately 15 miles southwest of the proposed Project. The Trail begins 200 feet north of Fivemile Creek and initially passes through a small stand of timber before climbing the creek valley, primarily through muskeg. The trail crosses the creek at approximately the midpoint to Colp Lake, which offers fishing for cutthroat trout and camping opportunities. The Trail is rated "more difficult".
- **Portage Mountain Loop Trail** - The Portage Mountain Loop trail connects Petersburg Lake with the Salt Chuck East Cabin, approximately 20 miles southwest of the proposed Project. The Trail may be difficult to follow as it is not frequently cleared because of low use. The trailhead starts at Petersburg Lake Cabin and continues to the north end of the lake. It continues to, the tidal flat of Goose Cove at the southeast end of Portage Bay, west across the tide flat and heads southwest through muskeg and timber, to the Salt Chuck East Cabin.

There is one TNF hiking trail located immediately adjacent to the project area, the Cascade Creek Trail, which is described below in Section 5.0.

4.2.4 Sea Kayaking Routes

The 60 mile Thomas Bay sea kayak route is also located in the project vicinity and traverses Frederick Sound and Thomas Bay (Figure 4-4). The trip is

broken up into four distinct segments based on the location of the USFS campsites along the route, described in greater detail below. From Petersburg, kayakers travel approximately 6.7 miles north along the Kupreanof Island coast to the Sukoi Islets. From the Sukoi Islets, kayakers travel across Frederick Sound approximately 7 miles to the Agassiz Peninsula. After reaching the Agassiz Peninsula, the route hugs the coast of Thomas Bay and the Baird Glacier for approximately 19 miles to the Mainland 4 Campsite near Spurt Cove. The last campsite is approximately 15 miles southeast of Spurt Cove and is located on the Lindenberg Peninsula. The route ends approximately 6 miles further southeast in Petersburg. There are four shoreline campsites and two USFS cabins (Spurt Cove Cabin and Cascade Creek cabin) that provide shelter along this route and which are discussed in greater detail below (USFS, 2010f).

Figure 4-4. Thomas Bay Sea Kayaking Route

Source: USFS, 2010f

There are three other USFS sea kayaking routes that originate from Petersburg and traverse waters in the project vicinity but are generally located beyond a 20 mile radius of the Project in Frederick Sound (USFS, 2010f):

- the North Shore Kupreanof Island Route, which extends from Petersburg north in Frederick Sound around the northwestern tip of the Island to the city of Kake;
- the South Shore Kurpeanof Island Route, which begins in Petersburg and travels southwest to Sumner Strait and traversing the southern shore of the Island and up the western shore to the city of Kake; and
- the LeConte Bay Loop, which loops from Petersburg south in Frederick Sound to LeConte Bay and back.

4.2.5 Overnight Use (Camping and Cabins)

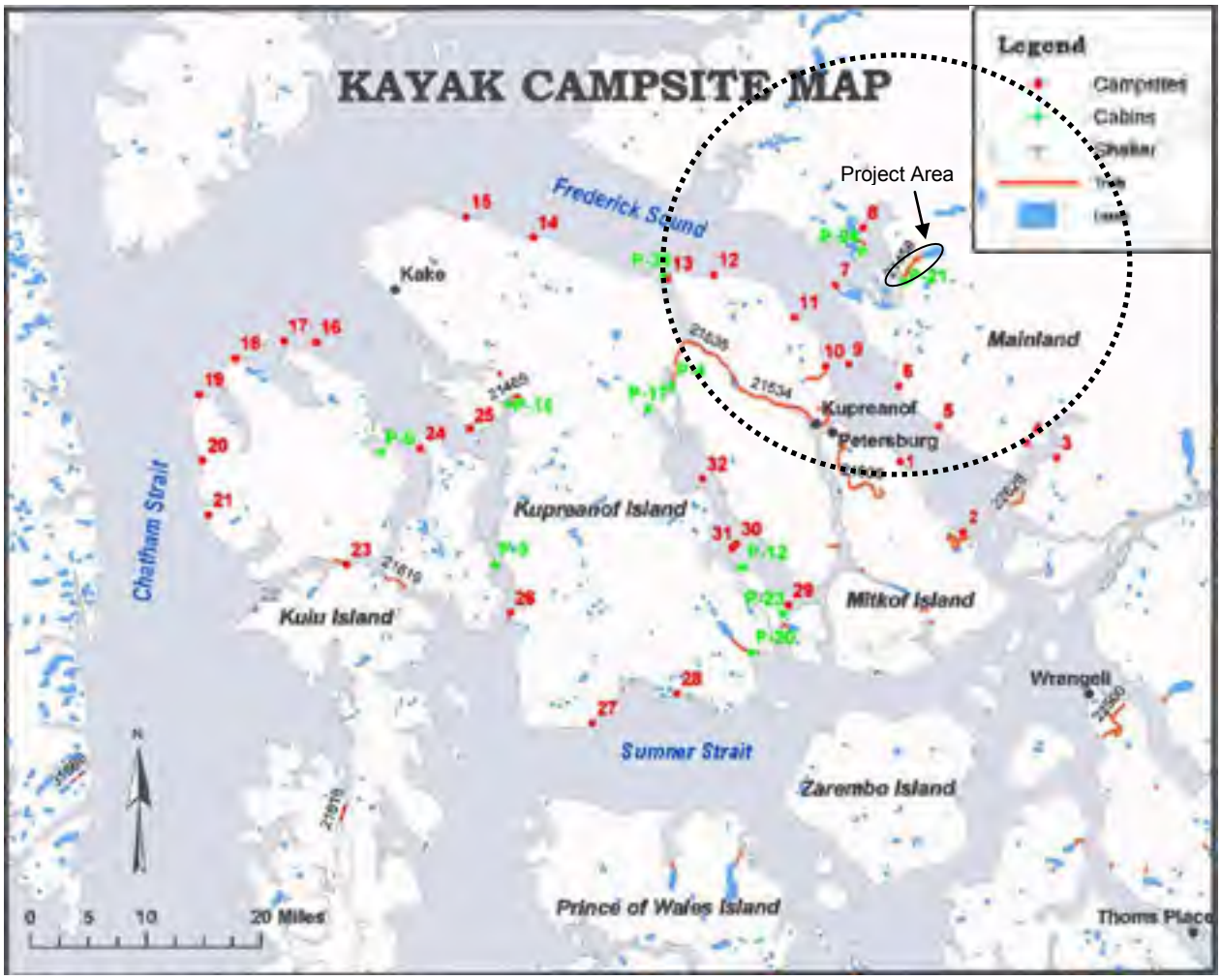
In addition to TNF lands in the project vicinity available for backcountry camping, the USFS identifies 11 formal campsites within the project vicinity that can accommodate overnight use (Figure 4-5) (USFS, 2010f).

- **Frederick 19 Campsite (#1) –** This beach site can accommodate three tents and is located on the south side of Cabin Creek on Mitkof Island.
- **Mainland 6 Campsite (#4)** – This wooded campsite is located in LeConte Bay on the northside of the Bussy Creek drainage and is only one of two sites in LeConte Bay. This site, located in the Stikine-LeConte Wilderness, offers a wildflower meadow.
- **Mainland 1 Campsite (#5) –** This beach and woodland campsite is located on the Agassiz Peninsula south of Moonshine Creek along Horn Cliffs on Frederick Sound. The site offers good views of the Sound and has one beach-front tent site and 6+ wooded campsites.
- **Mainland 2 Campsite (#6)** - This beach front campsite can accommodate eight tents and is located in Ice Cove off of Frederick Sound on the Point Agassiz Peninsula.
- **Mainland 3 Campsite (#7) –** This beach campsite is located on the Agassiz Peninsula just east of Wood Point. The site can accommodate twelve tents and is considered a good campsite to explore Thomas Bay.
- **Mainland 4 Campsite (#8) –** This beach campsite is located on the mainland near Spurt Cove. The site can accommodate two

tents and also provides views of Baird Glacier, which is approximately 3 miles north.

- **Sukoi 1 Islet Campsite (#9) –** This island beach campsite is located on the northern end of East Sukoi Islet. The site can accommodate three tents and provides a great view of the northern lights.
- **Frederick Sound 2 Campsite (#10) –** This beach campsite is located on the southeastern shore of Lindenberg Peninsula. The site can accommodate three tents and also provides access to the Colp Lake Trail. The Sukoi Islets Lighthouse is visible from this campsite.
- **Frederick Sound 3 Campsite (#11) –** This is a beach campsite located on the eastern shore of the Lindenberg Peninsula. The site can accommodate three tents.
- **Frederick Sound 8 Campsite (#12)** – This site is located at the northern shore of Kupreanof Island and is a beach site. The site can accommodate six tents.
- **Frederick Sound 11 Campsite (#13)** – This beach site is located in Portage Bay on the northern end of Kupreanof Island. This site is a beach site accommodating 1 tent. There is a dock and road terminal located 0.5 miles south of the site and the USFS West Point Cabin is located approximately 0.5 miles across the Bay.

Figure 4-5. Campsites in the Project Vicinity



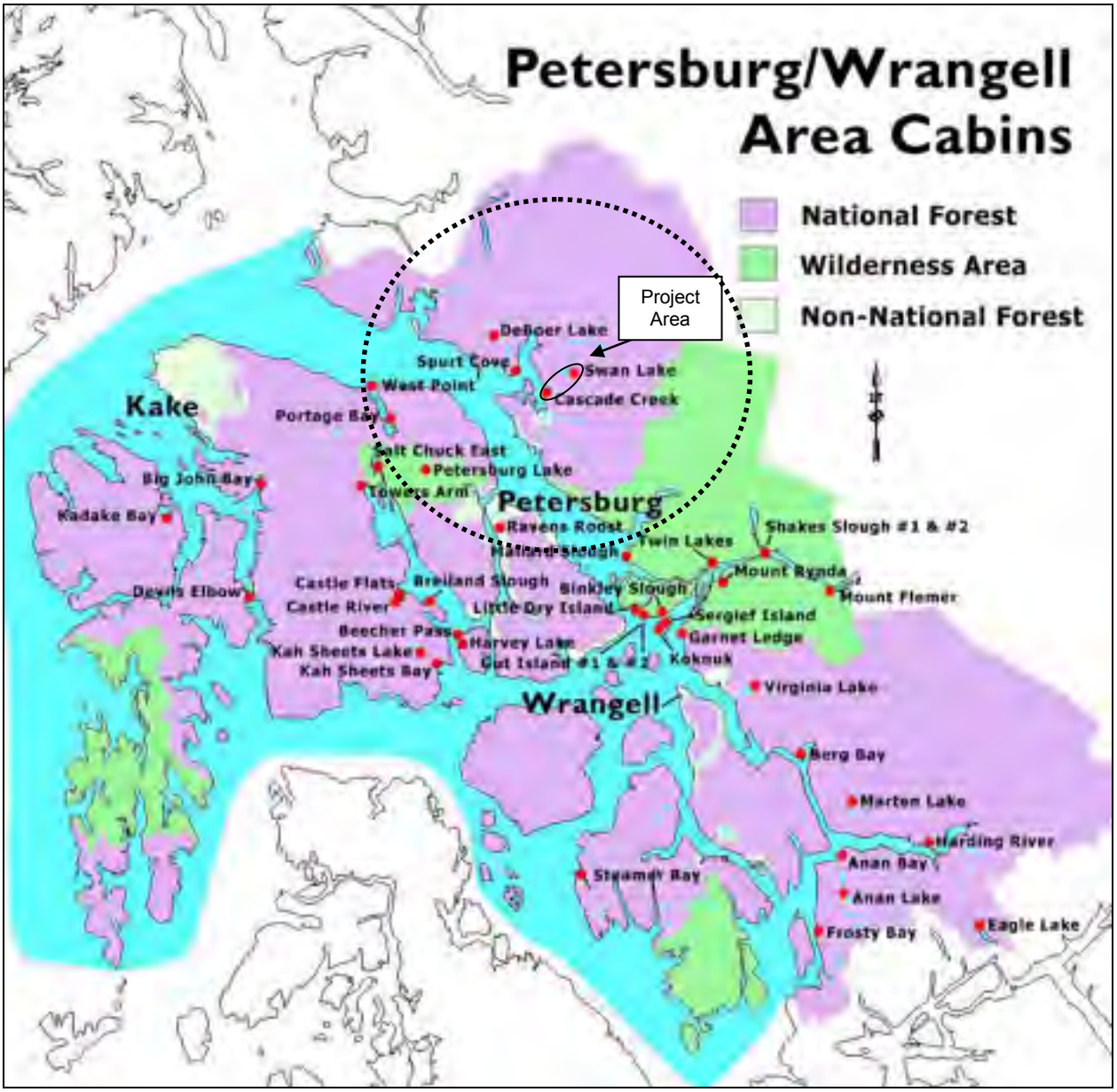
Note: Project vicinity (20 mile radius) denoted by dotted line.
Source: USFS, 2010f, modified

There are two commercial campgrounds in the project vicinity. The Trees RV Park is located on Mitkof Island adjacent to Wrangell Narrows and offers 13 RV sites, laundry facilities, restrooms and shower house, and general store (Trees RV, 2010). Le Conte RV Park is located in downtown Petersburg and provides RV sites (PCC, 2010).

Public use cabins are available throughout the TNF providing remote recreation opportunities (Figure 4-6). Many of the cabins within the project vicinity are accessible by floatplane/helicopter, depending on lake conditions, or via boat or float plane, some of which are then accessible by foot from waterfront trailheads. Areas of the TNF used for hunting, sightseeing, and hiking are

accessible from these cabins. In addition, many of these cabins are located on waterbodies and provide rowboats for non-motorized boating and angling opportunities.

Figure 4-6. USFS Cabins in the Project Vicinity



Note: Project vicinity (20 mile radius) denoted by dotted line.
Source: USFS, 2010f, modified

There are six USFS maintained and operated cabins located within approximately 20 miles of the project area within the TNF (USFS, 2010f Recreation.gov, 2010):

- **DeBoer Lake Cabin -** This cabin is located on the western end of DeBoer Lake on the mainland, approximately 10 miles northwest of the project area and is only accessible via floatplane during ice-out or helicopter. It is approximately 20 air miles from Petersburg and 3 miles northwest of Thomas Bay. The cabin is a typical A-frame cabin that can accommodate up to six people (Photo 4-1). The DeBoer Lake Cabin offers basic facilities including sleeping bunks and loft, wooden tables and benches, oil heater, pit-type outhouse and a rowboat for access to DeBoer Lake for rainbow trout angling. Nearby recreational opportunities include fishing for rainbow trout in DeBoer Lake, hunting, sightseeing and hiking. There are no formal trails near the cabin, although several mountains are accessible including Jefferson, Fulton, Hancock, and Hamilton Mountains.

Photo 4-1. DeBoer Lake Cabin

- **West Point Cabin** – This cabin is located at the mouth of Portage Bay on Kupreanof Island, approximately 20 miles west of the project area and is only accessible via boat or plane. The cabin is a modified A-frame style and can accommodate up to six people. Additionally, the cabin offers provides an ADA accessible boat ramp, walkway, and outhouse (Photo 4-2). The West Point Cabin offers basic facilities including a large sleeping loft, two single bunks, woodstove, wood-table and benches, cooking counter, and mooring buoy. The cabin also provides access to beach hiking, wildlife viewing and fishing in Frederick Sound.

Photo 4-2. West Point Cabin

- **Portage Bay Cabin** - This cabin is located on the eastern shore of the interior of Portage Bay on Kupreanof Island, approximately 20 miles west of the project area and is only accessible via boat or plane. The cabin is a single level hunter-style cabin that can accommodate up to four people (Photo 4-3). The cabin offers basic facilities, including two single bunks, wooden table and benches, oil heater, and a pit-type outhouse. The cabin provides access to fishing in Portage Bay, the Portage Mountain Trail, Petersburg Lake Cabin, and the Salt Chuck East Cabin.

Photo 4-3. Portage Bay Cabin

- **Petersburg Lake Cabin -** This Cabin is located on the southeast end of Petersburg Lake on Kupreanof Island approximately 15 miles southwest of the project area. The cabin is available year-round but accessible by floatplane or boat only when Petersburg Lake is ice-free. Boat access is from Petersburg Creek, at high tide only, then via the Petersburg Creek Trail (6.5 miles) or from Wrangall Narrows to the Kupreanof State Boat Dock then via the Petersburg Creek Trail (10.5 miles). The Petersburg Lake Cabin is a pan-adobe style cabin that can accommodate up to six people (Photo 4-4). The cabin provides basic accommodations and offers basic facilities including sleeping bunks, wooden table and benches, wood stove, pit-type outhouse, and a rowboat. Nearby recreational opportunities include fishing for cutthroat trout and sockeye salmon in Petersburg Lake. Fishing for steelhead, coho, and sockeye salmon is available in nearby Petersburg Creek. Hunting, hiking, and sightseeing opportunities are also available via the Petersburg Lake Trail and the Portage Mountain Trail.

Photo 4-4. Petersburg Lake Cabin

- **Ravens Roost Cabin –** This alpine cabin is located atop a mountain south of the Petersburg airport (Photo 4-5) and is a popular wintertime destination. The cabin is accessible year-round by helicopter or by foot from the Raven Trail and is approximately 17 miles southwest of the project area on Mitkof Island south of Petersburg, Alaska. The cabin can accommodate up to six people and is available year-round. It offers basic facilities including a sleeping platform and loft, wooden table and benches, oil heater, deck, and a pit-type outhouse. The cabin provides access to such recreational opportunities as hiking, cross-country skiing, snowshoeing and sightseeing.

Photo 4-5. Ravens Roost Cabin

- **Spurt Cove Cabin** - The Spurt Cove Cabin is located approximately 5 miles northeast of the project area along the north shore of Thomas Bay on the mainland, and providing views of the Bay for sightseeing and wildlife watching. The **cabin** is accessible year-round by float plane and by boat. The Spurt Cove Cabin is a hunter-style cabin that accommodates up to four people (Photo 4-6). It offers basic accommodations, including bunk beds, table and benches, and oil heater and woodstove and a pit-type outhouse. Thomas Bay provides opportunities for halibut, king salmon and trout fishing. The Spurt Lake trail is around the point just north of Spurt Cove but the trailhead is only accessible by boat or float plane.

Photo 4-6. Spurt Cove Cabin

While the Spurt Cove Cabin was considered to be within the area of potential effect for the Project in the study plan for this effort, the distance of the cabin from the project area, coupled with intervening topography and vegetation from Ruth Island, as well as inherent project design (natural materials, screening buffer, etc.) will preclude effects of the project structures and operations on recreational use of the Spurt Cove Cabin. In addition, the Spurt Cove Cabin was identified in the 2005 USFS Recreation Facility Analysis (USFS, 2005) by the USFS as being planned for closure, thus the future provision of recreation opportunities at this site is unknown. As such, the Spurt Cove Cabin is not considered further in the analysis of direct project effects. It is important to note, however, that the Spurt Cove Cabin may experience an increase in use should recreators shift use from the Cascade Creek Cabin and/or Swan Lake Cabin, either temporarily or permanently as a result of project construction activities or the presence of project structures or operations.

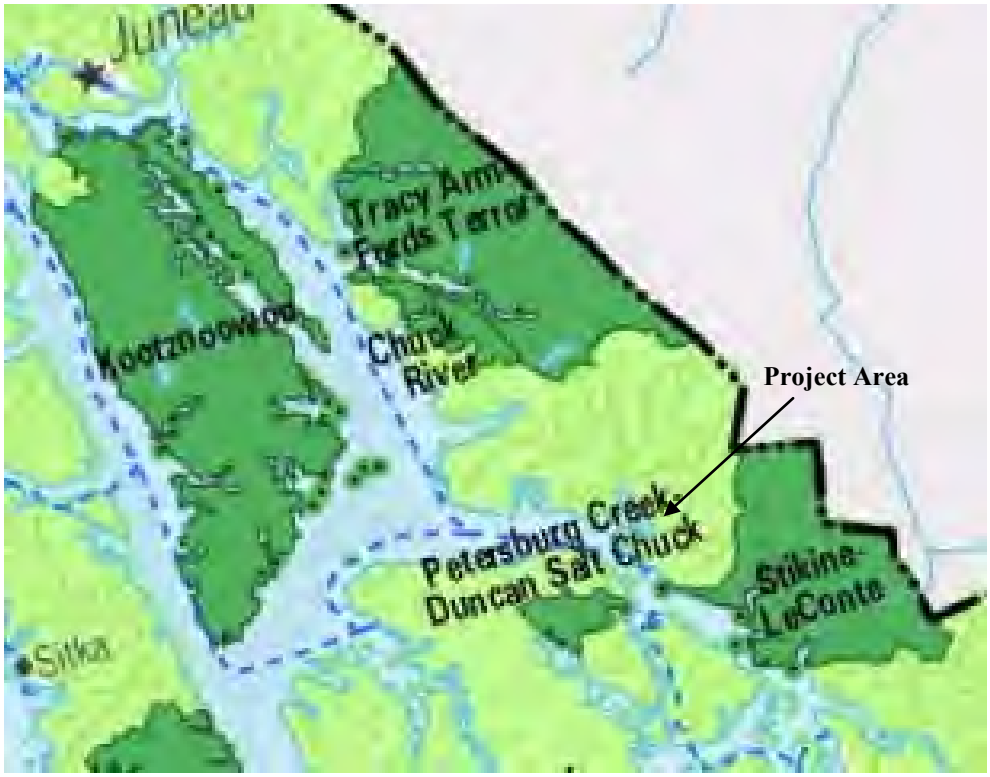
In addition to the six USFS cabins discussed above, there are three USFS maintained and operated cabins or shelters located within close proximity of the project area, the Cascade Creek Cabin, Swan Lake Cabin, and Falls Lake Shelter, which are described in Section 5.0, as part of those within the project area and immediate vicinity.

4.2.6 Specially Designated Recreation Areas

4.2.6.1 Wilderness and Wildlife Areas

There are three congressionally designated wilderness areas within approximately 20 miles of the project area within the TNF (Figure 4-7): the Tracy Arm-Fords Terror Wilderness, Stikine-LeConte Wilderness, and the Petersburg Creek-Duncan Salt Chuck Wilderness, described below. Recreation activities are predominantly traditional outdoor pursuits such as hunting, fishing, hiking/mountaineering and camping.

Figure 4-7. Wilderness Areas in the Project Vicinity



Tracy Arm-Fords Terror Wilderness

The southern boundary of the Tracy Arm-Fords Terror Wilderness (TAW) is located approximately 70 miles north of Petersburg, 45 miles south of Juneau, and about 23 miles from the project area on the mainland. The TAW encompasses approximately 653,179 acres and is characterized

by rugged mountains with deep valleys and high waterfalls. The most common access to the TAW is by boat or float plane (USFS, 2010i).

Recreation opportunities at the TAW include sea kayaking, wildlife viewing, fishing, hunting, and primitive camping. Day trips to the fjords are available from Juneau on motorized boats and ferries for kayakers are also provided to Harbor Island. Large cruise ships also make regular calls into Tracy Arm (Wilderness.net, 2010). Wildlife includes brown and black bears, mountain goats, wolves, Sitka black-tailed deer, many smaller furbearing animals, bald eagles and shorebirds, and marine mammals (USFS, 2010i).

Stikine-Leconte Wilderness

The Stikine-Leconte Wilderness (SLW) is located less than 10 miles southeast of the project area on the mainland between the towns of Wrangell and Petersburg (USFS, 2010j; USFS, 2010j). The SLW is comprised of 448,926 acres and its main features include the Stikine River, the fastest free-flowing navigable river in the US, and the LeConte Glacier, the southernmost tidewater glacier on the Pacific Coast (USFS, 2010j). The Stikine River drainage is recognized as an important fish and wildlife area (USFS, 2007) and the 29,180-acre Stikine River Delta is the largest estuary in southeast Alaska, providing salt marsh habitat during avian migrations (USFWS 2010b).

The SLW provides opportunities for camping, hunting, fishing, sightseeing, boating, and hiking. There are 12 USFS recreation cabins, two trails, and two hot spring bathing structures at Chief Shakes Hot Springs within the SLW. There are no formal campgrounds within the SLW, although back-country camping is common in forested upland areas (USFS, 2010j).

Wildlife-dependent recreation such as fishing, hunting and wildlife viewing are dominant in the SLW. A variety of fish including king and other species of salmon are found in the waters of the SLW. In April, the

eulachon smelt run occurs in the SLW which attracts more than 15,000 bald eagles, the second largest known concentration of bald eagles in the world (Miller 2008). Moose, mountain goats, brown and black bear, deer, and wolves also inhabit the area.

Petersburg Creek-Duncan Salt Chuck Wilderness

The 46,849-acre Petersburg Creek-Duncan Salt Chuck Wilderness (PCW) is located on northeastern Kupreanof Island, near the small village of Kupreanof, approximately 15 miles southwest of the project. The PCW is accessible by either boat or floatplane and then inland by one of several trails. The eastern boundary of the PCW is easily reached by boat from Petersburg by going across Wrangell Narrows to the Kupreanof State Dock or Petersburg Creek. The Duncan Salt Chuck is a large, tidally influenced salt marsh which has a rocky constriction at its outlet to the sea that allows boat access at slack tide. Float plane access is available at the Duncan Salt Chuck of Petersburg lake area (USFS, 2010k; USFS, 2010k).

The PCW provides opportunities for camping, hunting, fishing, sightseeing, photography, canoeing, and hiking. The PCW contains two public recreation cabins (the USFS Petersburg Lake Cabin, discussed above, and the USFS Salt Chuck East Cabin) and four hiking trails (Petersburg Lake Trail and the Petersburg Mountain Trail, and the Portage Mountain Loop Trail, which are discussed in detail above, as well as an unnamed primitive trail).

The PCW provides habitat for such game species as black bear, Sitka black-tailed deer, moose, and gray wolves, as well as trumpeter swan, bald eagle, and osprey, providing opportunities for hunting and wildlife viewing. The waters of PCW support a variety of game species including salmon, Dolly Varden, and cutthroat trout, including those of Petersburg Lake, Petersburg Creek and Salt Chuck Creek which provide opportunities for angling (USFWS 2010c; USFS, 2010k).

4.2.6.2 National Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (16 USC. 1271 et seq.) to preserve and maintain in an un-impounded condition designated rivers having "outstanding natural, cultural, and recreational values" (NPS, 2007a). In addition, the Alaska National Interest Lands Conservation Act of 1980, amended the Wild and Scenic River Act, adding several rivers to the designation, many of which were located within National Parks and National Wildlife Refuges newly established by the Alaska Lands Act of 1980 (USFWS, 1980).

There are 31 rivers or river segments that have been proposed for Wild, Scenic, or Recreational designation under the National Wild and Scenic Rivers System in the TNF (USFS, 2008a). There are no rivers or river segments in the project area including Cascade Creek that have been or are currently proposed for Wild, Scenic, or Recreational designation.

4.2.6.3 National Trails System

The National Trail System was established in 1968 to promote the development of trails in both urban and rural settings (NPS, 2010a). No trails in the vicinity of the proposed Project have been designated as a National Trail (NPS, 2010a).

4.2.7 State Parks and Forests

There are no state parks or forests within the project vicinity. The closest state park to the Project is the Petroglyph State Historic site in Wrangell, which covers 7 acres and features an ADA compliant boardwalk, trails, interpretive facilities and a beach (APOR, 2010b).

4.2.8 Other State Lands

State lands within the project vicinity are administered by the ADNR under the Central/Southern Southeast Area Plan, developed for the management of state owned and state selected uplands, tidelands, submerged lands and

shorelands, including for recreational uses. The project area is located within the Sumdum-Stephens Passage Region (Region 1) and the Petersburg Region (Region 3). Within a 20 mile radius of the proposed Project are several parcels designated for recreation or resource protection, such as fish and wildlife habitat (ADNR, 2000).

Within the Sumdum-Stephens Passage Region (Region 1), state lands in the project vicinity are mostly concentrated in Farragut Bay. Four parcels in the project vicinity in Region 1 are designated as either "Undeveloped Public Recreation and Tourism" lands, which offer dispersed recreation, minimal support facilities and are generally conveyed to municipalities for recreation management, or "Developed Public Recreation and Tourism" lands, which offer localized attractions or ease of access and developed facilities, including public and commercial uses, and which remains in state ownership for recreation management. Reed Islands and the adjacent marine waters are recommended for designation as a state marine park and are designated as undeveloped recreation. A parcel on the Farragut River is managed for dispersed recreation and scenic resources. There is an existing USFS trail on this parcel, which also provides non-motorized boat access to the river system. Near the project area at the terminus of Thomas Bay to the north, a tideland parcel has been designated as a major seabird nesting colony providing opportunities for wildlife viewing, exploring the North Baird Glacier and climbing nearby peaks (ADNR, 2000).

State uplands in the Petersburg Region (Region 3) are primarily concentrated on Mitkof Island and mainly used for recreation, commercial timber harvest and settlement. Most of the road accessible parcels, particularly in the vicinity of the city of Petersburg, are used for dispersed recreation such as hunting, walking and motorized recreation. In the project vicinity, there are nine state parcels within the city of Petersburg that are designated for undeveloped or developed recreation (ADNR, 2000).

LeConte Bay, to the south of the project area, within the Stikine-LeConte Wilderness, is also designated by the ADNR as undeveloped recreation providing wildlife viewing opportunities, boating, and scenic attractions such as glaciers and

icebergs. Closer to the project area, there is one state managed parcel on the western shore of the mainland, Brown Cove on Frederick Sound, designated as undeveloped recreation and managed for fish and wildlife habitat. An access trail from an anchorage in Brown Cove provides access to the Horn Cliffs and portions of the Coast Range (ADNR, 2000).

The southern portion of Thomas Bay, to the west and east of Ruth Island, has been designated as undeveloped recreation, noting the significance of access to the USFS Cascade Creek Cabin and Trail. The "Thomas Bay Parcel", located at the southern terminus of Thomas Bay, to the south of the proposed Project, is managed for habitat protection, timber harvest and continued dispersed recreation (ADNR, 2000).

4.2.9 County and Municipal Recreation Areas

Several county and municipal recreation areas are located within 20 miles of the project area, primarily in the city of Petersburg. In addition, the city of Wrangell is home to several parks and recreation areas including Wrangell City Park, the Mount Dewey Trail, Wrangell Volunteer Park, and Shoemaker Bay Recreational Area, which, while generally outside of the 20 mile project vicinity radius, are discussed in greater detail below. These areas provide opportunities for picnicking, hiking and walking, fishing, and camping, as well as such facilities as tennis courts, running tracks, and sports fields.

- **Petersburg Visitors Information Center -** The Petersburg Visitors Information Center is a joint effort of the Chamber of Commerce and the USFS. It is located at First and Farm Streets and provides visitors with maps, brochures, and local knowledge of the region (Miller 2008).
- **Eagle's Roost Park -** The Eagle's Roost Park is located in Petersburg on North Nordic Drive. It is operated by the City of Petersburg and includes picnic tables, a viewing platform and benches (Miller 2008). The park is a popular spot for observing the Wrangell Narrows and to watch bald eagles perched near prime fishing grounds.
- **Overlook Park -** Overlook Park is located in Petersburg near Eagle's Roost Park. The Overlook Park provides a viewing spot for visitors to see humpback whales and other wildlife using Frederick Sound. The Overlook also includes a telescope for viewing wildlife, mountains, glaciers, and

Devli's Thumb, a dominant landmark peak, which rises from the Stikine Ice Field (Miller 2008).

- **Sandy Beach Recreation Area -** The Sandy Beach Recreation Area is located 2 miles outside of Petersburg. At low tide, petroglyophs can be observed along rocks on the north end of the beach (Miller 2008). From the beach, visitors can walk the Cabin Creek Road which leads to the city's reservoir. The Creek Walking Bridge is located approximately 1 mile down this road. Depending on the season, salmon may be viewed in waters below.
- **Falls Creek Fish Ladder -** The Falls Creek Fish Ladder is located approximately nine miles outside of Petersburg off the Mitkof Highway on the Three Lakes Loop Road. A small bridge from a parking area provides visitors with a view of migrating coho and pink salmon during the late summer and fall (Miller 2008).
- **Papke's Landing** - Papke's Landing is located near the Fall Creek Fish Ladder off the Papke's Landing Road. The landing overlooks the Wrangell Narrows and includes a state maintained float and boat launch ramp.
- **Wrangell City Park** - The City Park is located off Zimovia Highway in Wrangell. The park is a waterfront park on Zimovia Straits and provides a scenic view of the inland waters surrounding the islands (TOW, 2010a). The city park also provides several picnic tables, four covered shelters, and fireplaces. The town allows tent camping on a 24-hour basis only. Restrooms are also available at the park.
- **Mount Dewey** - Mount Dewey is centrally located near the Wrangell Ferry Terminal and is also accessible from the downtown area (TOW, 2010a). Visitors can hike the small hill via the short and steep Mt. Dewey Trail. The hike offers views of the town, waterfront, and surrounding area.
- **Wrangell Volunteer Park** - The volunteer park in Wrangell provides locals and visitors with a tennis court, running track, two ball fields, concession stand, and public restrooms (TOW, 2010a). In addition to the facilities, the Volunteer Park Trail is available to walkers and hikers, directly behind the ball fields. The trail is approximately 1.5 miles long and traverses through forested and muskeg terrain.
- **Shoemaker Bay Recreational Area** - The Shoemaker Bay Recreation Area is located five miles outside of Wrangell. The park provides a picnic shelter with a fireplace, picnic tables, tennis court, horseshoe pits, playground equipment, outdoor volleyball area and public restroom facilities (TOW, 2010a). The park also provides access to the tidelands and stream frontage of Institute Creek and the ocean. Nearby recreation sites include the Shoemaker Bay Harbor, a tent and camping area near Shoemaker Bay RV Park. Visitors may also access Falls Trail which is located above the park and provides hiking and sightseeing opportunities.

- **Pats Lake** - Pats Lake is accessible from Wrangell by going south on the Zimovia Highway. The land surrounding the lake is owned by the Alaska Mental Health Trust (AMHT) and has been proposed for future growth in the Wrangell Draft Comprehensive Plan (TOW, 2010b). Local residents currently use the Pat's Lake area to fish, hike, picnic, and sightsee.

5.0 RECREATION FACILITIES ADJACENT TO AND WITHIN THE PROJECT AREA

The TNF largely encompasses the lands within the project area and the immediate vicinity. As discussed in Section 4.2, there are a number of USFS maintained cabins, trails, and wilderness sites available for recreational use within the project vicinity. Falls Lake, Cascade Creek and Thomas Bay provide recreational opportunities adjacent to the project area. Swan Lake provides opportunities within the project boundary. All built facilities (e.g. cabins) are outside the proposed project boundary.

Swan Lake and Falls Lake support a stocked, non-native rainbow trout fishery, as well as non-motorized boating opportunities (the USFS provides a row boat at both lakes). Cascade Creek likewise supports limited rainbow trout angling and Dolly Varden are reported for the lower reaches of the Creek. The Creek also provides a scenic attraction that can be viewed from several vantage points along the Cascade Creek Trail. Thomas Bay provides angling opportunities for several salmon (coho, Chinook, chum, pink, and sockeye), as well as opportunities for on-water recreation such as pleasure boating, kayaking, and wildlife watching. The lands immediately adjacent to the Project also provide opportunities for large and small game hunting and backcountry recreation opportunities such as hiking and camping.

The USFS owns and operates all recreation facilities adjacent to the proposed Project as part of the TNF including the Cascade Creek Cabin, Cascade Creek Trail, Falls Lake Shelter, and the Swan Lake Cabin (Photo 5-1 through Photo 5-5).

5.1 Cascade Creek Cabin

Cascade Creek Cabin is located near the mouth of Cascade Creek in Thomas Bay on the mainland. The cabin, approximately 14 miles from Petersburg, is accessible by floatplane or boat (USFS, 2010d). The Cascade Creek Cabin is a hunter-style cabin that can accommodate up to six people (Photo 5-1). The cabin is available year-round and can be reserved in advance. The cabin and offers basic facilities including sleeping bunks, wooden table and benches, oil heater, wood stove, and a pit-type outhouse. The Cascade Creek Trail is accessible from the cabin. Nearby recreational opportunities include fishing, boating and kayaking, hunting, sightseeing and hiking. The USFS

reports that this Cabin was occupied an average of 80 days annually from 2008 to 2010 (personal correspondence, Brad Hunter, USFS, November 4, 2010).

Photo 5-1. Cascade Creek Cabin

5.2 Cascade Creek Trail

The Cascade Creek Trail is a challenging, primitive, unimproved trail that extends approximately 4 miles from the Thomas Bay shoreline to Swan Lake, passing by or across Falls Lake and following the Cascade Creek for much of its length. Cascade Creek Trail is accessible from three trailheads: one at the Cascade Creek Cabin; one near the mouth of Cascade Creek (accessible by floatplane or boat); and one at the west end of Swan Lake (accessible by float plane or boat or by skiff from Swan Lake Cabin). The trail is largely inaccessible due to limited maintenance. Outside of the peak recreation season, snow and ice cover make sections of the trail impassable (USFS 2010l).

From the Thomas Bay shoreline, the Cascade Creek Trail begins either at the tidewater trailhead at the base of the Creek or from the USFS Cascade Creek Cabin, approximately 0.25 miles south of the tidewater trailhead. The Trail follows Lower Cascade Creek for the first 0.5 miles, crossing a boardwalk and bridge where views of the Cascade Creek lower falls are most visible (Photo 5-2). The trail then continues along the opposite side of the Creek. The first 0.5 mile of the trail is rated as “easiest” with the remainder of the trail rated “more difficult” to “most difficult” (USFS 2010l).

Photo 5-2. View of Cascade Creek from Cascade Creek Trail (~500 yards from the beach).

The Trail then climbs 1.75 miles from the bridge to the junction at Falls Lake. The Cascade Creek Trail then continues approximately 1 mile around Falls Lake to a high bog providing views of Petersburg and Frederick Sound. This section of the trail is rugged, not well defined, and very steep. Access to the Falls Lake Shelter is available from the main trail. Alternatively, a spur trail at the junction provides access to the western shoreline of Falls Lake (Photo 5-3). A row boat provides transportation across Falls Lake to another spur trail on the eastern shoreline that reconnects with the Cascade Creek Trail (USFS, 2010l).

Photo 5-3. Falls Lake

After passing Falls Lake, the Trail crosses another small lake providing views of cliffs and waterfalls, then follows Cascade Creek for approximately 1 mile to the trailhead at Swan Lake. The shoreline around Swan Lake is mostly precipitous and unvegetated, to the extent that there is no access from the Lake's west end (at the terminus of the Cascade Creek Trail) to the Swan Lake cabin at the lake's east end. Again, a row boat at Swan Lake provides access across the lake to the Swan Lake Cabin (USFS, 2010l).

5.3 Falls Lake Shelter

Falls Lake Shelter is located above Falls Lake near the upper section of the Cascade Creek Trail. The shelter is a rustic 3-sided Adirondack-style shelter (Photo 5-4) and is available year-round. Nearby recreational opportunities include fishing and hiking the Cascade Creek Trail. The Falls Lake Shelter is accessible from 0.25-mile-long spur trail off of the main Cascade Creek Trail, as it continues around Falls Lake. The lake itself is another 0.25 miles by spur trail from the shelter (USFS, 2010l; USFS, 2010d).

Photo 5-4. Falls Lake Shelter

5.4 Swan Lake Cabin

Swan Lake Cabin is located on the shores of Swan Lake and is accessible by floatplane or helicopter depending on the season. Due to the topography of the lake, the cabin is not accessible from the Cascade Creek Trail. The Swan Lake Cabin is a typical

A-frame cabin that can accommodate up to five people (Photo 5-5). The cabin is available year-round and can be reserved in advance. The cabin offers basic facilities including sleeping bunks and loft, wooden tables and benches, oil heater, pit-type outhouse and two rowboats. Nearby recreational opportunities include fishing for rainbow trout in Swan Lake, hunting, and sightseeing (USFS, 2010d). The USFS reports that the Swan Lake Cabin was occupied an average of 81 days annually from 2008 to 2010 (personal correspondence, Brad Hunter, USFS, November 4, 2010).

Photo 5-5. Swan Lake Cabin

6.0 RECREATION USE

The 2010 survey effort targeted commercial and public recreational use of Thomas Bay, Falls Lake/Cascade Creek, and Swan Lake. Knowledge of who is using the project area and immediate vicinity for recreation purposes as well as user preferences and opinions regarding recreation opportunities are useful in understanding future needs and how best to accommodate them. Accordingly, the surveys also solicited socio-demographic characteristics of commercial operators and public recreators.

Respondents were asked to quantify recreational use of these areas by month and provide information on the recreation activities engaged in for each of the four seasons: Spring (March, April, May); Summer (June, July, August); Fall (September, October, November); and Winter (December, January, February). The survey also solicited information regarding average trip length and average group size. In an effort to qualitatively assess potential, secondary socioeconomic project effects, respondents were also asked to estimate expenditures incurred in support of their recreational use or services provided. In addition, the USFS provided overnight use data for Cascade Creek, Swan Lake, and Spurt Cove cabins project area and immediate vicinity. These data taken were used to develop use estimates for commercial and public recreational use in the project area and immediate vicinity.

6.1 Commercial Recreation Use

6.1.1 Business and Commercial Trip Characteristics

Commercial outfitter/guide respondents reported "on-water" activities as the most popular of their services with charter boat/water taxi as the service most provided (76 percent) (Table 6-1). Approximately 67 percent of respondents provide scenic boat tours and wildlife watching. Whale watching was reported to be a service provided by approximately 55 percent of respondents and nature study/photography was indicated by approximately 46 percent respondents. In addition to these activities, over 60 percent reportedly offer recreational fishing, approximately 52 percent reported providing sea kayaking, and over half of respondents offer cruises.

Table 6-1. Services Provided by Commercial Outfitters/Guides

Commercial Recreation Service	Percent of Respondents Reporting
Charter boat/water taxi (transportation)	75.8%
Wildlife watching	66.7%
Scenic tours	66.7%
Recreational fishing	60.6%
Whale watching	54.5%
Destination/overnight cruises	51.5%
Sea kayaking	51.5%
Nature study/photography	45.5%
Hiking/mountaineering	36.4%
Hunting	15.2%
Boat rentals	9.1%
Charter flight (transportation)	9.1%
Scenic tours	9.1%
Other service	9.1%
Jetboat tours	3.0%
N=	33

Note: Total sums to greater than 100 percent because respondents were allowed to indicate more than one response.

Of the commercial operations surveyed, the average number of years in business was 18 years, with the newest business starting 3.5 years ago and the oldest business providing services for 60 years. The reported average cost per trip by outfitter/guide respondents providing recreation or transportation services to the project area and immediate vicinity was $600 or more, with almost 60 percent of respondents indicating that the average cost of a trip exceeded $600.

The average total revenue from commercial recreation/transportation services in 2009, before taxes, was approximately $543,612 with business revenues ranging from $0 annually to $7.2 million annually. Approximately 22 percent of commercial outfitter/guide respondents indicated that they make less than $25,000 annually, approximately 30 percent indicated an annual revenue of between $40,000 and $100,000, 15 percent made between $100,000 and $200,000, 19 percent made between $200,000 and $500,000, and approximately 15 percent made more than $500,000 annually from their recreation or

transportation business. Only three businesses surveyed indicated revenues greater than $1 million annually.

The average length of a commercial trip reported by outfitter/guide respondents was 3.3 days, with trips ranging from 1 hour to multi-day cruises. The average group size of commercial trips was reported to be approximately 6 people per trip.

6.1.2 Characterization of Business Owners

The majority of business owners indicated that they reside in Petersburg, Alaska. The average age of the business owner responding to the Outfitter/Guide Survey was 57 years with the ages of surveyed outfitters/guides ranging from 40 to 81 years. The average annual personal total gross household income in 2009 was reported to be between $70,000 and $80,000, with 30 percent of outfitter/guide respondents indicating a personal gross income of between $100,000 and $150,000. Approximately 13 percent of respondents indicated a personal gross household income of less than $20,000 annually, while the same percentage indicated an income of greater than $200,000 annually. The majority, 56 percent of outfitter/guide respondents, have acquired a college degree of Bachelor's or higher. Almost all, 97 percent, had some college or technical school education.

6.1.3 Characterization of Commercial Patrons

Respondents to the Outfitter/Guide Survey were asked to provide some information on the characteristics of the patrons they serve. The reported average age of commercial patrons was 50 years. 85 percent of commercial patrons were reported to originate from states outside of Alaska. "All states" was specified as the location of origin approximately 27 percent of the time. California was indicated 27 percent of the time, while Washington and Oregon were indicated as the point of origin of commercial patrons 18 percent and 12 percent of the time, respectively.

Because commercial patrons are largely non-residents, outfitter/guide respondents were asked to provide information on any lodging or camping services they might use in conjunction with their commercial trip. Commercial patrons were said to stay overnight in Petersburg area hotels, motels, and cabins, by approximately 90 percent of outfitter/guide respondents. The Cascade Creek Cabin was indicated as an overnight destination by approximately 43 percent of respondents, while the Spurt Cove Cabin and the Swan Lake Cabin are each reported for overnight use by approximately 32 percent of respondents.

6.1.4 Expenditure Analysis

Commercial outfitter/guide respondents were asked to estimate the amount of money their patrons spend on trips to the project area and immediate vicinity, outside those services the outfitter/guide respondents provide (Table 6-2). Reported total expenditures per trip averaged approximately $1,665. The majority of all expenditures were for transportation (airfare, gas, rental car, etc.) with an average of $999 per trip. This was followed by lodging which comprised approximately 15 percent of total expenditures, on average. Food and beverages, other activities (aside from the money spent on engaging in activities and services provided by the outfitter/guide), and miscellaneous expenditures (such as souvenirs) constituted approximately 13 percent, 11 percent and 11 percent of total expenditures, on average, respectively.

Table 6-2. Commercial Patron Expenditures

Expenditures	Average	Minimum	Maximum
Transportation	$999	$0	$3,000
Food and Beverages	$268	$0	$1,000
Other Activities	$232	$0	$1,000
Bait and Tackle	$40	$0	$200
Misc	$215	$0	$1,000
Lodging	$288	$0	$600
Total Expenditures	$1,665	$0	$5,350

6.1.5 Commercial Use Analysis

Total reported use in RVDs from October, 2009 through September, 2010 by commercial and outfitter respondents is provided in Table 6-3. Respondents reported a total of 1,665 annual trip days. Calculated RVDs for the 12 month period of estimation was just over 9,500 RVDs. Thomas Bay received the highest use (5,930 RVDs), accounting for approximately 63 percent of total use; followed by Falls Lake/Cascade Creek (2,320 RVDs or 24 percent of total use) and Swan Lake (1,260 RVDs or 13 percent of total use).

Table 6-3. Commercial Recreation Use (RVD) Estimated from 2010 Outfitter/Guide Survey Effort (October, 2009 through September, 2010)

Month	Thomas Bay		Swan Lake		Falls Lake/Cascade Creek		Total All Areas	
	Total Reported Trip Days	Calculated RVDs	Total Reported Trip Days	Calculated RVDs	Total Reported Trip Days	Calculated RVDs	Total Reported Trip Days	Calculated RVDs
September	109	810	20	130	48	280	177	1,220
October	48	280	2	10	27	110	77	400
November	37	150	0	0	12	50	49	200
December	17	70	0	0	2	20	19	90
January	2	10	0	0	5	10	7	20
February	0	0	0	0	0	0	0	0
March	9	70	0	0	0	0	9	70
April	49	330	9	100	27	170	85	600
May	151	820	29	200	75	370	255	1,390
June	181	1,040	41	240	90	440	312	1,720
July	204	1,210	51	270	86	410	341	1,890
August	188	1,140	54	310	92	460	334	1,910
TOTAL	**995**	**5,930**	**206**	**1,260**	**464**	**2,320**	**1,665**	**9,510**
N=	32		12		23			

Note: Recreation Visitor Days (RVD) as defined by the USFS is 12 hours of recreational use (for example, one individual recreating for 12 hrs or 12 individuals recreating for 1 hr) (USFS, 2009b). It is a calculation of total recreation pressure; not a quantification of the number of individuals recreating.

The summer months of June, July and August account for the greatest reported use by commercial outfitters and guides, totaling approximately 60 percent of total use. The project area and immediate vicinity overall receives very little commercial recreation use from October through April, comparatively speaking, with these months comprising approximately 14 percent of total use. In fact, Swan Lake and Falls Lake/Cascade Creek receive approximately 3.5 percent of the total estimated use over these off-season months. The spring and fall shoulder months (September and May) account for just over a quarter of the total use.

Commercial outfitter/guide respondents were also asked to report the activities in which their customers participated on a seasonal basis (Table 6-4). Overall, the most popular reported recreational activities for commercial patrons were recreational fishing and aesthetics-based activities (nature study, wildlife viewing, sightseeing and photography) regardless of season. This was followed by cruising and hiking, mountaineering, and camping. Fishing activity (recreational and subsistence) was the most popular activity reported across all seasons.

Table 6-4. Recreational Activities Reported for Commercial Patrons by Season

	Percent of Respondents Reporting			
Recreational Activity	**Spring (M/A/M)**	**Summer (J/J/A)**	**Fall (S/O/N)**	**Winter (D/J/F)**
Whitewater rafting/kayaking	0.0%	3.4%	5.6%	0.0%
Sea kayaking/canoeing	23.8%	44.8%	33.3%	0.0%
Pleasure boating (include jet boat tours)	19.0%	27.6%	27.8%	0.0%
Cruising	33.3%	55.2%	44.4%	16.7%
Recreational fishing	57.1%	72.4%	66.7%	33.3%
Subsistence fishing	14.3%	6.9%	16.7%	16.7%
Hunting - small game	9.5%	3.4%	5.6%	0.00%
Hunting - large game	28.6%	6.9%	38.9%	50.0%
Trapping	0.0%	3.4%	0.0%	16.7%
Hiking/mountaineering/camping	52.4%	51.7%	61.1%	16.7%
Nature study/wildlife viewing/sightseeing/photography	57.1%	72.4%	72.2%	16.7%
Other Activity	4.8%	3.4%	11.1%	0.0%
N=	21	29	18	6

Note: Total sums to greater than 100 percent because respondents were allowed to indicate more than one response.

There is not much seasonal variation in commercial patron activities with the exception of winter recreation. In the spring and summer months, recreational fishing and aesthetics-based recreation are the two most popular activities, followed by hiking, mountaineering and camping. In the fall (September, October, November), nature viewing and wildlife watching activities become the most popular, followed by recreational fishing and hiking, mountaineering and camping. The winter month activities are focused on large game hunting primarily, with some recreational fishing activity reported. Small game hunting is reported for all other seasons except winter. Paddling activity is non-existent in the winter, as expected.

6.2 Public Recreation Use

6.2.1 Characterization of Public Recreators

The average age of the boater/pilot respondents was 55 years. Respondents to the Resident Boater/Pilot Survey were predominantly male (84 percent). The majority of boater/pilot respondents were from Petersburg (94 percent), Wrangell (4 percent) and Kake (1 percent).

Approximately 24 percent of boater/pilot respondents indicated a personal gross household income in 2009 of between $100,000 and $150,000. The average annual personal total gross household income was reported to be between $70,000 and $80,000. Approximately 6 percent of respondents indicated a personal gross household income of less than $20,000 annually, while 5 percent indicated an income of greater than $200,000 annually. The majority, 51 percent, of boater/pilot respondents have acquired a college degree of Bachelor's or higher with 31 percent having some college or technical school education.

6.2.2 Trip Characteristics

The average group size for resident boater/angler respondents for trips made to the project area and immediate vicinity was just over 3 people per trip. The average trip length by Resident Boater/Pilot Survey respondents was 1.9 days.

Although boater/pilot respondents are largely residents of Petersburg, some do take advantage of overnight facilities on trips they make to the project area and immediate vicinity. Approximately 56 percent of respondents indicated that they stay on their own boat when recreating in the project vicinity. Campsites in the project area of potential vicinity were also popular. Approximately 15 percent of respondents indicated that they stay overnight at the Thomas Bay beach campsite near Wood Point, 11 percent use Frederick Sound beach campsites, and 7 percent stay at the Thomas Bay beach campsite near Baird Glacier. The Cascade Creek Cabin was indicated as an overnight destination by approximately 38 percent of respondents. The Spurt Cove Cabin was indicated as an overnight destination by 25 percent of respondents while the Swan Lake Cabin supported overnight use for approximately 26 percent of respondents. Overnight occupancy rates (number of days occupied) reported by the USFS for the Cascade Creek, Spurt Cove and Swan Lake Cabins is provided in Table 9-4. Approximately 7 percent of boater/pilot respondents use the Falls Lake Shelter during overnight trips to the project area and immediate vicinity.

6.2.3 Expenditure Analysis

Respondents to the Resident Boater/Pilot Survey were asked to estimate the amount of money they spend on trips to the project area and immediate vicinity (Table 6-5). Reported total expenditures per trip averaged approximately $263, with the majority of all expenditures spent on transportation (airfare, gas, rental car, etc.), 41 percent with an average of $123 per trip. Unlike commercial patrons, lodging only comprised approximately 10 percent of total expenditures, on average. Food and beverages constituted 27 percent of total expenditures, on average, with recreation activities constituting 5 percent and miscellaneous expenditures (such as on film and souvenirs) constituting approximately 9 percent.

Table 6-5. Resident Boater/Pilot Expenditures

Expenditures	Average	Minimum	Maximum
Transportation	$123	$0	$600
Food and Beverages	$82	$0	$400
Recreation Activities	$14	$0	$200
Bait and Tackle	$29	$0	$300
Misc	$26	$0	$200
Lodging	$29	$0	$270
Total Expenditures	$263	$0	$1,100

6.2.4 Public Use Analysis

Public recreational use of Thomas Bay, Swan Lake, Falls Lake and Cascade Creek was analyzed. Of the 284 total survey respondents, just over half (54 percent) indicated that they participate in recreation activities at Thomas Bay, Swan Lake, and/or Falls Lake/Cascade Creek. Of all respondents, approximately half (49 percent) indicated use of Thomas Bay for recreational purposes, 22 percent reported use of Swan Lake for recreational purposes, and approximately 31 percent indicated that they participate in recreation activities at Falls Lake/Cascade Creek.

Of the respondents indicating that they participate in recreational activities in the project area and immediate vicinity, 47 percent indicated that they visit other recreation destinations more often. The most popular alternative destinations for recreation purposes were reported to be Duncan Canal (26 percent), Frederick Sound (21 percent), Portage Bay (20 percent), Stikine River (19 percent), Farragut Bay (19 percent), LeConte Bay (16 percent) and Wrangell Narrows (15 percent).

Of respondents indicating recreational use of Thomas Bay, Swan Lake, or Falls Lake/Cascade Creek, approximately 94 percent were from the Petersburg area and approximately 5 percent were from Wrangell. No recreational use was reported for respondents indicating they were residents of Kake. Because of this, use estimates for the project area and immediate vicinity were extrapolated by city of origin to account for the significantly higher participation rate reported by

Petersburg residents. Use reported by survey respondents, used in the estimation of recreation use calculated in RVDs, is provided in Table 6-6.

Table 6-6. Reported Recreation Use (in Trip Days) for the Project Area and Immediate Vicinity

Month	Thomas Bay	Swan Lake	Falls Lake/ Cascade Creek	Total All Areas
September	361.5	53	110	525
October	295.5	22	115	433
November	131.0	0	60	191
December	73.5	0	20	93
January	46.5	3	13	62
February	63.5	0	16	79
March	76.5	0	20	96
April	176.0	9	50	235
May	394.5	20	133	547
June	380.0	41	136	557
July	355.0	50	147	552
August	362.0	60	125	547
TOTAL	**2,716**	**258**	**942**	**3,915**
N=	130	52	80	

Regarding extrapolation of reported use by city of origin, approximately 77 percent of all respondents from Petersburg reported recreational use of the project area and immediate vicinity. This equates to an anticipated total number of 558 Petersburg boater/pilot recreators expected to use Thomas Bay, Swan Lake, and Falls Lake/Cascade Creek for recreational purposes. As approximately 9 percent of respondents from Wrangell indicated recreational use, an anticipated total of 41 Wrangell boater/pilot recreators are expected to use the project area and immediate vicinity for recreational purposes. Given the total estimated RVDs calculated in Table 6-7, this equates to an average of approximately 40 RVDs annually per resident boater/pilot, with an average number of 2.6 RVDs at Swan Lake annually and 9.7 RVDs at Falls Lake/Cascade Creek annually per resident boater/pilot.

Total estimated public recreation use (in RVDs) for Thomas Bay, Swan Lake, Falls Lake and Cascade Creek is provided in Table 6-7. As with commercial recreation use, Thomas Bay received the highest amount of public recreation use, accounting for almost 70 percent of total use (16,820 RVDs). Swan Lake, Falls Lake and Cascade Creek supported a total of approximately 7,340 RVDs from October, 2009 through September, 2010, accounting for 6 percent and 24 percent of total use respectively.

Table 6-7. Public Recreation Use (RVD) Estimated from 2010 Boater/Pilot Survey Effort (October, 2009 through September, 2010)

Month	Thomas Bay	Swan Lake	Falls Lake/ Cascade Creek	Total
September	2,380	340	730	3,450
October	2,020	160	700	2,880
November	870	0	400	1,270
December	510	0	120	630
January	310	20	70	400
February	450	0	90	540
March	470	0	120	590
April	1,150	50	280	1,480
May	2,360	100	770	3,230
June	2,150	240	850	3,240
July	1,990	280	740	3,010
August	2,170	350	940	3,460
TOTAL	**16,820**	**1,530**	**5,810**	**24,180**

Note: Recreation Visitor Days (RVD) as defined by the USFS is 12 hours of recreational use (for example, one individual recreating for 12 hrs or 12 individuals recreating for 1 hr) (USFS, 2009b). It is a calculation of total recreation pressure; not a quantification of the number of individuals recreating.

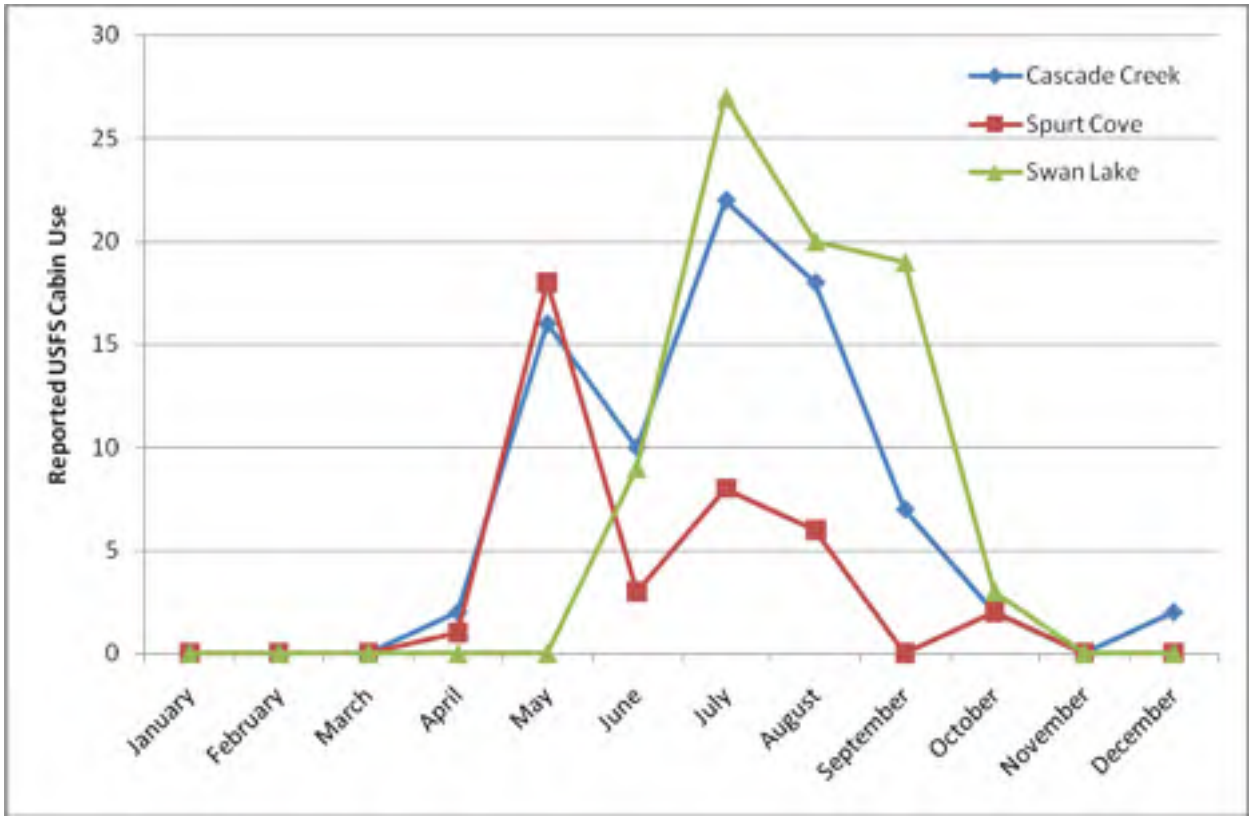
From November through April, monthly public recreation use of project area and immediate vicinity (Thomas Bay, Swan Lake, and Falls Lake/Cascade Creek) drops to between 2 and 6 percent of total use, with this 6 month time frame supporting approximately 20 percent of the total annual estimated use. Use is fairly evenly spread out for the remainder of the year on an average monthly basis. The months of May through October see between 12 and 14 percent of the total reported use, on average.

This lack of monthly variation in estimated use of Thomas Bay, Swan Lake and Falls Lake/Cascade Creek across the peak and non-peak recreation

seasons changes somewhat across the three locations. While use at Thomas Bay generally follows these patterns, which is logical given the level of use this location receives, there is some variation in use at Swan Lake and Falls Lake/Cascade Creek. During the late fall, winter and early spring months (from November through April), use at Swan Lake totals only 5 percent of annual use at this location, while use of Thomas Bay and Falls Lake/Cascade Creek support approximately 22 percent and 19 percent of total reported use during these months. Essentially, 95 percent of all use at Swan Lake occurs from May through October with almost 60 percent of total use occurring in the summer months (June, July and August). By comparison, Thomas Bay and Falls Lake/Cascade Creek support approximately 37 percent and 43 percent of their respective total use during the summer months.

Occupancy of the individual USFS cabins in the project area and immediate vicinity (Cascade Creek Cabin, Swan Lake Cabin, and Spurt Cove Cabin) during the October, 2009 to September, 2010 timeframe as reported by the USFS is presented in (Figure 6-1), which shows a similar pattern of seasonal use as was estimated for commercial and public use of the project area and immediate vicinity. The majority of overnight occupation (number of days occupied) of these cabins (over 95 percent of the total occupied days) occurs between the months of May and October. For the Cascade Creek Cabin and the Swan Lake Cabin, well over half (63 percent and 72 percent, respectively) of total occupied days occurs in the peak summer months (June through August). Approximately 45 percent of the total occupied days at the Spurt Cove Cabin are from June through August, with almost half of its total occupied days occurring in May (47 percent). There is a similar peak in use of the Cascade Creek Cabin in May (20 percent of total occupied days).

Figure 6-1. Reported Occupancy of USFS Cabins in the Project Area and Immediate Vicinity



Respondents to the Resident Boater/Pilot Survey were asked to indicate the recreation activities in which they participated in by season (Table 6-8). Recreational fishing was reported to be the most popular recreational activity indicated by boater/pilot respondents. Coupled with commercial and subsistence fishing activities, fishing activity accounted for the most use across all seasons overall. Pleasure boating was the next most popular activity reported for the project areas of potential effects across all seasons, followed by sightseeing and photography; hiking and mountaineering, and camping. Large game hunting was also among the most popular recreation activities reported across all seasons.

Table 6-8. Recreational Activities Reported for Public Recreators by Season

Recreational Activity	Percent of Respondents Reporting			
	Spring (M/A/M)	Summer (J/J/A)	Fall (S/O/N)	Winter (D/J/F)
Whitewater rafting kayaking	1.7%	2.2%	0.0%	0.0%
Sea kayaking/canoeing	6.1%	11.7%	5.4%	2.2%
Pleasure boating	40.9%	51.8%	22.3%	20.0%
Commercial fishing	11.3%	6.6%	9.8%	17.8%
Recreational fishing	71.3%	77.4%	53.6%	51.1%
Subsistence fishing	23.5%	24.1%	25.0%	22.2%
Hunting - small game	7.0%	5.1%	17.0%	17.8%
Hunting - large game	4.3%	10.9%	73.2%	33.3%
Trapping	0.0%	0.0%	2.7%	17.8%
Hiking/mountaineering	31.3%	38.7%	28.6%	13.3%
Camping	23.5%	40.1%	29.5%	15.6%
Nature study/wildlife viewing	21.7%	33.6%	22.3%	15.6%
Picnicking	19.1%	32.1%	18.8%	8.9%
Sightseeing/photography	29.6%	43.8%	27.7%	22.2%
Harvesting (mushrooms, lichens, berries, etc.)	4.3%	13.1%	24.1%	6.7%
Cross-country or downhill skiing or snowboarding	0.9%	1.5%	0.9%	17.8%
Other Activity	8.7%	8.8%	7.1%	4.4%
N=	115	137	112	45

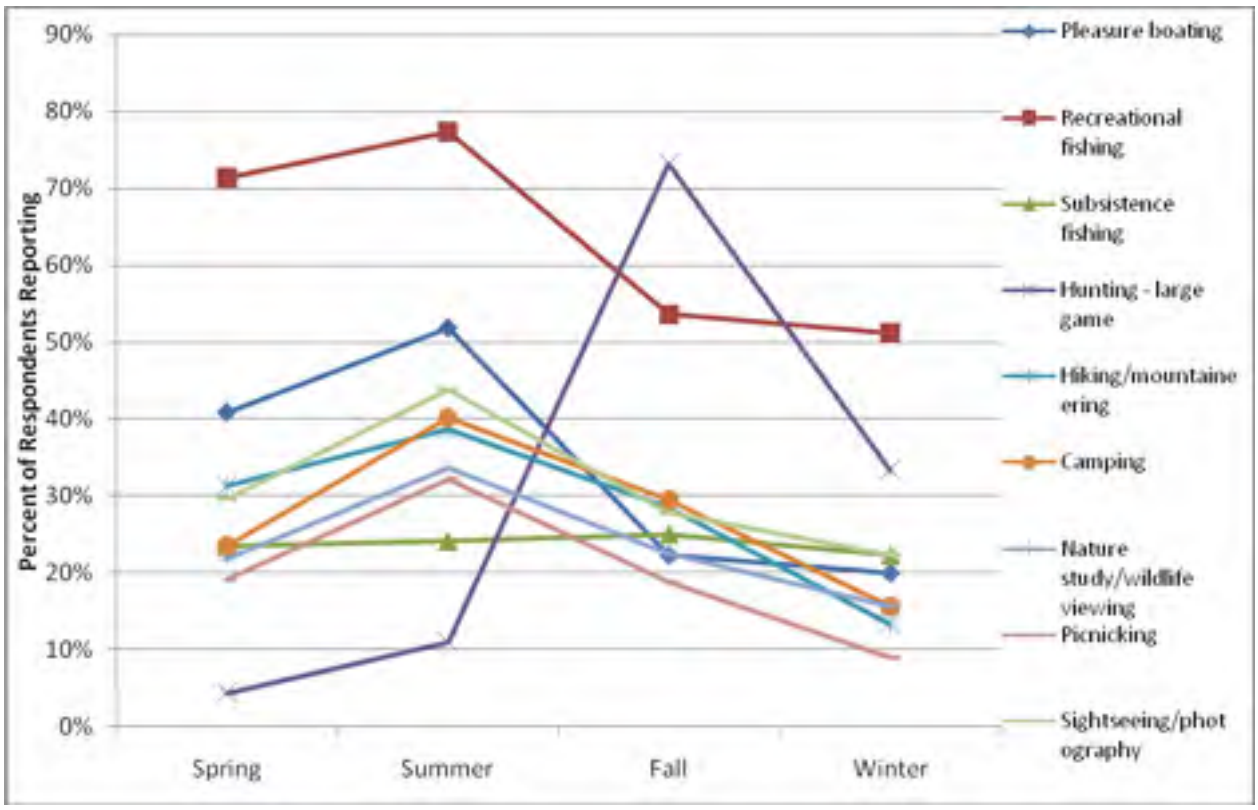
Note: Total sums to greater than 100 percent because respondents were allowed to indicate more than one response.

For public recreators, there was some seasonal variation in the most popular activities reported (Figure 6-2). For spring recreation, respondents indicated recreational fishing (71 percent), pleasure boating (41 percent), and hiking/mountaineering (31 percent) as the most popular activities. The two most popular activities for summer recreators were likewise recreational fishing (77 percent) and pleasure boating (52 percent) but the third most popular activity reported for the summer was sightseeing and photography (44 percent), followed by camping (40 percent), which was only reported by 24 percent of spring recreators.

The fall activities reported to be the most popular were large game hunting (73 percent), recreational fishing (54 percent), and camping (30 percent). Winter recreation activities reported by respondents were predominantly fishing and

hunting with recreational fishing (51 percent), subsistence fishing (22 percent), large game hunting (33 percent), small game hunting (18 percent) and trapping (18 percent) reported to be the most popular winter activities. Sightseeing and photography were also reported to be among the most popular recreation activities in the winter (22 percent).

Figure 6-2. Comparison of Participation by Season of the Most Popular Recreation Activities Reported by Resident Boater/Pilot Respondents



7.0 POTENTIAL PROJECT EFFECTS TO RECREATION

7.1 Effects of Project Structures

Construction activity (noise, blasting, increased human presence), may have localized, temporary effects on use of the area. Any permanent effect of project structures on the recreation experience may be associated with the changes to the visual landscape resulting from the presence of the intake structure on Swan Lake, the outlet structure at Cascade Creek, and the powerhouse complex and tailrace near the shore of Thomas Bay. As part of this study, commercial operators/guides and resident boaters/ pilots were asked to rate visual aspects of Thomas Bay, Swan Lake, Falls Lake, and Cascade Creek.

For commercial operators, the average response to the question of rating the visual aspects of Thomas Bay, Swan Lake, Falls Lake, and Cascade Creek was "Good" to "High" (4.6 on a scale from 1 to 5 with 1 being "Low Quality", 3 being "Neutral" and 5 being "High Quality). Approximately 88 percent of the respondents rated the area as "High Quality". When asked to indicate the scenic attributes or detriments of the project area and immediate vicinity, approximately 86 percent of outfitters/guides stated that Thomas Bay was considered to be a predominant scenic attribute, followed by Cascade Creek, indicated by approximately 48 percent of commercial respondents. One-third of all respondents indicated that the entire area was a scenic attribute with undeveloped wilderness noted by approximately 39 percent or respondents as a particular scenic feature of the project area and vicinity. This was followed by the falls of Cascade Creek (indicated by approximately 17 percent of commercial respondents). Approximately 72 percent of commercial outfitter/guide respondents indicated that the visual quality of Thomas Bay, Swan Lake, Falls Lake, and Cascade Creek was "Essential" to the recreation services they provide.

Resident boaters and pilots were asked to provide the public perspective for the same series of questions. When asked about the visual quality of the project area and immediate vicinity, the average resident boater/pilot response was a visual quality rating of 4.7 ("Good" to "High"), with 79 percent of the respondents rating the area as "High Quality". Respondents to the Resident Boater/Pilot Survey were also asked what they

considered to be scenic attributes or detriments of Thomas Bay, Swan Lake, and Cascade Creek with approximately 64 percent stating that Thomas Bay was considered to be a scenic attribute, while 63 percent of respondents stated that Cascade Creek was a predominant scenic attribute of the area. Approximately 36 percent of boater/pilot respondents cited Swan Lake as a scenic attribute and 20 percent indicated Falls Lake. Regarding the particular scenic features of the project area and vicinity, approximately 20 percent of respondents reported that mountains were a scenic feature of the area, while nearly 20 percent reported wilderness and approximately 17 percent reported waterfalls as scenic features of the area. Approximately 60 percent of respondents indicated that the visual quality of the project area and immediate vicinity (Thomas Bay, Swan Lake, Falls Lake, and/or Cascade Creek) was "Essential" to their recreational experience.

Resident boater/pilot respondents were also asked to evaluate the significant recreation features of the project area and immediate vicinity. When asked how they would rate the recreation facilities and features of Thomas Bay, Swan Lake, Falls Lake and Cascade Creek, approximately 72 percent of public respondents indicated "Good" to "High" quality with an average rating of 4.1. Cascade Creek was the location noted most often as having significant recreation facilities and features (86 percent of respondents), followed by Thomas Bay (76 percent of respondents), Swan Lake (49 percent of respondents), and Falls Lake (18 percent of respondents). Other notable recreation areas in the project vicinity cited by boater/pilot respondents were Scenery Cove (20 percent of respondents), Ruth Island (9 percent of respondents), Patterson River Estruary (7 percent) and Ruth Lake (6 percent of respondents).

Swan Lake

The intake structure, once completed, will be largely encased within the mountainside, where it will serve as the beginning of the excavated power conduit. As the majority of the structure will be subterranean, only the intake facility entrance, measuring approximately 50 feet wide by 30 feet high, will be visible (Photo 7-1).

Photo 7-1. Photo-rendering of Swan Lake Intake Structure.

Commercial outfitters and guides and public recreational users (boaters and pilots) who participate in recreation activities in the area were asked to evaluate the effect of the proposed intake on their use of Swan Lake. Commercial outfitter and guide respondents indicated that the shoreline of Swan Lake in the location of the proposed intake in the pre-construction condition was of "Good" to "High" visual quality (average rating of 4.6 on a scale from 1 to 5 with 1 being "Low Quality", 3 being "Neutral" and 5 being "High Quality"). Approximately 72 percent of the commercial respondents rated the proposed intake location as "High" quality. Commercial outfitters and guides were presented with a photorendering of the post-construction condition of the Swan Lake shoreline, depicting the intake structure entrance as viewed from within 100 feet of the structure. The average rating for the visual quality reported by commercial operators was 1.9 ("Fair" to "Low" quality). Approximately 58 percent of the commercial outfitters and guides rated the visual quality of the view of the intake structure entrance as "Low". When commercial outfitter/guide respondents were asked why they rated the visual aspects of the post-construction rendition the way they did, 46 percent stated that they preferred the visual aspects of a "natural" shoreline while 27 percent specifically objected to the aesthetics of the "man-made" structure.

Respondents to the Boater/Pilot Survey indicated that the location of the proposed intake as it currently exists, the unconstructed shoreline of Swan Lake, was of "Good" to "High" visual quality (average quality rating of 4.3). Approximately 60 percent of the

boater/pilot respondents rated the proposed intake location as "High" quality. In response to a question regarding the rating of the visual aspects of the location of the proposed intake in the post-construction rendition (see Photo 7-1), the average response was "Fair" quality (average quality rating of 2.0), with approximately 42 percent of the respondents rating it as "Low" Quality. When respondents were asked why they rated the visual aspects of the rendition of the constructed intake structure the way they did, 37 percent stated that they preferred the visual aspects of the shoreline without man-made structures, approximately 12 percent stated that the area was no longer wilderness, and 11 percent preferred the shoreline in an undeveloped state.

Approximately 58 percent of commercial outfitter and guide respondents indicated that the presence of the intake would affect their recreational use of the lake with 44 percent indicating that they would expect a decrease in patrons to the area or that they would specifically use Swan Lake less often as a result of the presence of the intake. Among the boater/pilot respondents who indicated that they recreate in the area, approximately 38 percent indicated that they would use Swan Lake less often as a result of the presence of the intake.

Cascade Creek

The outlet structure will be constructed at the headwaters of Cascade Creek, where Swan Lake discharges into the Creek, and will control flows into Cascade Creek. The visibility of the outlet structure will be limited to a small section of the northern reach of the Cascade Creek Trail; it will generally not be visible from Swan Lake (Photo 7-2).

Photo 7-2. Rendition of Cascade Creek Outlet (After).

Commercial outfitter/guide respondents rated the visual aspects of Cascade Creek at the outlet of Swan Lake under existing conditions as "Good" to "High" quality (average quality rating of 4.4), with approximately 63 percent of respondents rating the headwaters of Cascade Creek as "High" quality. When asked to rate the visual aspects of the Swan Lake outlet structure, based on a post construction rendition (Photo 7-2), the average response rating was 1.8 ("Fair" quality), with approximately 56 percent of respondents rating it as "Low" quality. Approximately 39 percent of outfitter/guide respondents stated that their rating of the post-construction outlet structure rendition was based on their preference for a "natural flow"; while 26 percent stated that they viewed the visual aspects as lessened because the location of the outlet structure would no longer be in a "natural" state. Approximately 13 percent of respondents specifically objected to the aesthetics of the man-made structure.

Respondents to the Resident Boater/Pilot survey likewise rated the visual aspects of the pre-construction condition of the outlet of Swan Lake into Cascade Creek. The visual quality of this feature was rated as "Good" to "High" quality (average quality rating of 4.4). Approximately 65 percent of boater/pilot respondents rated the headwaters of Cascade Creek as "High" quality. Boater/pilot respondents were asked to rate the visual aspects of the Swan Lake outlet structure, based on a post construction rendition (Photo 7-2). The average response rating was 2.0 ("Fair" quality), with approximately 49 percent of boater/pilot respondents rating it as "Low" Quality. Approximately 29 percent of boater/pilot respondents rated had a neutral opinion of the visual quality of the Swan

Lake outlet structure. When asked to specify the impetus behind the rating of the visual quality of the outlet structure, approximately 32 percent of boater/pilot respondents stated that they preferred the aesthetics of a fuller creek and 25 percent stated that they viewed the visual aspects as lessened because the creek would no longer be in its natural state.

Approximately 69 percent of commercial outfitter and guide respondents indicated that the presence of the outlet structure would impact their recreational use of Cascade Creek. Approximately 22 percent of commercial outfitter and guide respondents indicated that they expected a decrease in patrons as a result of the structure, while approximately 9 percent indicated that they would use Cascade Creek less often as a result of the presence of the outlet structure.

Thomas Bay

Because the area is mountainous, and the powerhouse will be constructed in a manner in which it will be concealed with rock and vegetation within the 200 foot setback, the powerhouse will be largely invisible from most vantage points, including from Thomas Bay. The powerhouse complex will also include staff housing and outbuildings and a boat dock (fixed pier/floating structure) and barge ramp, access road, and rock fill that will be used to bury the penstock.

The tailrace will be a naturalized channel that will exit at a 90 degree angle into Thomas Bay, further screening the powerhouse from view. A fish barrier will be constructed in the tailrace approximately 100 feet from tideline in Thomas Bay. As such, only the bottom outlet of the tailrace will be visible from the Bay. A footbridge will be constructed that will traverse the tailrace just below the constructed falls providing continuity of the Cascade Creek Trail from Cascade Creek Cabin to the trailhead and providing a scenic vantage point from which to view the barrier falls and Thomas Bay.

Among the structures visible from Thomas Bay will be the dock and barge, a portion of the access road and the rock fill outfall, as well as the new tailrace discharge into Thomas Bay (Photo 7-3).

Photo 7-3. Photo-rendering of Thomas Bay Shoreline Containing Powerhouse

Respondents to the Commercial Outfitter/Guide Survey and respondents to the Resident Boater/Pilot Survey surveys indicating that they recreate in the area were asked to evaluate the effects of the proposed powerhouse complex on their recreation experience. Approximately 75 percent of outfitter/guide respondents indicated that the proposed powerhouse was of "Fair" or "Low" visual quality (average visual quality rating of 1.9), compared with 6 percent who indicated the shoreline was of "Fair" visual quality as it exists today in the unconstructed condition (average visual quality rating of 4.2) and 24 percent who had a neutral opinion of the aesthetics of the Thomas Bay shoreline. When commercial outfitter/guide respondents were asked why they rated the visual aspects of the post-construction photograph the way that they did, 46 percent stated that they preferred an undeveloped shoreline and approximately 23 percent objected to the aesthetics of the "man-made" structures. Approximately 72 percent of outfitter/guide respondents indicated that the presence of the powerhouse would affect their use of the area, with 26 percent anticipating a decrease in patrons and 30 percent indicating that they would use the area less as a result.

Likewise, 29 percent of boater/pilot respondents who use the area for recreational purposes indicated an unfavorable of the visual quality of the powerhouse structures. Boater/pilot respondents indicated that the shoreline of Thomas Bay as it exists today is of "Good" to "High" visual quality (3.8 average visual quality rating), with 34 percent

indicating "High" visual quality. An equal number of respondents, 34 percent, indicated a neutral opinion of the visual quality of the Thomas Bay shoreline. The opinion of the visual quality of the rendition of the proposed powerhouse complex as viewed from Thomas Bay was of "Fair" to "Low" visual quality (average visual quality rating of 2.3), with 29 percent indicating the structures were of "Low" visual quality and 27 percent indicating the visible structures of the Thomas Bay shoreline being of "Fair" visual quality. Approximately 28 percent of boater/pilot respondents stated that they preferred an undeveloped shoreline, approximately 10 percent of respondents stated that the negative view of the powerhouse site was due to vegetation removal, and approximately 9 percent stated that the shoreline would no longer be wilderness. Approximately 25 percent of boater/pilot respondents indicated they would visit less often and 18 percent indicated that they would visit somewhat less often as a result of the presence of the powerhouse complex. However, given that the most often suggested recreational improvements for the project area and immediate vicinity included dock facilities and shoreline access and given that these facilities would not only be provided but would primarily be the only facilities visible from Thomas Bay, it is unclear whether use of the new recreation facilities would offset the effects of increased development.

Other Project Facilities

The approximately 3-mile-long, 12-foot-diameter tunnel complex extending from the intake at Swan Lake to the powerhouse at Thomas Bay will be subterranean for much of the route or otherwise concealed with rock and native vegetation so as not to disrupt the natural scenic qualities of the area. Transmission will consist of a combination of overland and undersea cable to a point of connection at Petersburg, Alaska, approximately 20 miles to the southwest of the project site, and will generally traverse an existing corridor.

7.2 Effects of Project Operations

Effects to Lake Levels

The Project will withdraw lake water for power generation in a manner that maintains the natural pre-development lake level fluctuation based on historical discharge records correlated to lake elevation stage. While the project powerhouse has been

designed to accommodate approximately 95 percent of the typical water year flow regime, high flows that exceed the plant capacity of 670 cfs (plus any in-stream flow requirement) would be subject to delayed release from Swan Lake if capacity below the normal high water was available, and/or released via the outlet structure, if storage capacity was not available. Project operations, therefore, are not expected to affect the visual quality of Swan Lake with respect to changes in the hydrologic regime. As lake levels will experience the similar seasonal fluctuation as they have historically, project operations would not be expected to alter participation in water-based activities.

The stage of Falls Lake currently varies greatly throughout the year, with fluctuations ranging from a lake stage of 15 feet up to a stage of 48 ft, an overall average of 31.2 feet, and spillage into Cascade Creek occurring at elevations of 34 feet or higher. Under project operations, the average lake stage will drop approximately 10 feet to an overall average of 21 feet with fluctuations ranging from a lake stage of 15 feet to 38 feet. While the overall stage will be lower on average, lake stage fluctuations will still be within the band of fluctuation currently experienced at Falls Lake and spillage into Cascade Creek will still occur, particularly during the peak recreation season. Average stage height from May through November will range from 18 feet in May to 27 feet in July, on average (Whitewater Engineering 2011).

To accommodate any access issues to Falls Lake for angling or spur trail connectivity associated with the average drop in elevation during the recreation season, CCLLC is proposing trail upgrades in consultation with the USFS. Falls Lake supports a trout fishery though, because of its hydrologic isolation and lack of spawning or rearing habitat, this population is likely the result of fish washing downstream from Swan Lake. As the fluctuations under post-Project conditions are within the range currently experienced, these changes are not expected to affect the fishery. Likewise, hydrologic inputs, though lessened overall, will maintain water quality and continue to pass fish from Swan Lake, though to a lesser degree.

Effects to Cascade Creek Flows

As the Project will take advantage of natural inflow variations, discharges into Thomas Bay from the powerhouse will generally follow the same hydrologic regime as

exists currently at the existing outlet of Cascade Creek. As inflow to the Project would generally equal natural outflow from Swan Lake, there will be times during the year where hydropower operation will be minimal or will, in some cases, be completely curtailed.

Project operations will result in the alteration of flow into Cascade Creek, as water that previously cascaded over the falls during high flow would be attenuated due to plant operation. While flows from Swan Lake into the upper section of Lower Cascade Creek will be diverted through the power conduit rather than discharging into the Creek, hydrologic studies indicate that seepage, accretion and tributary flows contribute additional hydrologic inputs from an average of 75 cfs in the winter to 129 cfs in the summer, though the Creek does currently experience occasional periods of no flow during the winter months (Whitewater Engineering 2011). In addition, seepage currently exits Falls Lake at lower lake level stages, generally less than 34 feet, such as those anticipated under project operations, on the order of between 50 and 100 cfs (Civil Science, 2011).

During the peak recreation season, from May through October, flows from Swan Lake will actually exceed the Project capacity of 670 cfs. Flows in excess of project capacity will be spilled into Cascade Creek from the Swan Lake outlet. Swan Lake overflow will range from approximately 10 cfs in late fall to approximately 75 cfs in mid-summer. This flow will augment any seepage flows and tributary flows that currently wet Cascade Creek along its length during this time period. Accordingly, Lower Cascade Creek, extending from Swan Lake to the outlet at Thomas Bay, will continue to exhibit the same basic hydrology of having surface water present in the stream bed during periods of high flow, though at lower overall volumes than currently experienced, and seepage from Swan and Falls Lake, accretion and tributaries supplying the water during periods of low flow.

Respondents to the commercial outfitter and guide survey were asked to evaluate the potential project effect of lower flows on their use of Falls Lake and Cascade Creek. Approximately 68 percent of commercial outfitters and guides indicated that the visual quality of Cascade Creek under lower average fall flow conditions (Photo 7-5), which presents similar hydrologic conditions as expected under the proposed action, was

"Good" to "High" quality (average rating of 3.9 with 42 percent indicating "High" quality). The majority of commercial outfitter/guide respondents (67 percent) indicated "No Change" when asked if they would prefer a lower or higher flow. Under average spring flow conditions (Photo 7-4), with higher water levels, similar preferences were reported. Approximately 87 percent of outfitter/guide respondents indicated higher Cascade Creek flows were of "Good" to "High" visual quality (4.6 average rating) with 77 percent indicating "No Change".

Photo 7-4. Cascade Creek Spring Flow Conditions

Photo 7-5. Cascade Creek Fall Flow Conditions

Registered boaters and pilots were asked to rate the visual aspects of the existing Cascade Creek under average spring flow conditions. Approximately 70 percent of boater/pilot respondents provided a rating of "High" quality (average rating of 4.5). When respondents were asked if they preferred flows that were higher, lower, or about the same for the existing Cascade Creek falls under average spring flow conditions, approximately 88 percent of respondents indicated that they would prefer no change. When respondents were asked to rate the visual aspects of the existing Cascade Creek under average fall conditions, the average response was "Good" quality (3.9 visual quality rating), with approximately 41 percent rating it as "High" quality and approximately 32 percent of respondents having a neutral opinion. Approximately 80 percent of respondents indicated that they preferred no change to the average fall flow condition.

8.0 EFFECTS TO LAND MANAGEMENT OBJECTIVES

The 2008 TLRMP guides all natural resource management activities and establishes management standards and guidelines for the TNF. The TLRMP describes resource management practices, levels of resource production and management, and the availability of lands for different kinds of resource management, including recreation. Forest-wide Standards and Guidelines include providing opportunities and programs that are appropriate to the Forest environment and dependent upon natural settings; consider the scenic condition of adjacent non-USFS lands during the planning of development activities on the TNF; and manage areas not seen from Visual Priority Routes and Use Areas (VPRUA) as "non-priority" with allowable activities including recreation facilities, roads, resource extraction, and, under Special Use Permits, hydroelectric projects (USFS, 2008a, 2008c).

The TLRMP identifies land use classifications (LUD) for lands of the TNF and provides management prescriptions for what is allowable within the area allocated to the corresponding LUD, the standards for accomplishing each activity, and the guidelines on how to implement the standards such that all activities are integrated to meet land allocation objectives (USFS, 2008a). These standards and guidelines are delineated into various resource categories such as facilities, recreation and tourism, fish, subsistence, trails, wetlands, wildlife and scenery, among others. Each LUD has scenic integrity objectives (SIO) for instituting landscape architecture in projects and ensuring consistency with the scenery management objectives for that LUD.

In addition to LUDs, the USFS's TLRMP identifies VRPUA for the Forest. VRPUA are routes and use areas from which scenery will be emphasized from a LUD management perspective, whereby VRPUA are used to institute design guidelines and visual quality objectives for proposed projects (USFS, 2008a; USFS, 2008b; USFS, 2008c).

As discussed above, lands on which project structures would be located (intake, outlet, power conduit and powerhouse complex) are contained within the Power Site Classifications No. 9 and 192 as reserved for hydropower development (Secretarial Orders of August, 20, 1921 and November 14, 1927) and are otherwise "withdrawn from other management considerations" (USFS, 2003). While the USFS assigns LUDs to the project area, discussed in further detail below, the Power Site classification remains the primary use objective. In instances related to

project design, operation, or safety, accommodation should be made for this primary designation. Portions of the transmission corridor are not classified within the Power Site classification.

The TLRMP does not expressly restrict facilities and development. It does, however, indicate that non-recreation facilities and development should be designed and located to reduce adverse effects on recreation and tourism opportunities. Development may be "minimal or occasionally may be larger in scale, but will be rustic in appearance, or in harmony with the natural setting" (USFS, 2008a). Not only must any construction be consistent with the LUD, but the TLRMP also requires that all new construction be conducted in accordance with an approved site development plan in order to provide safe, functional, aesthetically pleasing, energy-efficient, and cost-effective facilities. Planning must encompass complete site development plans for all facility needs as identified in the TLRMP implementation schedule or the Forest Facility Master Plan (USFS, 2008a).

8.1 Land Use Designations

Swan Lake, Falls Lake, Cascade Creek and Thomas Bay

The TLMP designates the majority of lands surrounding the Project for Semi-Remote Recreation. The TLMP goals for these lands are to provide "predominantly natural or natural-appearing settings for semi-primitive types of recreation and tourism, and occasional enclaves of concentrated recreation and tourism facilities" and to provide "opportunities for a moderate degree of independence, closeness to nature, and self-reliance in environments requiring challenging motorized or non-motorized forms of transportation" (USFS, 2008a). The objectives of this LUD involve managing use, development, and activities on these lands to be consistent with the Semi-Primitive Recreation Opportunity Spectrum (ROS) classifications and the moderate scenic integrity objective. Although the USFS generally manages these areas for the Semi-Primitive ROS classifications; new or existing development and other factors may result in the application of different ROS classifications to a particular area (USFS, 2008a).

The Semi-Remote Recreation LUD outlines objectives to meet the goals for recreation opportunities and access and dictates the appropriate management prescriptions to achieve the defined "desired condition". For Semi-Remote Recreation lands the "desired condition" is characterized as generally unmodified natural

environments, moderate levels of remoteness and seclusion with some areas offering support facilities, development and motorized access and opportunities (USFS, 2008a).

The SIOs for the Semi-Remote Recreation LUD include, but are not limited to:

- design activities to be subordinate to the landscape character of the area;
- minimize amount and breadth of vegetation clearing;
- enhance views from recreational facilities;
- select materials and colors that blend with those found in the natural surroundings; and
- minimize potential scenic impacts through scheduling or timing of activities, subject to considerations given to other resources, such as wildlife.

Specific to development (including non-recreation development), land management, recreation and tourism and aesthetics, the following standards and guidelines are applied to the Semi-Remote LUD:

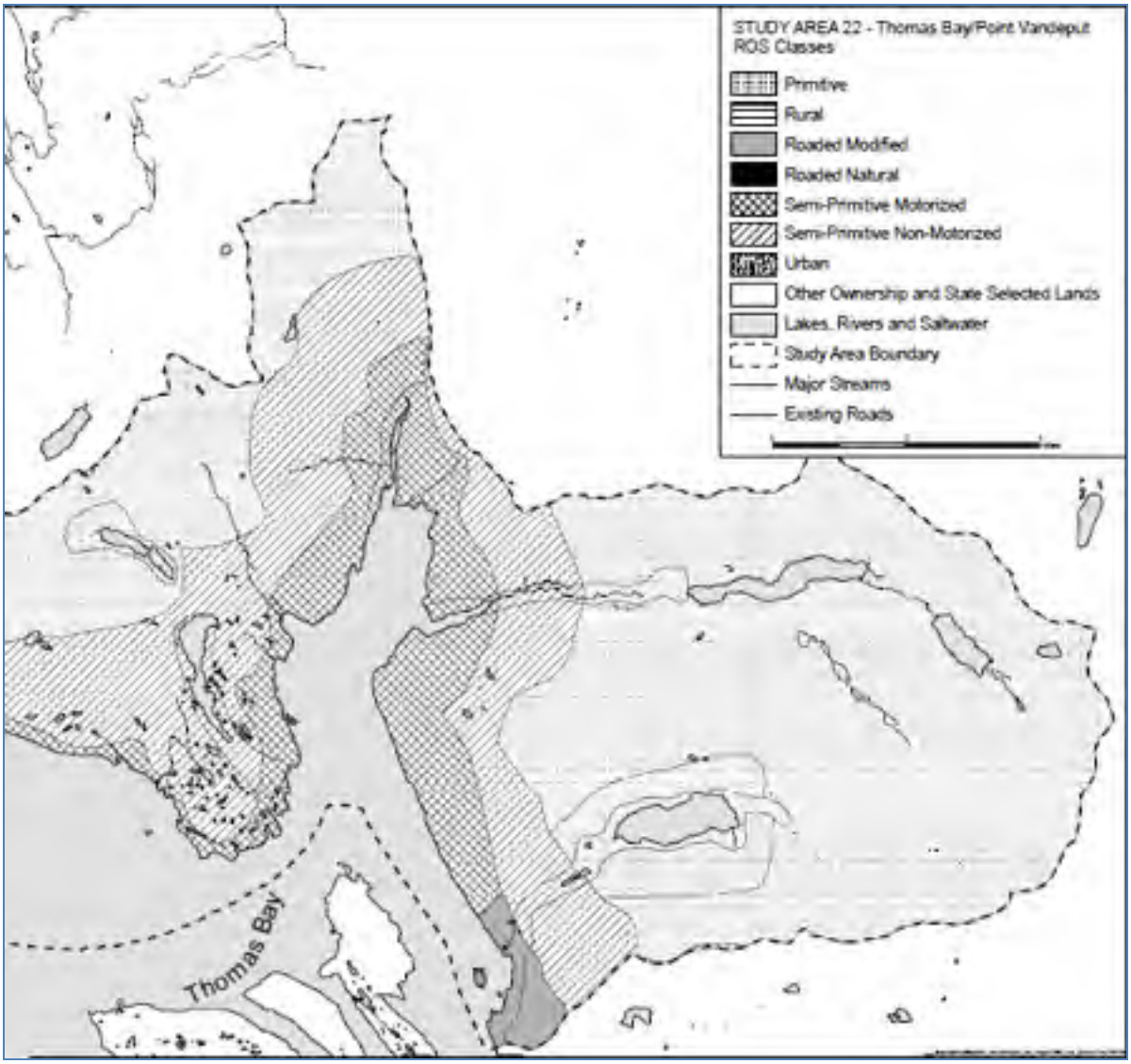
- Design and locate administrative and non-recreation structures to reduce adverse effects on recreation and tourism opportunities;
- Permit only facilities and uses consistent with Semi-Remote Recreation LUD objectives which include a Transportation and Utility System (TUS) "window", providing opportunities for the future designation and location of TUS sites.
- Generally manage for Semi-Primitive ROS settings, allow limited motorized recreation routes, permit small scale, rustic recreation and tourism facilities, and
- Design resource activities to remain visually subordinate to the characteristic landscape.

The lands immediately surrounding the project area at Swan Lake, the upper reach of Cascade Creek (from Swan Lake to Falls Lake), and the northern half of Falls Lake are classified as “Primitive” (Figure 8-1). The existing SIO for Primitive ROS lands is high to very high with no motorized activities except those associated with traditional recreation. The Primitive ROS lands are generally characterized by a high level of remoteness with limited access and very little visitor management facilities such as signage. Development is effectively non-existent with the exception of public recreation cabins and facilities limited to such support amenities as trails, boat moorings, and bear-proof food caches (USFS, 2008a).

Primitive ROS standard calls for high scenic integrity, very limited indication of human presence, and limited motorized access (USFS, 2008a). Construction activities will have implications to the scenic integrity and indication of human presence; however, these effects will be temporary and timed to occur outside of the peak recreation season (May through October). They are also within the allowable activities associated with the project areas designation as a Power Site.

The lands surrounding southern half of Falls Lake and lower Cascade Creek are classified as "semi-primitive non-motorized" ROS lands. Non-motorized travel is typical of this ROS classification with use of airplanes, helicopters, motorboats, and snow machines for traditional activities and off-road vehicles occurring on designated routes. Remoteness is less than the Primitive classification; distant sights or sounds may be observed and access is more readily available. Visitor information facilities, such as interpretive kiosks, may be present along with USFS recreation cabins and other such compatible facilities as trails, boat moorings and docks (USFS, 2008a).

Figure 8-1. ROS Classes of the Project area and immediate vicinity



Source: USFS, 2009

The lands at the outfall of Cascade Creek and Thomas Bay shoreline are classified as "roaded modified" ROS lands. All forms of access and travel modes may occur within this ROS classification, although roads are generally not well maintained or suitable for standard vehicles. Off-highway vehicle use on designated routes or areas is allowed. Visitor facilities may include interpretive facilities, cabins and other amenities. Social encounters are generally less than 20 other parties per day on trails and in dispersed areas during at least 80 percent of the primary use season with numerous other parties encountered on roads. Few, if any, other parties are visible at dispersed campsites (USFS, 2008a).

The Semi-Primitive Non-motorized ROS standards have a similar aesthetic characteristic as the primitive ROS, and limited human activity, structures and motorized access facilities (USFS, 2008a), while the Roaded Modified ROS has a very low scenic integrity objective, allows for all forms of access and motorized travel and has some development (USFS, 2008a). Again, construction activities may present short-term disruption to the scenic and aural environmental within these ROS classifications, but long-term effects will be minimized by designing project structures consistent with the surrounding environment to the extent possible and in keeping with the management objectives of the Semi-Remote Recreation LUD.

Transmission Line Corridor

Lands of the proposed transmission line corridor traverse Scenic Viewshed, Old Growth Habitat, and Modified Landscape LUDs, as well as non-federal lands (USFS, 2008a). The majority of overland transmission lines will follow existing corridors within the Old Growth and Scenic Viewshed LUDs. The goal of the Old-Growth Habitat LUD is to maintain old-growth forests in a natural or near-natural condition for wildlife and fish habitat. Timber harvesting activities are limited, as is development. The Scenic Viewshed LUD has goals including allowing timber and resource activities while maintaining scenic quality in the areas viewed from VPRUA and popular travel and marine travel routes and recreation areas.

Land clearing will be required for a portion (approximately 3,000 linear feet) of the overland transmission line on the Point Agassiz peninsula within the Modified Landscape LUD. The goals of the Modified Landscape LUD are:

- To provide a sustained yield of timber and a mix of resource activities while minimizing the visibility of developments in the foreground distance zone.
- To recognize the scenic values of suitable forest lands viewed from identified popular roads, trails, marine travel routes, recreation sites, bays, and anchorages, and to modify timber harvest practices accordingly.
- To maintain and promote wood production from suitable forest lands, providing a continuous supply of wood products to meet society's needs.

- To seek to provide a supply of timber from the Tongass National Forest that meets the annual and planning-cycle market demand, consistent with the standards and guidelines for this LUD.

Under the Modified Landscape LUD, the desired condition dictates that a somewhat modified landscape is acceptable and management activities in the visual foreground will be subordinate to the characteristic landscape, but may dominate the landscape in the middle and backgrounds. Vegetation clearing and timber removal in the foreground is preferred to be small and "affect only a small percentage of the seen area at any one point in time". Structures are to be subordinate to the foreground landscape.

8.2 Assessment of Project Structures within Land Use Designations

In general, the project structures and operations will have limited effects to the USFS management of surrounding lands within the Semi-Remote Recreation LUD. Lands which the project structures will occupy are entirely within the Power Site classification. As the Power Site classification supercedes other management objectives, project structures do not contradict management prescriptions. For adjacent lands, the project structures will be limited to relative small and obscure footprints and CCLLC is committed to working with the USFS to develop structures that are, within operational requirements and constraints, compatible with adjacent management objectives. For example, only the face of the entrance to the intake structure will be visible and visibility will be limited to near shore areas of Swan Lake. No lands outside of the Power Site classification will provide a vantage point from which to see the Swan Lake intake or outlet structures.

USFS management of the near shore areas of Thomas Bay may be affected by the presence of project facilities and operations, particularly the Cascade Creek Cabin and Trail. While the power conduit will traverse lands within all three ROS classifications, it will consist of a buried tunnel and will have no effect on recreational use of the project vicinity. Additionally, this use is acceptable under the Power Site classification.

There will be a limited amount of new clearing required for the installation of the transmission line. Approximately 3,000 linear feet from the end of the existing transmission line corridor to the Point Agassiz shoreline on Frederick Sound will require additional clearing. This clearing will be limited to a 100 ft wide corridor that will only be visible from certain vantage points on Frederick Sound. Much of the path of the existing transmission line corridor has already been identified as a potential utility corridor by the USFS. Overall, no inconsistencies with the Modified Landscape LUD are expected. The installation and maintenance of transmission line corridors on the mainland and Mitkof Island may encourage wildlife utilization, such as moose, which may actually provide additional hunting opportunities in the project vicinity.

8.3 Visual Priority Routes and Use Areas

The USFS's Visual Priority Routes and Use Areas (VPRUA) for the TNF are used to institute design guidelines and visual quality objectives for proposed projects. VPRUA's are categorized into: State Marine Parks, Recommended Wild, Scenic, and Recreational Rivers, Saltwater Use Areas, Dispersed Recreation Areas, Communities, Forest Service Cabins, Developed Recreation Sites, and Boat Anchorages. Visual Priority Routes are separated into several categories: Alaska Marine Highway, Tour Ship Routes, Roads, and Hiking Trails. In concert, the LUD SIOs and VRPUA list convey how scenery will be considered in project design for any given area, identifies distance zones within the LUD as visible from the VRPUAs and implements development and management standards for each of these zones to maintain the scenic integrity of the landscape from these various priority viewpoints (USFS, 2008a).

VPRUA that are within the project vicinity include Frederick Sound, Farragut River and Farragut Bay, and various Dispersed Recreation Sites, Hiking Trails, Developed Recreation Sites, USFS Cabins, as well as the communities of Petersburg, Kake and Wrangell. VPRUA adjacent to or within the project area include (USFS, 2008a):

- Thomas Bay, identified as a Saltwater Use Area, Dispersed Recreation Area, and Boat Anchorage;

- Swan Lake, identified as a Dispersed Recreation Area, and having a USFS Cabin;
- Cascade Creek, identified as having a USGS Cabin and as a Hiking Trail, and
- Falls Lake, which is identified as a Developed Recreation Site (Falls Lake Shelter).

The Recreation Areas (dispersed or developed and facilities such as trails and cabins) are defined by the type of recreation use and can require few, if any, improvements or modifications that enhance recreation opportunities and accommodate intensive recreation activities in a defined area. For Dispersed Recreation Areas, such recreation includes activities related to roads, trails, and undeveloped waterways and beaches and activities may not necessarily take place on or adjacent to a road, trail, or waterway, but would likely occur in conjunction with it. Activities are typically day-use oriented and include hunting, fishing, boating, off-highway vehicle use, and hiking. Many developed recreation areas (such as shelters) can accommodate overnight use, as well. Because the recreation experience has a direct correlation to aesthetics, these area types have an impact on the visual quality management objectives of classified LUDs. The effects to aesthetics from project construction, structures and operations on the recreation areas of Thomas Bay, Swan Lake, Falls Lake and Cascade Creek, are discussed in greater detail above. There is no defined objective for Saltwater Use Areas (USFS, 2008a; USFS, 2008b).

9.0 CURRENT AND FUTURE RECREATION NEEDS

This section discusses the need for any new recreation facilities and/or public access in the vicinity of the proposed Project to meet current and future (over the term of any new license) recreation demand.

9.1 Potential Future Recreation Use

Population projections for Wrangell Petersburg Census Area were used to estimate future participation in recreation activities by resident public recreators in the project area and immediate vicinity (Table 9-1).

Overall, US Census data for the city of Petersburg shows that the population has declined by approximately 12 percent between 1990 and 2009 (US Census, 2010a). US Census data for the town of Wrangell show a similar decline in population by approximately 13 percent between 1990 and 2009 (US Census, 2010b). The population of Kake has also declined between 1990 and 2009 (US Census, 2010c) by approximately 10 percent. The population of the Wrangell Petersburg Census Area is expected to decline approximately 35 percent in the next 25 years, an average annual decline of 1.4 percent (ADL, 2010). Accordingly, should use of recreation sites and areas of Thomas Bay, Swan Lake and Cascade Creek mirror population growth patterns, recreation pressure within the project area and immediate vicinity would be expected to remain relatively stable and potentially decrease over the next 25 years.

Approximately 85 percent of commercial outfitter/guide respondents indicated that their patrons originate from states other than Alaska. Participation in commercial recreation activities in the project area and immediate vicinity would be much more sensitive to the effects of extraneous forces such as the economy, competition, changes in regulation, and the personal goals of the business owners, among other factors, that it would be an impracticality to apply the same assumptions and methodology to commercial use levels. As such, no attempt to estimate future participation in commercial recreation activities was made. Trends noted from recent studies indicate an increase in tourism to the state from 1993 to 2006 (McDowell, 2007a) and an overall decline in visitation to the state of Alaska from 2008 to 2010, expected to continue in the short-term in light of recent economic conditions (McDowell, 2010).

Table 9-1. Estimated Future Recreation Participation for the Project area and immediate vicinity

	Use Estimates (2009 - 2010)	Estimated Future Participation				
		2014	2019	2024	2029	2034
Population Growth Rates for the Wrangell Petersburg Census Area		-6.95%	-6.89%	-7.28%	-9.04%	-10.48%
Total Public Recreation Use	24,180	22,500	20,950	19,430	17,670	15,820

Source: ADL, 2010.

With respect to state-wide trends in recreation participation, the reported participation rates of Alaska residents in the Alaska SCORP are high. Among the most popular activities reported in the 2009 SCORP are outdoor pursuits such as hiking (91 percent), fishing (84 percent), bird/wildlife watching (84 percent), backpacking (83 percent), and foraging (82 percent) (APOR, 2009). This represents a shift in activities, as well as an overall increase in participation in recreation activities from that reported in the 2004 SCORP (APOR, 2004). In 2004, Alaska residents reported participation in sightseeing (83 percent), walking (83 percent), hiking (81 percent), bird/wildlife watching (77 percent), fishing (70 percent) and foraging (64 percent) as among the most popular activities (APOR, 2004).

The analysis of future potential demand for recreation in the project area of potential effects presented in Table 9-1 is provided as a general assessment of potential future recreation pressure. While it is acknowledged that future changes in the supply of recreation resources either in their quantity, accessibility, and/or quality such as from the presence of project facilities, project operations or recreation enhancements proposed by CCLLC, may influence future demand and use, the demand analysis undertaken for this study does not attempt to speculate on what these future changes might be or how they might specifically affect levels of use within the project area of potential effect. Therefore, the demand analysis results should be viewed as a general guide of potential future recreation pressure developed for planning purposes only. Section 7.0 provides a qualitative assessment of commercial and public recreation user opinions of how the

construction and/or presence of proposed project features would affect their recreational use of Thomas Bay, Swan Lake, Falls Lake, and/or Cascade Creek. A discussion of the need for new facilities in the project area and immediate vicinity, including recommendations in line with those proposed by CCLLC, which may also have implications to future recreation use is provided in Section 9.3.

9.2 Adequacy of Existing Sites

The USFS PRD conducted an analysis to determine the recreation carrying capacity for the district in 2009 (USFS, 2009). The USFS' Recreation Carrying Capacity Study (2009) of the PRD estimated the number of RVDs within the "managed season of use", defined as 150 days from May through November that could be accommodated by the various recreation facilities of the project area and immediate vicinity.

The PRD study areas within the project vicinity (20 mile radius of the project area) included: a portion of the mainland (Muddy River Area, Thomas Bay/Point Vandeput, Farragut Bay/Cape Fanshaw, and Baird/Patterson Glaciers), Mitkof Island, the PCW, and the North Lindenburg Peninsula. Together, these study areas were reported to have accommodated an estimated 1,405 total recreation visitor days annually, on average, from 2004 – 2008 (USFS, 2009) and were well within their estimated net RVD capacities (Table 9-2).

The project area and immediate vicinity (including Swan Lake, Falls Lake and Cascade Creek and surrounding lands, as well as the USFS facilities of the Cascade Creek Cabin, Swan Lake Cabin, Spurt Cove Cabin, and Falls Lake Shelter) is contained within the Thomas Bay/Point Vandeput Study Area. The Thomas Bay/Point Vandeput Study Area received the second highest amount of use when compared among the seven study areas within the project vicinity but represents only approximately 7 percent of the total use for all of the District study areas. This study area received use from the residents of Petersburg and non-residents with transportation for camping, moose, black bear, deer, mountain goat hunting, sightseeing, fishing, trapping, and kayaking and does not include USFS cabin overnight use (USFS 2009).

Table 9-2. Reported Capacities at PRD Study Areas within the Project Vicinity (2004-2008) (in Recreation Visitor Days[a]).

Study Area	Primary Commercial Recreation Uses	Total Acres	Total Capacity (RVDs)	Annual Average USFS Reported Use (2004 – 2008) (RVDs)
1 Mitkof Island	Sightseeing, hiking swimming, picnicking, fishing, camping, black bear hunting	16,009	127,806	429
7 Petersburg Creek/Duncan Salt Chuck	Fishing, hiking , sightseeing, black bear hunting	4,786	12,634	228
8 North Lindenberg Peninsula	Fishing, camping, hiking, sightseeing, black bear and deer hunting	6,791	12,220	207
21 Muddy River Area	Camping, hunting (deer, mountain goat, wolf, black bear), guided trapping, outfitting kayaks, sightseeing	3,398	12,944	212
22 Thomas Bay/Point Vandeput	Camping, hunting (deer, mountain goat, wolf, black bear), guided trapping, outfitting kayaks, sightseeing, fishing	4,284	12,149	282
23 Farragut Bay/Cape Fanshaw	Camping, hunting (mountain goat, wolf, black bear), outfitting kayaks, sightseeing, fishing.	2,753	4,802	32
24 Baird/Patterson Glaciers	Helicopter landing tours, mountain goat hunting	2,732	1,630	15

Source: USFS, 2009

Recreation estimates calculated for the time period October 2009 to September 2010 for this study (Table 6-3 and Table 6-7) indicate that use of Swan Lake and Falls Lake and certain use of the Cascade Creek Trail and the USFS cabins currently exceed the total RVD carrying capacity for these areas (USFS, 2009) (Table 9-3). Total estimated and reported commercial and public use of these areas for 2009 – 2010, approximately 10,920 RVDs, is approximately 25 percent greater than total capacity, on average.

Table 9-3. USFS Recreation Capacities

Recreation Place Name	Acres	Net Area Capacity (RVDs)	Cabin Capacity (RVDs)[4]	Total Capacity (RVDs)
Cascade Creek Trail and Cabin	276	5,613	792	6,405
Upper Cascade Creek Trail and Falls Lake	255	163	--	163
Swan Lake[5]	715	502	1,500	2,002

Source: USFS, 2009

However, USFS reported occupied days for the Cascade Creek Cabin is within approximately 10 percent of the USFS reported capacity of the cabin; while average annual occupied days for the Swan Lake Cabin is within approximately 5 percent of capacity (Table 9-4). As such, the recreation facilities within the project area and immediate vicinity are anticipated to be used well within the design carrying capacity and are expected to accommodate additional use.

[4] The USFS recreation cabins on the PRD are available for outfitters and guides to use in their operations on a limited basis. The Deputy District Ranger identifies each cabin and the corresponding time periods and number of days the cabins are available for commercial use. The Cabin Capacity RVDs is the number of RVDs that cabins are not available for commercial use (i.e. are open to the public for recreation purposes). The net RVDs are the Cabin Capacity RVDs subtracted from the gross RVDs calculated for a recreation area. Therefore, the net RVDs are the capacity of the recreation area plus any available days a USFS cabin is available for commercial use (USFS, 2009).

[5] The ROS capacity coefficient used to calculate gross capacity RVDs was increased to reflect "visitor expectation of a less primitive experience when using this area, located outside of Wilderness, and with access from the Swan Lake cabin" (USFS, 2009).

Table 9-4. Project Area Recreation Facilities Overnight Use from 2007-2010 by Number of Days Occupied

USFS Cabin		Total Days Occupied by Month												
		January	February	March	April	May	June	July	August	September	October	November	December	Annual Totals
Cascade Creek Cabin	2010	0	0	0	2	16	10	22	18	7	10	NA	NA	85
	2009	0	0	1	0	13	17	14	7	11	2	0	2	67
	2008	0	6	0	2	10	23	24	19	2	1	2	0	89
	2007	NA	NA	NA	NA	NA	NA	NA	0	3	4	0	0	7
Spurt Cove Cabin	2010	0	0	0	1	18	3	8	6	0	0	0	0	36
	2009	0	0	0	7	15	4	11	13	4	2	0	0	56
	2008	0	0	0	0	2	5	8	8	6	0	3	0	32
	2007	0	0	0	0	0	0	0	0	0	5	0	0	5
Swan Lake Cabin	2010	0	0	0	0	0	9	27	20	19	9	NA	NA	84
	2009	0	0	0	0	0	2	28	24	21	3	0	0	78
	2008	0	0	0	0	0	6	19	27	11	18	0	0	81
	2007	NA	NA	NA	NA	NA	NA	NA	0	3	8	0	0	11
Monthly Totals		0	6	1	12	74	79	161	142	87	62	5	2	

SOURCE: personal correspondence, Brad Hunter, USFS, November 4, 2010

In its 2009 Recreation Carrying Capacity Study, the USFS reported RVDs from outfitters and guides from 2004 through 2008. The average annual reported RVDs for the entire Thomas Bay/Point Vandeput study area, which includes the project area and immediate vicinity plus portions of the mainland to the north and west such as Spurt Lake and DeBoer Lake, was 282 RVDs (Table 9-2). While USFS capacity RVD calculations take into account public use of recreation areas, the reported use in the USFS 2009 Recreation Carrying Capacity Report is from outfitters and guides only. These use numbers are significantly less than that calculated for commercial use for 2009 – 2010 for the project area and immediate vicinity by this study effort.

This is likely attributable to several factors. First, the USFS RVDs are calculated from reported use by guides and outfitters holding Special Use Permits needed for commercial recreation activities on USFS lands. By comparison, the 2010 survey effort returns included 11 operators holding Special Use Permits and 22 operators that do not. It is therefore expected that this study effort captured additional non-USFS land dependent uses (such as boating and fishing use in Thomas Bay), as well as commercial charter/transportation services providing recreators with access to the area for recreational purposes, that do not require a Special Use Permit.

Second, the use of an average reported group size in RVD calculation for commercial operators may result in overestimation. There is likely seasonal variation in group size that may not be fully captured by the reported average group size per trip. This is supported by the fact that calculated RVDs for outfitter and guide respondents holding Special Use Permits only was also higher than that reported by the USFS for the project area and immediate vicinity.

As discussed previously, non-response bias may result in overestimation for user groups. In particular, avid participants with an interest in the project area and/or the proposed licensing are more likely to respond to the use surveys than those who do not participate, assume that the survey does not apply to them, or consider the survey unimportant.

9.3 Need for New Facilities

The project area and surrounding lands are accessed by private and commercial

charter boat via Thomas Bay with limited anchorages and some accessible shorelines suitable for landing small craft but no direct ferry service. There are no sites suitable for landing wheeled aircraft; however, there are some helicopter landing sites available, in addition to frozen lake landings and floatplane access on Swan Lake as well as on Thomas Bay (USFS, 2008b). Recreation and support facilities in the project area and immediate vicinity are the USFS cabins (Swan Lake and Cascade Creek Cabins) and shelter (Falls Lake Shelter) and the Cascade Creek Trail.

Lands surrounding the proposed project area and immediate vicinity are predominantly Semi-Remote Recreation LUD lands with an ROS classification ranging from "Primitive" in the vicinity of Swan Lake to "Roaded Modified" in the vicinity of the Thomas Bay shoreline. As such, any of these lands would be suitable for additional recreation development and improvements keeping in accordance with the land management objectives of the LUD and the ROS classifications with respect to such factors as facility design, capacity and access. Potential sites for an additional USFS cabin within the project vicinity, comparable to the experiences offered by the Swan Lake and/or Cascade Creek Cabin, would be Scenery Lake and areas of the Thomas Bay shoreline such as in the vicinity of Baird Glacier (Porter Cove).

In support of recreational use of the project area, CCLLC is proposing to install an additional access/landing at Thomas Bay via the new boat dock. This dock would provide direct access to the Cascade Creek Trail and would be within proximity of the Cascade Creek Cabin. Trail improvements from the Cascade Creek Cabin to the boat dock and trailhead for the Cascade Creek Trail, such as a new bridge across the new project tailrace are also proposed. In addition, CCLLC is proposing to coordinate with the USFS to determine the need for establishing a new cabin or other mitigative measures to address additional access and facilities over the term of the new license. As part of the proposed Project, CCLLC is also proposing improvements to the Cascade Creek Trail which would allow this trail to accommodate a greater number of individuals for longer period within the recreation season.

During the 2010 survey effort, both commercial operators and resident boaters/pilots were asked whether any additional recreation facilities or access were needed in the vicinity of Thomas Bay, Swan Lake, Falls Lake or Cascade Creek.

Approximately 27 percent of commercial outfitter/guide respondents and 22 percent of boater/pilot respondents indicated the need for additional recreation facilities; approximately 17 percent of boater/pilot respondents likewise indicated a need for additional access to the project area and immediate vicinity. Among the recommendations for recreation facilities were: better or improved trails (40 percent of outfitter/guide respondents and 18 percent of boater/pilot respondents) and more overnight cabins (20 percent of outfitter/guide respondents and 25 percent of boater/pilot respondents). For access, both groups made recommendations for docks, anchorages or moorings in Thomas Bay at various locations. Commercial outfitters and guides also made the recommendation for increasing the customer group size restriction imposed by the USFS for commercial use of Baird Glacier and Patterson Lake.

An additional consideration for assessment of future use are the levels reported by commercial outfitters and guides and public recreators (boaters and pilots) for Swan Lake, Falls Lake, and Cascade Creek are high and in excess of USFS calculated capacity RVDs. Though the trend in demand for recreation in the future is anticipated to decline along with population in the Petersburg-Wrangell Census Area, if recreational use of the project area and immediate vicinity is as high as that reported by commercial and public recreators, then the above actions together would enhance and maintain recreation opportunities in the project area and to accommodate these use levels. As discussed in Section 7.0, the construction and/or presence of project structures and project operations may have detrimental effects to recreational use of the project area and immediate vicinity and the facilities contained therein, though these effects are expected to be temporary and/or localized. Nevertheless, should recreational use of the project area facilities decline as a result of these effects, the additional of new recreation facilities in the area and the improvement of existing facilities will help to maintain the recreation opportunities provided by the project vicinity.

There are uncertainties when predicting future recreational use, both in general, and specific to the project area and immediate vicinity. As discussed above, among the general uncertainties of demand for recreation in the project vicinity are new technologies, shifting demographic patterns, economic growth, etc. However, based upon the data collected as part of this study, the recreational facilities within the project

area and immediate vicinity (Cascade Creek Cabin, Swan Lake Cabin and the Falls Lake Shelter) do not appear to have reached a point of being at or over neither capacity nor are they expected to approach capacity in the future. Because of the Project's proximity to other TNF lands and facilities, including 12 freshwater fishing sites, six trails, 11 campsites, and six USFS cabins, and the presence of three wilderness areas and various community parks and recreation areas, it is believed that the existing recreation facilities within the project area and immediate vicinity provide opportunities sufficient to satisfy public recreation demand in the area.

10.0 DISCUSSION AND CONCLUSIONS

Surveys of commercial outfitters/guides and resident boater/pilots indicate that while the project area and immediate vicinity provide recreation opportunities, it is not among the primary destinations for recreators and commercial patrons in comparison with other locations within the TNF. Over 75 percent of boater/pilot respondents indicated that they visit other recreation destinations more often or instead of the project area and immediate vicinity. The most popular destinations for recreation within the same general distance from Petersburg were reported to be Duncan Canal, Frederick Sound, Portage Bay, Stikine River, Farragut Bay, LeConte Bay, and Wrangell Narrows.

10.1 Potential Effects

10.1.1 Project Construction

Potential project construction effects on the recreational use of Swan and Falls Lake, the USFS Cabins, the Cascade Creek Trail and Thomas Bay include the potential for temporary disruption of recreational use as a result of increased human activity and the potential for noise. After construction, site activity will return to relative pre-construction levels and construction noise will cease.

While project structures would be primarily located within the Power Site classification, the management of adjacent lands by the USFS for recreation and aesthetics may be affected temporarily by project construction activities or permanently by project structures and operations.

10.1.2 Project Facilities and Operation

The project features will permanently change the landscape and viewshed in the vicinity of the proposed structures. These effects are expected to attenuate with distance and time as the project features will be largely constructed on natural materials and/or screened from view by berming, revegetation, and other landscape architecture. Once constructed, the visual effects of the Project will be limited to vantage points immediate to these structures from which the project features can be seen. As the project design includes a recessed powerhouse,

surrounded by earthen berms, the auditory nature of project operations would be significantly dampened. Changes to the landscape within the project area that could result in a decrease in recreational use at Swan Lake, Falls Lake, Cascade Creek and the USFS recreation facilities may be offset by improvements proposed by CCLLC. Project operation will be within the natural fluctuation of Swan Lake and the project structures have no overt operational aspects (no movement or sound). Accordingly, once constructed, there is no anticipated project effect on the recreational use of Swan Lake.

Average annual flows into Cascade Creek from the Swan Lake outlet would be reduced. Under some hydrologic conditions there may be no flow below the outlet; however this is currently a typical seasonal occurrence (Civil Science, 2011). Access to Cascade Creek is limited and challenging between the Swan Lake outlet and Falls Lake and provides limited recreation. As such, the effect to recreational use of this area is expected to be limited.

Project operation will result in a lower average lake level and reduced hydrologic inputs into Falls Lake comparable to the conditions currently experienced outside of the recreation season. Lowered Falls Lake levels may create access issues where the Cascade Creek spur trail provides access to the row boat at Falls Lake. Proposed recreation improvements include trail improvements that will address this access issue.

Average annual flows into the lower section of Cascade Creek, from Falls Lake to Thomas Bay, will be reduced; however, peak recreation season flows from Falls Lake will be highest from June through September, in line with existing off-peak season conditions (Whitewater Engineering, 2011). Survey respondents rated both high and low flow representations fairly equally, indicating “Good” to “High” quality aesthetics and “No Change” to the flow regime. Since the flow under proposed operations will mimic a flow rated as “Good” to “High” by the respondents, the potential effect to visual aesthetics is likely to be low.

The transmission line corridor largely will be undersea or will follow existing overland corridors. There are no anticipated aesthetic effects or over-arching implications to recreational use.

10.2 Conclusions

Project construction, structures, and operational effects on the landscape within the project boundary may have a limited effect on recreation use of the area; however, the Project's Power Site classification anticipates and accommodates these effects.

While survey results indicate a general public perception that the project area will no longer be a destination point because of project structures and operation, survey responses can be reflexive, regarding the concept of development. Proposed mitigation and enhancements are likely to provide additional recreational opportunities. CCLLC's proposed recreation use monitoring will provide data regarding any changes in use.

All recreation opportunities currently available will remain after construction. Recreational improvement proposed by CCLLC will likely make the site accessible to a broader range of recreators for a longer period of time seasonally. During construction commercial operators or public recreators may shift use to other TNF recreation areas and facilities that provide similar opportunities. These opportunities are within the project vicinity (20 miles). Over a period of years, construction effects will naturalize – particularly the powerhouse site, which CCLLC proposes to revegetate. Accordingly recreation may decline during construction; however, over time use is expected to stabilize or increase.

Should a decrease in recreational use within or adjacent to the project area (either temporary or permanent) occur, it will likely result in commercial operators and public recreators shifting use to other TNF recreation areas and facilities generally within the project vicinity (20 mile radius) that provide near identical opportunities to those of the project area.

As the city of Petersburg currently provides the most proximate support services to a variety of recreation opportunities within the project vicinity, recreators will likely continue to base trips out of Petersburg to substitute sites within the TNF. Accordingly,

the result will be displacement of use not a reduction in overall recreational activity in the project vicinity. There will be no significant effect to the local, recreation based economies.

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GeoDiv=geoSelect&_useEV=&pctxt=fph&pgsl=160&_submenuId=population_0&ds_name=null&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry= . Accessed November 15, 2010.

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APPENDIX A

SURVEY INSTRUMENTS

OUTFITTER/GUIDE MAIL SURVEY

OUTFITTER/GUIDE SCREENER SURVEY

RESIDENT BOATER/PILOT MAIL SURVEY

Cascade Creek Project Recreation Study
Outfitter/Guide Survey

1. **Does your business provide recreation services at or transportation to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Please check <u>one</u> box*)

   ☐ YES → SKIP TO QUESTION 3

   ☐ NO

2. **If you do not provide services or transportation to the destinations listed above, please indicate your primary location(s) of operation.** (*Please fill in the blank*.)

   _____

   _____

↓

IF YOU DO NOT PROVIDE SERVICES OR TRANSPORTATION TO THE DESTINATIONS LISTED IN QUESTION 1, YOU CAN STOP COMPLETION OF THE SURVEY AT THIS POINT. THANK YOU FOR YOUR TIME. WE APPRECIATE YOUR ASSISTANCE WITH THIS STUDY

3. **Which of the following services do you provide in Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Check <u>as many as are applicable</u> to your business for these locations.*)

Check <u>as many</u> as apply	**Types of Service**	**Check <u>as many</u> as apply**	
	Boating		**Flying**
☐	charter boat/water taxi (transportation)	☐	charter flight (transportation)
☐	recreational fishing	☐	scenic tours
☐	wildlife watching		**Other Guide Service**
☐	whale watching	☐	hunting
☐	scenic tours	☐	nature study/photography
☐	destination/overnight cruises	☐	hiking/mountaineering
☐	jetboat tours	☐	other land tours
☐	whitewater rafting/kayaking	☐	other:_____
☐	sea kayaking	☐	other:_____
☐	boat rentals	☐	other:_____

4A. **Does your business provide recreation services at or transportation to Thomas Bay (east of Ruth Island)?** (*Please check <u>one</u> box*)

   ☐ YES

   ☐ NO → SKIP TO QUESTION 5A

4B. **For the past 12 months, approximately how many *days per month* did you make a *trip* to Thomas Bay (east of Ruth Island) while providing recreation or transportation services?** *(Please fill in the blank for each month; if you do not operate in a specific month, write 0. If your trips involve multiple days/overnights, please provide the total of all days. For example, if you provided 5 trips that were each 3 days in duration, please write 15 days in the space provided.)*

Total Days Per Month	Total Days Per Month	Total Days Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

4C. **For the past 12 months, approximately how many *total customers* did you serve while providing recreation or transportation services at Thomas Bay (east of Ruth Island)?** *(Please fill in the blank for each month; if you do not operate in a specific month, write 0.)*

Total Customers Per Month	Total Customers Per Month	Total Customers Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

5A. **Does your business provide recreation services at or transportation to Swan Lake?** (*Please check one box*)

☐ YES

☐ NO → SKIP TO QUESTION 6A

5B. **For the past 12 months, approximately how many *days per month* did you make a *trip* to Swan Lake while providing recreation or transportation services?** *(Please fill in the blank for each month; if you do not operate in a specific month, write 0. If your trips involve multiple days/overnights, please provide the total of all days. For example, if you provided 5 trips that were each 3 days in duration, please write 15 days in the space provided.)*

Total Days Per Month	Total Days Per Month	Total Days Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

5C. **For the past 12 months, approximately how many *total customers* did you serve while providing recreation or transportation services Swan Lake?** *(Please fill in the blank for each month; if you do not operate in a specific month, write 0.)*

Total Customers Per Month	Total Customers Per Month	Total Customers Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

6A. **Does your business provide recreation services at or transportation to Falls Lake and/or Cascade Creek?** (*Please check one box*)

☐ YES

☐ NO → SKIP TO QUESTION 7

6B. **For the past 12 months, approximately how many *days per month* did you make a *trip* to Falls Lake and/or Cascade Creek while providing recreation or transportation services?** *(Please fill in the blank for each month; if you do not operate in a specific month, write 0. If your trips involve multiple days/overnights, please provide the total of all days. For example, if you provided 5 trips that were each 3 days in duration, please write 15 days in the space provided.)*

Total Days Per Month	Total Days Per Month	Total Days Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

6C. **For the past 12 months, approximately how many *total customers* did you serve while providing recreation or transportation services Falls Lake and/or Cascade Creek?** *(Please fill in the blank for each month; if you do not operate in a specific month, write 0.)*

Total Customers Per Month	Total Customers Per Month	Total Customers Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

7. **For the services you provide, what is the average length of a trip you make to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Please fill in the blank and indicate your average trip length in hours. If you typically provide multiple day/overnight trips, please convert your average trip length from days to hours. For example, if you typically provide trips that are 3 days in duration, please write 72 hours in the space provided.*)

_____ Hours (on average)

8. **For the services you provide, what is the average group size for trips you make to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Please fill in the blank*.)

_____ People (on average)

9. **What is the average cost per trip for the recreation or transportation services you provide?** *(Check <u>one</u> box.)*

- ☐ Less than $50
- ☐ $50 - $99
- ☐ $100 - $199
- ☐ $200 - $299
- ☐ $300 - $399
- ☐ $400 - $499
- ☐ $500 - $599
- ☐ $600 or more

10. **As best you can, please estimate the average amount you anticipate your customers spend during one trip with you for services other than those which you provide.** (*If you estimate that they did not have expenses for a particular category, write 0.)*

$_____Transportation (airfare, gas, rental car/RV – NOT including services you provide)

$_____Food and beverages (store purchases and restaurant/bar purchases)

$_____Other Activities (recreation and entertainment - NOT including services you provide)

$_____Bait & tackle

$_____Miscellaneous (film, clothing, souvenirs, personal, business and medical expenses)

$_____Lodging (hotel, cabin, campsite – NOT including services you provide)

$_____TOTAL

11. **Please indicate whether your patrons typically stay overnight at any of the following facilities, either as part of your offered trips or on their own.** (*Please check <u>all that apply</u>*.)

	Hotel/Motel/Cabin Lodging		**Camping**
☐	Spurt Cove Cabin	☐	Sukoi Campsite
☐	Cascade Creek Cabin	☐	Frederick Sound Beach Campsite
☐	Swan Lake Cabin	☐	Thomas Bay Beach Campsite near Wood Point
☐	Petersburg Area Hotel/Motel/Cabin	☐	Thomas Bay Beach Campsite between Baird Glacier and Spurt Cove
☐	Wrangell Area Hotel/Motel/Cabin	☐	Falls Lake Shelter
☐	Other Lodging - please specify:_____	☐	Other Camping - please specify:_____
☐	**To my knowledge, my patrons do not stay overnight at any of the above facilities**.		

12. **What is the average age of your patrons?** (*Please fill in the blank.*)

_____ Years

13. **Where do the majority of your patrons originate from?** (*Please check <u>one</u> box and fill in the blank, as appropriate.*)

- ☐ Alaska – please specify cities: _____
- ☐ Another US state – please specify state(s): _____
- ☐ Canada
- ☐ Europe
- ☐ Asia
- ☐ Other – please specify: : _____

14. **What is the primary activity your patrons normally participate in when utilizing your services in the Spring (March – May)? Summer (June – August)? Fall (September – November)? Winter (December – February)?** *(Check <u>one main activity</u> for <u>each</u> column.)*

Spring (M/A/M)	Summer (J/J/A)	Fall (S/O/N)	Winter (D/J/F)	Types of Activities
				BOATING
☐	☐	☐	☐	whitewater rafting/kayaking
☐	☐	☐	☐	sea kayaking/canoeing
☐	☐	☐	☐	pleasure boating (including jet boat tours)
☐	☐	☐	☐	cruising
				FISHING
☐	☐	☐	☐	commercial fishing
☐	☐	☐	☐	recreational fishing
☐	☐	☐	☐	subsistence fishing
				HUNTING
☐	☐	☐	☐	hunting – small game
☐	☐	☐	☐	hunting – large game
☐	☐	☐	☐	trapping
				OTHER
☐	☐	☐	☐	hiking/mountaineering/camping
☐	☐	☐	☐	nature study/wildlife viewing/sightseeing/photography
☐	☐	☐	☐	other:_____
☐	☐	☐	☐	**None – I do not provide services during this season**

15. **What was your total revenue from your recreation/transportation business in 2009 before taxes?** *(Please refer to our Privacy Statement. Please fill in the blank.)*

$_____ TOTAL GROSS REVENUE (2009)

16. **How many years have you been in business?** *(Please fill in the blank.)*

_____ YEARS

17A. **Are there any additional recreational facilities or improvements needed in the vicinity of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek**? *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 18A

17B. **What do you recommend?** *(Please fill in the blank.)*

_____

_____

18A. **How would you rate the visual aspects of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek <u>overall</u> on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 19

18B. **What would you consider to be scenic attributes or detriments of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Fill in blanks*.)

Location(s): _____

Description: _____

_____

19. **How essential is the visual quality of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek to the recreation/transportation services you provide?** *(Circle <u>one</u> number.)*

Not Essential (Activities Not Influenced by Aesthetics) — Neutral (Activities Somewhat Influenced by Aesthetics) — Essential (Activities Fully Influenced by Aesthetics)

1 2 3 4 5

FOR THE NEXT SEVERAL QUESTIONS, YOU WILL NEED TO REFER TO THE BEFORE AND AFTER PHOTOS OF THE PROPOSED PROJECT FACILITIES

THOMAS BAY SHORELINE (POWERHOUSE BEFORE)

THOMAS BAY SHORELINE (POWERHOUSE AFTER)

20A. **How would you rate the visual aspects of the location of the proposed powerhouse as it exists today on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "POWERHOUSE BEFORE" picture. Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

20B. **How would you rate the visual aspects of the location of the proposed powerhouse in the post-construction rendition on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "POWERHOUSE AFTER" picture. Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 21A

20C. **Why did you rate the visual aspects of the *"after"* photograph the way that you did?** (*Please fill in blank.*)

_____

_____

21A. **Would the construction and/or presence of the powerhouse affect your recreation/transportation services at Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 22A

21B. **How would the construction or presence of the powerhouse affect your recreation/transportation services at Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Please fill in blank.*)

_____

_____

SWAN LAKE SHORELINE (INTAKE BEFORE)

SWAN LAKE SHORELINE (INTAKE AFTER)

22A. **How would you rate the visual aspects of the location of the proposed intake as it exists today on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "INTAKE BEFORE" picture. Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

22B. **How would you rate the visual aspects of the location of the proposed intake in the post-construction rendition on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "INTAKE AFTER" picture. Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 23A

22C. **Why did you rate the visual aspects of the *"after"* photograph the way that you did?** (*Please fill in blank.*)

_____

_____

23A. **Would the construction or presence of the intake affect your recreation/transportation services at Swan Lake?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 24A

23B. **How would the construction or presence of the intake affect your recreation/transportation services at Swan Lake?** (*Please fill in blank.*)

_____

_____

CASCADE CREEK (AVERAGE SPRING FLOW)

CASCADE CREEK (AVERAGE FALL FLOW)

24A. **How would you rate the visual aspects of the existing Cascade Creek under average <u>spring</u> flow conditions on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "CASCADE CREEK AVERAGE SPRING FLOW" picture. Circle <u>one</u> number.)*

Low Quality		Neutral		High Quality
1	2	3	4	5

24B. **For recreational purposes, would you prefer a level that was higher, lower, or about the same for the existing Cascade Creek under average <u>spring</u> flow conditions**? *(Circle <u>one</u> number.)*

Much Lower	Lower	No Change	Higher	Much Higher
1	2	3	4	5

25A. **How would you rate the visual aspects of the existing Cascade Creek under average <u>fall</u> flow conditions on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "CASCADE CREEK AVERAGE FALL FLOW" picture. Circle <u>one</u> number.)*

Low Quality		Neutral		High Quality
1	2	3	4	5

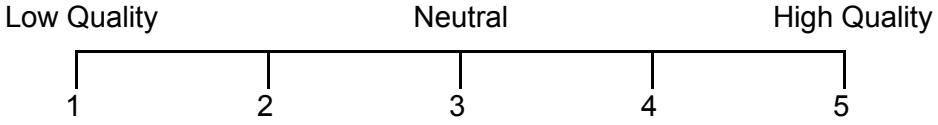
25B. **For recreational purposes, would you prefer a level that was higher, lower, or about the same for the existing Cascade Creek under average <u>fall</u> flow conditions**? *(Circle <u>one</u> number.)*

Much Lower	Lower	No Change	Higher	Much Higher
1	2	3	4	5

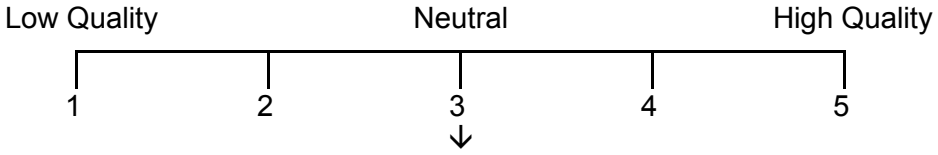
CASCADE CREEK (OUTLET BEFORE)

CASCADE CREEK (OUTLET AFTER)

26A. **How would you rate the visual aspects of the existing Cascade Creek at the outlet of Swan Lake on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "OUTLET BEFORE" picture. Circle <u>one</u> number.)*



26B. **How would you rate the visual aspects of Cascade Creek at the outlet of Swan Lake on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "OUTLET AFTER" picture. Circle <u>one</u> number.)*



SKIP TO QUESTION 27A

26C. **Why did you rate the visual aspects of the *"after"* photograph the way that you did?** (*Please fill in blank.*)

_____

_____

27A. **Would the construction or presence of the outlet structure affect your recreation/transportation services at Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 28

27B. **How would the construction or presence of the outlet structure affect your recreation/transportation services at Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Fill in blank.*)

_____

_____

JUST A FEW MORE QUESTIONS ABOUT YOU PERSONALLY.

28. **Do you own a permanent or seasonal waterfront home on Thomas Bay?** (*Check <u>one</u> box and fill in the blank(s) as appropriate. If you have a seasonal home, please also provide the zip code of your permanent residence.)*

☐ YES, Permanent Home
↓
ZIP: _____

☐ YES, Seasonal Home
↓
ZIP Seasonal: _____
ZIP Permanent: _____

☐ NO
↓
ZIP: _____

29. **How many years of formal education have you completed?** *(Check <u>one</u> box)*

- ☐ Less than high school
- ☐ High school degree or GED
- ☐ Associates/technical degree
- ☐ Some college
- ☐ Bachelors degree
- ☐ Post-graduate degree

30. **What was your personal total gross income in 2009 (before taxes)?** *(Check <u>one</u> box)*

- ☐ Less than $20,000
- ☐ $20,000 - $29,999
- ☐ $30,000 - $39,999
- ☐ $40,000 - $49,999
- ☐ $50,000 - $59,999
- ☐ $60,000 - $69,999
- ☐ $70,000 - $79,999
- ☐ $80,000 - $89,999
- ☐ $90,000 - $99,999
- ☐ $100,000 or more
- ☐ $150,000 - $199,999
- ☐ $200,000 or more

31. **In what year were you born?** *(Please fill in blank.)*

_____ YEAR

32. **Additional Comments:** _____

_____

_____

_____

Good Afternoon/Morning [*ADDRESSEE*]

My name is [*YOUR NAME*], and I'm calling from Kleinschmidt Associates. We are conducting a study of commercial recreation in the area in cooperation with the Federal Energy Regulatory Commission, Department of Natural Resources, Forest Service, and other state and federal agencies. Specifically, we are collecting data regarding commercial recreational use of Thomas Bay, Swan Lake, Falls Lake, the Cascade Creek Trail and the Tongass National Forest in the vicinity of the proposed Cascade Creek Hydroelectric Project. On October 7 and again on October 25, we sent an Outfitter Survey to you. Since we did not receive your completed Survey, we are following up to solicit information about your commercial recreational use in the vicinity of Thomas Bay.

1. Could you please tell me if you received our survey? [Note: *If they respond NO, you will have the opportunity to collect their email address to send them one and you will need to reschedule a new time for the interview*].

   ☐ YES
   ☐ NO

2. Does your business provide recreation services at or transportation to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?

   ☐ YES →[*SKIP TO QUESTION 4*].
   ☐ NO → [*CONTINUE TO QUESTION 3*].

3. What are your primary location(s) of operation?

   _____

   _____

4. What type of recreation or transportation services do you provide? [*Do no read list. Please check as many as apply and fill in other(s) as necessary*].

	Types of Service		**Types of Service**
	Boating		**Flying**
☐	charter boat/water taxi	☐	charter flight (transportation)
☐	recreational fishing	☐	scenic tours
☐	wildlife watching		**Other Guide Service**
☐	whale watching	☐	hunting
☐	scenic tours	☐	nature study/photography
☐	destination/overnight cruises	☐	hiking/mountaineering
☐	jetboat tours	☐	other land tours
☐	whitewater rafting/kayaking	☐	other:_____
☐	sea kayaking	☐	other:_____
☐	boat rentals	☐	other:_____

FOR RESPONDENTS **NOT** PROVIDING SERVICES IN THE PROJECT AREA, END SURVEY:

Since you do not provide recreational services at or transportation to the vicinity of Thomas Bay, this survey is not applicable to you. Do you have any additional comments?

[*IF THE PERSON PROVIDES ADDITIONAL COMMENTS INCLUDE IN QUESTION 9*].

Thank you for your time, and have a great day!

FOR RESPONDENTS PROVIDING SERVICES IN THE PROJECT AREA, CONTINUE SURVEY:

5. Do you have a copy of the survey available to you?

   ☐ YES → [*CONTINUE TO QUESTION 7*].
   ☐ NO

6. Would you like to have a copy of the survey emailed to you to assist in conducting a phone interview?

   ☐ YES = e-mail →_____ *[CONTINUE TO QUESTION 8]*

   ☐ NO → Thank you for your time, do you have any additional comments?
   [*IF THE PERSON PROVIDES ADDITIONAL COMMENTS PLEASE RECORD BELOW*].
   Thanks again, and have a great day!

7. Do you have about 15 minutes at this time to take the survey over the phone?

   ☐ YES → [*CONTINUE TO QUESTION 9*].
   ☐ NO

8. Is there a more convenient time for you to conduct the phone interview?

   ☐ YES →_____(date) _____ (time) _____ (contact)
   ☐ NO → Thank you for your time, do you have any additional comments?
   [*IF THE PERSON PROVIDES ADDITIONAL COMMENTS PLEASE RECORD BELOW*].
   Thanks again, and have a great day!

9. Before we begin the survey, are there any issues or concerns you would like to convey regarding the proposed Cascade Creek Hydroelectric Project?

Cascade Creek Project Recreation Study
Boater/Pilot Survey

1. **Do you travel to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek for personal recreational purposes?** (*Please check <u>one</u> box*)

   ☐ YES

   ☐ NO → **IF YOU DO NOT RECREATE AT ANY OF THE DESTINATIONS LISTED IN QUESTION 1, YOU CAN STOP COMPLETION OF THE SURVEY AT THIS POINT. THANK YOU FOR YOUR TIME. WE APPRECIATE YOUR ASSISTANCE WITH THIS STUDY.**

2. **Is Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek your <u>primary</u> destination for recreation activities or do you primarily travel to other locations for recreation purposes?** *(Check <u>one</u> box.)*

   ☐ YES, Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek are the locations I visit most often for recreation.

   ☐ NO, I visit other destinations for recreation more often.

3. **What other destinations do you visit for recreational purposes besides Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** *(Fill in the blank. If you do not visit any other areas for recreation, write "NONE".)*

   _____

   _____

4. **What is your <u>primary mode of transportation</u> to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Check <u>one</u> primary mode of transportation for these locations.*)

Check <u>one</u> box	**Mode of Transportation**	**Check <u>one</u> box**	**Mode of Transportation**
	Boating		**Flying**
☐	personal motor boat	☐	personal float plane
☐	personal sail boat	☐	personal helicopter
☐	charter boat/water taxi	☐	charter flight (plane or helicopter)
☐	rental boat (motor or sail)		**Other Transportation**
☐	sea kayak/canoe	☐	other:_____

5A. **Do you participate in recreational activities in Thomas Bay (east of Ruth Island)?** (*Please check <u>one</u> box*)

   ☐ YES

   ☐ NO → SKIP TO QUESTION 6A

5B. **For the past 12 months, approximately how many *days per month* did you make a trip to Thomas Bay (east of Ruth Island) for recreational purposes?** *(Please fill in the blank for each month; if you do not visit in a specific month, write 0. If your visits involve multiple days/overnights, please provide the total of all days. For example, if you made 5 trips that were each 3 days in duration, please write 15 days in the space provided.)*

Total Days Per Month	Total Days Per Month	Total Days Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

6A. **Do you participate in recreational activities at Swan Lake?** (*Please check one box*)

☐ YES

☐ NO → SKIP TO QUESTION 7A

6B. **For the past 12 months, approximately how many *days per month* did you make a trip to Swan Lake for recreational purposes?** *(Please fill in the blank for each month; if you do not visit in a specific month, write 0. If your visits involve multiple days/overnights, please provide the total of all days. For example, if you made 5 trips that were each 3 days in duration, please write 15 days in the space provided.)*

Total Days Per Month	Total Days Per Month	Total Days Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

7A. **Do you participate in recreational activities at Falls Lake and/or Cascade Creek?** (*Please check one box*)

☐ YES

☐ NO → SKIP TO QUESTION 8

7B. **For the past 12 months, approximately how many *days per month* did you make a trip to Falls Lake and/or Cascade Creek for recreational purposes?** *(Please fill in the blank for each month; if you do not visit in a specific month, write 0. If your visits involve multiple days/overnights, please provide the total of all days. For example, if you made 5 trips that were each 3 days in duration, please write 15 days in the space provided.)*

Total Days Per Month	Total Days Per Month	Total Days Per Month
_____ September, 2009	_____ January, 2010	_____ May, 2010
_____ October, 2009	_____ February, 2010	_____ June, 2010
_____ November, 2009	_____ March, 2010	_____ July, 2010
_____ December, 2009	_____ April, 2010	_____ August, 2010

8. **What is your average group size for trips you make to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek for recreational purposes including yourself?** (*Please fill in the blank*.)

_____ People (including yourself on average)

9. **What is the average length of a trip you make to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek for recreational purposes?** (*Please fill in the blank and indicate your average trip length in hours. If you typically visit for multiple days/overnight trips, please convert your average trip length from days to hours. For example, if you typically visit for 3 days, please write 72 hours in the space provided*.)

_____ Hours (on average)

10. **What is the <u>primary activity</u> you normally participate in when recreating at Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek in Spring (March – May)? Summer (June – August)? Fall (September – November)? Winter (December – February)?** *(Check <u>one main activity</u> for <u>each</u> column.)*

Spring (M/A/M)	Summer (J/J/A)	Fall (S/O/N)	Winter (D/J/F)	Types of Activities
				BOATING
☐	☐	☐	☐	whitewater rafting/kayaking
☐	☐	☐	☐	sea kayaking/canoeing
☐	☐	☐	☐	pleasure boating
				FISHING
☐	☐	☐	☐	commercial fishing
☐	☐	☐	☐	recreational fishing
☐	☐	☐	☐	subsistence fishing
				HUNTING
☐	☐	☐	☐	hunting – small game
☐	☐	☐	☐	hunting – large game
☐	☐	☐	☐	trapping
				OTHER
☐	☐	☐	☐	hiking/mountaineering
☐	☐	☐	☐	camping
☐	☐	☐	☐	nature study/wildlife viewing
☐	☐	☐	☐	picnicking
☐	☐	☐	☐	sightseeing/photography
☐	☐	☐	☐	harvesting (mushrooms, lichens, berries, etc.)
☐	☐	☐	☐	cross-country or downhill skiing or snowboarding
☐	☐	☐	☐	other:_____
☐	☐	☐	☐	other:_____
☐	☐	☐	☐	other:_____
☐	☐	☐	☐	**None – I do not recreate in any of these locations during this season**

11. **What <u>other recreation activities</u> do you participate in when recreating at Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek in Spring (March – May)? Summer (June – August)? Fall (September – November)? Winter (December – February)?** *(Please fill in any additional activities for each season in the boxes.)*

Spring (M/A/M)	Summer (J/J/A)	Fall (S/O/N)	Winter (D/J/F)

12. **As best you can, please estimate the average amount you spend during one trip to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek for recreational purposes.** (*If you estimate that do not typically have expenses for a particular category, write 0.)*

$_____Transportation (gas & oil, repair & service, rental car, rental RV)

$_____Food and beverages (store purchases and restaurant/bar purchases)

$_____Activities (recreation equipment rental, guide or outfitter fees, etc.)

$_____Bait & tackle

$_____Miscellaneous (film, clothing, souvenirs, personal, business and medical expenses)

$_____Lodging (hotel, motel, bed & breakfast, rental home/cabin/condo, camp site)

$_____TOTAL

13. **Please indicate whether you typically stay overnight at any of the following facilities.** (*Please check <u>all that apply</u> for facilities that you typically stay overnight*.)

	Hotel/Motel/Cabin Lodging		Camping
☐	Spurt Cove Cabin	☐	Sukoi Campsite
☐	Cascade Creek Cabin	☐	Frederick Sound Beach Campsite
☐	Swan Lake Cabin	☐	Thomas Bay Beach Campsite near Wood Point
☐	Petersburg Area Hotel/Motel/Cabin	☐	Thomas Bay Beach Campsite between Baird Glacier and Spurt Cove
☐	Wrangell Area Hotel/Motel/Cabin	☐	Falls Lake Shelter
☐	Other Lodging - please specify:_____	☐	Other Camping - please specify:_____
	Private Lodging		
☐	Your own House/Cabin/Condo	☐	Friends House/Cabin/Condo
☐	Rental House/Cabin/Condo	☐	On My Boat
☐	**I do not stay overnight at any of the above facilities**.		

14A. **Are there any additional <u>recreational</u> facilities or improvements needed in the vicinity of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 15A

14B. **What do you recommend and where?** *(Please fill in the blanks.)*

Location(s): _____

Description: _____

_____

15A. **Are any additional <u>access</u> facilities such as roads or docks needed in the vicinity of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 16A

15B. **What do you recommend and where?** *(Please fill in the blanks.)*

Location(s): _____

Description: _____

_____

16A. **How would you rate the <u>recreation</u> facilities and features of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek <u>overall</u> on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(Circle <u>one</u> number.)*

Low Quality Neutral High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 17A

16B. **What would you consider to be significant recreation facilities or features of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Fill in blanks*.)

Location(s): _____

Description: _____

_____

17A. **How would you rate the <u>visual aspects</u> of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek <u>overall</u> on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(Circle <u>one</u> number.)*

Low Quality Neutral High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 18

17B. **What would you consider to be scenic attributes or detriments of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** (*Fill in blanks*.)

Location(s): _____

Description: _____

_____

18. **How essential is the visual quality of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek to your recreational experience?** *(Circle <u>one</u> number.)*

Not Essential (Activities Not Influenced by Aesthetics)	Neutral (Activities Somewhat Influenced by Aesthetics)	Essential (Activities Fully Influenced by Aesthetics)

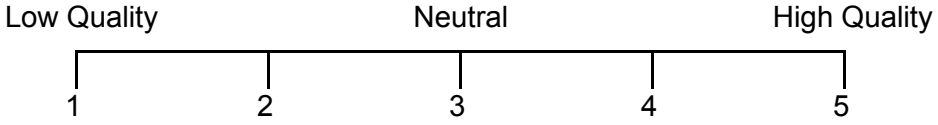
1 2 3 4 5

FOR THE NEXT SEVERAL QUESTIONS, YOU WILL NEED TO REFER TO THE BEFORE AND AFTER PHOTOS OF THE PROPOSED PROJECT FACILITIES

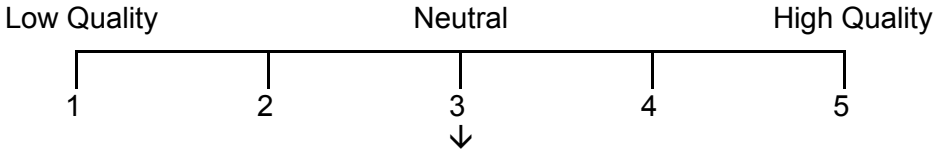
THOMAS BAY SHORELINE (POWERHOUSE BEFORE)

THOMAS BAY SHORELINE (POWERHOUSE AFTER)

19A. **How would you rate the visual aspects of the location of the proposed powerhouse as it exists today on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "POWERHOUSE BEFORE" picture. Circle <u>one</u> number.)*



19B. **How would you rate the visual aspects of the location of the proposed powerhouse in the post-construction rendition on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "POWERHOUSE AFTER" picture. Circle <u>one</u> number.)*



SKIP TO QUESTION 20A

19C. **Why did you rate the visual aspects of the *"after"* photograph the way that you did?** (*Please fill in blank.*)

_____

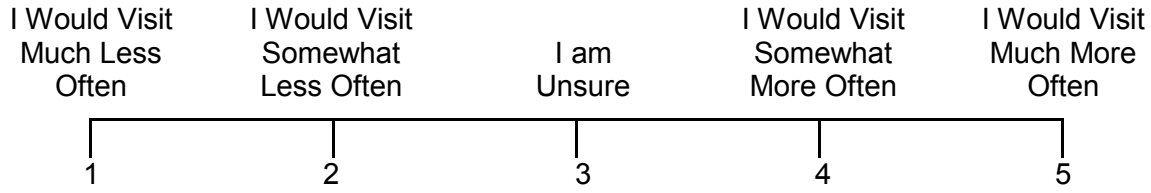
_____

20A. **Would the construction and/or presence of the powerhouse affect your recreational use of Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 21A

20B. **How would the construction and/or presence of the powerhouse affect how often you visit Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, and/or Cascade Creek for recreational purposes?** (*Circle <u>one</u> number.*)



SWAN LAKE SHORELINE (INTAKE BEFORE)

SWAN LAKE SHORELINE (INTAKE AFTER)

21A. **How would you rate the visual aspects of the location of the proposed intake as it exists today on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "INTAKE BEFORE" picture. Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

21B. **How would you rate the visual aspects of the location of the proposed intake in the post-construction rendition on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "INTAKE AFTER" picture. Circle <u>one</u> number.)*

Low Quality — Neutral — High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 22A

21C. Why did you rate the visual aspects of the "after" photograph the way that you did? (Please fill in blank.)

_____

_____

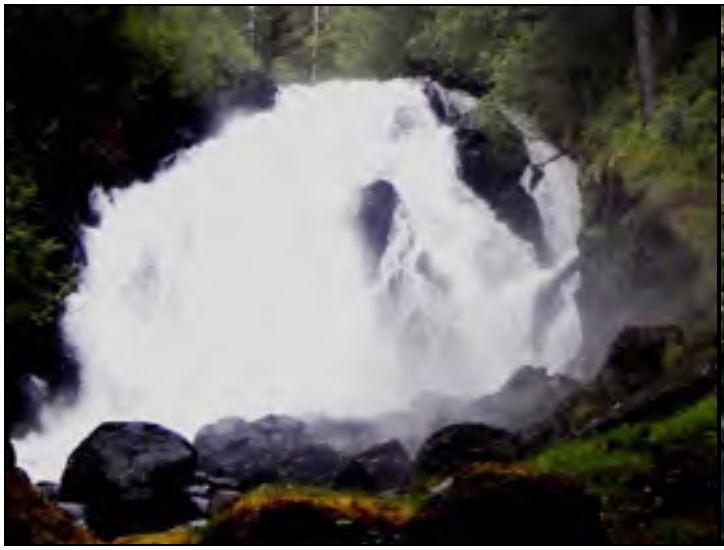
22A. **Would the construction or presence of the intake affect your recreational use of Swan Lake?** *(Check <u>one</u> box.)*

☐ YES

☐ NO→ SKIP TO QUESTION 23A

22B. **How would the construction and/or presence of the intake affect how often you visit Swan Lake for recreational purposes?** (*Circle <u>one</u> number.*)

I Would Visit Much Less Often	I Would Visit Somewhat Less Often	I am Unsure	I Would Visit Somewhat More Often	I Would Visit Much More Often
1	2	3	4	5



CASCADE CREEK (AVERAGE SPRING FLOW)

CASCADE CREEK (AVERAGE FALL FLOW)

23A. **How would you rate the visual aspects of the existing Cascade Falls under average <u>spring</u> flow conditions on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "CASCADE FALLS AVERAGE SPRING FLOW" picture. Circle <u>one</u> number.)*

Low Quality		Neutral		High Quality
1	2	3	4	5

23B. **For recreational purposes, would you prefer a level that was higher, lower, or about the same for the existing Cascade Falls under average <u>spring</u> flow conditions**? *(Circle <u>one</u> number.)*

Much Lower	Lower	No Change	Higher	Much Higher
1	2	3	4	5

24A. **How would you rate the visual aspects of the existing Cascade Falls under average fall flow conditions on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** (*See the "CASCADE FALLS AVERAGE FALL FLOW" picture. Circle one number.*)

Low Quality		Neutral		High Quality
1	2	3	4	5

24B. **For recreational purposes, would you prefer a level that was higher, lower, or about the same for the existing Cascade Falls under average <u>fall</u> flow conditions**? *(Circle <u>one</u> number.)*

Much Lower Lower No Change Higher Much Higher

1 2 3 4 5

CASCADE CREEK (OUTLET BEFORE)

CASCADE CREEK (OUTLET AFTER)

25A. **How would you rate the visual aspects of the existing Cascade Creek at the outlet of Swan Lake on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "OUTLET BEFORE" picture. Circle <u>one</u> number.)*

Low Quality Neutral High Quality

1 2 3 4 5

25B. **How would you rate the visual aspects of Cascade Creek at the outlet of Swan Lake on a scale from 1 to 5, with 1 being low quality, 3 being neutral, and 5 being high quality?** *(See the "OUTLET AFTER" picture. Circle <u>one</u> number.)*

Low Quality Neutral High Quality

1 2 3 4 5

↓

SKIP TO QUESTION 26

25C. **Why did you rate the visual aspects of the *"after"* photograph the way that you did?** (*Please fill in blank.*)

_____

_____

JUST A FEW MORE QUESTIONS ABOUT YOU PERSONALLY.

26. **Do you own a permanent or seasonal waterfront home on Thomas Bay?** (*Check <u>one</u> box and fill in the blank(s) as appropriate. If you have a seasonal home, please also provide the zip code of your permanent residence.)*

☐ YES, Permanent Home ↓ ZIP: _____

☐ YES, Seasonal Home ↓ ZIP Seasonal: _____ ZIP Permanent: _____

☐ NO ↓ ZIP: _____

27. **How many years of formal education have you completed?** *(Check <u>one</u> box)*

☐ Less than high school ☐ Associates/technical degree ☐ Bachelors degree
☐ High school degree or GED ☐ Some college ☐ Post-graduate degree

28. **In what year were you born?** *(Please fill in blank.)*

_____ YEAR

29. **What is your gender**? *(Check <u>one</u> box).*

☐ MALE ☐ FEMALE

30A. **Are you a registered outfitter/guide providing recreation services or transportation to Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, Cascade Creek, Frederick Sound (in Petersburg) and/or the Point Agassiz Peninsula**? *(Check <u>one</u> box).*

☐ YES

☐ NO→ SKIP TO QUESTION 31

30B. **Which of the following services do you provide in Thomas Bay (east of Ruth Island), Swan Lake, Falls Lake, Cascade Creek, Frederick Sound (in Petersburg) and/or the Point Agassiz Peninsula?** (*Check <u>as many as are applicable</u> to your business for these locations.*)

Check <u>as many</u> as apply	**Types of Service**	**Check <u>as many</u> as apply**	
	Boating		**Flying**
☐	charter boat/water taxi (transportation)	☐	charter flight (transportation)
☐	recreational fishing	☐	scenic tours
☐	wildlife watching		**Other Guide Service**
☐	whale watching	☐	hunting
☐	scenic tours	☐	nature study/photography
☐	destination/overnight cruises	☐	hiking/mountaineering
☐	jetboat tours	☐	other land tours
☐	whitewater rafting/kayaking	☐	other:_____
☐	sea kayaking	☐	other:_____
☐	boat rentals	☐	other:_____

30C. **How many people does your business accommodate annually, on average?** (*Fill in blank.*)

_____ PEOPLE ANNUALLY, ON AVERAGE

31. **What was your personal total gross income in 2009 (before taxes)?** *(Check <u>one</u> box)*

☐ Less than $20,000	☐ $50,000 - $59,999	☐ $90,000 - $99,999
☐ $20,000 - $29,999	☐ $60,000 - $69,999	☐ $100,000 or more
☐ $30,000 - $39,999	☐ $70,000 - $79,999	☐ $150,000 - $199,999
☐ $40,000 - $49,999	☐ $80,000 - $89,999	☐ $200,000 or more

32. **Additional Comments:** _____

_____

_____

_____

_____

THANK YOU FOR YOUR HELP! WE APPRECIATE YOUR TIME TODAY!