

FINAL 2011 WILDLIFE RESOURCES STUDY PLAN

Takatz Lake Hydroelectric Project (FERC No. 13234)

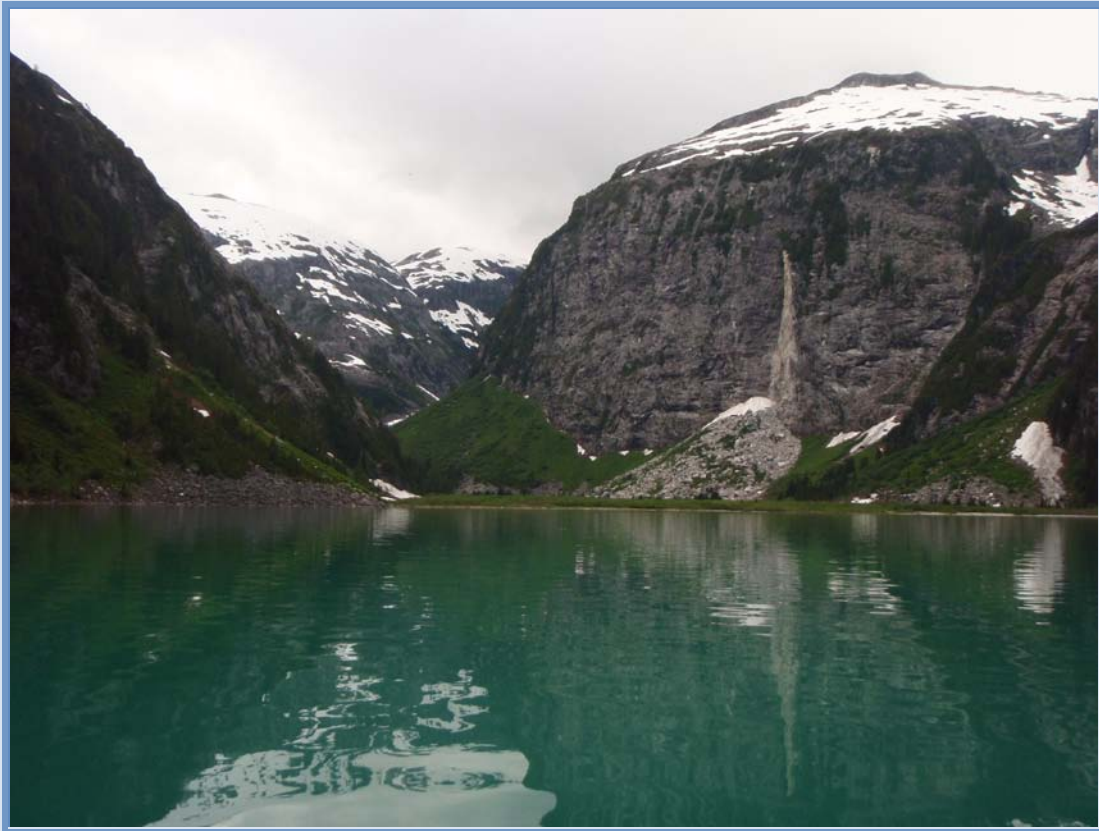
Prepared by:

Kent Bovee, Sitka, Alaska

Prepared for:

City and Borough of Sitka Electric Department

July, 2011



1.0 BACKGROUND

In February, 2008, the City and Borough of Sitka (“City”) received a Preliminary Permit (“Permit”) for the Takatz Lake hydroelectric Project (FERC No. 13234, “Project”) from the Federal Energy Regulatory Commission (FERC) in Washington D.C. The Project would be located approximately 18 miles NW of Sitka, Alaska, on Baranof Island and would affect Takatz Lake and Takatz Creek, and Baranof Lake and River. The Project is described in detail in City, 2009.

1.1 PROJECT DESCRIPTION

Generally, the Project would consist of one or two dams on Takatz Lake, a power conduit consisting of a mostly unlined tunnel and steel penstock leading to a powerhouse located at tidewater on Takatz Bay (Figure 1). Installed capacity of the Project would be approximately 27 megawatts (MW).

The originally proposed Project transmission line would extend from the powerhouse underwater in Takatz Bay, Chatham Straight and Warm Springs Bay to overhead or buried segments which would continue westward past Baranof Lake and Baranof River. This transmission routing was termed the "Marine Transmission Alternative" (MTA). The transmission line would then enter a tunnel through the Baranof Mountains. From the western tunnel portal, the transmission line would continue down the Medvejie River valley past Medvejie Lake and on to its interconnection with the existing transmission line from the City’s Green Lake Project (FERC No. 2818).

1.2 ALTERNATIVE TRANSMISSION ROUTINGS

Based on comments received during SD1 review and after Scoping meetings, the City has developed a new transmission alternative which avoids potential effects on marine resources and on the community of Baranof Warm Springs. This routing, referred to as the “Overland Transmission Alternative”, (OTA) is shown in Figure 1.

The primary feature of this transmission route would be the overland segment south from the powerhouse, past Sadie Lake, thence south and west to the shore of Baranof Lake. While Figure 1 shows an underwater segment beneath Baranof Lake, the City may elect to use an overhead segment along the north shore of Baranof Lake, depending on the outcome of fisheries and bathymetric surveys.

The OTA does not change the routing of the transmission segments beyond the point at which the line emerges from upper Baranof Lake.

At this time, the OTA is the City’s preferred transmission alternative because it responds to concerns for impacts on both the community of Baranof Warm Springs and those on marine resources in Chatham Straight. Further, the MTA would necessitate extensive and difficult marine engineering feasibility analyses.

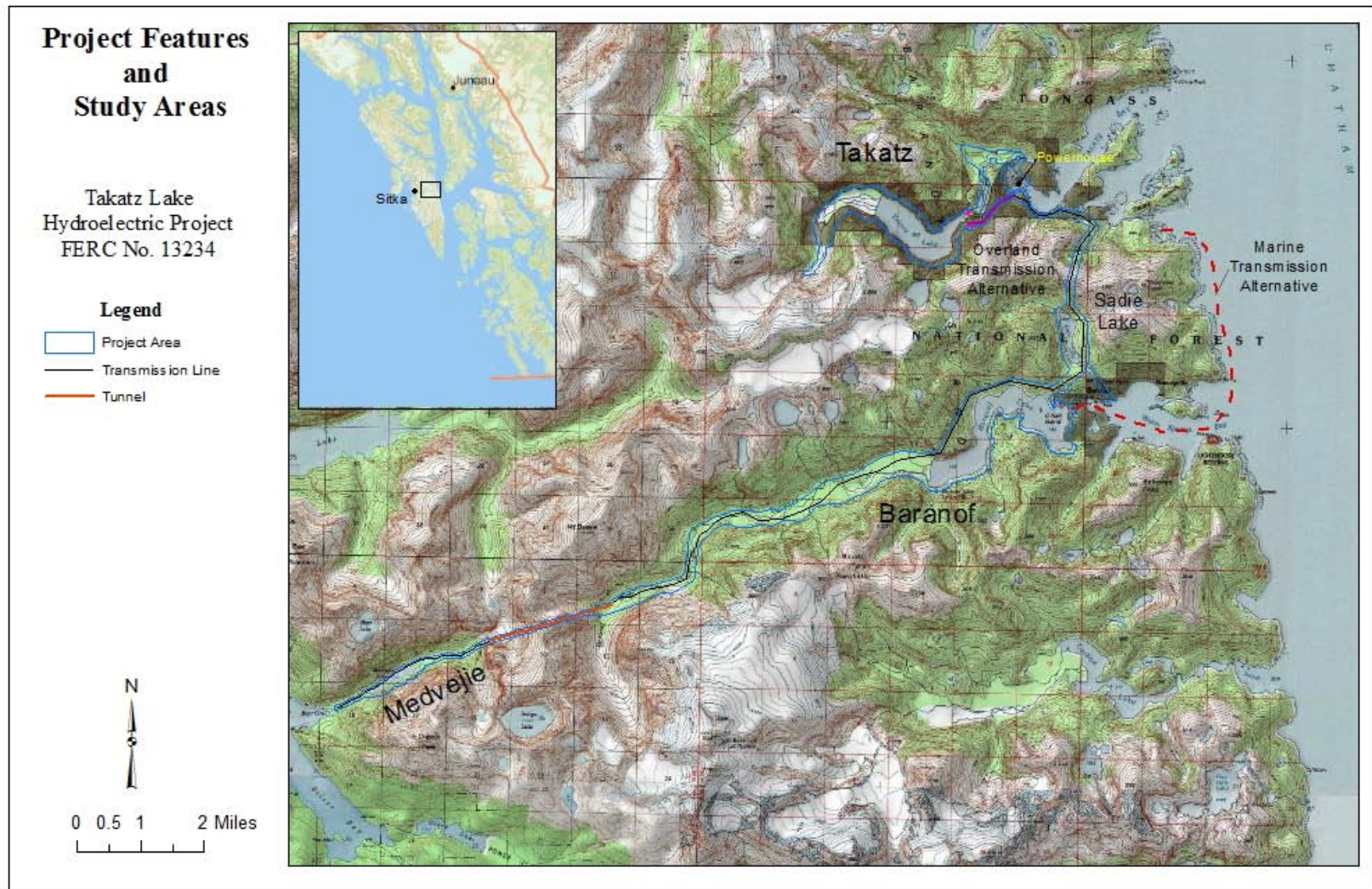


Figure 1. Project Features and Study Areas

1.2 2010 STUDY RESULTS

Field studies were completed in 2010 following the Wildlife Resources Study Plan (City 2010). Results from these studies are documented in Bovee (2011) and findings include:

- Documented 48 wildlife species, including 11 mammals, 36 birds, and 1 amphibian;
- No threatened and endangered (T&E) species were observed;
- One Species of Concern, US Forest Service (USFS), the marbled murrelet (*Brachyramphus marmoratus*), was observed in Takatz Bay;
- Trumpeter swans, (*Cygnus buccinator*), a USFS Sensitive Listed Species, were commonly seen in beaver ponds adjacent to Baranof River;
- Extensive activity by American beaver (*Castor canadensis*) was observed, particularly in the lower Baranof River and Takatz Creek areas;
- A cooperative goat study with Alaska Department of Fish and Game (ADF&G) resulted in radio collaring 12 mountain goats, which will assist in determining the impact of this project on their population (White et al. 2010);
- Goats were observed in late spring using steep terrain at the head of Baranof Lake adjacent to proposed transmission line corridor.

1.3 CONSULTATION and COMMENT

The City conducted an interagency meeting on April 27, 2011, to discuss the report for 2010 wildlife studies (Bovee 2010) and studies for the upcoming 2011 study season. Draft minutes of the interagency meeting were distributed on May 16, 2011. Participants were given the opportunity to make suggestions on the proposed study plan and encouraged to send comments and suggestions within 60 days.

The City distributed a Draft Wildlife Study Plan on June 1, 2011. In response, comments were received from Phil Mooney, ADF&G, dated June 24, 2011. All comments were addressed, without dispute, in this Final Wildlife Study Plan. The ADF&G comments are shown, with numbering added by the City, in Attachment I. Comment summaries and descriptions of actions taken in response to comments are in Attachment II. All text added to the Draft Study Plan is in italics in this Final Study Plan.

2.0 STUDY PROPOSALS FOR 2011

2.1 OBJECTIVES

General objectives of the proposed 2011 studies are to: 1) build on work completed in 2010; and 2) expand the scope and emphasis of 2010 studies to include the entire transmission corridor. As in 2010, in all study areas, the objectives will be to:

1. Gather baseline data on wildlife species presence/not detected, resulting in a species list and conservation rankings and the identification of target species (e.g. T&E, MIS, Species of Concern);
2. Determine distribution of target species within the study area and, when possible, determine a relative abundance (abundance indices) to assist in identifying critical habitat areas;
3. Identify important areas for wildlife, such as waterfowl nesting, goat wintering and kidding, and beaver ponds.

2.2 STUDY AREA

The Project Area (Fig. 1) consists of 3 watershed basins (Takatz, Baranof, and Medvejie), along with a small lake basin (Sadie).

3.0 STUDY METHODS

Wildlife studies will consist of three major components, a literature and information search, field surveys, and *cooperative radio telemetry studies with ADF&G on mountain goats*, as described below.

3.1 LITERATURE SEARCH

The City will continue to conduct a literature search to gather any pertinent information about wildlife in the Project area. The sources for this information include:

- USFS Tongass National Forest survey and planning reports, noting any sensitive species, species of special concern, or indicator species;
- ADF&G periodic wildlife surveys, harvest records for big game, wildfowl, trapping and other activities, and records of subsistence uses and takes in the overall area;
- US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) for information on federally-listed threatened, endangered or candidate species;
- Alaska Natural Heritage Program (AKNHP) listings for important and sensitive species; and
- Academic libraries of the University of Alaska and its affiliates in southeast Alaska, as well as the Environment and Natural Resources Institute, Anchorage.

Wildlife researchers will also establish communication with other studies being done on the project, such as Cultural, Recreation, and Fisheries to glean any more information on wildlife species in the affected area.

3.2 FIELD SURVEYS

Field surveys will be conducted in various areas to determine distribution, relative abundance and life history of wildlife species. Table 1 shows an overview of field techniques, frequency, locations, and approximate timeline.

Table 1. Field Techniques, Frequency, Location, and Approximate Timeline, Takatz Lake Project, 2011.

Field Technique	Frequency	Basin*	April	May	June	July	August	Sept	October
Foot & boat surveys	Monthly	All	■	■	■	■	■	■	■
Goat kidding surveys	Daily	T, B, M		■	■				
Goshawk broadcast survey	Monthly	S, B, M		■	■	■	■		
Owl broadcast survey	Monthly	S, B, M	■	■	■				
Marbled murrelet surveys	Monthly	T		■	■	■	■		
Small mammal trapping	Once	All						■	■
Beaver cache surveys	1x/yr	T, S, B						■	■

*T = Takatz, S = Sadie, B = Baranof, M = Medvejie

3.2.1 Foot, Boat and Aerial Reconnaissance Surveys

3.2.1.1 General

Generally, foot surveys will involve ground observations by a wildlife specialist knowledgeable in identifying wildlife species, sign, life history activity, and habitat. The researcher(s) will survey established routes on foot, noting, among other factors:

- Sightings of large and small mammals, amphibians and birds;
- Sign, including such items as tracks, scat, rubs, carcasses and dens for mammals and droppings, owl pellets, nests and other items for birds;
- Habitat types and their associations with fauna either sighted or noted through sign.

Actual foot survey routes will be largely determined after researchers have done a ground reconnaissance within the study area. Foot surveys will include, to varying degrees, all areas potentially affected by construction or long-term operation in the lake and intake, powerhouse and transmission line areas. Access and topography are expected to limit survey areas, particularly in the upper Baranof and Medvejie basins due to steep terrain and avalanche hazard.

Prior to foot surveys, researchers will prepare a survey area map and record observations on the map and in terms of GPS coordinates, to the extent possible. The result of these early efforts will be maps on which proposed foot survey boundaries within which foot surveys will be delineated. These maps will serve as base maps for all wildlife and perhaps other resource studies. Consulting resource agencies will be asked for review and comment on the proposed survey area(s).

3.2.1.2 Transmission Corridor Surveys

In 2011, special emphasis will be placed on documenting wildlife and/or wildlife habitat along the entire proposed OTA route. As currently envisioned, (and described in the Project Description Section) the transmission route would extend from the switchyard on Takatz Bay, past Sadie Lake, then around Baranof Lake at an elevation of several hundred feet above the lake shoreline. All of this area is either densely forested or rocky, potentially limiting access and continuous travel along the route. Upstream of Baranof Lake, the transmission corridor traverses increasingly difficult terrain including braided stream channels, rock outcrops, avalanche areas, and mixed rock/forested areas, with extreme inclines.

In the Medvejie River basin, conditions are expected to be less extreme, but the transmission corridor will be similarly untracked and without developed ground access.

Therefore, before a detailed survey plan may be developed for the 2011 transmission corridor surveys, researchers will use a helicopter to fly the proposed transmission route from Takatz Bay to the point at which the line would enter the tunnel near the high ridge of the Baranof Mountains. The flight would continue on the west side of the mountains to the base of the Medvejie Valley. This reconnaissance flight will give insights into access feasibility and also probability of habitation by the various major categories of wildlife species (large mammals, small mammals and birds) expected in such an upland area. After the reconnaissance flight, researchers will prepare a more detailed plan documenting study area and associated methods and survey schedules for the various transmission corridor segments. To the extent possible, researchers will then conduct these proposed transmission corridor studies in 2011 and possibly 2012.

Some wildlife observations of nearshore areas and areas around the transmission corridor may be facilitated by using boats on Takatz, Baranof and Medvejie Lakes. Boats will be used in these areas either for access to Takatz Lake and/or Baranof Lake foot survey areas, or to directly observe wildlife on or near shorelines and visible mountainsides. Boat survey areas will include transmission routes and all potential tidewater dock or equipment staging areas.

3.2.1.3 Data Recording

During all surveys researchers will note:

- Date/time/location;
- Weather conditions;
- Species or sign;
- Sex and life stage;
- Movement, behavior or other activity patterns;

- Evidence of life-history activity, such as denning, kidding, nesting, feeding, rearing, etc.

All survey observations will be documented, to the extent possible, using Global Positioning System (GPS) equipment, and will be noted on Project study area base maps.

These surveys will also be the primary source of information on existence of T&E species. Any initial reports of T&E species will prompt discussions with USFWS and/or NMFS to determine if additional study effort is needed to adequately confirm sightings.

Species specific surveys include the following:

1. Goat kidding;
2. Goshawk and other diurnal raptors;
3. Owl Broadcast;
4. Marbled murrelet;
5. Small mammals; and
6. Beaver caches.

More detailed plans for these studies are discussed below.

3.2.2 Goat Kidding Surveys

Focused surveys will be done during late May and early June to determine kidding areas for mountain goat and their timing. Observations will be made with a Nikon 75x spotting scope and data recorded will include location, behavior, group size and association, age class (kid, yearling, subadult, adult), and sex. *Additional observations will be made when possible during transit flights for field work.*

3.2.3 Diurnal Raptors

3.2.3.1 Goshawk Broadcast Surveys

Broadcast acoustical surveys will be used to survey for goshawks (Barton 1992) and will be performed in conjunction with other field surveys. The survey consists of a broadcast call, point sampling technique which includes the following:

1. Aerial photos and habitat GIS layers will be used to select high quality goshawk habitat.
2. Transects will be established 250 m apart with sample stations every 200 m, alternating the stations by 100 m on adjacent transects in order to increase coverage. (The exception to this is the transect along the lake shore; this consists of one transect paralleling the shoreline 50 m out with stations every 200 meters and then the next transect 100 m inland.)
3. Calling equipment consists of mp3 player connected to a NiteLite 15 watt speaker and amplifier, producing 80-110 dB output, 1 meter from speaker.

4. Adult alarm calls will be used during the nestling period, late May to early July and other times during the year. Juvenile begging (wail) calls will be used during the fledgling dependency period, early July to mid-August.
5. Calling will be conducted from ½ hour before sunrise up to ½ hour after sunset.
6. On the arrival at each calling station, at least one minute will be allowed for listening for any calls. Broadcasting begins at 60 degrees from the transect line for 30 seconds, then listening and watching for 30 seconds. This will be repeated 5 more times, rotating 120 degrees between each broadcast, resulting in a total of 6 calls over 6 minutes.
7. Surveying during times of heavy rain or winds exceeding 15 mph will be avoided.
8. Data recorded will include station number, location description, latitude and longitude, date, time, habitat, responses to call, direction and distance of responses, visual sightings, age and sex of birds, behavior, and other birds in area.

3.2.3.2 Other Diurnal Raptors

Observations of other raptors such as Bald Eagles and Peregrine Falcons will be recorded during boat, foot surveys and other field work. Aerial surveys, when possible, will also be used to locate nests (RIC 2001).

3.2.4 Owl Broadcast Surveys

The method for surveying owls will be a modified protocol for “presence/not detected” sampling which is based on methods from Southeast Alaska Owl Network (Kissling and Lewis 2009) and Inventory Methods for Raptors (RIC 2001). Because of the broad list of potential owls in the project area, priority will be placed on owls most likely to be present. Owls with abundance ratings of occasional or rare will have a priority of one and will be included in all call survey stations. Those with abundance ratings of uncommon, very rare or accidental will have a priority of two and will be included in every other station (Table 2). Abundance ratings are approximate for the Sitka area and may not reflect true abundance in the study area.

Table 2. Owl Species, Expected Abundance and Survey Priority

Owl species (by size)	Abundance	Priority
Northern Pygmy Owl	Occasional	1
Northern Saw-whet owl	Occasional	1
Western Screech Owl	Common	1
Boreal Owl	Accidental/Very Rare	2
Short-eared Owl	Uncommon	2
Long-eared Owl	Accidental	2
Northern Hawk Owl	Very Rare	2
Barred Owl	Rare	1
Great Horned Owl	Rare	1
Snowy Owl	Very Rare	2
Great Grey Owl	Accidental	2

Owl survey stations will be located in areas with: a) low ambient noise, b) low traffic levels, and c) at least 25% forest within 500 m of the station. Distance between stations will be approximately 1.6 km.

Surveys will be conducted half an hour after sunset until midnight. Data collection includes: location, habitat, time, temperature, cloud cover, precipitation, snow cover, moon phase, wind conditions, and noise level.

Broadcast calls will be played for owl species based on the table above. Calling equipment will consist of mp3 player connected to a Cass Creek speaker, producing 100-110 dB output, one meter from speaker.

The order of calling will always be from the smallest to largest owl, since some species of larger owls are known to prey on smaller owls and their calls may influence response by smaller owls. For each species, the broadcast series will consist of three calls (20 seconds each) followed by a 30 second listening period. The first recording will be broadcast at 60° from the transect line (i.e. direction of travel on road, trail, etc.), the second at 180° from the transect line, and the third at 300° from the transect line. After each series of calls, the observer will listen and watch for five minutes.

Data collected for each owl response will include detection number, species and time; estimated distance to nearest 50 m, and direction. The procedure will be repeated for each owl species at each station.

3.2.5 Marbled Murrelet Audio-Visual Surveys

Marbled murrelet audio-visual stations will be established and the ADF&G standard technique will be used. This consists of arriving at the station at least one hour before dawn and listening/watching for 30 minutes for murrelets passing through area (ADF&G).

3.2.6 Small Mammal Surveys

Small mammals will be collected using snap traps (Victor and Museum Special), live traps (Sherman), and pit-fall traps. Traps will be set in a variety of habitats and locations to maximize the variety of species caught and baited with peanut butter and oats mixture. Trap sites will be recorded with GPS and set for one to two nights and checked daily.

Data collected will include: trap number, date and time set and checked, latitude and longitude, trap type, habitat, microhabitat, elevation, weather, species and sex of specimen. Live animals will be dispatched and all animals will be placed in separate Ziploc bags and labeled with the above data. Specimens will be frozen and then shipped to the University of Alaska Museum of the North, Mammals Collection, in Fairbanks for species identification confirmation, other pertinent information, and deposition into their museum collection.

3.2.7 Beaver Surveys

During foot, boat and other surveys, beaver sign and activity will be mapped for general “presence/not detected” baseline data. Relative abundance data will be obtained through additional, more focused surveys of these areas (RIC 1998) recording dams and lodges using GPS and GIS and overlaid with project features. In the fall, focus will shift to mapping food caches.

3.2.8 Snow Depth Monitoring

Snow depth will be monitored in the study area along an east/west elevational gradient. This will involve deploying temperature profile poles. Each pole will have a series of iButtons at one foot intervals and programmed to record temperatures every 3 hours. Poles will be placed at the elevations (denoted "El" feet above mean sea level): El 0, El 1200, El 2400, and El 3200, with 4 poles being placed on the east side of the central Baranof Island study area and 4 poles on the west side. This will result in an east/west elevational gradient and provide environmental context for wildlife monitoring, especially goat movements in response to snow depth (Kevin White, ADF&G, pers. comm.). These elevations were selected to compare with the El 1200 elevation weather station at Eaglecrest Ski Area in Juneau, Alaska, which will allow for better data interpretation and extrapolation. Data may also be used for predicting avalanche occurrence along the proposed OTL route (Hood et al. 2005).

3.3 COOPERATIVE (WITH ADF&G) MOUNTAIN GOAT

ADF&G plans to deploy 6 more GPS collars on goats in the central Baranof study area (White et al. 2010). During transit flights to the study area for field work methods (described above), when time and weather permits, radio-tracking and other air-based observations will be made by city employees to assist in this study.

4.0 THREATENED AND ENDANGERED SPECIES

No Threatened or Endangered species were observed in 2010, however, Table 3 lists T & E and other species of special interest that may occur in the study area and will be searched for during all field work.

Table 3. Threatened, Endangered, Candidate and Other Species of Concern, Possibly Occurring in the Study Area, Takatz Lake Project.

Species List	Federal	USFS	ADF&G
Humpback Whale (<i>Megaptera</i>)	Endangered		Endangered

<i>novaeangliae</i>)			
Steller sea lion (<i>Eumetopias jubata</i>)	Threatened		
Kittlitz's Murrelet (<i>Brachyramphus brevirostris</i>)	Candidate Species		
Queen Charlotte Goshawk (<i>Accipiter gentilis laingi</i>)		Sensitive	Special Concern
Osprey (<i>Pandion haliaetus</i>)		Sensitive	
Peale's Peregrine Falcon (<i>Falco peregrinus anatum</i>)		Sensitive	
Trumpeter Swan (<i>Cygnus buccinator</i>)		Sensitive	
Marbled Murrelet (<i>Brachyramphus marmoratus</i>)		Species of Concern	
Olive-sided Flycatcher (<i>Contopus cooperi</i>)			Special Concern
Townsend's Warbler (<i>Dendroica townsendi</i>)			Special Concern

5.0 REPORTING

Progress reports documenting the 2011 wildlife and habitat studies will be distributed monthly. A final report will be issued no later than January 31st, 2012.

The reports will generally contain the following sections:

Methods. The author(s) will describe observation methods, including sites, dates, observations recorded (wildlife numbers and species, weather, etc, as described above) identification keys used and other items.

Results. Authors will describe the results of the foot, boat, camera and aerial surveys and other recorded data. Study Area base maps will be used to the extent possible to identify wildlife locations from the surveys, noting habitat utilization and life history activities

A separate Results section will be devoted to T&E and sensitive species. In coordination with ADF&G, USFS and USFWS, researchers will compile and add to a list of potentially-affected sensitive species in addition to T&E species noted by USFWS. If any sensitive species are sighted, the significance of the observation will be reported and further documented to the above wildlife agencies via separate written report.

Discussion. This section will be brief and limited to general discussions of species present, timing and habitat utilization, as they relate to other areas in Southeast Alaska, and to any previous data collected in Project area. More intensive interpretation of these data in terms of species importance, impacts and mitigation measures will be done as part of development of the relicensing NEPA documents.

Recommendations. This section will focus on evaluation of previous studies and ways in which they might be improved. In successive months this section will be used to evaluate effectiveness of changes and the extent to which proposals have been achieved.

Impact and Mitigation Evaluations. As possible, reports will address potential project effects on wildlife and habitat. As appropriate, reports may address proposed changes in project operation, or effects of mitigation proposals which arise during the licensing process.

6.0 LITERATURE CITED

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- Resources Inventory Committee. 2001. Inventory Methods for Raptors: Standards for Components of British Columbia's Biodiversity No. 11. Version 2.0. Ministry of Sustainable Resource Management, Environment Inventory Branch, Victoria, BC. Website: http://srmwww.gov.bc.ca/risc/pubs/tebiodiv/raptors/version2/rapt_ml_v2.pdf.
- White, K. S., P. Mooney, and K. Bovee. 2010. Mountain Goat Movement Patterns and Population Monitoring on Baranof Island. Wildlife Research Annual Progress Report. Alaska Department of Fish and Game, Division of Wildlife Conservation, Douglas, AK. 5 pp.

ATTACHMENT I

Comments via email to Christopher Brewton from Phil Mooney, ADF&G, dated 24 June 2011

("ADF&G" added by the City to numbering)

Christopher et al.:

Thanks for the opportunity to comment on the Draft Wildlife Resources Plan, Takatz Lake Hydro Project, FERC No. 13234. I'm sending these comments via email to expedite the process. Kevin White and I have discussed a few items we believe would be beneficial to consider:

ADF&G 1. Monitoring of snow depth - Using a transect(s) across an east/west and elevational gradient, measure/monitor snow depth in the project area using relatively low-cost ibutton sensors. These data would be helpful for providing environmental context for the wildlife (fish and other) monitoring data that is collected for the project. For example, since winter severity is a strong driver of many wildlife populations in Southeast Alaska (SEAK) it is important to have parallel wildlife monitoring and snow depth information to assess whether patterns seen in wildlife abundance or distribution reflects mild-average-severe winter conditions. The existing NWS weather stations are at sea level and not likely representative of the strong climate gradients that occur, both from elevational and longitudinal standpoints, throughout the central Baranof study area.

ADF&G 2. Opportunistic radio-tracking of marked mountain goats - During Kent's pre-scheduled transit flights across the island the City should take advantage of the opportunity to conduct radio-tracking of marked mountain goats. These are likely to help Kent interpret the observations he is collecting via ground based monitoring. For example, general knowledge of whether goats are on summer or winter range or have shifted out of his "view shed" will help him assess how representative his observations are of the overall area he is responsible for monitoring. These flights would be extremely beneficial to identify kids and the timing of their birth and appearance and locations in May and thru early-June. ADFG will ultimately be able to provide detailed GPS records of where collared animals are distributed at specific times but most of these data will not be available until GPS data are downloaded from released collars at the end of the collar deployment period (2014 for the 7 store-on-board collars). Consequently, having relatively "real-time" data on mtn goat distribution can assist Kent in adjusting his observational sampling efforts to maximize efficiency and help interpret his findings in the short term.

ADF&G 3. Opportunistic radio-collaring of brown bears -(see the attached paper) - The preconstruction and construction phases of the Blue Lake and Takatz Lake

hydroelectric projects have the ability to displace brown bears. The displacement may compound competition between bears with overlapping or adjoining home ranges, resulting in bear mortality either from each other or from the possibility of displacement into areas with higher human contact. I would recommend that the projects take advantage of opportunities to capture/collar bears in the immediate project areas. The GPS locations will give us specific information related to bear locations at various times of the year, including den sites, as well as seasonal habitat use patterns. It will also give us some degree of bear interaction and overlap with mountain goats. The VHF signal may provide useful in having approximate locations of the bears when crews are working in the area.

Phil Mooney
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ATTACHMENT II

Table documenting how numbered comments (from Attachment I) were addressed

Comment Number	Comment Summary	Location and Action Taken on Comment
ADF&G 1	Use sensors to monitor snow depth at various elevations in project area	Page 10 @ 3.2.8. Language added to describe monitoring methods.
ADF&G2	Track radio-tagged mountain goats during transit flights	Page 4 @ 3.0, Page 10 @ 3.3. Language added to describe tracking assistance.
ADF&G 3	Radio collar brown bears in Blue Lake and Takatz Lake areas	No bear tracking will be done in 2011 for the Takatz Project. Blue Lake bear study planning is included in draft Blue Lake Expansion Monitoring Plans.