

DRAFT 2011 WILDLIFE INVESTIGATIONS REPORT

Takatz Lake Hydroelectric Project (FERC No. 13234)

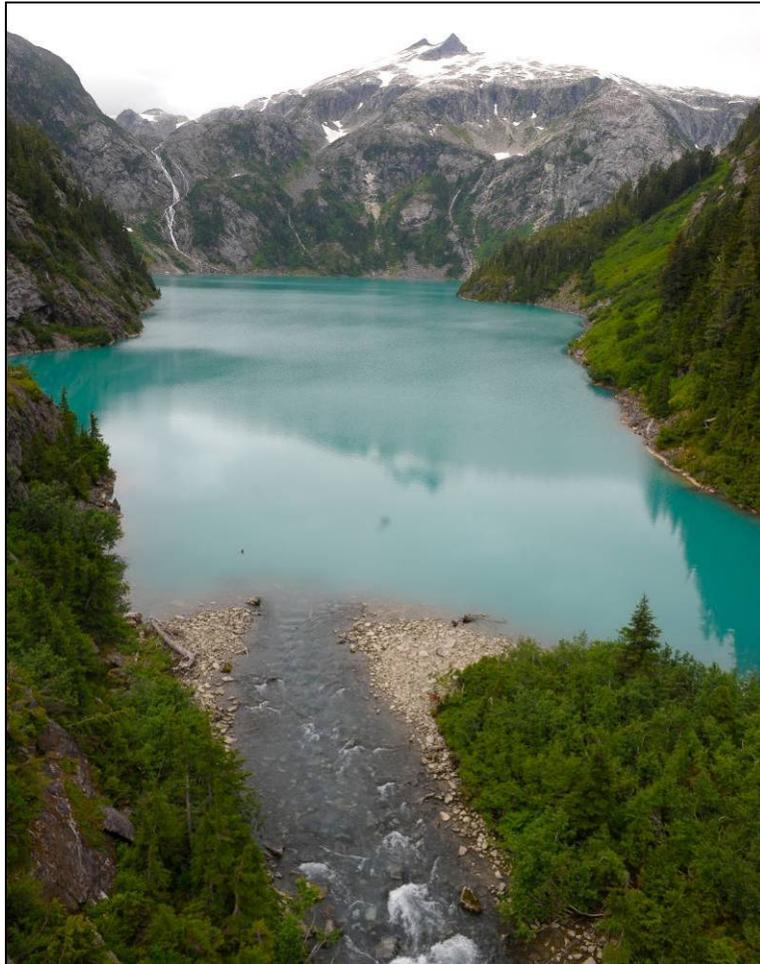
Prepared by:

Kent Bovee, Sitka, Alaska

Prepared for:

City and Borough of Sitka Electric Department

March, 2011



EXECUTIVE SUMMARY

BACKGROUND

In February, 2008, the City and Borough of Sitka Electric Department (“City”) received a Preliminary 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 potentially affect resources in the Takatz, Sadie, Baranof and Medvejie river basins which fall within the potential project boundaries.

During Initial Consultation and Scoping, Project Stakeholders including Alaska state and federal resource agencies, indicated concern for Project effects on wildlife resources within the project area and close proximity. To address wildlife issues, the City consulted with resource agencies to develop a Wildlife Study Plan (City 2010) describing studies to be conducted in 2010. The results of these studies were documented in a Draft Wildlife Report distributed on March 21, 2011 (Bovee 2011).

The City conducted an interagency meeting on April 27, 2011, to discuss the report for 2010 wildlife studies and proposed studies for the upcoming 2011 season. Draft minutes of the interagency meeting were distributed on May 9, 2011. As a result, a Draft 2011 Wildlife Study Plan was developed and distributed for comment in May of 2011 (Bovee 2011).

Studies conducted in 2010-2011 were designed to document existing wildlife resources in the potentially-affected areas and to assess which resources might be most affected by the Project.

Field surveys included foot and boat surveys, raptor broadcast techniques, and small mammal trapping. All areas within the project area have been surveyed at least once with the exception of the upper Baranof and Medvejie River valleys. These areas will be top priority in the 2012 field season.

Field studies in 2010-2011 documented 59 wildlife species, including 13 mammals, 45 birds, and one amphibian. Results from these surveys were organized by major wildlife groups, including: Threatened and Endangered (T&E) species; furbearers; large mammals; small mammals; raptors; waterfowl; and amphibians. Results and interpretations of 2010-2011 surveys, by major wildlife group, are presented below.

THREATENED, ENDANGERED and SPECIES of SPECIAL CONCERN

No T&E species were observed during terrestrial surveys in the project area. Two marine T&E species, humpback whale (*Megaptera novaeangliae*) and Steller sea lion (*Eumetopias jubata*), are known to occur offshore of eastern Baranof Island, but were not observed along the only marine portion of the project, inside Takatz Bay. One marine bird, the marbled murrelet (*Brachyramphus marmoratus*), was observed in Takatz and Baranof Warm Springs Bays. This species is listed by the U.S. Forest Service (USFS) as a Species of Concern. Two species listed

by USFS as a Sensitive Listed Species were observed: Trumpeter swan (*Cygnus buccinator*) and Queen Charlotte Goshawk (*Accipiter gentilis laingi*). Trumpeter swans were commonly seen in beaver ponds adjacent to Baranof River during late spring and early summer and one sighting of a goshawk was made in the muskeg area upriver from these beaver ponds. Scats from ermine (*Mustela erminea*) were observed on several occasions. It is assumed they are of the subspecies, *M. e. initis*, which has Global and Subnational conservation rankings of "vulnerable." Identification to the subspecies level would require genetic analysis of hair samples or tissue samples from voucher specimens (Dawson et al. 2007).

FURBEARERS

Extensive evidence of American beaver (*Castor canadensis*) activity was obvious from numerous ponds, sloughs, dams, and chewed trees, particularly in Baranof River and Takatz Creek areas. Field studies in 2011 were extended farther up Baranof River valley, resulting in doubling the known range for beaver in that watershed. These wetland areas provide extensive habitat for waterfowl, fish, and other wildlife species.

American marten (*Martes americana*) populations appeared slightly higher in number as compared to 2010, perhaps in response to high vole numbers in both seasons. American mink (*Neovison vison*) and North American river otter (*Lontra canadensis*) occurrences followed the typical pattern of higher incidence along marine shoreline areas, with relatively low numbers observed in inland areas. Sign from ermine were found on a few occasions, in association with their main prey item, voles, and muskeg habitat.

LARGE MAMMALS

Mountain goats (*Oreamnos americanus*) were commonly observed, particularly in an area at the head of Baranof Lake potentially-affected by the project transmission line route. This area also had extensive beaver areas and associated wetlands, making it a key area of concern for potential wildlife and other terrestrial impacts. A cooperative goat study with Alaska Department of Fish and Game (ADG&G) continued in 2011 and resulted in the radio collaring of an additional 7 goats, adding to the 12 goats in 2010. However, one of the goats from 2010 died, leaving 18 goats with active collars. The goat was scavenged on by a brown bear, but the cause of death is unknown.

Distribution of brown bears (*Ursus arctos*) in the project area was characteristic of brown bears in southeast Alaska, with the highest densities along salmon streams, especially during spawning season. As many as 15 different bears (including 1 sow with 2 year old cubs, 2 sows, each with 2 cubs of the year, 2 sub-adults, and one boar) were observed in the Takatz Bay area, especially in late summer during salmon spawning. Other areas within the project area without salmon availability had very few bears. Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) appeared to be more common this year as compared to 2010, possibly due to a milder winter. However, deer densities on the eastern side of central Baranof historically are much less than those on the western side and continue to follow this pattern. This reduced carrying capacity is a result of heavy snowfall accumulations (10 to 20 feet) and the lack of large tracts of old growth timber.

SMALL MAMMALS

Among small mammals, high densities of root voles (*Microtus oeconomus*) were observed, as in other areas of Baranof Island. Both 2010 and 2011 appear to have had high levels of voles, with 2011 showing a slight decrease from 2010. As compared to vole densities, there were low numbers of Northwestern deer mouse (*Peromyscus keeni*), and cinereus shrew (*Sorex cinereus*). One bat species, most likely the little brown myotis (*Myotis lucifugus*), were commonly seen at Baranof Lake and occasionally in Takatz Basin. Other bat species may be present however, which would require capture and/or sampling of bats.

RAPTORS

Five species of raptors were observed in the project area, including bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), northern goshawk, northern saw-whet owl (*Aegolius acadicus*), and western screech owl (*Megascops kennicottii*). Bald eagles occurred occasionally in inland areas but were mostly associated with areas closer to the marine shoreline. One active eagle nest was found just outside the project area in Takatz Bay. One helicopter survey was flown to locate raptor nests but no additional nests were found. Red-tailed hawks were commonly seen singly or in pairs in the Baranof Lake area and Takatz basin, suggesting that there may have been at least one pair nesting in or adjacent to the project area. One northern goshawk was observed in Baranof River valley. Several kill remains of voles were observed in muskeg areas, most likely from these diurnal raptors. No goshawks were observed during broadcast surveys. Owls were only heard a few times, with none responding to broadcast calls.

WATERFOWL AND SHOREBIRDS

Freshwater-Associated

Waterfowl and shorebirds made use of the variety of water bodies readily available in the project area, in particular Baranof Lake. Five species were observed nesting, Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), common loon (*Gavia immer*), red-throated loon (*Gavia stellata*), and mew gull (*Larus canus*). The highest concentration of nests was on O'Neil Island, which included nesting pairs of 2 Canada goose, 2 mallard, one common loon, and one mew gull. The mallard and common loon nests were predated, most likely by mink and/or gulls, but the other nests appeared to be successful. Another Canada goose nest was also observed along Baranof River. Beaver ponds were used by trumpeter swans, Canada geese, mallards, and Wilson's snipe (*Gallinago delicata*). Harlequin ducks (*Histrionicus histrionicus*) and American dippers (*Cinclus mexicanus*) were often seen working the faster, whitewater streams and occasionally the lakes' shorelines.

Other freshwater-associated waterfowl included bufflehead (*Bucephala albeola*), glaucous-winged gull (*Larus glaucescens*), green-winged teal (*Anas carolinensis*), and ring-necked duck (*Aythya collaris*).

Marine-Associated

Waterfowl and shorebirds that were predominantly marine-associated included Barrow's goldeneye (*Bucephala islandica*), belted kingfisher (*Megaceryle alcyon*), bufflehead, great blue heron (*Ardea herodias*), common merganser (*Gavia immer*), gulls (glaucous-winged and mew), and marbled murrelet.

FOREST AND SONGBIRDS

There were 15 species of forest or songbirds observed. Two new species observed in 2011 include willow ptarmigan (*Lagopus lagopus*) and sooty grouse (*Dendragapus fuliginosus*). Male grouse were heard "hooting" in the Baranof Lake area on several occasions.

AMPHIBIANS

One amphibian, the western toad (*Buro boreas*), was observed as both adults and in the tadpole stage. The numbers in Baranof Lake appeared to be low as compared to historical levels.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
BACKGROUND	2
THREATENED, ENDANGERED and SPECIES of SPECIAL CONCERN	2
FURBEARERS	3
LARGE MAMMALS	3
SMALL MAMMALS	4
RAPTORS	4
WATERFOWL AND SHOREBIRDS	4
Freshwater-Associated	4
Marine-Associated	5
FOREST AND SONGBIRDS	5
AMPHIBIANS	5
LIST OF FIGURES	7
LIST OF TABLES	7
LIST OF PHOTOS	7
INTRODUCTION AND BACKGROUND	10
PROJECT DESCRIPTION	10
NEW TRANSMISSION ROUTING	10
OBJECTIVES	13
STUDY AREAS	13
Takatz Lake and Bay	13
Sadie Lake	15
Baranof Lake	17
Medvejie Lake	20
METHODS	23
FIELD SURVEYS	23
General Observational Surveys	23
Species-Specific or other Wildlife Group Surveys	26
THREATENED and ENDANGERED (T and E) SPECIES	29
RESULTS	30
FIELD SURVEYS	30
Large Mammals	31
Furbearers	39
Small Mammals	45
Raptors	47
Waterfowl and Shorebirds	51
Forest and Songbirds	59
Amphibians	60
THREATENED and ENDANGERED (T&E) SPECIES	62
LITERATURE CITED	63
Appendix. Species List - Major Group, Common Name, Scientific Name, Primary Survey Method Used, Relative Abundance, Residency, and Conservation Rankings.	64

LIST OF FIGURES

Figure 1. Project Features and Study Areas..... 12
 Figure 2. Takatz Lake and Bay Study Area..... 14
 Figure 3. Sadie Lake Study Area 16
 Figure 4. Baranof Lake Study Area..... 18
 Figure 5. Medvejie Lake Study Area..... 21
 Figure 6. Mountain Goat Observations..... 32
 Figure 7. Location of Mountain Goat capture Sites, ADF&G-CBS Cooperative Study (White et al. 2011)..... 35
 Figure 8. Beaver Areas, Takatz, Sadie, and Baranof Lake Areas..... 42
 Figure 9. Small Mammal Trap Sites..... 46
 Figure 10. Raptor Observations and Survey Sites for Goshawks and Owls..... 49
 Figure 11. Waterfowl Nests in Project Area..... 52

LIST OF TABLES

Table 1. Owl Species, Expected Abundance, and Survey Priority..... 28
 Table 2. Descriptions and Abbreviations for Relative Abundance, Residency, and Ranks..... 29
 Table 3. Wildlife Survey Date, Area Surveyed, and Survey Type..... 30
 Table 4. Large Mammals and Their Relative Abundance, Residency, and Conservation Rank.. 31
 Table 5. Furbearers and Their Relative Abundance, Residency, and Conservation Rank..... 40
 Table 6. Small Mammals and Their Relative Abundance, Residency, and Conservation Rank.. 45
 Table 7. Raptors and Their Relative Abundance, Residency, and Conservation Rank..... 48
 Table 8. Waterfowl and Their Relative Abundance, Residency, and Conservation Rank..... 51
 Table 9. Dates and Observations at Canada Goose Nest, O'Neil Island, Baranof Lake..... 53
 Table 10. Forest and Songbirds and Their Relative Abundance, Residency, and Conservation Rank..... 59
 Table 11. Occurrence of Threatened, Endangered, Candidate and Other Species of Concern in the Project Area..... 62

LIST OF PHOTOS

Photo 1. Takatz Bay Showing Field Camp Location (circle)..... 13
 Photo 2. View from Ridge between Outer Takatz Bay to Sadie Lake (behind observer), Showing Steep Broken Terrain Typical of Area, Proposed T-Line Route..... 15
 Photo 3. Baranof Lake Freezes Over Most Winters. Jim Gillis Doing Foot Surveys, at East End of Lake, Looking West, 22 March 2011..... 17
 Photo 4. Baranof Lake Cabin in an Average Snowfall Year, March 2011..... 17
 Photo 5. Temporary Camp, Baranof River, Mid-Valley..... 19
 Photo 6. Just Downstream of Canyon, Upper Baranof River Valley..... 19
 Photo 7. Medvejie Lake, Looking East During Low Water Levels. 17 April 2011..... 20
 Photo 8. Medvejie Lake, Looking West During Low Water Levels. 17 April 2011..... 20
 Photo 9. Upper Valley Medvejie Lake, Active Colluvial and Alluvial Deposition in Forest..... 22
 Photo 10. Active Avalanche Zones Are Common in Upper Medvejie Valley..... 22

Photo 11. Jon Martin Hiking Up Baranof River Valley, with Packraft for Float Trip Back Downriver, During Foot Surveys.....	24
Photo 12. Jon Martin, Packrafting down Baranof River.....	25
Photo 13. Clayton Stromquist and Devan Romine Setting Small Mammal Traps in Takatz Lake Basin.	27
Photo 14. Jim Gillis Locating Radio Collared Goats in Baranof Lake Area, March 22.	31
Photo 15. View of USFS Cabin, Baranof Lake, with Goat Wintering/Spring Area, March 22. ...	33
Photo 16. Mountain Goat (circled) in Winter/Spring Use Area, Baranof Lake.	33
Photo 17. Wintering Goat Habitat at the Head of Medvejie Lake.....	34
Photo 18. Tyler Orbison Showing Where Karl Wolfe, Fisheries Biologist, was Attacked by Brown Bear Along Takatz Creek.....	36
Photo 19. Brown Bear on Trail Camera, Lower Baranof River.	37
Photo 20. Brown Bear Trail in Upper Medvejie Lake Valley (note fire ring showing poorly selected campsite).	37
Photo 21. Brown Bear Using Scratching Tree, Trail Camera Picture, Medvejie Lake Upper Valley (note hiking/game trail to left).	38
Photo 22. Deer, Marten, Otters and Red Squirrel Made Use of the Frozen Surface of Baranof Lake.....	39
Photo 23. Red Squirrel Spruce Cone Cache, Upper Valley Medvejie Lake.....	40
Photo 24. Location of Red Squirrel Crossing Frozen Baranof Lake, a Distance of 500 m (0.3 mi).	Error! Bookmark not defined.
Photo 25. Beaver Pond Areas, Lower Takatz Creek.	41
Photo 26. Beaver Ponds and Sloughs, Lower Baranof River.	43
Photo 27. Beaver Bank Den in Northwest Baranof Lake, Summer 2011 (not present in 2010)..	43
Photo 28. Beaver Chewing Sign on Hemlock at Baranof Lake Cabin.	44
Photo 29. Beaver Pond Complex, at Base of Avalanche Area, Mid-Valley Baranof River.....	44
Photo 30. Typical Vole Habitat, Baranof Lake Area.....	45
Photo 31. Root Cache of Voles, Baranof Lake Valley.	47
Photo 32. Vole Fur at a Raptor Kill Site, Baranof River Valley.	50
Photo 33. Canada Goose Nest, O'Neil Island, Baranof Lake.	53
Photo 34. Canada Goose Nest, O'Neil Island, Baranof Lake.	54
Photo 35. Canada Goose Turning Eggs, O'Neil Island, Baranof Lake.	54
Photo 36. Canada Goose and Goslings, O'Neil Island, Baranof Lake.....	54
Photo 37. Canada Goose and Goslings, O'Neil Island, Baranof Lake.....	54
Photo 38. Mallard Duck Nest, O'Neil Island, Baranof Lake.	55
Photo 39. Mallard Duck Nest (closeup), O'Neil Island, Baranof Lake.	55
Photo 40. Mallard Duck Nest, O'Neil Island, Baranof Lake.	55
Photo 41. Common Loon Nest, O'Neil Island, Baranof Lake.	56
Photo 42. Common Loon Nest Predated, Mew Gull Wing and Feathers, June 5, 2011.....	56
Photo 43. Remains at Predated Common Loon Nest, Mew Gull Wing and Loon Egg Shell.....	56
Photo 44. Gull or Raptor Pellet at Predated Loon Nest, O'Neil Island, Baranof Lake.	56
Photo 45. Mew Gull and Nest, O'Neil Island, Baranof Lake.....	57
Photo 46. Canada Goose Nest, 4 June 2011, Baranof River Valley.....	57
Photo 47. Canada Goose Nest, , 4 June 2011, Baranof River Valley.....	58
Photo 48. Snag in Baranof River Valley with Nesting Tree Swallows.	60

Photo 49. Small Streamlet Area Along Baranof Warm Springs Boardwalk Where Western
Toadlets Were Commonly Found..... 61
Photo 50. Western Toad, Toadlet Found in Small Side Spring, Baranof Warm Springs..... 61

INTRODUCTION AND BACKGROUND

In February, 2008, the City received a Preliminary Permit for the Takatz Lake Hydroelectric Project (FERC No. 13234) from the Federal Energy Regulatory Commission 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.

During Initial Consultation and Scoping, Project Stakeholders including Alaska state and federal resource agencies, indicated concern for Project effects on wildlife resources within the project area and close proximity. To address wildlife issues, the City consulted with resource agencies to develop a Wildlife Study Plan (City 2010) describing studies to be conducted in 2010. The results of these studies were documented in a Draft Wildlife Report distributed on March 21, 2011 (Bovee 2011).

The City conducted an interagency meeting on April 27, 2011, to discuss the report for 2010 wildlife studies and proposed studies for the upcoming 2011 season. Draft minutes of the interagency meeting were distributed on May 9, 2011. As a result, a Draft 2011 Wildlife Study Plan was developed and distributed for comments in May of 2011 (Bovee 2011).

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 a steel penstock leading to a powerhouse located at tidewater on Takatz Bay. 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. 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).

NEW TRANSMISSION ROUTING

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," or simply "Overland Alternative" 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 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 Overland Alternative 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 Overland Alternative 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 Strait. Further, the Marine Alternative would necessitate extensive and difficult marine engineering feasibility analyses.

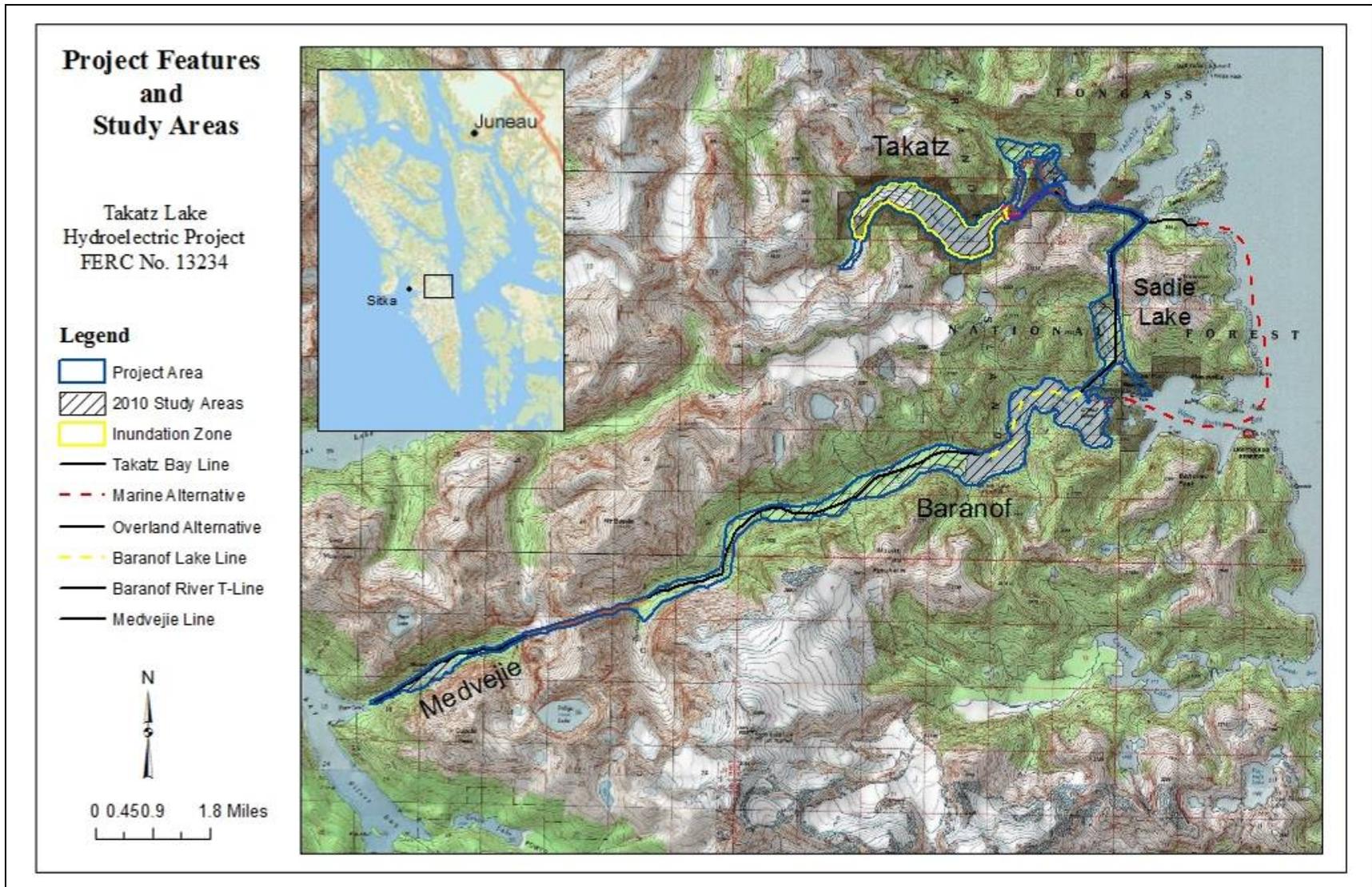


Figure 1. Project Features and Study Areas.

OBJECTIVES

Wildlife studies documented in this report were designed to: 1) establish baseline wildlife resources data in areas potentially affected by the project; and 2) evaluate the effects of project construction and operation of the project in those areas.

STUDY AREAS

Wildlife surveys during 2011 were conducted in four main areas: Takatz, Sadie, Baranof, and Medvejie Lakes and associated watersheds (Figure 1).

Takatz Lake and Bay

Field work in the Takatz watershed involved access from 2 locations - the alpine lake and saltwater bay. To support field work in Takatz Bay and Creek, a semi-permanent field camp was established on a small island in the bay (Figure 2 and Photo 1). The camp consisted of a tent platform, wall tent and wood stove set up for the summer field season, which was used by various field teams. The island allowed for relatively easy access by floatplane and was only accessible from the mainland at extreme low tides, reducing the likelihood of bear encounters. To further reduce the bear interactions, an electric fence was installed around the camp site. A small rubber raft and outboard were used for accessing Takatz Creek.



Photo 1. Takatz Bay Showing Field Camp Location (circle).

Takatz Lake and Bay Study Area

Takatz Lake
Hydroelectric Project
FERC No. 13234

Legend

- Camp Sites
- Inundation Zone
- Lake Tap
- Penstock
- Access Road
- Takatz Bay Line
- Overland Alternative



0 0.3 0.6 0.9 Miles

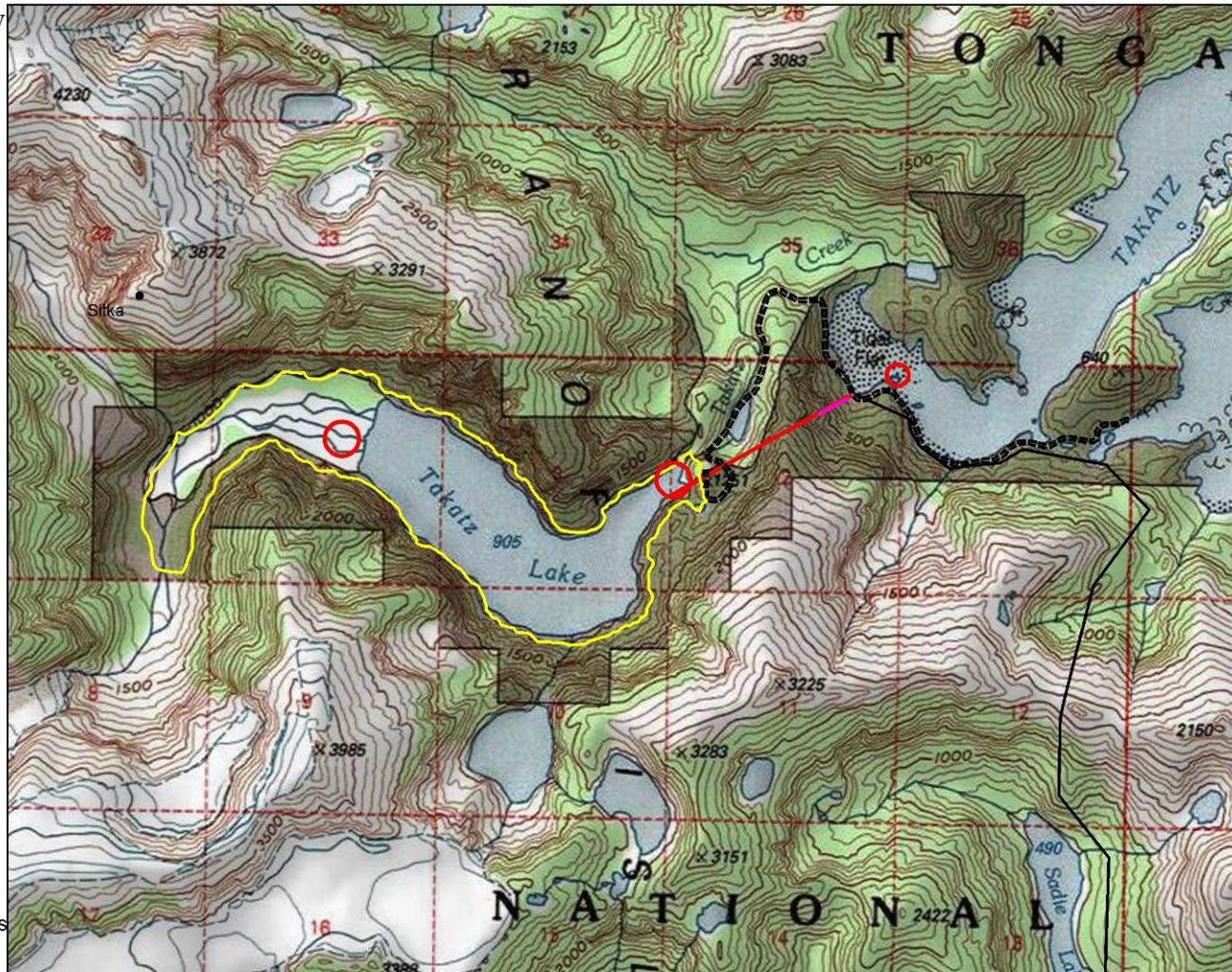


Figure 2. Takatz Lake and Bay Study Area.

For field work at the lake, temporary camps were used for the duration of the trip only, and were located at the head or outlet of the lake (Figure 2). A welded aluminum boat and outboard was kept at the lake outlet for use on the lake. The terrain in this watershed is quite distinct from western Baranof Island, in that there are numerous steep canyons that are too small to be identified on a topographic map with 100' contours (Photo 2). This created access difficulties in much of the T-line corridor.



Photo 2. View from Ridge between Outer Takatz Bay to Sadie Lake (behind observer), Showing Steep Broken Terrain Typical of Area, Proposed T-Line Route.

Sadie Lake

Float planes can land in Sadie lake when conditions are optimal but departing from the lake with a fully loaded plane is not an option. Access to Sadie Lake was done by hiking the one mile trail from Baranof Warm Springs (Figure 3). Temporary camps were used at either end of the lake and a portable raft was used to assist with field surveys.

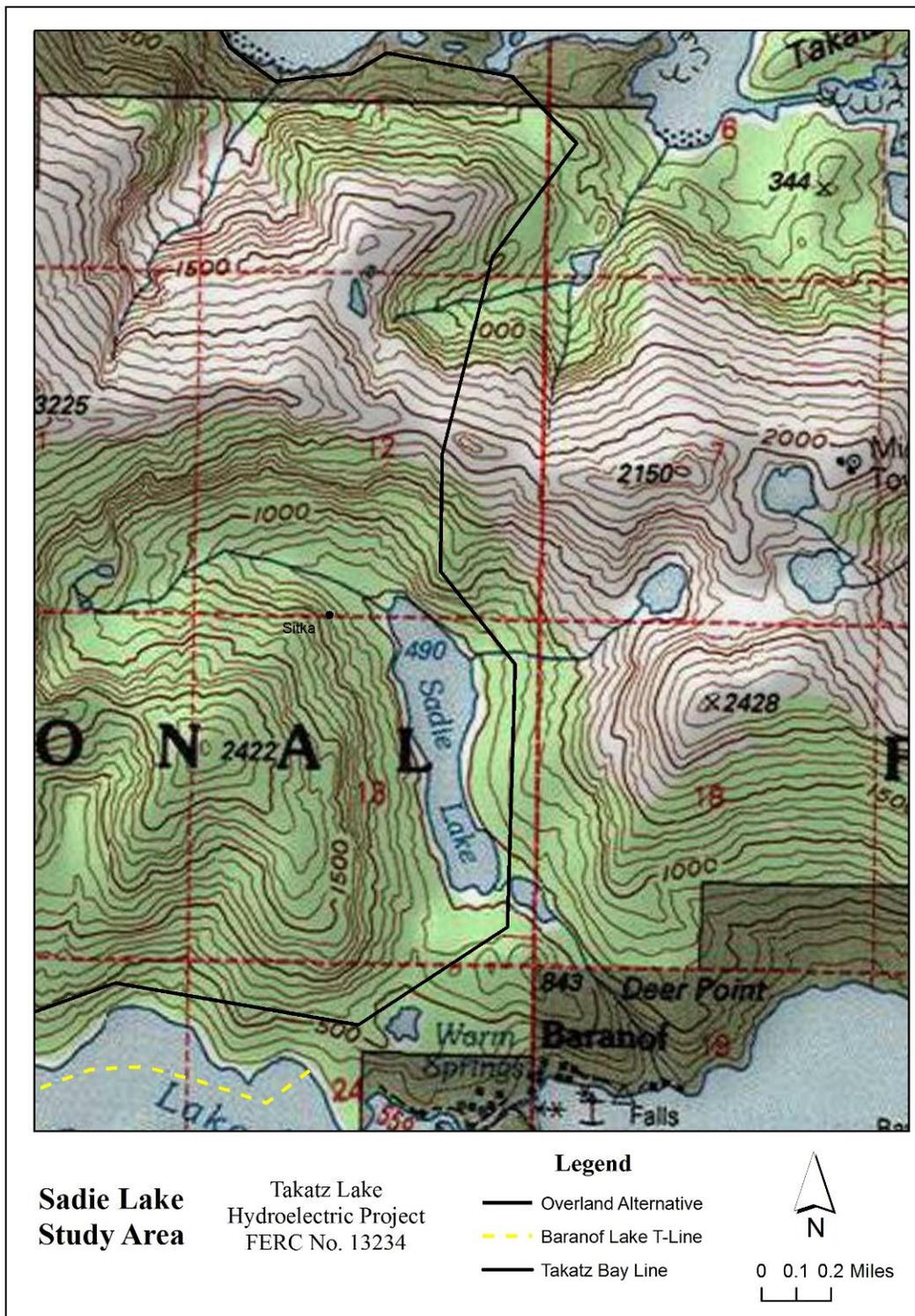


Figure 3. Sadie Lake Study Area

Baranof Lake

The Baranof Lake and River study area is by far the largest within the project area. Although floatplane access to the lake is easier than other study areas, accessing the upper reaches of Baranof River on foot has been a challenge (Figure 4). Field workers have used the USFS cabin at the head of the lake (Photo 4), as well as a small cabin in Baranof Warm Springs for lodging. There is a USFS skiff available with the cabin and an outboard is flown in for use. Baranof lake freezes most winters, allowing access by foot along the shore from Baranof Warm Springs (Photo 3). Temporary camps have been used when doing survey work in the upper reaches of Baranof River (Photo 5). To date, the farthest point of surveying is up to a steep river canyon (Figure 4 and Photo 6).



Photo 3. Baranof Lake Freezes Over Most Winters. Jim Gillis Doing Foot Surveys at East End of Lake, Looking West, 22 March 2011.



Photo 4. Baranof Lake Cabin in an Average Snowfall Year, March 2011.

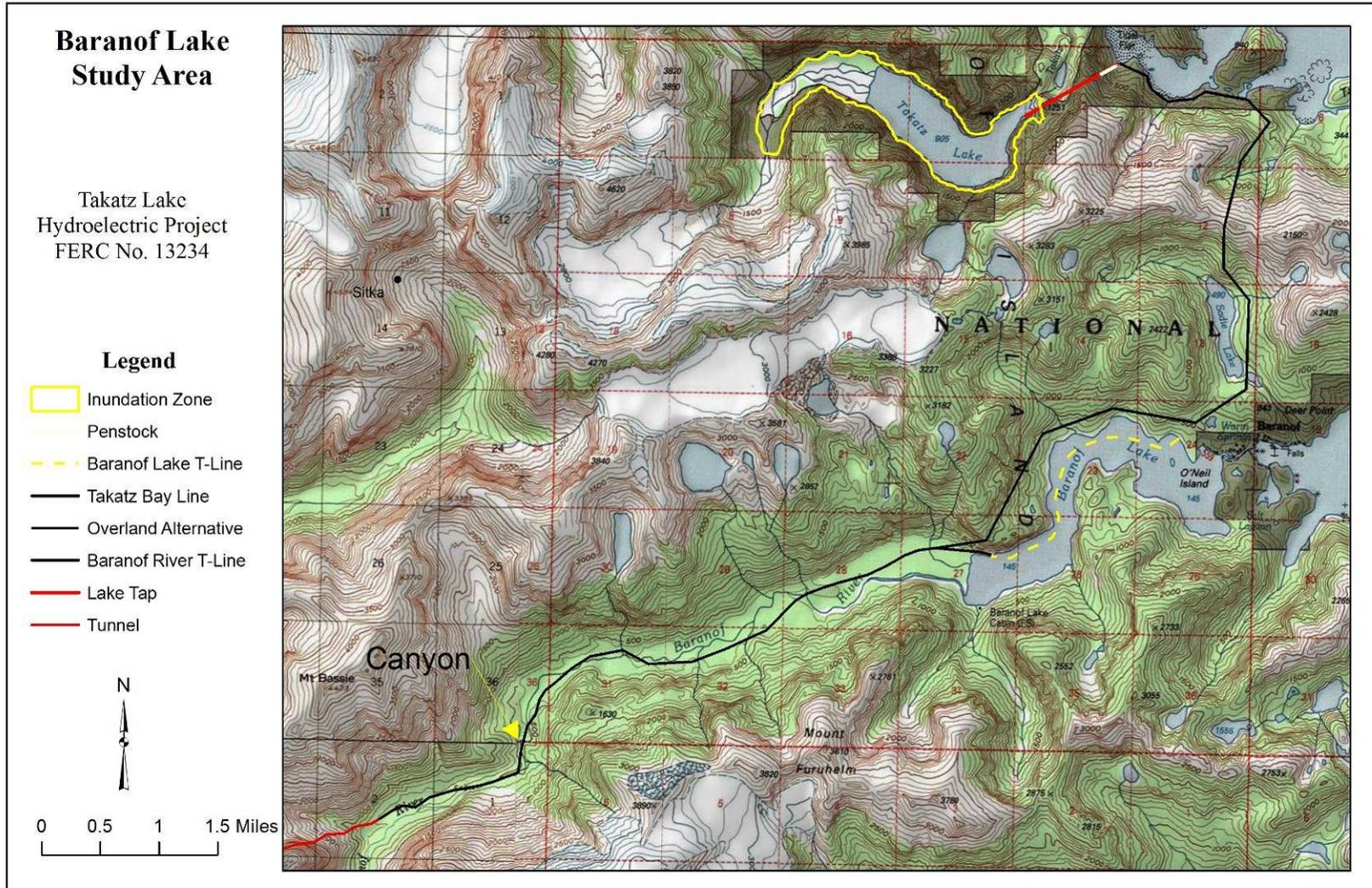


Figure 4. Baranof Lake Study Area.



Photo 5. Temporary Camp, Baranof River, Mid-Valley.



Photo 6. Just Downstream of Canyon, Upper Baranof River Valley.

Medvejie Lake

The narrow and steep watershed of Medvejie Lake is the smallest study area within the project area (Figure 5). The small lake (approx. 1 mile long) is easily accessed by a trail which begins at Medvejie Hatchery in Bear Cove and follows along the 0.5 mi outlet stream. This trail continues along the north shore but becomes very difficult at the far end when it encounters numerous boulders and rock slides. In winter, the lake often freezes, with little inflow or outflow, lowering the water level so the lake shoreline is easily accessible (Photo 7 and Photo 8). Once past the lake, the trail becomes easier until reaching the upper areas of the inlet stream where boulder fields and slide zones dominate the area (Photo 9 and Photo 10).



Photo 7. Medvejie Lake, Looking East During Low Water Levels. 17 April 2011.



Photo 8. Medvejie Lake, Looking West During Low Water Levels. 17 April 2011.

Medvejie Lake Study Area

Takatz Lake
Hydroelectric Project
FERC No. 13234

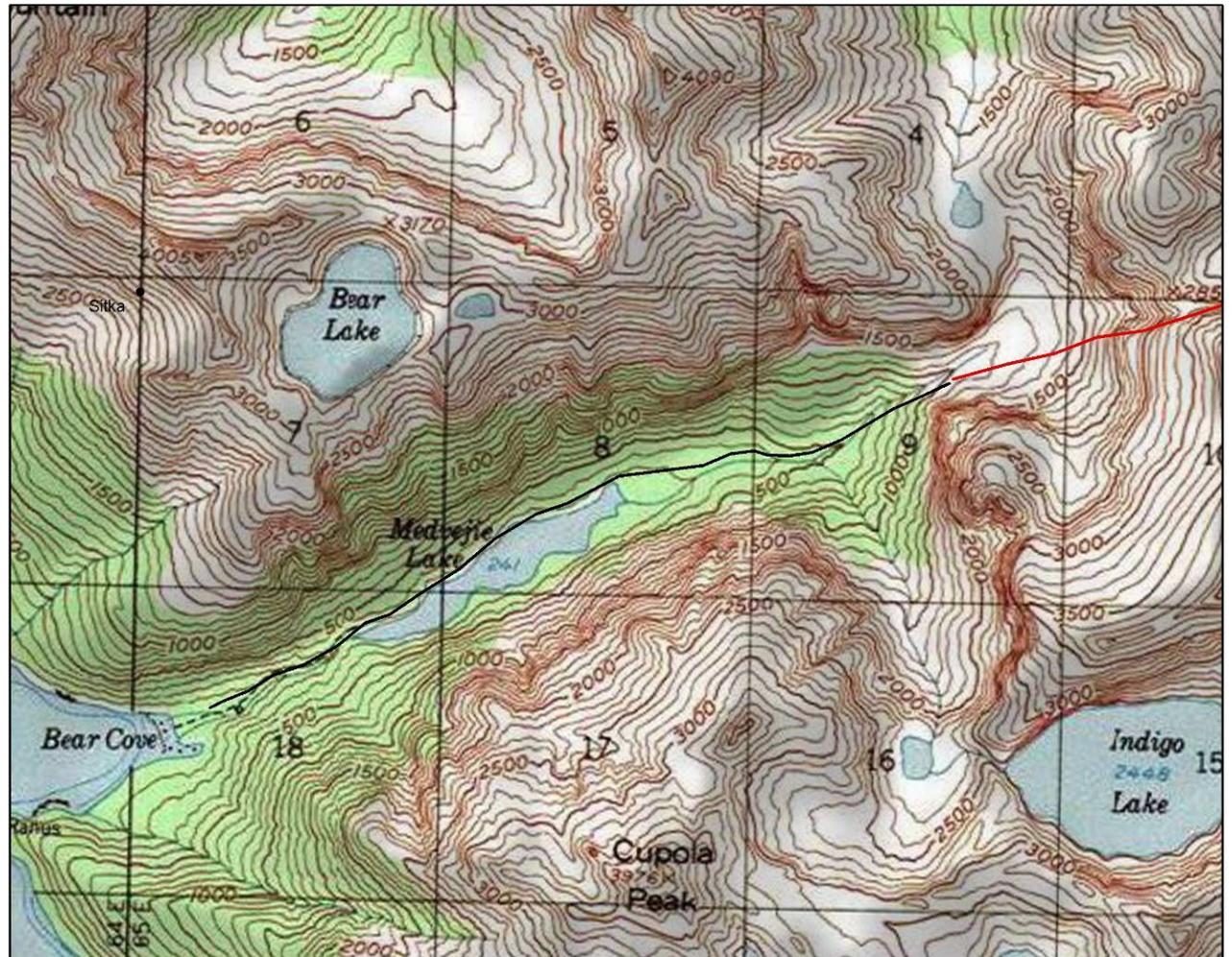
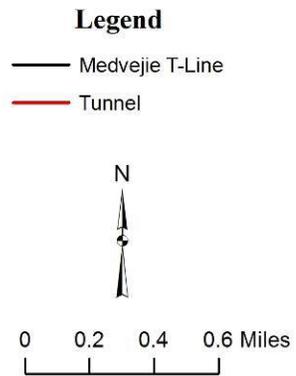


Figure 5. Medvejie Lake Study Area.



Photo 9. Upper Valley Medvejie Lake, Active Colluvial and Alluvial Deposition in Forest.



Photo 10. Active Avalanche Zones Are Common in Upper Medvejie Valley.

METHODS

FIELD SURVEYS

Field surveys were conducted to note presence, relative abundance, life history and habitat associations of wildlife species (including mammals, birds and amphibians) in the project area. To the extent possible, field surveys were conducted as described in the Final Wildlife Study Plan (City 2011). In some cases, access, safety and other concerns limited field surveys in certain project areas, as noted in the sections below.

On all surveys, including the flights to and from the study areas, GPS tracks were recorded and digital cameras were used to collect stills and videos. GPS locations and images were linked using computer software for analysis and future reference. The following techniques were used for field surveys -

General Observational Surveys:

- Foot surveys
- Boat surveys
- Trail cameras

Species or Other Wildlife Group Surveys:

- Northern goshawk
- Small mammals
- Owls
- Mountain goat

General Observational Surveys

General observational surveys were conducted as foot surveys and boat surveys, as described below.

Foot Surveys

Generally, foot surveys involved ground observations by a wildlife specialist knowledgeable in identifying wildlife species, sign, life history activity, and habitat (Photo 11). Observations included:

- 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.



Photo 11. Jon Martin Hiking Up Baranof River Valley, with Packraft for Float Trip Back Downriver, During Foot Surveys.

Boat Surveys

Boat surveys were completed on Takatz, Baranof, Medvejie and Sadie Lakes. Procedures used in performing foot surveys were followed. Lightweight packrafts were used to help access rivers and ponds, increasing access to these areas (Photo 12).



Photo 12. Jon Martin, Packrafting down Baranof River.

Trail Cameras

Several types of trail cameras were deployed to assist in field observations. The types included:

- Bushnell Trail Sentry
- Moultrie M60
- Trail Watcher 4220

Species-Specific or other Wildlife Group Surveys

As described in detail in the following sections, these surveys used specific methods for the species or wildlife group described below:

Goshawk

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

1. Aerial photos and habitat GIS layers were used to select high quality goshawk habitat.
2. Transects were established 250 meters apart with sample stations every 200 meters, alternating the stations by 100 meters on adjacent transects in order to increase coverage. (The exception to this is the transect along the lake shore; this consisted of one transect paralleling the shoreline 50 meters out with stations every 200 meters and then the next transect 100 meters inland.)
3. Calling equipment consisted of mp3 player connected to a Cass Creek Big Horn speaker, producing 80-110 dB output, 1 meter from speaker.
4. Adult alarm calls were used during the nestling period, late May to early July and other times during the year. Juvenile begging (wail) calls were used during the fledgling dependency period, early July to mid-August.
5. Calling was conducted from ½ hour before sunrise up to ½ hour after sunset.
6. On the arrival at each calling station, at least one minute was allowed for listening for any calls. Broadcasting began at 60 degrees from the transect line for 30 seconds, then listening and watching for 30 seconds. This was 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 was avoided.
8. Data recorded included 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.

Small Mammals

Small mammals were collected using Victor snap traps, Sherman live traps, or shotgun. Collecting of small mammals was done under a permit with University of Alaska Museum of the North, Mammals Collection (UAM) in Fairbanks. Traps were set in a variety of habitats and locations to maximize the variety of species caught and baited with a mixture of peanut butter and oats (Photo 13). GPS tracks and photos were used to record transect data. Traps were typically set for one to two nights and checked daily.

Data collected included: date and time set and checked, latitude and longitude, trap type, macrohabitat, microhabitat, weather, species and sex caught, and total traps set. Live animals were dispatched and all animals were placed in separate Ziploc bags with the above data labeled on bag. Specimens were frozen and then shipped to UAM for species identification confirmation, other pertinent information, and deposition into their museum collection.



Photo 13. Clayton Stromquist and Devan Romine Setting Small Mammal Traps in Takatz Lake Basin.

Owls

The method for surveying owls was a modified protocol for “presence/not detected” sampling which was based on methods from Southeast Alaska Owl Network (Kissling and Lewis 2005) and Inventory Methods for Raptors (RIC 2001). Because of the potentially broad list of owls in the project area, priority was placed on owls most likely to be present. Based on literature and personal experience, "Expected Abundance" ratings were made. Owls with abundance ratings of occasional or rare had a priority of one and were included in all call survey stations. Those with abundance ratings of uncommon, very rare or accidental had a priority of two and were included in every other station (Table 1). The order of calling was always from 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.

Table 1. Owl Species, Expected Abundance, and Survey Priority.

Owl species (from smallest to largest)	Expected 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 were located in areas with: a) low ambient noise, b) low traffic levels, and c) at least 25% forest within 500 meters of the station. Distance between stations was approximately ½ mile.

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

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

For each species, the broadcast series consisted of three calls (20 seconds each) followed by a 30 second listening period. The first recording was broadcast at 60° from the transect line (i.e. direction of travel on road, trail, etc.), the second at 120° from the transect line, and the third at 240° from the transect line. After each series of calls, the observer listened and watched for five minutes.

Data collected for each owl response included detection number, species and time; estimated distance to nearest 50 meters, and direction. The procedure was repeated for each owl species at each station.

Mountain Goat

In addition to general observation surveys, the City assisted in funding, in cooperation with the Alaska Department of Fish and Game, a mountain goat tagging study to better determine potential cumulative effects of the Takatz Lake Project when assessed in association with proposed changes in the City's Blue Lake hydroelectric project. Separate progress reports will focus on this cooperative study (White et al. 2011).

Using the field data collected from the various methods described above, along with information from local agencies, reports, and conservation ranks (ANHP 2011), tables indicating relative abundance, residency, and ranks were included for each major animal group. Descriptions and abbreviations for these are described in Table 2. *It should be noted that, although the Relative Abundance rankings are included, they are based on only one or two field seasons so are only a rough estimate.* Field observation data for key species was also entered into a Geographical Information System (GIS) for further analysis.

Table 2. Descriptions and Abbreviations for Relative Abundance, Residency, and Ranks.

Abbreviation	Description
<i>Relative Abundance in Project Area</i>	
A	Abundant - present almost everywhere in large numbers
C	Common - present almost everywhere or commonly observed in area
U	Uncommon – present almost everywhere but in low numbers and not commonly observed
R	Rare - Present locally and in very small numbers
V	Very rare - only a few scattered records
Ac	Accidental - Occasional visitor, no permanent population
Un	Unknown - Confirmed sightings, insufficient data to estimate population
<i>Residency in Project Area</i>	
R	Resident
B	Breeder - known or thought to breed in project area
M	Migratory - latitudinal and/or altitudinal
<i>Alaska Natural Heritage Program Tracking List</i>	
1	Critically imperiled
2	Imperiled
3	Vulnerable
4	Apparently secure
5	Demonstrably widespread, abundant, and secure.
G	Global
S	Subnational
B	Status refers to breeding population
N	Status refers to nonbreeding population

THREATENED and ENDANGERED (T and E) SPECIES

The City was designated as the primary contact party to conduct T&E species consultation for the Takatz Lake Project. In terms of wildlife species, researchers were careful to note either sightings or other sign of the identified T&E species in the area during the 2011 field surveys.

RESULTS

FIELD SURVEYS

Field surveys were organized into two primary types: 1) general observational surveys; and 2) species or other wildlife group surveys. In 2011, there were 44 days spent in the field doing general observations, species or wildlife group specific surveys, assisting other studies and personnel, and logistic work on the project (Table 3).

Table 3. Wildlife Survey Date, Area Surveyed, and Survey Type.

Survey Date	Area Surveyed	Survey Type
March 22-26	Baranof	Foot, goat and owl surveys
April 17	Medvejie	Foot, goat and owl surveys
May 24-31	Baranof	Foot, boat, goshawk, goat and owl surveys
June 2-6	Baranof	Foot, boat, goshawk, goat and owl surveys
June 8	Medvejie	Foot, boat, goshawk, goat and owl surveys
June 23-27	Takatz Bay	Foot, boat, goshawk, and owl surveys
July 5	Medvejie	Foot, goat, goshawk surveys
July 6-8	Sadie	Foot, boat, goshawk, owl and small mammal surveys
July 11	Medvejie	Foot, goat, and goshawk surveys
July 12-14	Takatz Lake	Foot, boat, goshawk, owl and small mammal surveys
July 22	Medvejie	Foot survey
July 26-28	Takatz Bay	Foot, boat, goshawk, and owl surveys
August 6-7	Baranof	Foot, boat, goshawk, and owl surveys
August 8-10	Takatz Bay	Foot, boat, goshawk, and owl surveys
August 15	Medvejie	Foot, boat, goat, and goshawk surveys
September 9-11	Takatz Lake	Foot, goshawk, owl and small mammal surveys
September 18	Medvejie	Foot, boat, goat, and surveys
October 19	Medvejie	Foot and small mammal surveys

The 2010 and 2011 field seasons resulted in documenting 59 species of wildlife, including 13 mammals, 45 birds, and 1 amphibian (Appendix).

The following subsections will cover wildlife groups and key species -

- Large mammals (mountain goat, brown bear, Sitka black-tailed deer)
- Furbearers (beaver, other furbearers)
- Small mammals
- Raptors (goshawk, other diurnal raptors, owls)
- Waterfowl and shorebirds
- Amphibians

Large Mammals

Three species of large mammals occur in the project area and are listed in Table 4, along with their relative abundance, residency, and conservation ranks. Each species is discussed in following sections.

Table 4. Large Mammals and Their Relative Abundance, Residency, and Conservation Rank.

Common Name ¹	Scientific Name ¹	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
Brown bear	<i>Ursus arctos</i>	C	R, B	4	4
Mountain goat ²	<i>Oreamnos americanus</i>	U	R, M	5	4
Sitka black-tailed deer	<i>Odocoileus hemionus sitkensis</i>	C	R, B	5	4

¹ Common and Scientific names are from MacDonald and Cook 2007

² Transplanted to Baranof Island

Mountain Goat

Mountain goats (*Oreamnos americanus*) were observed during foot and boat surveys, as well as focused field observations and flights to and from field camps. Radio telemetry equipment was also used to monitor collared goats (Photo 14). Early spring locations were generally on south facing, steep terrain, adjacent to forested areas, with summer use being in higher elevations (Figure 6). The winter use of the Takatz basin is largely unknown due to the inaccessibility of the area until mid-summer.



Photo 14. Jim Gillis Locating Radio Collared Goats in Baranof Lake Area, 22 March 2011.

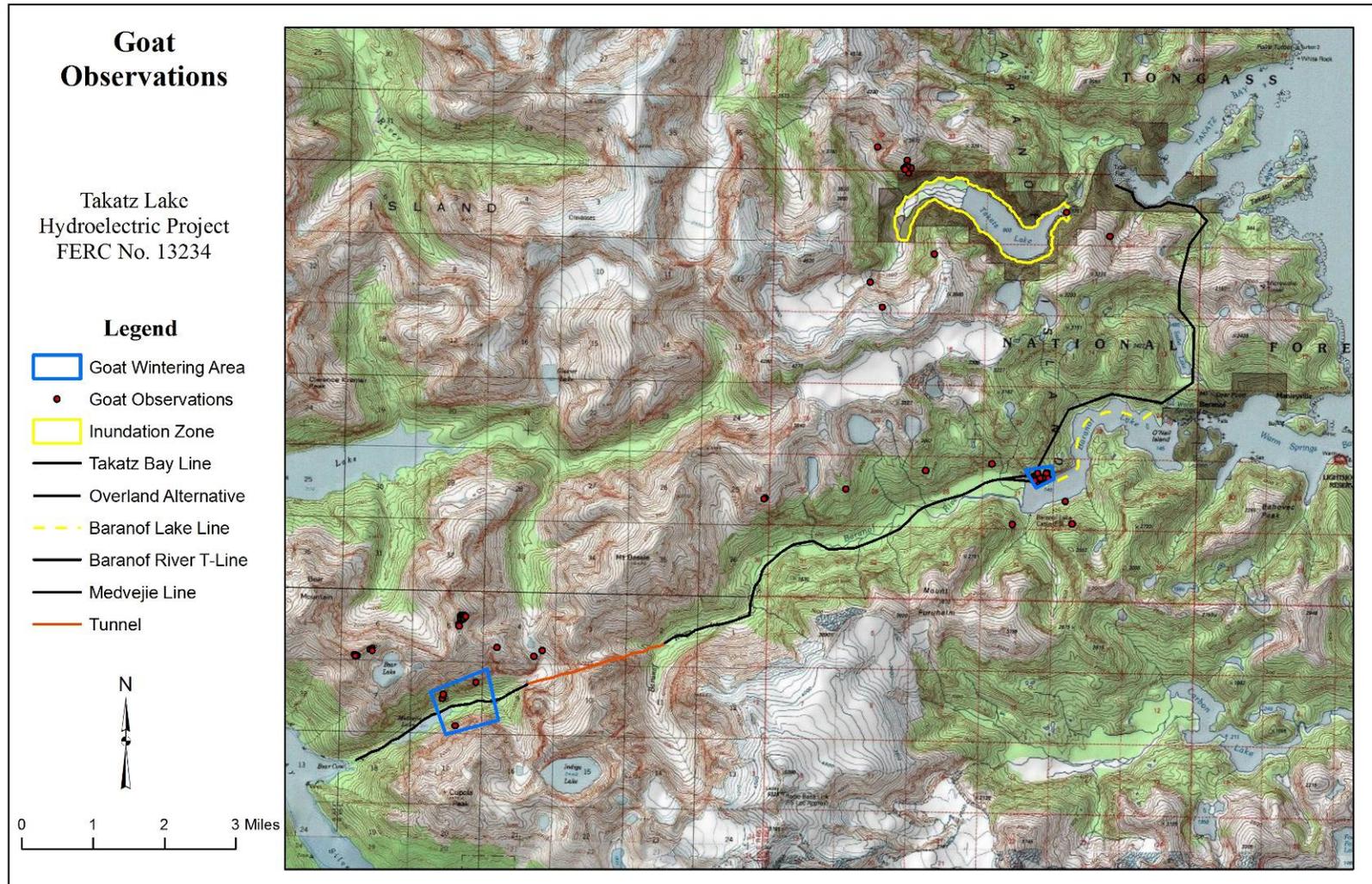


Figure 6. Mountain Goat Observations.

The most noticeable use by goats, with implications to the project, was at the inlet to Baranof Lake, directly north of the USFS cabin (Photo 15). As many as 10 goats (8 adults, 2 yearlings) simultaneously were seen from early April to June using this area which is adjacent to the proposed T-line (Figure 6). Although there are south facing cliffs with adjacent forests further up Baranof River valley, this area's terrain is characterized by more broken rock providing for better access and more vegetation (Photo 16). Its aspect also provides for earlier and longer snow-free periods. This area appears to be one of the most important wintering areas in this watershed.



Photo 15. View of USFS Cabin, Baranof Lake, with Goat Wintering/Spring Area, 22 March 11.

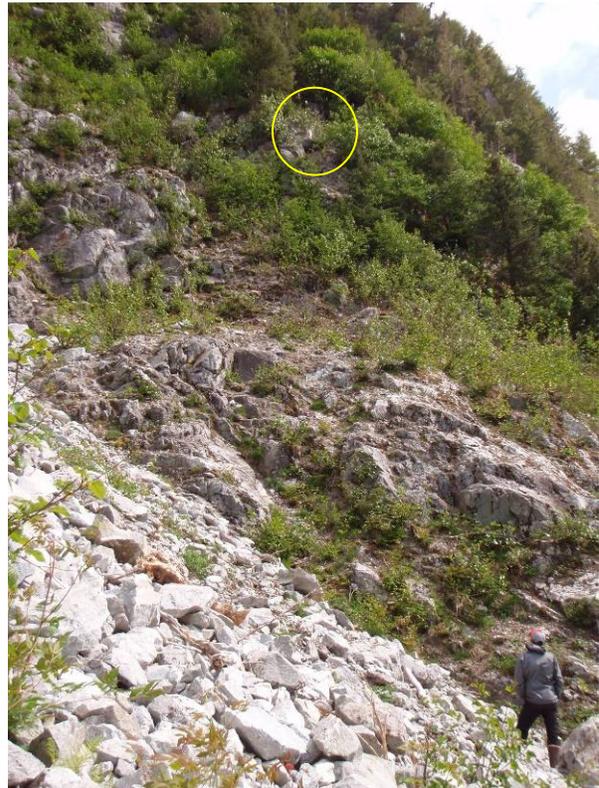


Photo 16. Mountain Goat (circle) in Winter/Spring Use Area, Baranof Lake, 6 June 2011.

Another area frequented by goats in the winter was the lower elevation areas of upper Medvejie Lake (Figure 6). Female and sub-adult goats were observed using south facing terrain (Photo 17) while adult males were observed on north facing slopes.



Photo 17. Wintering Goat Habitat at the Head of Medvejie Lake.

ADF&G - CBS Cooperative Mountain Goat Study

A cooperative goat study with Alaska Department of Fish and Game (ADG&G) continued in 2011 and resulted in the radio collaring of an additional 7 goats, adding to the 12 goats in 2010 (Figure 7). However, one of the goats from 2010 died, leaving 18 goats with active collars. The goat was scavenged on by a brown bear, but the cause of death is unknown. Further details of this study can be found in the annual progress report (White et al. 2011).

Brown Bear

Distribution of brown bears in the project area followed the typical pattern of bears in southeast Alaska, with the highest densities along salmon streams, especially during spawning season. Body size, coloration and markings, association with other bears, track size, and behavior were used to distinguish individual bears.

At least one bear was observed using the outlet of Takatz Lake and one using the inlet stream. It is not known whether this was the same bear. Of all areas within the project area, Takatz Lake had the least amount of bear activity.



Photo 18. Tyler Orbison Showing Where Karl Wolfe, Project Fisheries Biologist, was Attacked by Brown Bear Along Takatz Creek.

As many as 15 different bears (including 1 sow with 2 year old cubs, 2 sows, each with 2 cubs of the year, 2 sub-adults, and one boar) were observed in the Takatz Bay area, especially in late summer during salmon spawning. Spawning activity is restricted to the intertidal area due to barrier falls at high tide level. Bears were observed catching and feeding on salmon in intertidal areas, especially in a slough area along the southwest corner. Bears and their sign were also observed up river, including an adult male bear that charged a fish biologist, Karl Wolfe, as he was completing a snorkel survey (Photo 18). This resulted in the biologist receiving a deep laceration of his thumb as he

fended off the oncoming bear. No shots were fired and no further bear incidents occurred.

At least one bear resided in the Baranof Warm Springs and Sadie Lake area, with more activity being noted during the salmon spawning season. At least one bear was observed in Baranof River valley (Photo 19). One bear scat with goat hair was found near talus slope at the Baranof Lake goat wintering area. It is likely this was scavenged from a winter kill. Evidence of bears attempting to prey on beaver was apparent through diggings of beaver bank dens and tracks commonly seen along beaver ponds. One bear was videotaped eating beaver lure set at a trail camera for beaver.



Photo 19. Brown Bear on Trail Camera, Lower Baranof River.

Bears commonly occur in the Medvejie Lake valley especially near the Medvejie hatchery during the salmon spawning season. Observations of bears farther up the valley included a well worn bear trail (Photo 20) and a bear using a scratching tree photographed by a trail camera (Photo 21).



Photo 20. Brown Bear Trail in Upper Medvejie Lake Valley (note fire ring showing poorly selected campsite).



Photo 21. Brown Bear Using Scratching Tree, Trail Camera Picture, Medvejie Lake Upper Valley (note hiking/game trail to left).

Sitka Black-tailed Deer

The Takatz Lake area, especially the upper valley (inundation area), was quite sparsely populated with Sitka black-tailed deer. Based on tracks, only a few deer were using the area in summer. The majority of the year, deep snow would prevent deer from using the area.

The lower elevations of forested areas in the Takatz Bay area appear to be supporting higher levels of deer than areas to the south and inland of Baranof. Even so, this area does not have the density of deer that is found on the western side of Baranof Island where there are larger tracts of old-growth timber and less snow fall, due to maritime influence.

Population levels of deer appear to be at low levels in the Baranof and Sadie Lake watersheds, especially in the Baranof River area, as compared to western Baranof. While tracks were commonly seen, lack of browsed areas and the amounts of tracks would suggest low population levels. Deer, along with other animals, used the frozen lake for access along Baranof Lake (Photo 22).



Photo 22. Deer, Marten, Otters and Red Squirrel Made Use of the Frozen Surface of Baranof Lake.

Population levels of deer for 2011 did appear to be slightly higher than 2010, perhaps due to less snowfall. However, annual snowfall at Baranof Warm Springs exceeds well over 10 feet most years with much higher levels as you progress up the valley. This, coupled with the lack of large tracts of old-growth timber, reduces the productivity for deer in this area.

Furbearers

Six species of furbearers were observed in the project area: the American beaver, American marten, American mink, North American river otter, ermine and red squirrel (Table 5).

Table 5. Furbearers and Their Relative Abundance, Residency, and Conservation Rank.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
American Beaver ¹	<i>Castor canadensis</i>	C	R, B	5	5
American Marten ²	<i>Martes americana</i>	U	R, B	5	5
American Mink	<i>Neovison vison</i>	U	R, B	5	5
Baranof Island Ermine	<i>Mustela erminea initis</i>	R	R, B	3	3
Ermine	<i>Mustela erminea</i>	R	R, B	5	5
North American River Otter	<i>Lontra canadensis</i>	C	R, B	5	5
Red Squirrel ²	<i>Tamiasciurus hudsonicus</i>	A	R, B	5	5

Beavers were the most common furbearer and will be discussed in the following section. Tracks and/or scats of marten were observed throughout the entire project area with higher frequency in lower forested elevations. Population levels appeared to be slightly higher in 2011 than 2010, following a general trend for western Baranof areas (pers. comm. local trappers). There were a few scats from ermine found, usually associated with vole activity in muskegs. It is assumed they are of the subspecies, *M. e. initis*, but genetic analysis of hair samples or tissue samples from voucher specimens would be needed to verify this (Dawson et al. 2007). Mink and river otters were common in marine areas in the project area and adjacent inland areas, following typical patterns for southeast Alaska. One mink was videotaped via trail camera investigating a goose nest after the geese had left the area. No predation on geese was observed, but two mallard nests and one Common loon nest were predated about that time and it is thought that mink and/or gulls were responsible. Red squirrels were very common, as is the case on most of Baranof Island, and population levels were most likely above average for a second year (2010 and 2011) following the general pattern of small mammal abundance on Baranof Island. Red squirrel middens and spruce cone caches were some of the largest the author has seen (Photo 23). This is most likely a combination of high



Photo 23. Red Squirrel Spruce Cone Cache, Upper Valley Medvejie Lake.

¹ Origin of population unknown (transplanted or native or both)

² Transplanted to Baranof Island



Photo 24. Location of Red Squirrel Crossing Baranof Lake, a Distance of 500 m (0.3 mi).

squirrel densities and successful spruce cone year. One interesting red squirrel observation was of one crossing frozen Baranof Lake, a distance of 500 m (0.3 mi) during March, which is their breeding season (Photo 24).

American Beaver

Beaver were quite common along riparian areas along lower Baranof River, Sadie Lake, and Lower Takatz River, but absent in Medvejie watershed (Figure 8). Their activities greatly influenced the habitat, causing numerous ponds and side channels, which in later successional stages develop into bogs and meadows (Photo 25).

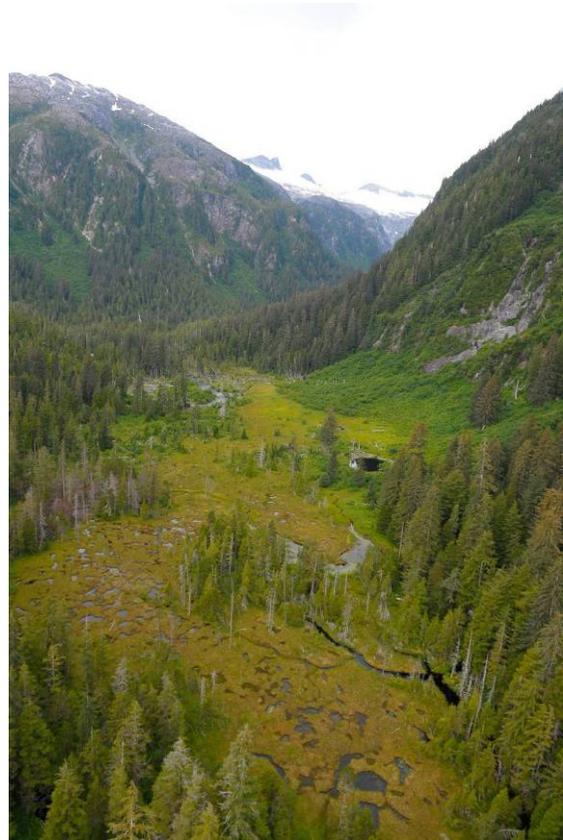


Photo 25. Beaver Pond Areas, Lower Takatz Creek.

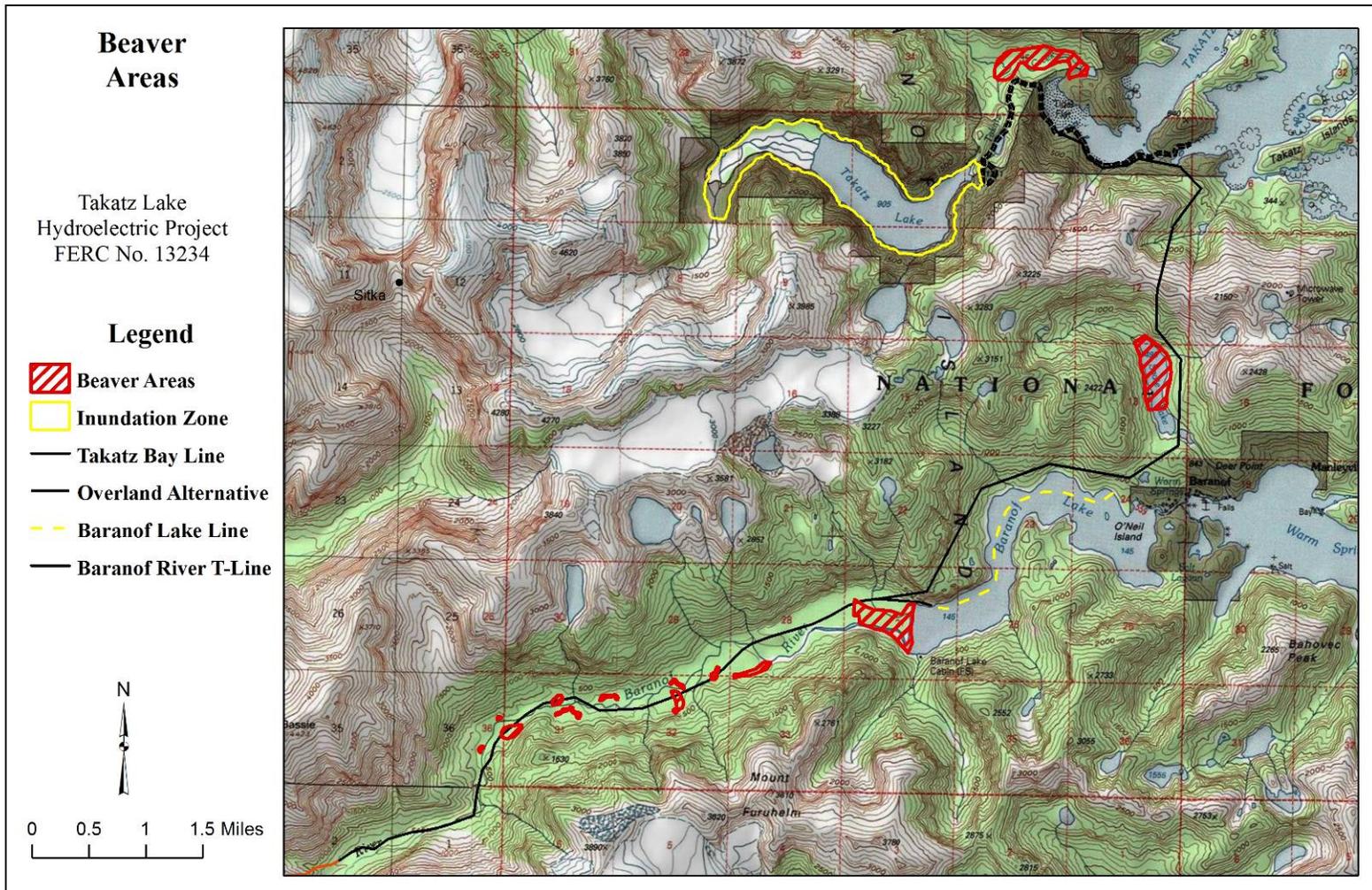


Figure 8. Beaver Areas, Takatz, Sadie, and Baranof Lake Areas.

The extensive areas of beaver activity in the lower one mile area of Baranof River as reported in Bovee 2010, continued to be active (Photo 26). An additional bank den was found in the northwest corner of Baranof Lake that was not present in 2010 studies (Photo 27). A small, docile adult beaver was seen several times swimming in the area, suggesting it might have dispersed from the beaver pond complex upriver. This same beaver was most likely the one that left sign of feeding on hemlocks near the USFS cabin (Photo 28). Foot surveys in 2011 extended into upper Baranof River Valley, resulting in doubling the known range for beaver in that watershed (Figure 8). Beaver ponds were often found at the base of slide zones, where associated side channels were dammed (Photo 29).



Photo 26. Beaver Ponds and Sloughs, Lower Baranof River.



Photo 27. Beaver Bank Den in Northwest Baranof Lake, Summer 2011 (not present in 2010).



Photo 28. Beaver Chewing Sign on Hemlock at Baranof Lake Cabin.



Photo 29. Beaver Pond Complex, at Base of Avalanche Area, Mid-Valley Baranof River.

Small Mammals

Four species of small mammals were observed in the project area - little brown myotis, northwestern deer mouse, root vole, and cinereus shrew (Table 6). Actual identification to species level for all small mammals has not been verified at this time.

Table 6. Small Mammals and Their Relative Abundance, Residency, and Conservation Rank.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
Little Brown Myotis	<i>Myotis lucifugus</i>	C	R?, B	5	4
Northwestern Deer Mouse	<i>Peromyscus keeni</i>	C	R, B	5	4
Root vole	<i>Microtus oeconomus</i>	V	R, B	5	5
Cinereus Shrew	<i>Sorex cinereus</i>	U	R, B	5	5

Small mammal trapping was done in conjunction with other surveys when time allowed, with the goal being to trap new areas not trapped in 2010 (Figure 9). Populations of voles were very high again in 2011 as was the case in 2010. This followed the general trend as compared to other locations on Baranof Island. Voles and their sign were common in muskeg and meadows (Photo 30) and food caches with roots were observed (Photo 31).



Photo 30. Typical Vole Habitat, Baranof Lake Area.

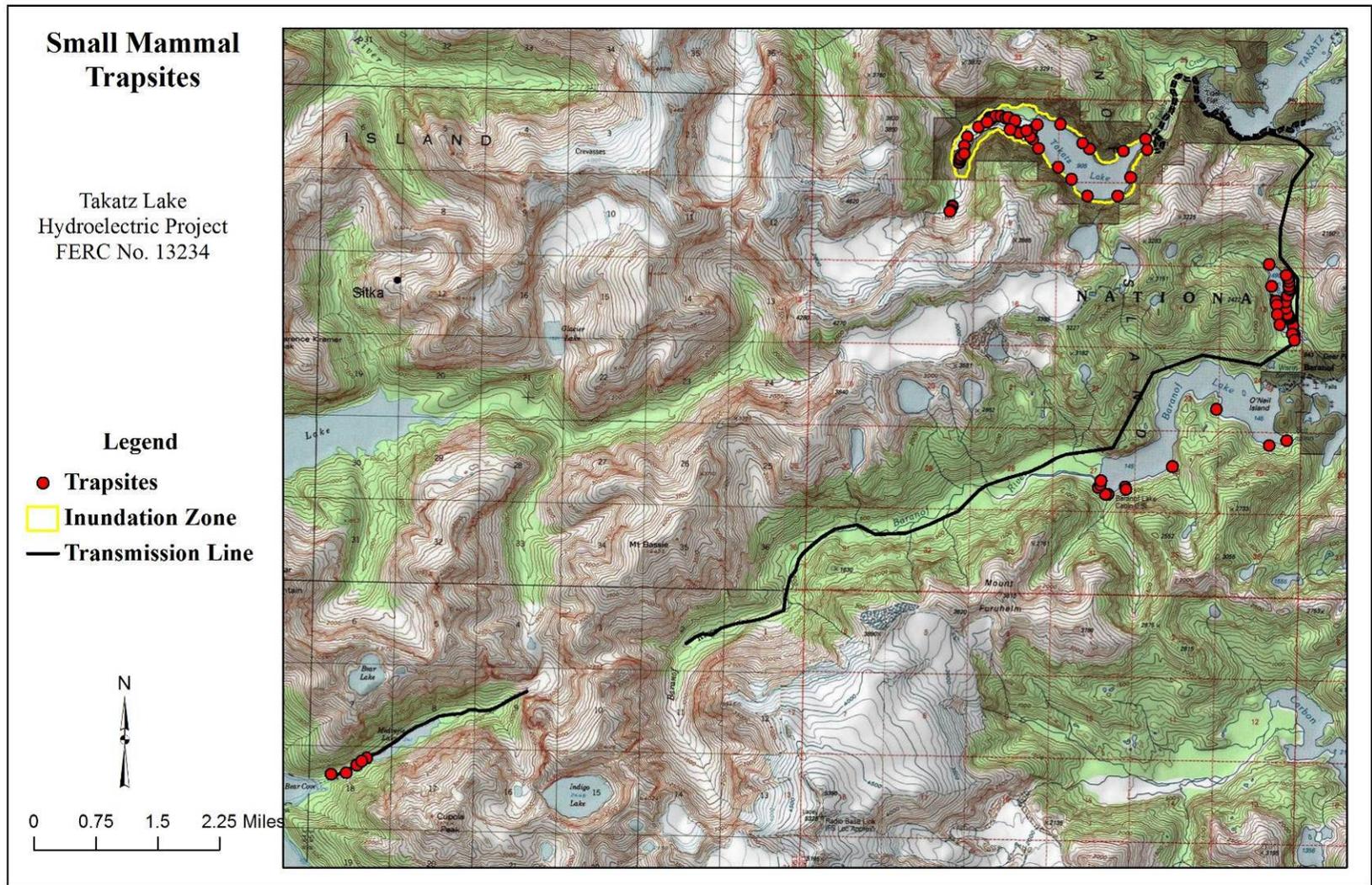


Figure 9. Small Mammal Trap Sites.



Photo 31. Root Cache of Voles, Baranof Lake Valley.

Bats were commonly seen in Takatz Bay and Baranof Lake riparian areas, and stream inlets associated with bodies of water where they feed on insects and drink water. Observed bats are assumed to be *Myotis lucifugus*, but positive identification requires obtaining voucher specimens and/or live capture for tissue sampling to identify potentially cryptic species (e.g. *yumanensis* vs. *lucifugus*). One voucher specimen was collected from Takatz Bay and was sent to UAF Museum of the North for species verification. Several other species of bats may occur in the area (*Myotis californicus*, *keenii*, & *yumanensis*) and are known to occur in adjacent areas (i.e. Hoonah and Juneau).

Raptors

Five species of raptors were observed in the project area, including bald eagle, red-tailed hawk, northern goshawk, northern saw-whet owl, and western screech owl (Table 7 and Figure 10).

Table 7. Raptors and Their Relative Abundance, Residency, and Conservation Rank.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
Bald Eagle	<i>Haliaeetus leucocephalus</i>	C	R, B	5	5
Red-tailed Hawk	<i>Buteo jamaicensis</i>	U	M, B	5	4, 5B
Queen Charlotte Goshawk	<i>Accipiter gentilis laingi</i>	VR (one sighting)	R	5	2B
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	R	R	5	3
Western Screech Owl	<i>Megascops kennicottii</i>	R	R	5	2

Bald Eagle

Bald eagles were common throughout the project area, especially near saltwater. One active nest was found adjacent to the project area in Takatz Bay (Figure 10). One helicopter survey was completed for most of the project area to locate raptor nests but no additional nests were found.

Red-tailed Hawk

Red-tailed hawks were commonly seen in Baranof and Takatz watersheds and it is believed there was a nesting pair in the west Baranof Lake area, based on frequency of observations and behavior of the birds. The closest known red-tailed hawk nest was in the Blue Lake area but no nest was confirmed in the Takatz Project Area (Figure 10). This season was another high year for voles (Photo 32) which most likely correlates to the high incident of hawk sightings.

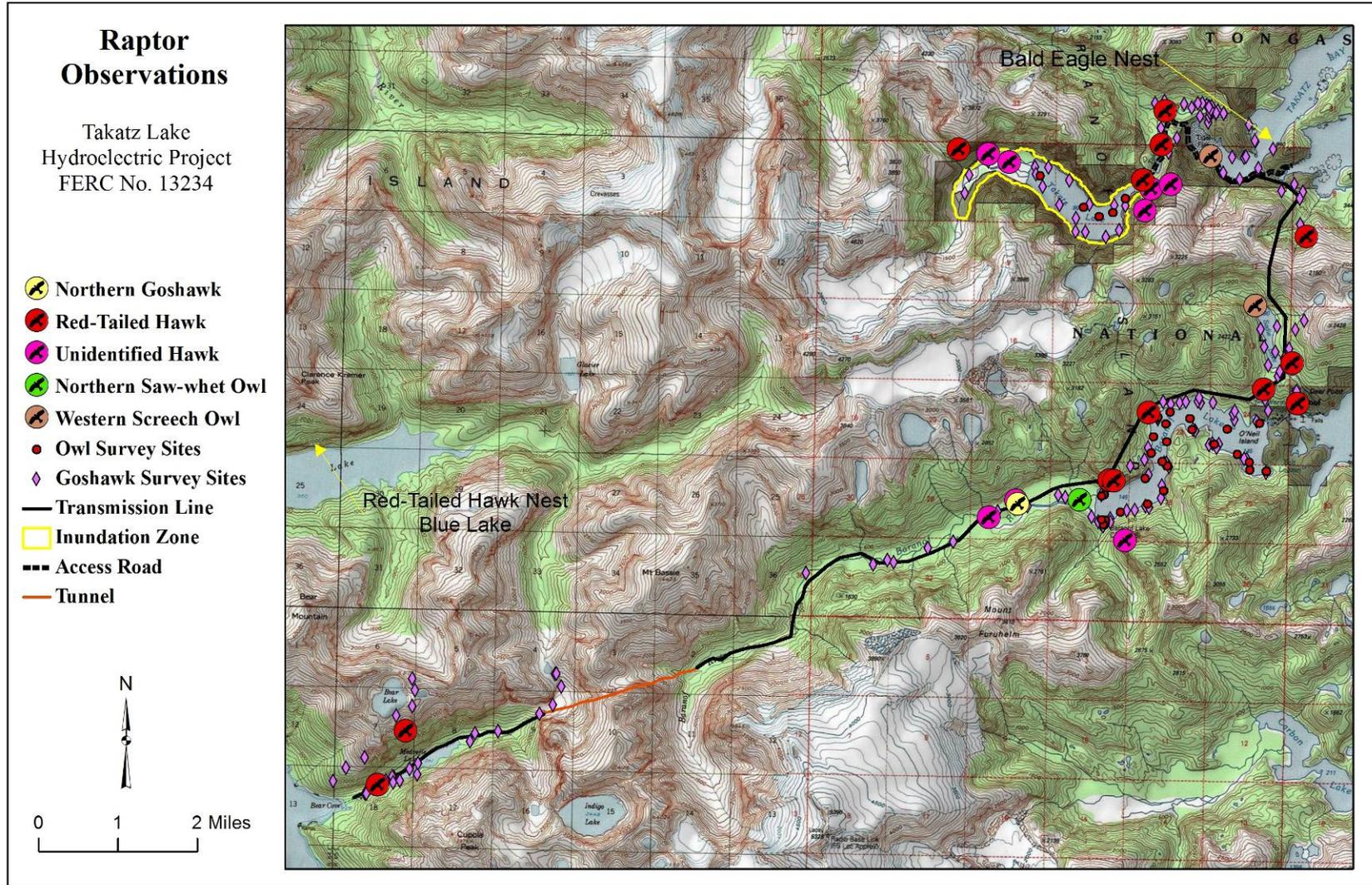


Figure 10. Raptor Observations and Survey Sites for Goshawks and Owls.



Photo 32. Vole Fur at a Raptor Kill Site, Baranof River Valley.

Northern Goshawk

One goshawk was seen briefly flying in a muskeg area in lower Baranof River valley area. Broadcast surveys for northern goshawks were completed on 169 different occasions at various sites (Figure 10) in conjunction with general foot and boat surveys. No goshawks responded to these broadcasts during the 2010 or 2011 field season.

Owls

Broadcast surveys for various species of owls (see Table 1) were completed on 35 different occasions at various sites in 2010 and 2011 (Figure 10). No owls responded during these surveys, however, two species were heard at other times, a western screech owl at Takatz Bay and a northern saw-whet owl at lower Baranof River (Figure 10).

Waterfowl and Shorebirds

A total of 22 species of waterfowl and shorebirds were observed in the project area, with seven species known to breed in the area (Table 8).

Table 8. Waterfowl and Their Relative Abundance, Residency, and Conservation Rank.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
American Dipper	<i>Cinclus mexicanus</i>	C	R, B	5	5
American Widgeon	<i>Anas americana</i>	U	M	5	5B, 4N
Barrow's Goldeneye	<i>Bucephala islandica</i>	U	R	5	5
Belted Kingfisher	<i>Megaceryle alcyon</i>	C	R	5	5
Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	C	M	5	5B
Bufflehead	<i>Bucephala albeola</i>	U	R	5	5
Canada Goose	<i>Branta canadensis</i>	C	R, B	5	5
Common Loon	<i>Gavia immer</i>	U	R, B	5	5B, 4N
Common Merganser	<i>Mergus merganser</i>	C	R	5	5
Glaucous-winged Gull	<i>Larus glaucescens</i>	U	R	5	5
Great Blue Heron	<i>Ardea herodias</i>	C	R	5	2, 3
Green-winged Teal	<i>Anas carolinensis</i>	U	M	5	5B, 4N
Harlequin Duck	<i>Histrionicus histrionicus</i>	C/R	R, B	4	4
Herring Gull	<i>Larus argentatus</i>	U	R	5	5
Mallard	<i>Anas platyrhynchos</i>	C	R, B	5	5
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	U	R	3, 4	2, 3
Mew Gull	<i>Larus canus</i>	C	R, B	5	5
Red-throated Loon	<i>Gavia stellata</i>	VR	B	5	4B, 4N
Ring-necked Duck	<i>Aythya collaris</i>	U	M	5	2N, 3B
Spotted Sandpiper	<i>Actitis macularius</i>	C	R, B	5	5
Trumpeter Swan	<i>Cygnus buccinator</i>	C	R	4	3N, 4B
Wilson's Snipe	<i>Gallinago delicata</i>	R	R	5	5B

The highest density for nesting waterfowl and shorebirds for 2011 occurred on O'Neil Island, a small island in the eastern end of Baranof Lake (Figure 11). There were two Canada goose nests (with six eggs each), two mallard nests (eight eggs each), one common loon nest (two eggs), and one mew gull nest in a tree. It is believed that both goose nests (Photo 33 through Photo 37) and the mew gull nest were successful (Photo 45). However, both of the mallard nests (Photo 38 through Photo 40) and the loon nest (Photo 41 through Photo 44) were predated, most likely by gulls and/or mink, both of which were observed in the area. Evidence at the loon nest suggested that a gull may have initially been responsible for predation and then it was killed by a raptor or mink and possibly scavenged by another gull. The evidence included a mew gull wing and plucked feathers, loon egg remains, and bird pellet (Photo 42 through Photo 44).

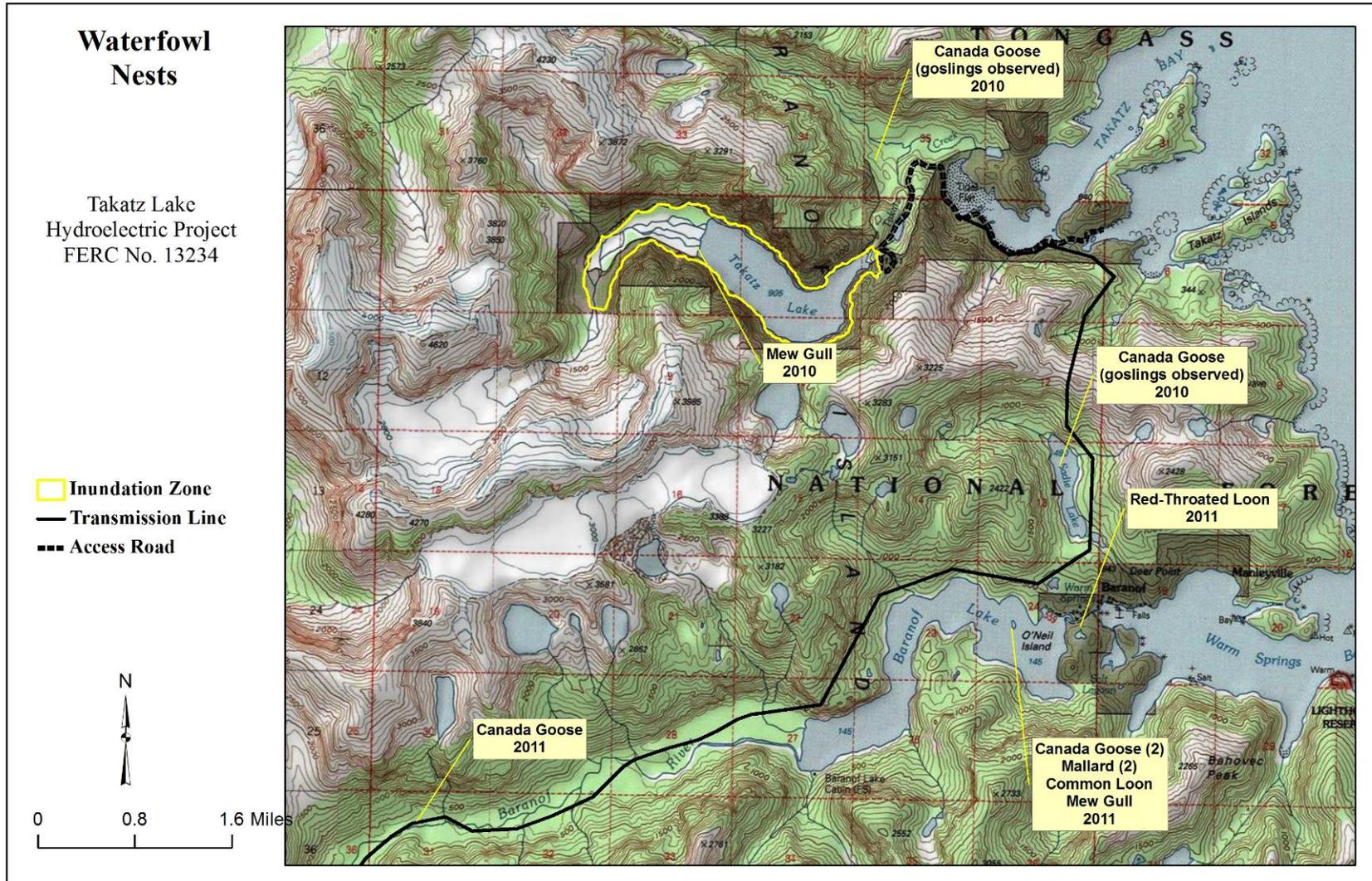


Figure 11. Waterfowl Nests in Project Area.

A trail camera was set up at one of the goose nests producing pictures (Photo 35 through 37) and video which provided approximate hatching and nest departure times (Table 9). It is not known whether there was a sixth gosling from the original six eggs. Unfortunately, no follow-up observations were made of adults or goslings due to field work in other areas.

Table 9. Dates and Observations at Canada Goose Nest, O'Neil Island, Baranof Lake.

Date	Observations
29 May 2011	Nest was found
31 May 2011	Trail camera installed
9 June 2011	First gosling appeared
10 June 2011	5 goslings present
11 June 2011	Nest was empty
17 June 2011	Mink was observed at nest
5 July 2011	Mink was observed at nest

Remains of several nests from prior seasons were found as well on the island. This, along with local knowledge of the nesting history of the island, indicates its importance for nesting waterfowl and shorebirds.



Photo 33. Canada Goose Nest, O'Neil Island, Baranof Lake.



Photo 34. Canada Goose Nest, O'Neil Island, Baranof Lake.



Photo 35. Canada Goose Turning Eggs, O'Neil Island, Baranof Lake.



Photo 36. Canada Goose and Goslings, O'Neil Island, Baranof Lake.



Photo 37. Canada Goose and Goslings, O'Neil Island, Baranof Lake.



Photo 38. Mallard Duck Nest, O'Neil Island, Baranof Lake.



Photo 39. Mallard Duck Nest (closeup), O'Neil Island, Baranof Lake.

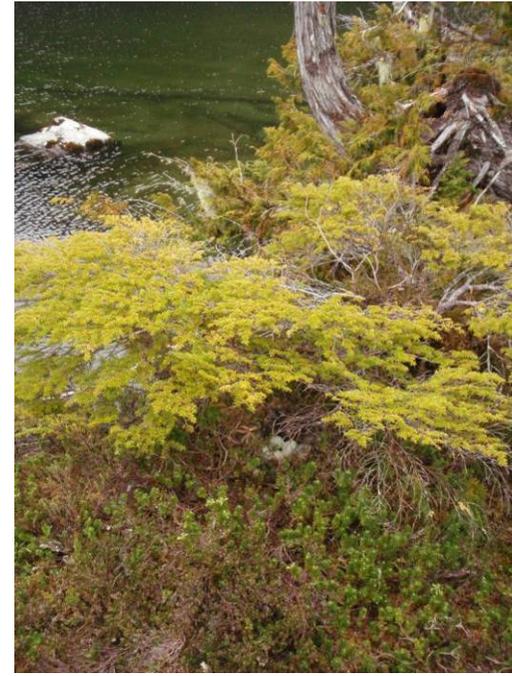


Photo 40. Mallard Duck Nest, O'Neil Island, Baranof Lake.



Photo 41. Common Loon Nest, O'Neil Island, Baranof Lake.



Photo 42. Common Loon Nest Predated, Mew Gull Wing and Feathers, June 5, 2011.



Photo 43. Remains at Predated Common Loon Nest, Mew Gull Wing and Loon Egg Shell.



Photo 44. Gull or Raptor Pellet at Predated Loon Nest, O'Neil Island, Baranof Lake.



Photo 45. Mew Gull and Nest, O'Neil Island, Baranof Lake.

Another Canada goose nest (with three eggs) was found on 4 June 2011 along Baranof River, midway up valley (Figure 11; Photo 46 and Photo 47). In 2010, a Canada goose family group was observed in Sadie Lake as well as the Takatz Creek area (Figure 11). Canada geese were commonly seen, along with their tracks and scats, in most of the project area where freshwater habitat was available (lakes, rivers, ponds, and adjacent wetlands).



Photo 46. Canada Goose Nest, 4 June 2011, Baranof River Valley.



Photo 47. Canada Goose Nest, , 4 June 2011, Baranof River Valley.

Not surprisingly, many species of waterfowl were often using beaver ponds and associated wetland areas, especially in the lower Baranof River area. These species included Canada goose, trumpeter swan, mallard, ring-necked duck, and green-winged teal, as well as the shorebird, Wilson's snipe (*Gallinago delicata*). Another shorebird, spotted sandpiper (*Actitis macularius*), was seen at both Baranof and Takatz Lakes, with young observed at Takatz Lake.

While young were not observed of harlequin duck (*Histrionicus histrionicus*), pairs of adults were seen several times in Baranof River, along Baranof Lake, and in the inlet stream to Takatz Lake, suggesting they are using this area to breed and rear young. These same clear, fast-moving rivers, in addition to the many smaller streams, were used by American dipper (*Cinclus mexicanus*) with at least one juvenile being observed.

The head of Baranof Lake was a common resting area for waterfowl. Species observed there included Canada goose, bufflehead (*Bucephala albeola*), glaucous-winged gull (*Larus glaucescens*), mew gull (*Larus canus*), green-winged teal (*Anas carolinensis*), and ring-necked duck (*Aythya collaris*). Many of these were also seen on the lake and/or along its shoreline, including several sightings of common loon

(*Gavia immer*). Red-throated loons (*Gavia stellata*) were seen in Sadie Lake and in 2 ponds adjacent to the east end of Baranof Lake. The southern pond likely had a red-throated loon nest based on behavior of adult loons in the area (Figure 11).

Mew gull nesting colonies occurred in two areas - at the head of Takatz Lake in 2010 and O'Neil Island in Baranof Lake in 2011 (Figure 11). Sightings of mew gulls in 2010 in the Baranof Lake area suggest they were likely nesting in the area during that season as well.

Takatz and Baranof Warm Springs Bays had the commonly seen marine component of waterfowl and shorebirds, including Barrow's goldeneye (*Bucephala islandica*), belted kingfisher (*Megaceryle alcyon*), bufflehead, great blue heron (*Ardea herodias*), common merganser, gulls (glaucous-winged, mew, and Bonaparte's, *Chroicocephalus philadelphia*), and marbled murrelet.

Forest and Songbirds

There were 19 species of forest or songbirds observed in the project area (Table 10). There were two species observed nesting, which included red-breasted sapsucker (*Sphyrapicus ruber*) and tree swallow (*Tachycineta bicolor*).

Table 10. Forest and Songbirds and Their Relative Abundance, Residency, and Conservation Rank.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
American Robin	<i>Turdus migratorius</i>	C	M	5	5
Brown Creeper	<i>Certhia americana</i>	R	R, B	5	4
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	C	R, B	5	5
Common Raven	<i>Corvus corax</i>	A	R, B	5	5
Dark-eyed Junco	<i>Junco hyemalis</i>	C	R, B	5	5
Hermit Thrush	<i>Catharus guttatus</i>	A	M, B	5	5
Northwestern Crow	<i>Corvus caurinus</i>	C	R	5	5
Ptarmigan (Rock &/or Willow)	<i>Lagopus sp.</i>	R	M	5	5
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	U	R, B	5	5
Rufous Hummingbird	<i>Selasphorus rufus</i>	C	M, B	5	4
Song Sparrow	<i>Melospiza melodia</i>	C	M, B	5	5
Sooty Grouse	<i>Dendragapus fuliginosus</i>	R	R, B?	5	5
Steller's Jay	<i>Cyanocitta stelleri</i>	U	R	5	5
Swainson's Thrush	<i>Catharus ustulatus</i>	A	M, B	5	5
Townsend's Warbler	<i>Dendroica townsendi</i>	U	M, B	5	4B
Tree Swallow	<i>Tachycineta bicolor</i>	A	M, B	5	5B
Varied Thrush	<i>Ixoreus naevius</i>	C	M, B	5	5
Wilson's Warbler	<i>Wilsonia pusilla</i>	U	M, B	5	5B
Winter Wren	<i>Troglodytes troglodytes</i>	C	R, B	5	5

Red-breasted sapsuckers were commonly seen in forested area, flying or feeding. They made use of snags for nesting cavities which in turn were also used by nesting tree swallows (Photo 48). Tree swallows were commonly seen in the project area associated with water, where they fed on insects. Other birds found in forested habitat included corvids (common raven, *Corvus corax*, Northwestern Crow, *Corvus caurinus*, and Steller's jay, *Cyanocitta stelleri*), thrushes (American robin, *Turdus migratorius*, hermit thrush, *Catharus guttatus*, Swainson's thrush, *Catharus ustulatus*, and varied thrush, *Ixoreus naevius*) and brown creeper, *Certhia americana*, chestnut-backed chickadee, *Poecile rufescens*, and Winter Wren, *Troglodytes troglodytes*. Male sooty grouse, *Dendragapus fuliginosus*, were heard several times "hooting" in the Baranof Lake area and it is assumed they were breeding in the area.



Photo 48. Snag in Baranof River Valley with Nesting Tree Swallows.

Habitat such as Sitka alder and salmonberry commonly had thrushes, rufuous hummingbirds (*Selasphorus rufus*) and warblers (Wilson's, *Wilsonia pusilla* and Townsend's, *Dendroica townsendi*).

Willow ptarmigan (*Lagopus lagopus*) were seen in the spring in the scrub timber and muskeg area around Baranof Warm Springs. Scat from ptarmigan was observed several times in similar habitat, as well as, the higher elevations in the Takatz Lake area.

Amphibians

One amphibian, western toad (*Buro boreas*), was observed in the eastern side of the project area. Its conservation ranks are four for global and three, four for state level. Adults, tadpoles, and toadlets were observed in a side streamlet flowing along the boardwalk at Baranof Warm Springs (Photo 49 and Photo 50). Tadpoles had hatched by mid-April in this area, apparently developing more rapidly due to warmer temperatures. Toads were also found at Sadie Lake and the lower reach of Takatz Creek. Occurrence of toads in the Baranof Lake area are lower as compared to

historical levels (pers. comm. with residents) which unfortunately follows the worldwide trend of amphibians.



Photo 49. Small Streamlet Area Along Baranof Warm Springs Boardwalk Where Western Toadlets Were Commonly Found.



Photo 50. Western Toad, Toadlet Found in Small Side Spring, Baranof Warm Springs.

THREATENED and ENDANGERED (T&E) SPECIES

No threatened or endangered species were observed during the 2010 or 2011 field seasons (Table 11). Humpback whales and Steller sea lions, Federally Endangered and Threatened species, respectively, likely occur in the outer areas of Takatz Bay at various times during the year but are not thought to occur in the inside bay area along the proposed T-line. Marbled murrelets were commonly seen in Takatz and Baranof Warm Springs Bays. This species is listed by the USFS as a Species of Concern.

Trumpeter Swans, a USFS Sensitive Listed Species, were observed in the beaver ponds in the Baranof River drainage in early spring and in Baranof Lake. Queen Charlotte Goshawk surveys were done in most of the project area with no responses observed. One goshawk was seen briefly during a foot survey in lower Baranof River area.

Table 11. Occurrence of Threatened, Endangered, Candidate and Other Species of Concern in the Project Area.

Species Category	Species List	Occurrence in the Project Area
Federal Endangered Species	Humpback Whale (<i>Megaptera novaeangliae</i>)	Probable occurrence along Marine Transmission Line
Federal Threatened Species	Steller sea lion (<i>Eumetopias jubata</i>)	Probable occurrence along Marine Transmission Line
Federal Candidate Species	Kittlitz's Murrelet (<i>Brachyramphus brevirostris</i>)	Not surveyed
USFS Sensitive Listed Species	Queen Charlotte Goshawk (<i>Accipiter gentilis laingi</i>)	One sighting, Baranof River valley
	Osprey (<i>Pandion haliaetus</i>)	Not observed
	Peale's Peregrine Falcon (<i>Falco peregrinus anatum</i>)	Not observed
	Trumpeter Swan (<i>Cygnus buccinator</i>)	Common in spring season in lower Baranof River beaver ponds
USFS Other Species of Concern	Marbled Murrelet (<i>Brachyramphus marmoratus</i>)	Observed in Takatz Bay; Probable occurrence along Marine Transmission Line

Acknowledgements

Field assistance was provided by Jon Martin, Tyler Orbison, Karl Wolfe, Paul Evans, Jim Gillis, Devan Romine, and Clayton Stromquist. Harris Aircraft provided fixed-wing charter services, including pilots Mark Hackett, John Reed, and Craig Walters.

LITERATURE CITED

- " Alaska Natural Heritage Program" (ANHP). University of Alaska Anchorage. 1 Mar. 2011 <<http://aknhp.uaa.alaska.edu/>>.
- Barton, Michael. 1992. Goshawk inventory protocol. USDA Forest Service, Alaska Region unpublished letter June 24, 1992, 8 pp.
- Bovee, K.T. 2011. Draft 2010 Wildlife Investigations Report Takatz Lake Hydroelectric Project, FERC No. 13234, City and Borough of Sitka Licensee. 53 pp.
- City and Borough of Sitka (City). 2010. Wildlife Resources Study Plan, Takatz Lake Hydroelectric Project, FERC No. 13234. 18 pp.
- City and Borough of Sitka (City). 2011. Draft Wildlife Resources Study Plan, Takatz Lake Hydroelectric Project, FERC No. 13234. 19 pp.
- Dawson, N. G., S. O. MacDonald and J. A. Cook. 2007. Endemic Mammals of the Alexander Archipelago. In J. Schoen (ed). Wildlife Management on the Tongass National Forest. Audubon Special Publication .
- Kissling, Michelle and Steve Lewis. 7 January 2005. Owl survey protocol. Southeast Alaska Owl Network, U.S. Fish and Wildlife Service and Alaska Department of Fish and Game, Juneau, Alaska. Unpublished document.
- MacDonald, S.O. and J.A. Cook. 2007. Mammals and amphibians of Southeast Alaska. The Museum of Southwestern Biology, Special Publication 8:1-191.
- Resources Inventory Committee (RIC). 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.pd.
- White, K. S., P. Mooney, and K. Bovee. 2011. 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. 13 pp.

APPENDIX

Species List - Major Group, Common Name, Scientific Name, Primary Survey Method Used, Relative Abundance, Residency, and Conservation Rankings.

Major Group	Common Name	Scientific Name	Primary Survey Method	Relative Abundance ²	Residency ³	2010 Global (G) and Subnational (S) Rank ⁴	
						G	S
Large Mammals	Brown Bear	<i>Ursus arctos</i>	Field observation	C	R, B	4	4
	Mountain Goat ¹	<i>Oreamnos americanus</i>	Field observation	C	Summer- alpine Winter-lower elev.	5	4
	Sitka Black-tailed Deer	<i>Odocoileus hemionus sitkensis</i>	Field observation	C	R, B	5	4
Furbearers	American Beaver ¹	<i>Castor canadensis</i>	Field Observation	C	R, B	5	5
	American Marten ¹	<i>Martes americana</i>	Field observation	C	R, B	5	5
	American Mink	<i>Neovison vison</i>	Field observation	C	R	5	5
	Baranof Island Ermine	<i>Mustela erminea initis</i>	Field observation	R	R, B	3	3
	Ermine	<i>Mustela erminea</i>	Field observation	R	R, B	5	5
	North American River Otter	<i>Lontra canadensis</i>	Field observation	C	R	5	5
	Red Squirrel ¹	<i>Tamiasciurus hudsonicus</i>	Field observation	A	R, B	5	5
Small Mammals	Cinereus Shrew	<i>Sorex cinereus</i>	Trapping	U	R, B	5	5
	Little Brown Myotis	<i>Myotis lucifugus</i>	Field observation	U	R, B	5	4
	Northwestern Deer Mouse	<i>Peromyscus keeni</i>	Trapping	C	R, B	5	4
	Root Vole	<i>Microtus oeconomus</i>	Trapping	A	R, B	5	5
	Sitka Root Vole	<i>Microtus oeconomus sitkensis</i>	Trapping	No ID to subspecies	R, B	2	2
Raptors	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Field observation	C	R, B	5	5
	Queen Charlotte Goshawk	<i>Accipiter gentilis laingi</i>	Field observation	VR	R, B	5	2B
	Northern Saw-whet Owl	<i>Aegolius acadicus</i>	Broadcast Survey	VR	R, B	5	4
	Northern Pygmy Owl	<i>Glaucidium gnoma</i>	Broadcast Survey	NO	R, B	5	3
	Red-tailed Hawk	<i>Buteo jamaicensis</i>	Field Observation	U	M, B	5	5B
	Western Screech Owl	<i>Megascops kennicottii</i>	Broadcast Survey	U	R, B	5	2
Waterfowl and Shorebirds	American Dipper	<i>Cinclus mexicanus</i>	Field Observation	C	R, B	5	5
	American Widgeon	<i>Anas americana</i>	Field Observation	U	M	5	5B, 4N
	Barrow's Goldeneye	<i>Bucephala islandica</i>	Field Observation	U	R	5	5
	Belted Kingfisher	<i>Megaceryle alcyon</i>	Field Observation	C	R, B	5	5

	Bonaparte's Gull	<i>Chroicocephalus philadelphia</i>	Field Observation	C	M	5	5B
	Bufflehead	<i>Bucephala albeola</i>	Field Observation	U	R	5	5
	Canada Goose	<i>Branta canadensis</i>	Field Observation	C	R, B	5	5
	Common Loon	<i>Gavia immer</i>	Field Observation	U	R, B	5	5B, 4N
	Common Merganser	<i>Mergus merganser</i>	Field Observation	C	R, B	5	5
	Glaucous-winged Gull	<i>Larus glaucescens</i>	Field Observation	U	R	5	5
	Great Blue Heron	<i>Ardea herodias</i>	Field Observation	C	R, B	5	2, 3
	Green-winged Teal	<i>Anas carolinensis</i>	Field Observation	U	M	5	5B, 4N
	Harlequin Duck	<i>Histrionicus histrionicus</i>	Field Observation	C/R	R, B	4	4
	Herring Gull	<i>Larus argentatus</i>	Field Observation	U	R	5	5
	Mallard	<i>Anas platyrhynchos</i>	Field Observation	C	R, B	5	5
	Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Field Observation	U	R	3, 4	2, 3
	Mew Gull	<i>Larus canus</i>	Field Observation	C	R, B	5	5
	Red-throated Loon	<i>Gavia stellata</i>	Field Observation	VR	M, B	5	4N, 4B
	Ring-necked Duck	<i>Aythya collaris</i>	Field Observation	U	M	5	2N, 3B
	Spotted Sandpiper	<i>Actitis macularius</i>	Field Observation	C	R, B	5	5
	Trumpeter Swan	<i>Cygnus buccinator</i>	Field Observation	C	R	4	3N, 4B
	Wilson's Snipe	<i>Gallinago delicata</i>	Field Observation	R	R	5	5B
Forest and Songbirds	American Robin	<i>Turdus migratorius</i>	Field Observation	C	M, B	5	5
	Brown Creeper	<i>Certhia americana</i>	Field Observation	R	R, B	5	4
	Chestnut-backed Chickadee	<i>Poecile rufescens</i>	Field Observation	C	R, B	5	5
	Common Raven	<i>Corvus corax</i>	Field Observation	A	R, B	5	5
	Dark-eyed Junco	<i>Junco hyemalis</i>	Field Observation	C	R, B	5	5
	Hermit Thrush	<i>Catharus guttatus</i>	Field Observation	A	M, B	5	5
	Northwestern Crow	<i>Corvus caurinus</i>	Field Observation	C	R, B	5	5
	Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	Field Observation	U	R, B	5	5
	Rock Ptarmigan	<i>Lagopus muta</i>	Field Observation	R			
	Rufous Hummingbird	<i>Selasphorus rufus</i>	Field Observation	C	M, B	5	4
	Song Sparrow	<i>Melospiza melodia</i>	Field Observation	C	M, B	5	5
	Sooty Grouse	<i>Dendragapus fuliginosus</i>	Field Observation	R	R, B?	5	5
	Steller's Jay	<i>Cyanocitta stelleri</i>	Field Observation	U	R, B	5	5
	Swainson's Thrush	<i>Catharus ustulatus</i>	Field Observation	A	M, B	5	5
	Townsend's Warbler	<i>Dendroica townsendi</i>	Field Observation	U	M, B	5	4B
	Tree Swallow	<i>Tachycineta bicolor</i>	Field Observation	A	M, B	5	5B
	Varied Thrush	<i>Ixoreus naevius</i>	Field Observation	C	M, B	5	5
	Wilson's Warbler	<i>Wilsonia pusilla</i>	Field Observation	U	M, B	5	5B
Willow Ptarmigan	<i>Lagopus lagopus</i>	Field Observation	R				

	Winter Wren	<i>Troglodytes troglodytes</i>	Field Observation	C	R, B	5	5
Amphibians	Western Toad	<i>Buro boreas</i>	Field Observation	U	R, B	4	3, 4

¹Transplanted to Baranof Island

²Relative Abundance in Study Area and/or Subareas

- A = Abundant - present almost everywhere in large numbers
- C = Common - present almost everywhere or commonly observed in area
- U = Uncommon – present almost everywhere but in low numbers and not commonly observed
- R = Rare - Present locally and in very small numbers
- VR = Very rare - only a few scattered records
- Ac = Accidental - Occasional visitor, no permanent population
- Un = Unknown - Confirmed sightings, insufficient data to estimate population
- NO = Not observed but known to occur on Baranof Island

³Residency in Study Area and/or Subareas

- R = Resident
- B = Breeder - known or thought to breed in study area
- M = Migratory - latitudinal and/or altitudinal)

⁴Alaska Natural Heritage Program Tracking List (<http://aknhp.uaa.alaska.edu/>)

- 1 = critically imperiled
- 2 = imperiled
- 3 = vulnerable
- 4 = apparently secure
- 5 = secure.
- B = Status refers to breeding population
- N = Status refers to nonbreeding population