DRAFT 2010 WILDLIFE INVESTIGATIONS REPORT

Takatz Lake Hydroelectric Project (FERC No. 13234)

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EXECUTIVE SUMMARY

BACKGROUND

Recent energy forecasts conducted by the City and Borough of Sitka Electric Department ("City") have indicated that, in order to assure continued delivery of low cost electrical power, it must expand its hydroelectric generating base. To meet these needs, the City is examining, among other alternatives, development of the Takatz Lake Hydroelectric Project ("Project") to be located approximately 18 miles NW of Sitka, Alaska, on Baranof Island.

Prior to construction and operation of the Project the City must receive a license from the Federal Energy Regulatory Commission (FERC) in Washington D.C. Prior to application for the FERC license the City must conduct specified studies. This report fulfills one element of the FERC license application requirements.

Elements of the Project, as described in more detail in the body of this report, would potentially affect wildlife resources in as many as three river basins: Takatz, Baranof and Medvejie.

Studies conducted in 2010 by the author 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 were conducted between March and September, 2010, and included foot and boat surveys, raptor broadcast techniques, and small mammal trapping. Overall study completion was reduced somewhat by deep snow in spring and early summer and the need to establish logistics and access in the very remote and often difficult terrain.

Field studies in 2010 documented 48 wildlife species, including 11 mammals, 36 birds, and 1 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 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 three river basins. However, two marine T&E species, the humpback whale (*Megaptera novaeangliae*) and Steller sea lion (*Eumetopias jubata*) are known to occur offshore of eastern Baranof Island and could be potentailly affected by a marine transmission line alternative, described in the report. One other marine species, the marbled murrelet (*Brachyramphus marmoratus*), was observed in Takatz Bay. This species is listed by the U.S. Forest Service (USFS) as a Species of Concern. Trumpeter swans, (*Cygnus buccinator*), a USFS Sensitive Listed Species, were commonly seen in beaver ponds adjacent to Baranof River.

FURBEARERS

Extensive evidence of American beaver (*Castor canadensis*) activity was obvious from numerous ponds, sloughs, dams, and chewed trees, particularly in the lower Baranof River and Takatz Creek areas. Resulting wetland areas were noted to provide extensive habitat for waterfowl, fish, aquatic mammals and other wildlife species.

Other furbearers included American marten (*Martes americana*) and American mink (*Neovison vison*) with relatively low numbers observed in inland areas. There was more evidence of both mink and North American river otter (*Lontra canadensis*) along marine shoreline areas.

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) resulted in radio collaring 12 goats, which will assist in determining the impact of this project on their population.

Relatively few Brown bear (*Ursus arctos*) or their sign were observed, as expected in areas without major salmon streams. Few Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) were observed compared to other areas of Baranof Island. This is likely due to heavy snowfall accumulation (10 to 20 feet) and lack of large tracts of old growth timber.

SMALL MAMMALS

Among small mammals, extremely high densities of root voles (*Microtus oeconomus*) were observed, as in other areas of Baranof Island. There was apparently low occurrence of Northwestern deer mouse (*Peromyscus keeni*), and cinereus shrew (*Sorex cinereus*). One bat species, most likely the little brown myotis (*Myotis lucifugus*), was observed.

RAPTORS

Four species of raptors were observed in the study area, including bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), 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. With the peak in the vole population it was surprising to not see more activity of diurnal raptors, but only red-tailed hawks were seen, and even then, on only a few occasions at higher elevations, perhaps feeding on voles in the alpine. Owls were only heard a few times, with none responding to broadcast calls. No northern goshawks (*Accipiter gentilis*) were observed or responded to broadcast calls.

WATERFOWL AND SHOREBIRDS

Freshwater-Associated

For an area that has a variety of water bodies available, it is not surprising that there were 19 species of waterfowl and shorebirds noted. Beaver ponds were used by Canada geese (*Branta canadensis*), trumpeter swans (*Cygnus buccinator*), and mallards (*Anas platyrhynchos*), as well as the shorebird, 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*), mew gull (*Larus canus*), green-winged teal (*Anas carolinensis*), ring-necked duck (*Aythya collaris*), and common loon (*Gavia immer*). One red-throated loon (*Gavia stellata*) was seen in Sadie Lake.

Marine-Associated

The marine water environment rounded out this assortment of birds with species such as Barrow's goldeneye (*Bucephala islandica*), belted kingfisher (*Megaceryle alcyon*), bufflehead, great blue heron (*Ardea herodias*), common merganser, gulls (glaucous-winged and mew), and marbled murrelet (*Brachyramphus marmoratus*).

Birds that were known to reproduce in the study area included geese, spotted sandpiper (*Actitis macularius*), and mew gulls, with the latter having established colonies, one on a small island in Baranof Lake and the other at the head of Takatz Lake.
There were 15 species of forest or songbirds observed (Table 11). There was no analysis done as to habitat preference or relative abundance, which will be done in future reports.

FOREST AND SONGBIRDS

There were 15 species of forest or songbirds observed. There was no analysis done as to habitat preference or relative abundance, which will be done in future reports.

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.

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INTRODUCTION AND 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.

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 Draft and Final Wildlife Study Plans (City, 2009a and 2009b, respectively) describing studies to be conducted in 2010. This document reports findings of the 2010 studies.

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. 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 or 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 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 Straight. Further, the Marine Alternative would necessitate extensive and difficult marine engineering feasibility analyses.

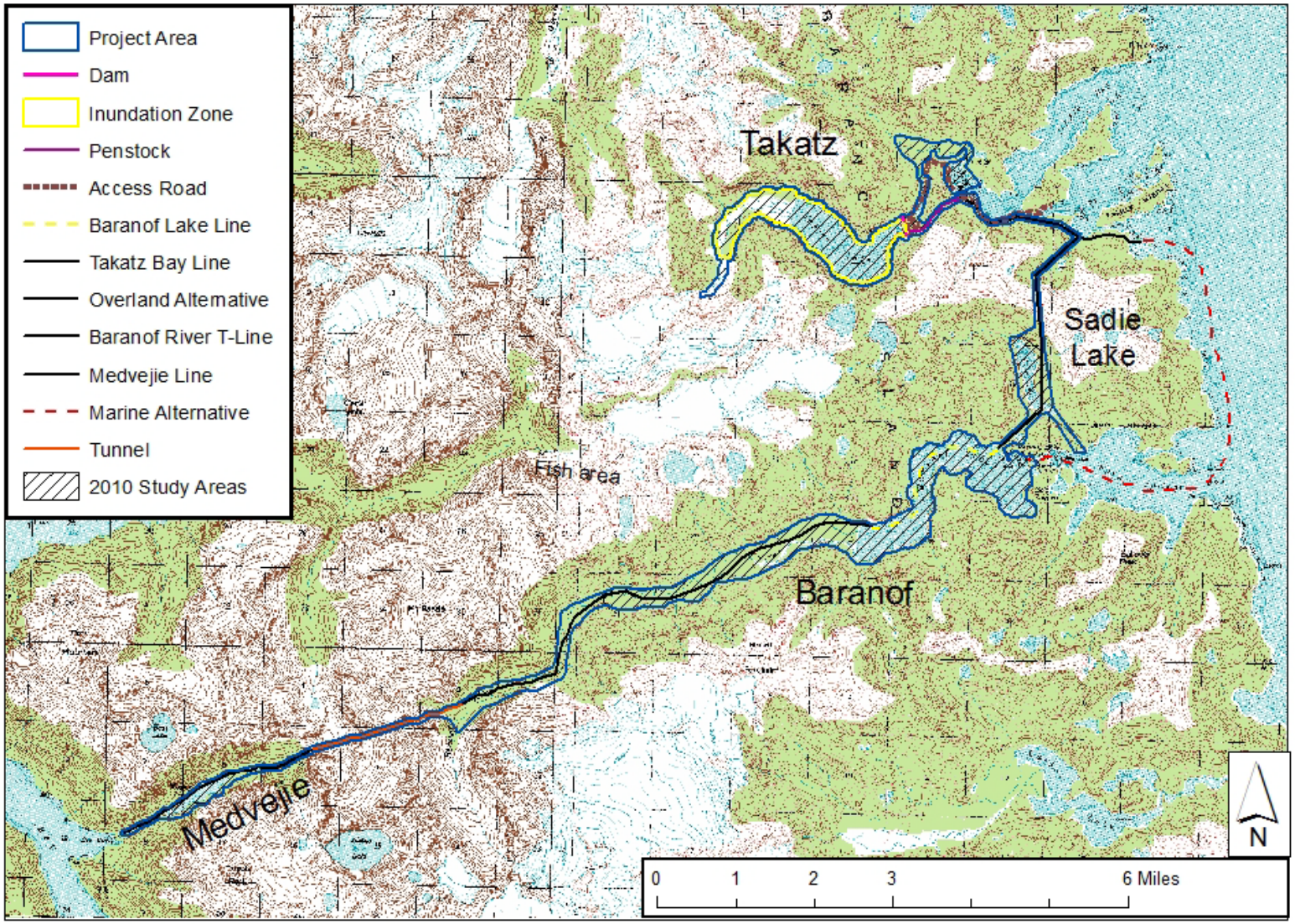

Figure 1. Project Features and Study Areas, Takatz Lake Project, 2010.

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 2010 were conducted in two potentially affected river basins: Takatz and Baranof. Additionally, surveys were conducted in the vicinity of Sadie Lake which is not related to the other river basins (see Figure 1). Medvejie basin was only surveyed one time so will not be covered in this report.

METHODS

The following study components were conducted in 2010:

- Literature Review
- Field Surveys
- Habitat Assessment
- Threatened and Endangered Species

LITERATURE REVIEW

A literature survey to gather existing data and information on all wildlife resources in the area was conducted prior to field surveys. This survey included all studies done for the Blue Lake hydroelectric project (FERC No. 2230) Relicensing and Expansion by the City and other studies, including Baranof Island mountain goat and furbearer harvest reports, from the Alaska Department of Fish and Game (ADF&G).

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, 2009b). 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

Species or Other Wildlife Group Surveys:

- northern goshawk
- small mammals
- owls
- American beaver
- 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. Researcher(s) surveyed 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.

This data was used to record all observations, as well as field journal notes. Field observation data for key species was also entered into a Geographical Information System (GIS) for further analysis.

Boat Surveys

Boat surveys were completed on Takatz, Baranof, Medvejie and Sadie Lakes. Procedures used in performing foot surveys were followed.

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:

Northern 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, and pit-fall traps. Traps were set in a variety of habitats and locations to maximize the variety of species caught and baited with peanut butter and oats mixture. 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 University of Alaska Museum of the North, Mammals Collection, Fairbanks for species identification confirmation, other pertinent information, and deposition into their museum collection.

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 (Resources Inventory Committee 2001). Because of the potentially broad list of owls in the study 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, Takatz Lake Project, 2010.

Owl species (from smallest to largest)	Expected Abundance	Priority
Northern pygmy owl	Occasional	1
Northern saw-whet owl	Rare	1
Western screech owl	Rare	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	Occasional	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.

American Beaver

During foot, boat and other surveys, beaver sign and activity was mapped for general "presence/not detected" baseline data. Relative abundance data was obtained through additional, more focused surveys of these areas (RIC 1998) recording dams and lodges using GPS and GIS and overlaid with project features.

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. 2010).

HABITAT ASSESSMENT

A general assessment of habitats in the various study areas was based on habitat maps for Baranof Island prepared by the US Department of Agriculture Forest Service (USFS) and visual inspection

THREATENED and ENDANGERED (T and E) SPECIES

The City was designated as the primary contact party to conduct T and 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 and E species in the area during the 2010 field surveys.

RESULTS

LITERATURE REVIEW

Various sources of literature were collected and perused, although information was quite sparse for this area. Information sources included -

- Wildlife studies conducted as part of the Blue Lake hydroelectric project (FERC No. 2230) Relicensing and Expansion (Bovee 2010). This project is adjacent to the current project area and provides good reference information
- Alaska Natural Heritage Program (ANHP) (ANHP 2011) species lists, ranking species according to their population status and sensitivity;
- Alaska Department of Fish and Game (ADF&G) harvest reports for brown bears, mountain goats, marten, and river otter, which is available by watershed. Deer harvest data is only available for larger, multi-watershed areas. No summary or analysis of the harvest data has been done to date.
- USFS vegetation GIS layers were obtained for future habitat quantification and analysis

Other inquiries to literature sources, including USFS, USFW, and general internet searches produced no additional information.

Using data from local agencies, reports, field studies, and ANHP ranks, 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 field season so are only a rough estimate.*

Table 2. Descriptions and Abbreviations for Relative Abundance, Residency, and Ranks, Takatz Lake Project, 2010.

Abbreviation	Description
Relative Abundance in Study Area	
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
Residency in Study Area	
R	Resident
B	Breeder - known or thought to breed in study area
M	Migratory - latitudinal and/or altitudinal
Alaska Natural Heritage Program Tracking List	
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

FIELD SURVEYS

Field surveys were organized into two primary types: 1) general observational surveys; and 2) species or other wildlife group surveys. In 2010, there were 36 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, Takatz Lake Project, 2010.

Survey Date	Area Surveyed	Survey Type
March 25	Medvejie	Foot, boat, and owl surveys
April 9-10	Baranof	Foot, boat, goshawk and owl surveys
April 23-24	Baranof	Foot, boat, goshawk and owl surveys
May 6-8	Baranof	Foot, boat, goshawk and owl surveys
June 9-14	Takatz Bay and Outlet	Foot, boat, goshawk and owl surveys
June 18-20	Baranof	Foot, boat, goshawk, owl and small mammal surveys
June 28-July 1	Takatz Bay and Outlet	Foot, boat, goshawk, owl and small mammal surveys
July 16-19	Takatz Lake	Foot, boat, goshawk, owl and small mammal surveys
July 26-28	Baranof	Foot, boat, goshawk, owl and small mammal surveys
August 13-15	Takatz Lake	Foot, boat, goshawk, owl and small mammal surveys
August 20-22	Sadie	Foot, boat, goshawk, owl and small mammal surveys
September 11-12	Takatz Lake	Foot, boat, goshawk, owl and small mammal surveys

The 2010 field season resulted in documenting 48 species of wildlife, including 11 mammals, 36 birds, and 1 amphibian (Appendix 1). These were based on over 350 observations, with key interest species being recorded into a GIS in order to determine distribution and relative abundance of wildlife species and their spatial and seasonal use patterns.

The following subsections will cover wildlife groups and key species -

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

Large Mammals

Three species of large mammals occur in the study 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, Takatz Lake Project, 2010.

Common Name[1]	Scientific Name[1]	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
Brown bear	*Ursus arctos*	C	R, B	4	5
Mountain goat[2]	*Oreamnos americanus*	U	R, M	5	4
Sitka black-tailed deer	*Odocoileus hemionus sitkensis*	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 were observed on 47 occasions and their spatial and seasonal use patterns were typical for goats in southeast Alaska. Early spring locations were generally on south facing, steep terrain, adjacent to forested areas, with summer use being in higher elevations (Figure 2).

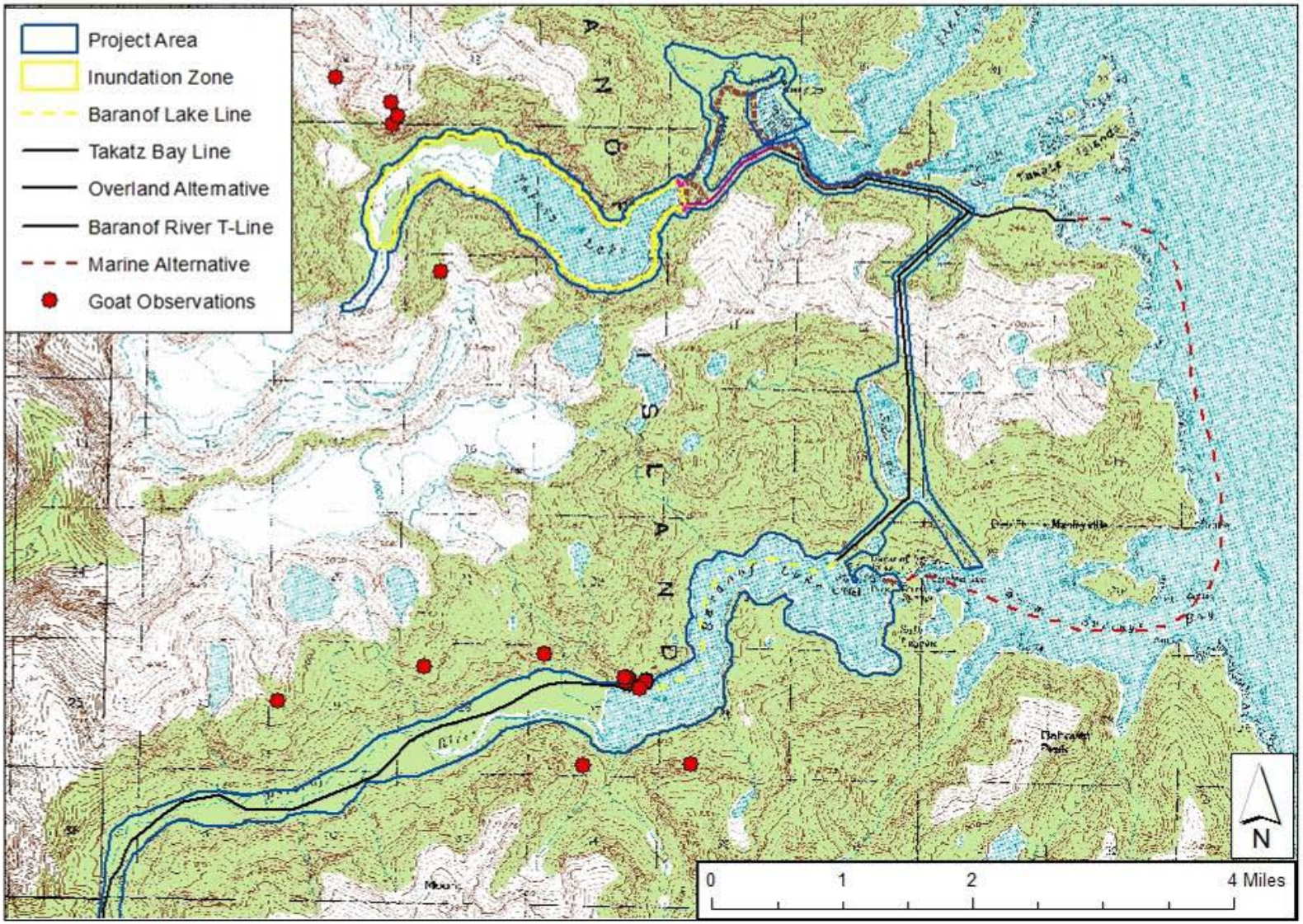

Figure 2. Mountain Goat Observations, Takatz Lake Project, 2010.

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 1). As many as 10 goats (8 adults, 2 yearlings) were seen in early April in this area simultaneously, which is adjacent to the proposed T-line as it transitions from marine cable to aerial line (Figure 2).

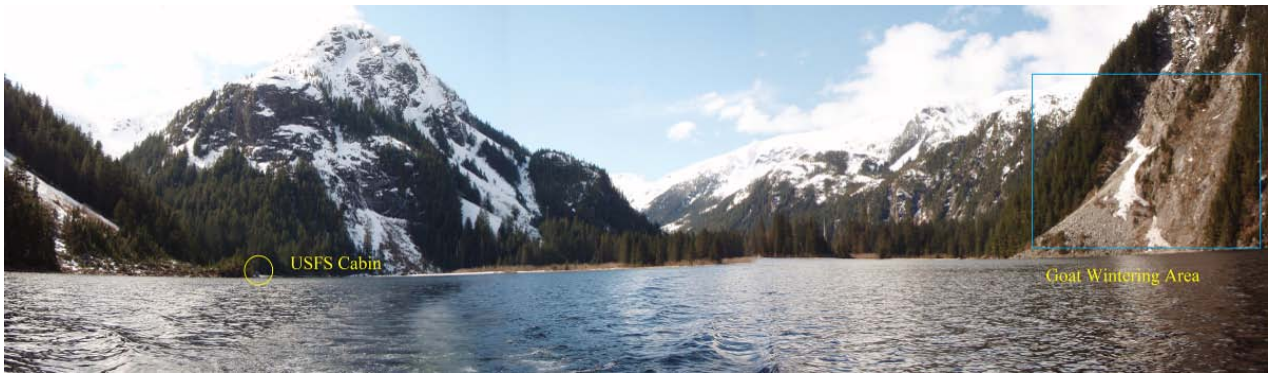

Photo 1. Photo Showing USFS Cabin and Goat Wintering Area, West End Baranof Lake, Takatz Lake Project, 2010..

ADF&G - CBS Cooperative Mountain Goat Study

ADF&G biologists captured and radio collared 12 goats, 7 within or immediately adjacent to the project area, and 5 more in a nearby watershed (Figure 3). Further details of this study can be found in the annual progress report (White et al. 2010).

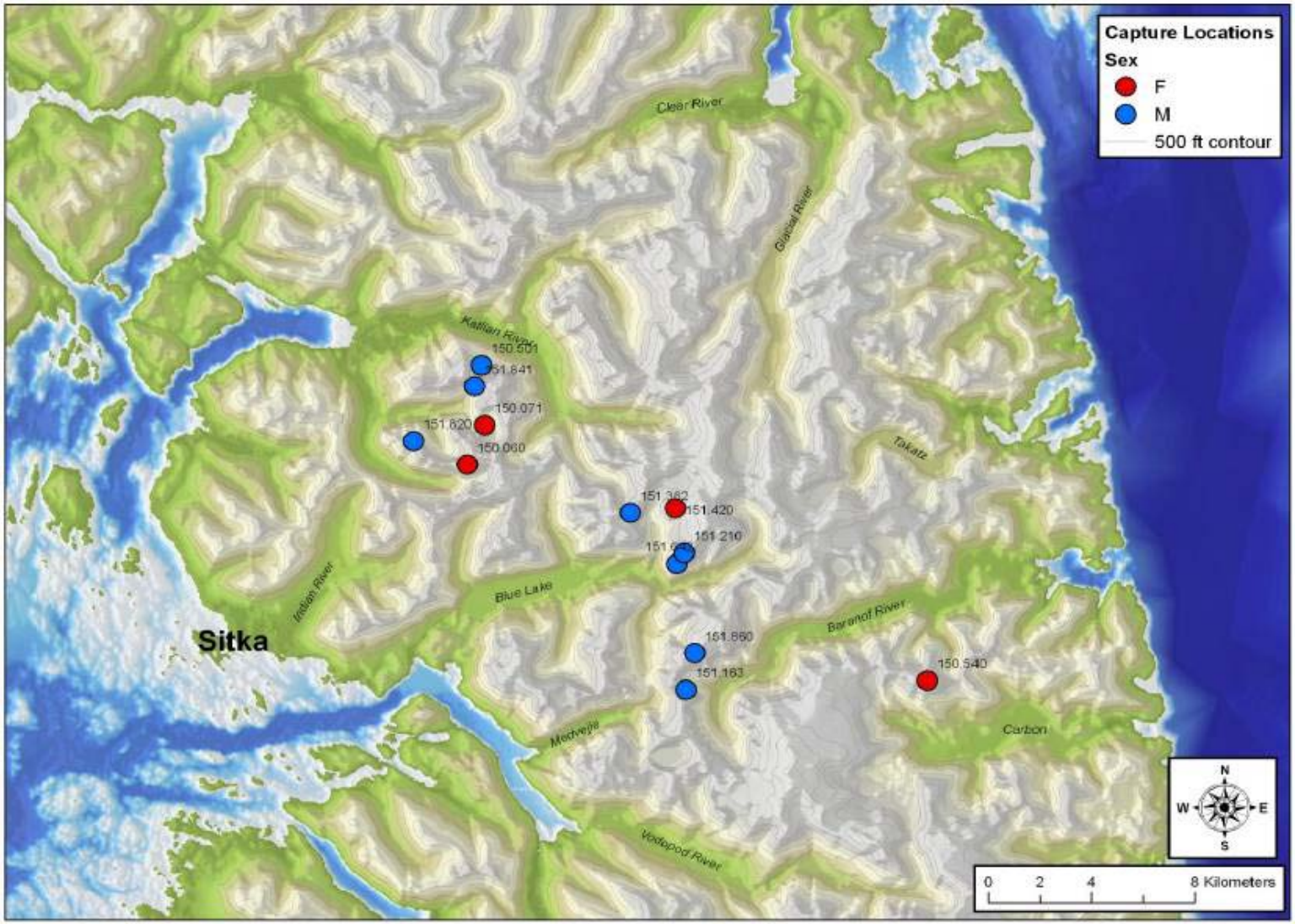

Figure 3. Location of Mountain Goat capture Sites, ADF&G-CBS Cooperative Study, Takatz Lake Project 2010 (White et al. 2010)

Brown Bear

It is estimated that at least 6 different brown bears were observed in the study area (excluding Medvejie) based on a total of 30 visual observations or sign (Figure 4). Body size, track size, and behavior were used to distinguish individual bears.

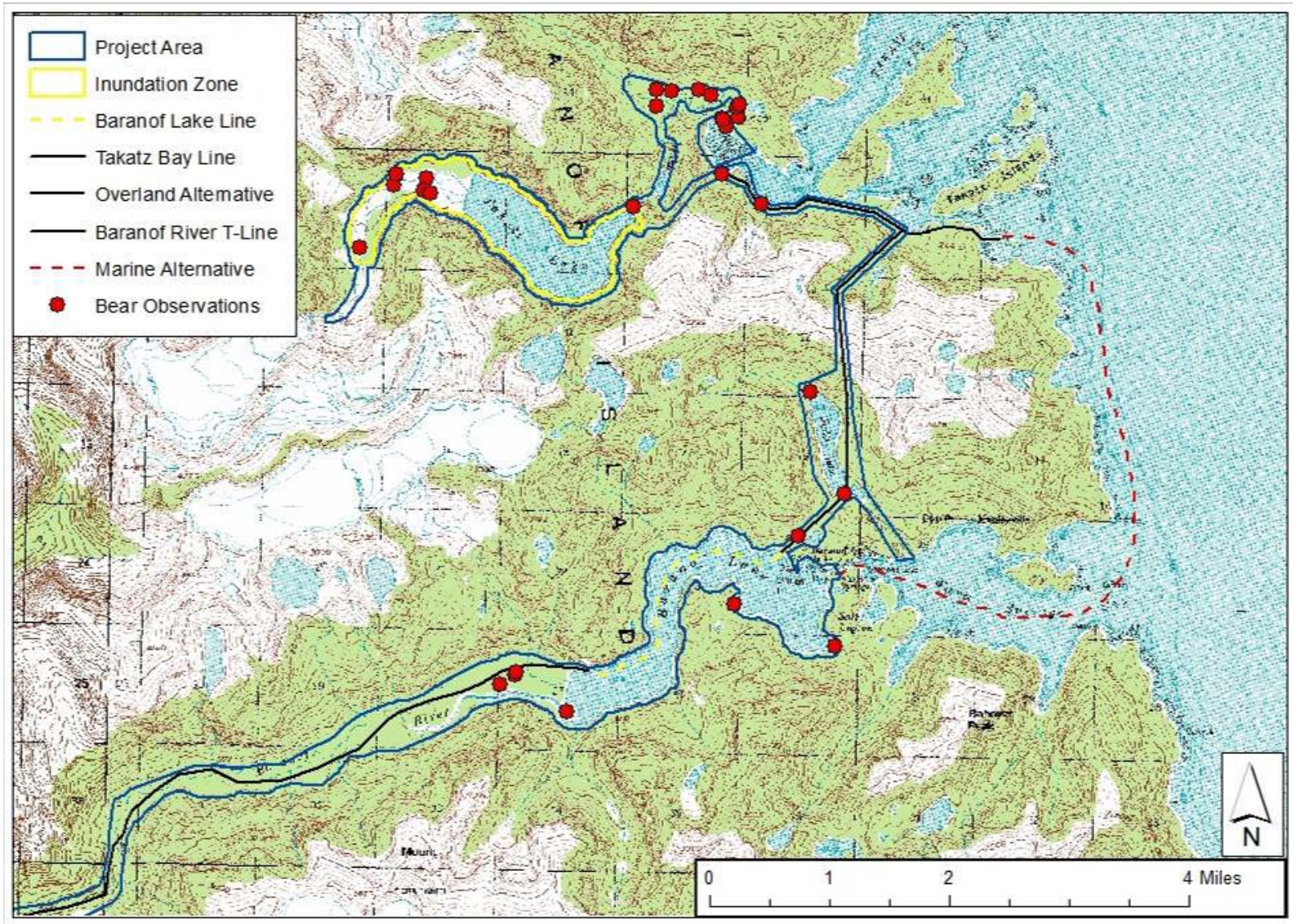

Figure 4. Brown Bear Observations, Takatz Lake Project, 2010

At least two individual bears were observed in Baranof River Valley. Sign indicated that they were attempting to prey on beaver in addition to their typical plant diet. It was not uncommon to see bear sign near the USFS cabin, including hair remains on window trim from being used as a scratching post. This has resulted in the cabin having its windows covered with plywood when not in use.

The tidal flats and shoreline of Takatz Bay were frequented by at least 2 different adult bears, which included one sow and two cubs of the year. Although Takatz River is a salmon stream, it is mostly an intertidal run due to the barrier falls at high tide level. The field camp was on a small island accessible by land at low tide but there were no bear encounters or problems at camp. The camp had bear proof fencing to prevent this but to our knowledge was never tested by a bear.

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.

Sitka Black-tailed Deer

There were not enough observations recorded of deer to produce a map showing locations. However, general trends can be summarized based on field observations and communication with locals familiar with the area.

Baranof and Sadie Lakes

Population levels of Sitka black-tailed deer appear to be at low levels in the Baranof and Sadie Lake watersheds, especially in the Baranof River area. While tracks were commonly seen, lack of browsed areas and the amounts of tracks would suggest low population levels. 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 lack of large tracts of old-growth timbered areas, reduces the productivity for deer.

Takatz Bay and Lake

The lower elevations of forested areas in the Takatz Bay area along with their proximity to the ocean appear to be supporting higher levels of deer than to the south and inland areas 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, moderated by the ocean. The Takatz Lake area, especially upper valley, inundation area, was quite sparsely populated with deer.

Furbearers

Five species of furbearers were observed in the study area in 2010, the American beaver, American marten, American mink, North American river otter, and red squirrel (Table 5, Figure 5). Beavers were the most common furbearer and will be discussed in the following section. Tracks and/or scats of marten were observed between Sadie and Baranof Lakes, as well as in the Takatz basin. Relative to other areas of Baranof Island, population levels for marten are low,

although island-wide marten population numbers were below average this year (pers. comm. local trappers). Mink were common in Takatz Bay yet only seen on a few occasions along the lake shores, which follows typical patterns for mink on Baranof Island. Tracks of otter were observed in the Takatz Bay area and once along Baranof River. As with the mink, their normal habitat would consist mostly of marine shoreline, with occasional occurrences inland. Red squirrels were quite common, as is the case on most of Baranof Island, and population levels were most likely above normal following this year's general pattern of small mammal abundance on Baranof Island.

Table 5. Furbearers and Their Relative Abundance, Residency, and Conservation Rank, Takatz Lake Project, 2010.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
American Beaver[1]	*Castor canadensis*	C	R, B	5	5
American Marten[2]	*Martes americana*	U	R, B	5	5
American Mink	*Neovison vison*	U	R, B	5	5
North American River Otter	*Lontra canadensis*	C	R	5	5
Red Squirrel[2]	*Tamiasciurus hudsonicus*	A	R, B	5	5

[1] Origin of population unknown (transplanted or native or both)
[2] Transplanted to Baranof Island

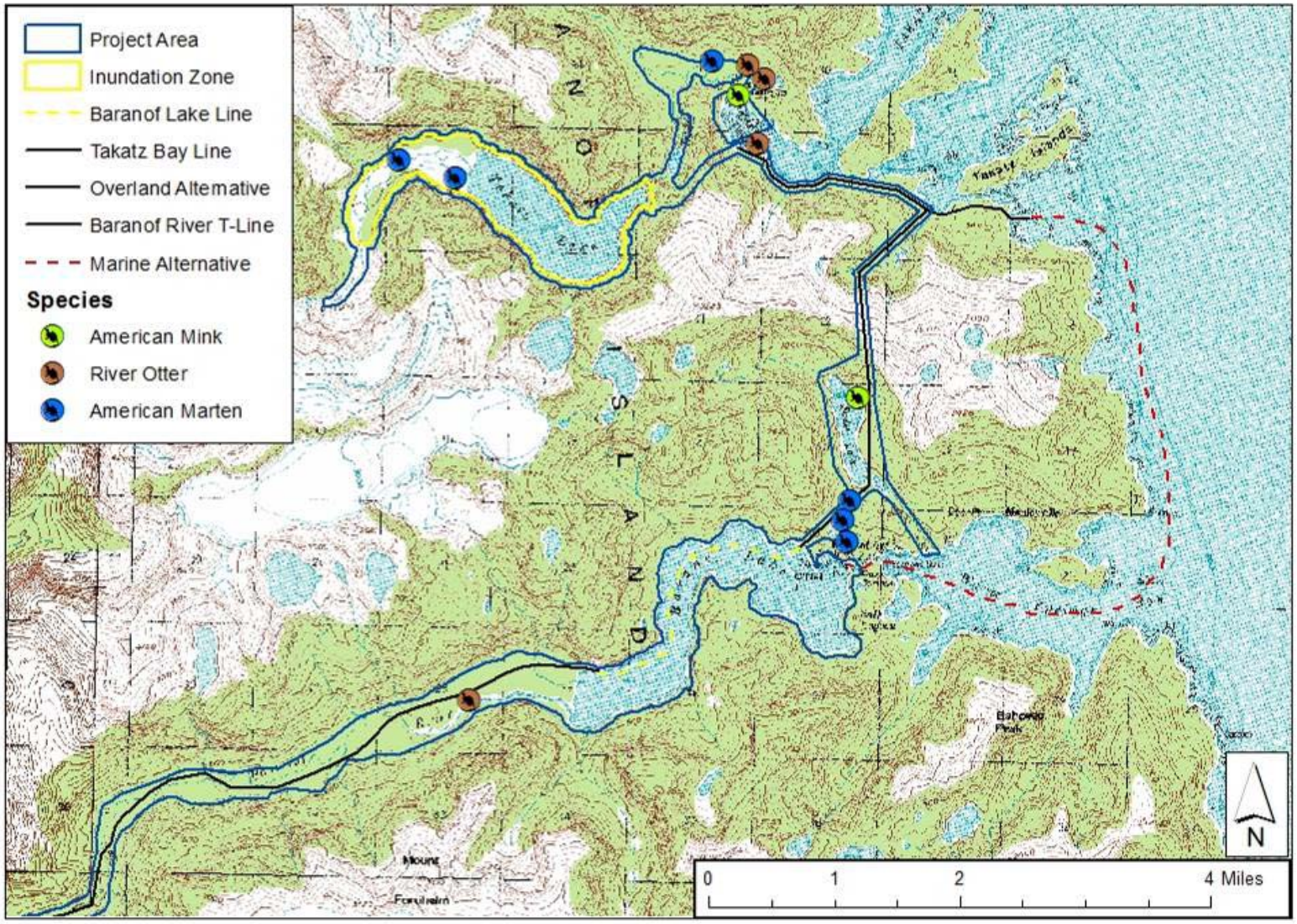

Figure 5. Mink, Marten, and River Otter Observations, Takatz Lake Project, 2010.

American Beaver

Beaver were quite common along riparian areas along lower Baranof River, Sadie Lake, and Lower Takatz River (Figure 6). As is usually the case, their activities greatly influenced the habitat, causing numerous ponds and side channels.

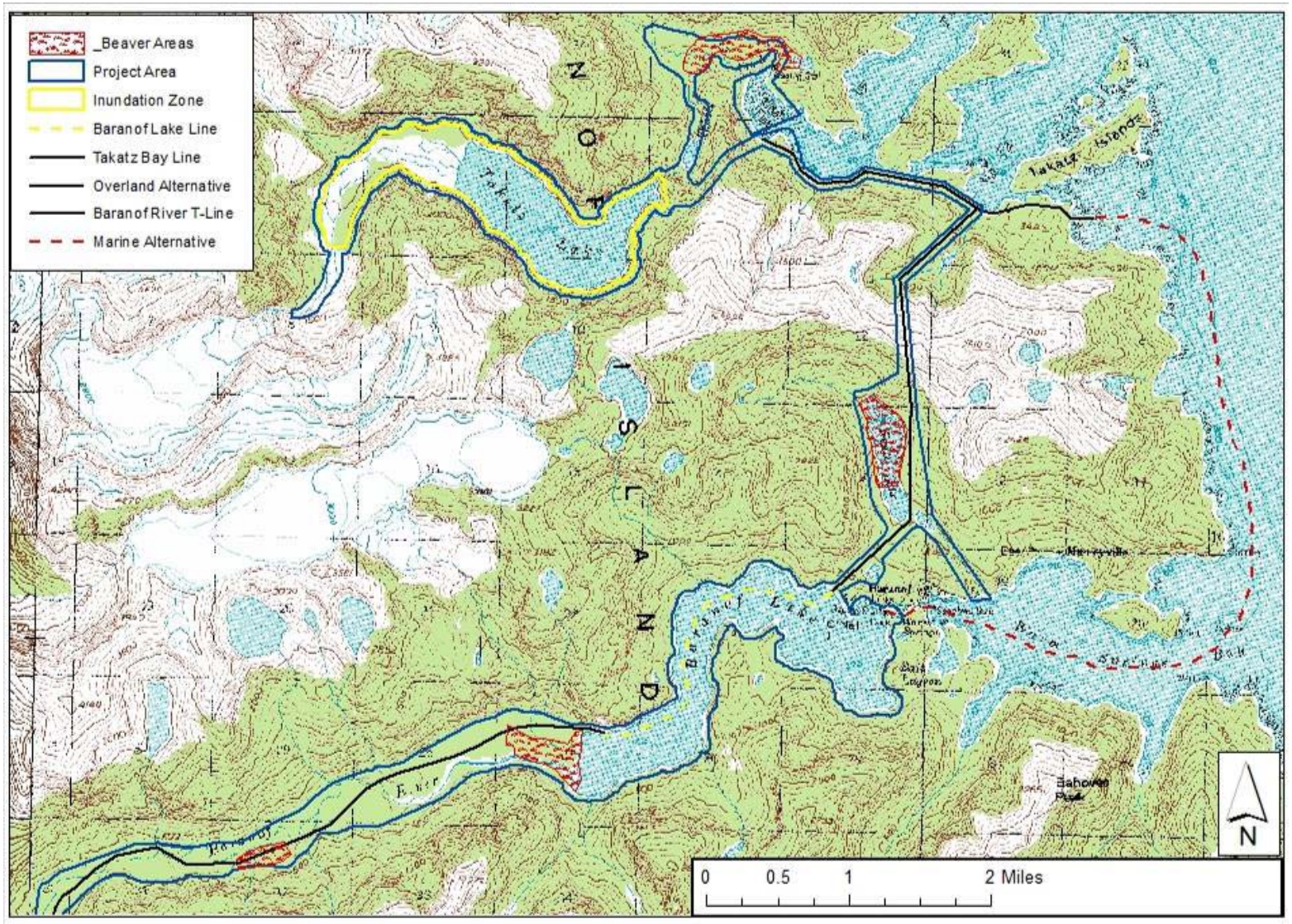

Figure 6. Beaver Areas, Takatz Lake Project, 2010.

One of the more extensive areas of beaver activity was the lower one mile area of Baranof River (Figure 6, Photos 2 and 3). There were 2 main dams (Photo 2) creating large ponds, with many smaller dams on side channels and sloughs.

Photo 2. Lower Beaver Area, Baranof River, Takatz Lake Project, 2010.

Photo 3. Main Pond Areas of Lower Beaver Area, Baranof River, Takatz Lake Project, 2010.

There were a total of 3 lodges in this area of stair stepping ponds. Two of the lodges used existing small islands with large trees to create the lodge (Photo 4), while one lodge was more of the classic, stand alone lodge. Several bank dens were used as well and there were numerous scent mounds in the area as well.

Photo 4. Beaver Lodge, Lower Baranof River, Takatz Lake Project, 2010.

Western hemlock, *Tsuga heterophylla*, appeared to be their preferred tree for cambium feeding (Photos 5 and 6). Building material for dams and lodges included Western hemlock, Sitka spruce (*Picea sitchensis*), red alder (*Alnus rubra*), and nearby shrubs.

Photo 5. Bridger Williams Next to Hemlock Tree Chewed by Beaver, Takatz Lake Project, 2010.

Photo 6. Hemlock Tree Felled and Fed on by Beaver, Takatz Lake Project, 2010.

Excavation of bank dens by bears suggested predation attempts on beavers by bears.

Small Mammals

Four species of small mammals were observed in the 2010 field season - little brown myotis (*Myotis lucifugus*), northwestern deer mouse (*Peromyscus keeni*), root vole (*Microtus oeconomus*), and cinereus shrew (*Sorex cinereus*) (Table 6). Actual identification to species level has not been verified at this time.

Table 6. Small Mammals and Their Relative Abundance, Residency, and Conservation Rank, Takatz Lake Project, 2010.

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

Small mammal trapping was done in conjunction with other surveys when time allowed, so many areas were not surveyed during this field season (Figure 7).

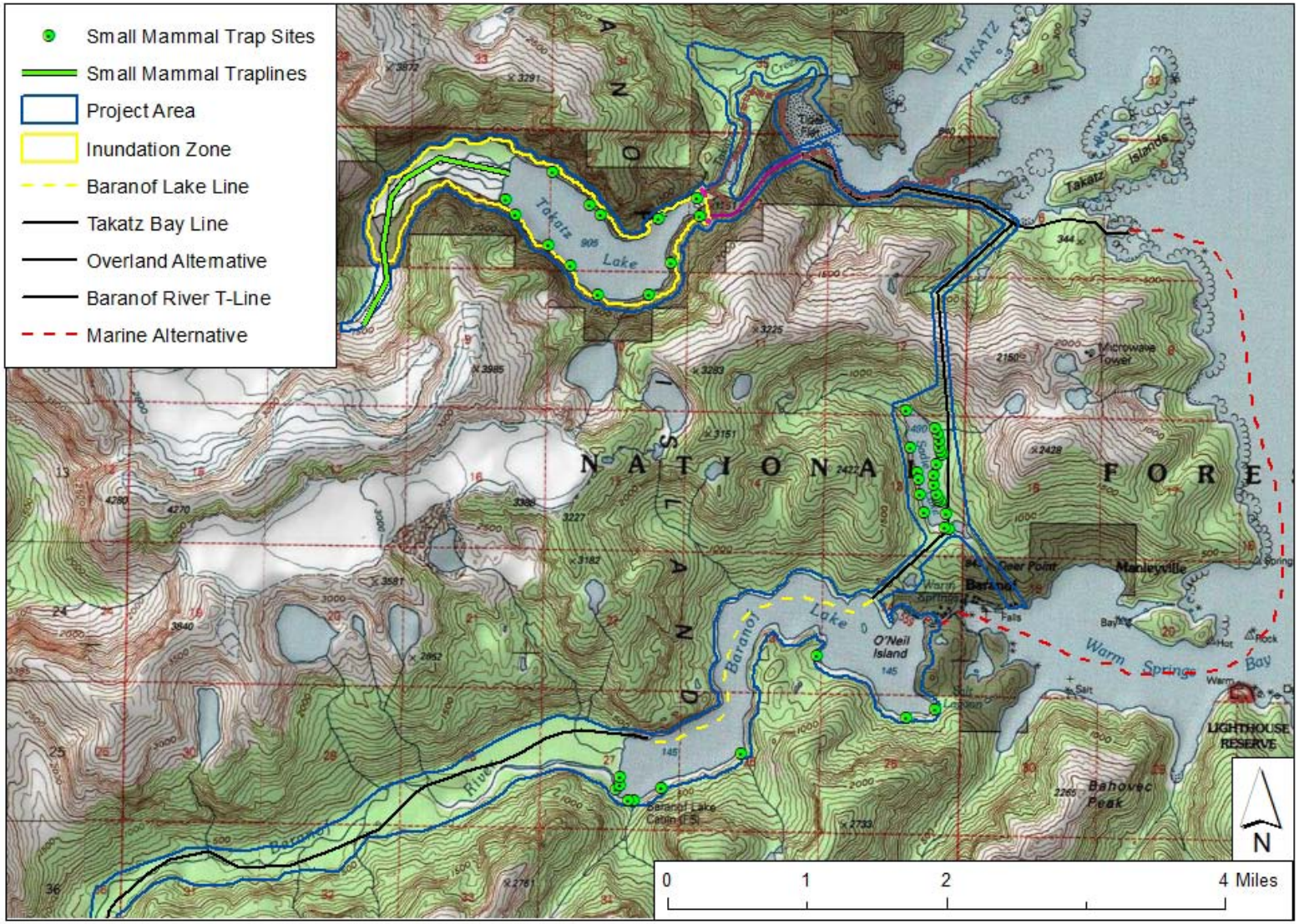

Figure 7. Small Mammal Trap Sites and Traplines, Takatz Lake Project, 2010.

Populations of voles were very high and followed the general trend as compared to other locations on Baranof Island. Vole capture rate was the highest in Baranof Lake, with a rate of 27 animals/100 trap nights (TN), followed by 20 and 22 in Takatz Lake inlet, 15 in Takatz Lake, and 9 in Sadie Lake (Table 7).

Table 7. Small Mammal Capture Data, Takatz Lake Project, 2010.
(C = captures, T = trap night)

Catch Data		Baranof Lake	Sadie Lake	Takatz Lake	Takatz Lake Inlet	
Dates		July 27-28	September 21-22	August 14-15	August 14-15	September 11-12
# TN		26	66	26	64	45
Vole	# C	7	6	4	13	10
	# C/100 TN	**27**	**9**	**15**	**20**	**22**
Mouse	# C	2	2	2	1	0
	# C/100 TN	**8**	**3**	**8**	**2**	**0**
Shrew	# C	0	0	0	1	0
	# C/100 TN	**0**	**0**	**0**	**2**	**0**

While this data should not be used to estimate animal density, it does provide information on species present and rough estimates of relative abundance between species and locations. Trap effort intensity was not high enough to detect possible species at low population levels and should be increased next season to address this goal, along with more trapping in more areas.

Preferred habitat for voles appeared to be well drained, grass-dominated areas, often associated with beaver created habitat (i.e. pond edges, remnant ponds and sloughs). Several voles were found dead in these areas near water's edge, apparently due to drowning from flooding.

Bats were observed once at Takatz Lake but most likely occur in other areas. It is assumed they are *M. lucifugus*, but positive identification would require obtaining voucher specimens, live capture, and/or the use of a bat detector.

Raptors

Four species of raptors were observed in the study area, including bald eagle (*Haliaeetus leucocephalus*), red-tailed hawk (*Buteo jamaicensis*), northern saw-whet owl (*Aegolius acadicus*), and western screech owl (*Megascops kennicottii*) (Table 8).

Table 8. Raptors and Their Relative Abundance, Residency, and Conservation Rank, Takatz Lake Project, 2010.

Common Name	Scientific Name	Relative Abundance	Residency	Global (G) and Subnational (S) Rank	
				G	S
Bald Eagle	*Haliaeetus leucocephalus*	C	R	5	5
Red-tailed Hawk	*Buteo jamaicensis*	R	M	5	4, 5B
Northern Saw-whet Owl	*Aegolius acadicus*	VR	R		
Western Screech Owl	*Megascops kennicottii*	R	R		

The 3 observations of bald eagles shown on Figure 8 do not truly represent the numbers in the area. This was a species of lower priority this season and more complete data will be gathered in the 2011 field season, including aerial surveys for nests. During flights to and from the study area, eagle nests were searched for with none being found, however no focused aerial surveys were done.

There was one confirmed sighting of a red-tailed hawk at Takatz Lake, but many of the 7 observations of unidentified hawks were most likely this species. Often these sightings did not allow enough time for identification or were at a great distance. Broadcast calls were made when possible without any definitive response.

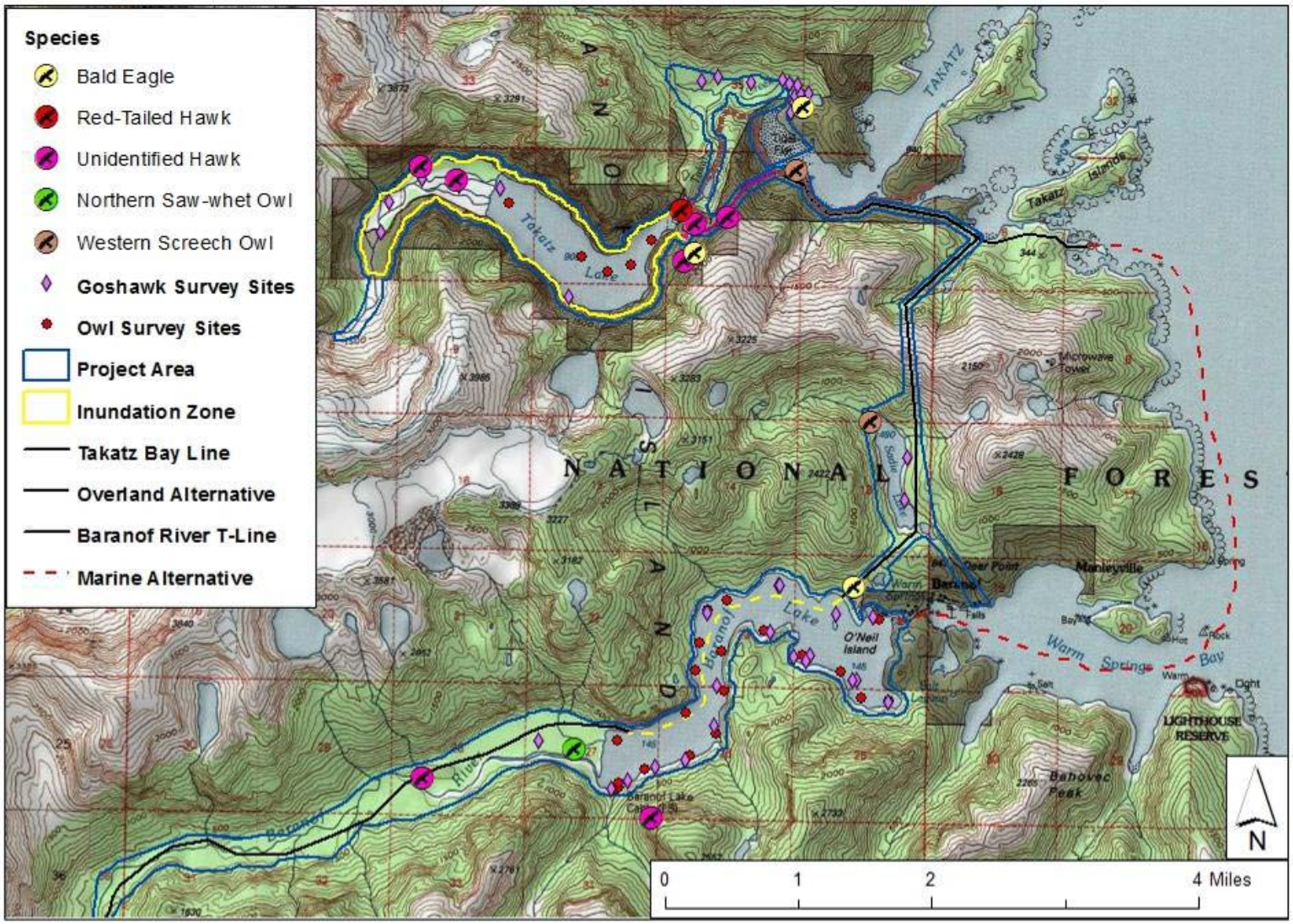

Figure 8. Raptor Observations and Survey Sites for Goshawks and Owls, Takatz Lake Project, 2010.

Northern Goshawk

Broadcast surveys for northern goshawks, *Accipiter gentilis*, were completed at 41different sites (Figure 8) in conjunction with general foot and boat surveys. No goshawks responded or were observed during the 2010 field season.

Owls

Broadcast surveys for various species of owls (see Table 1) were completed at 26 different sites (Figure 8). No owls responded during these surveys, however, 2 species were heard at other times, a western screech owl at Takatz Bay and a northern saw-whet owl at lower Baranof River (Figure 8).

Waterfowl and Shorebirds

A total of 84 observations of waterfowl and shorebird species resulted in identifying 19 species, five of which are known to breed in the study area (Table 9).

Table 9. Waterfowl and Their Relative Abundance, Residency, and Conservation Rank, Takatz Lake Project, 2010.

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

Waterfowl, such as Canada geese (*Branta canadensis*), trumpeter swans (*Cygnus buccinator*), and mallards (*Anas platyrhynchos*), as well as the shorebird, Wilson's snipe (*Gallinago delicata*), were often found in beaver ponds and associated wetland areas, especially lower Baranof River (Figure 9, Photo 7). Another shorebird, spotted sandpiper (*Actitis macularius*), was seen at both Baranof and Takatz Lakes, with young observed at Takatz Lake.

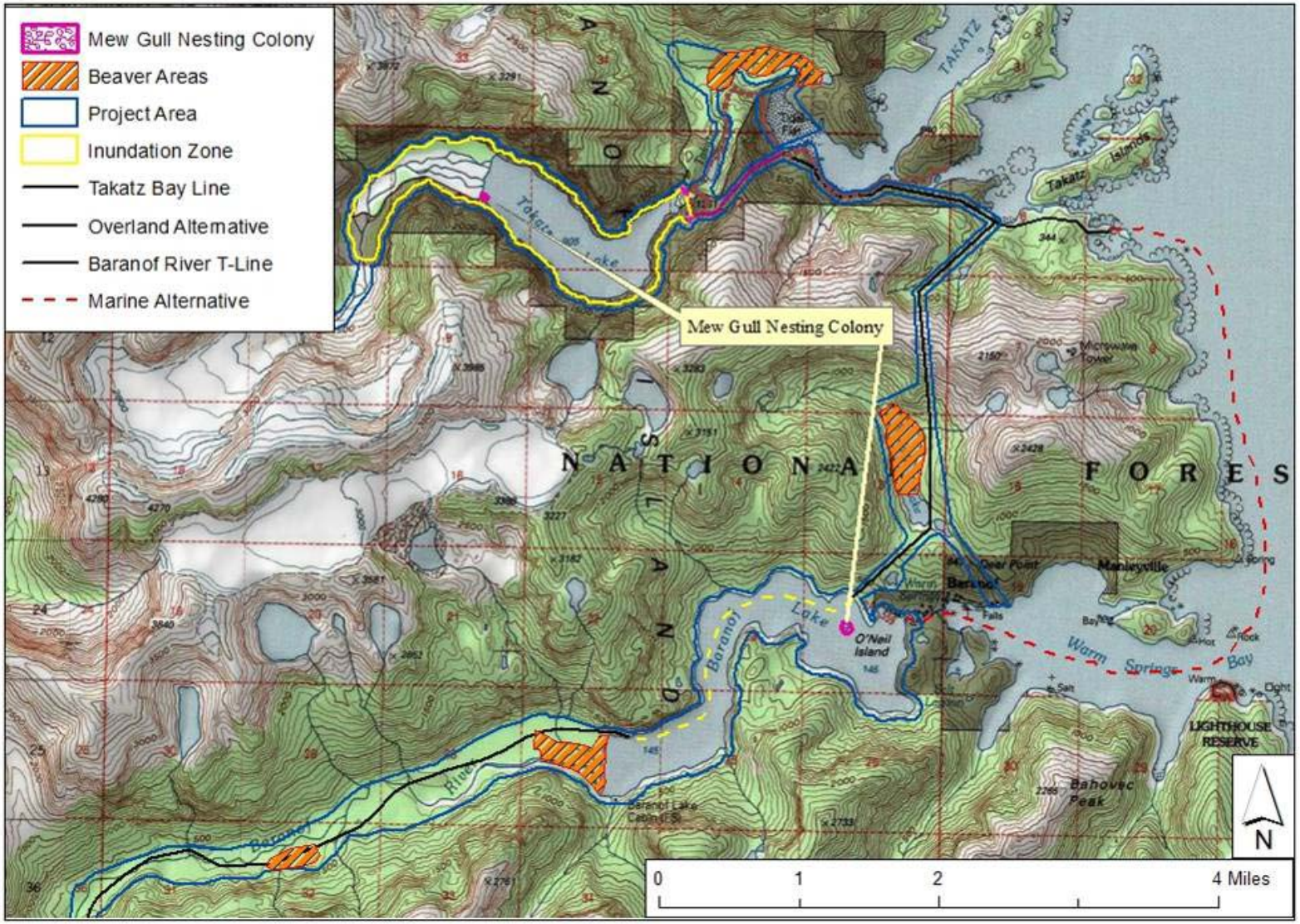

Figure 9. Mew Gull Nesting Colonies and Beaver/Waterfowl Areas, Takatz Lake Project, 2010.

Canada goose adults with young were seen in Sadie Lake and the Takatz Creek beaver pond area (Figure 9). Another group of geese were seen later in the summer in upper Takatz Lake inlet and was likely the same family group as seen earlier at lower elevations. One pair of geese were seen several times in Baranof Lake but no young were observed.

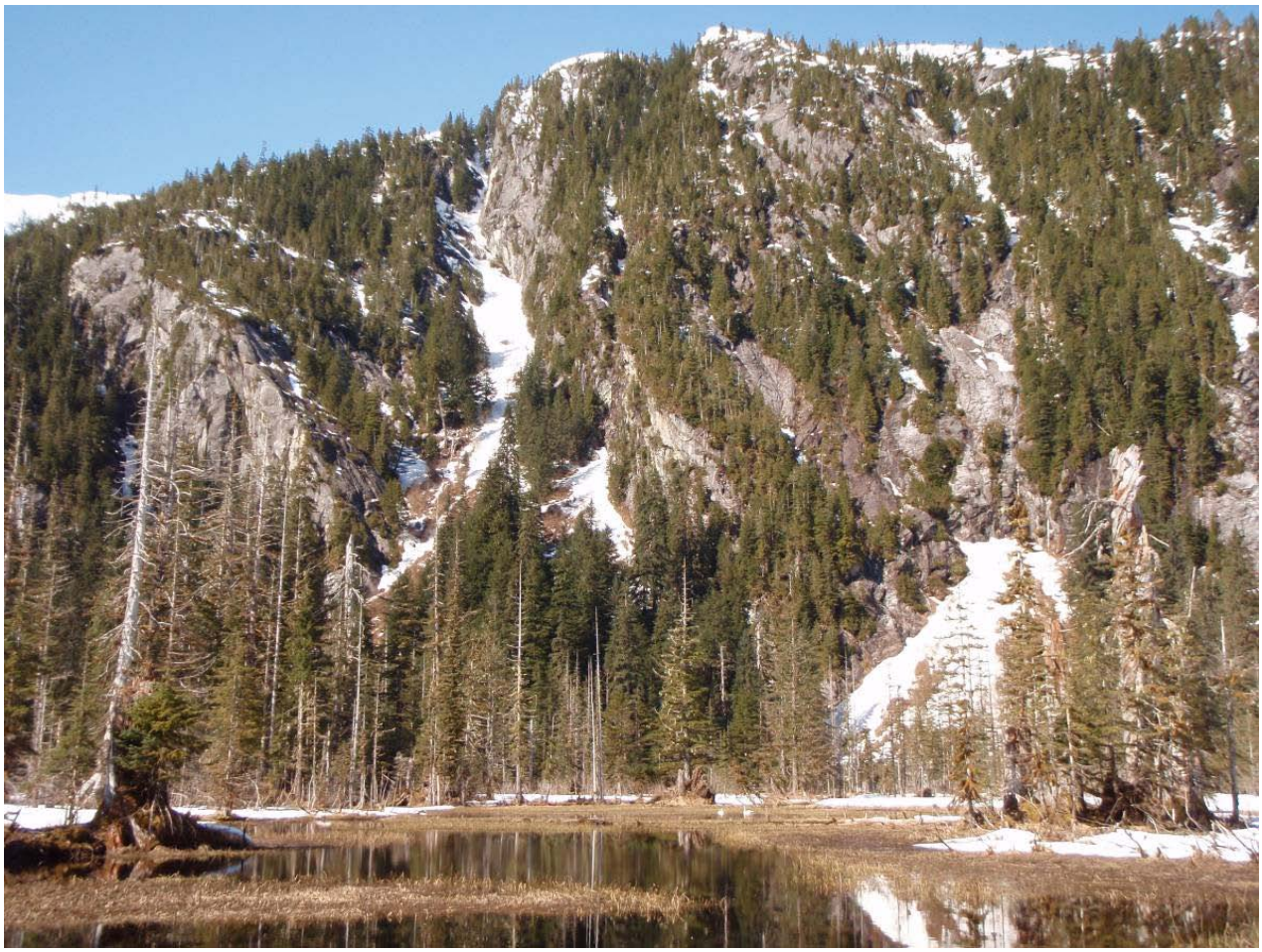

Photo 7. Beaver Ponds Provided Habitat for Waterfowl (also shown - snags used by cavity nesting birds and winter goat habitat on hillside), Takatz Lake Project, 2010.

While young were not observed of harlequin duck (*Histrionicus histrionicus*), pairs of adults were seen several times in Baranof River (Photo 8), 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.

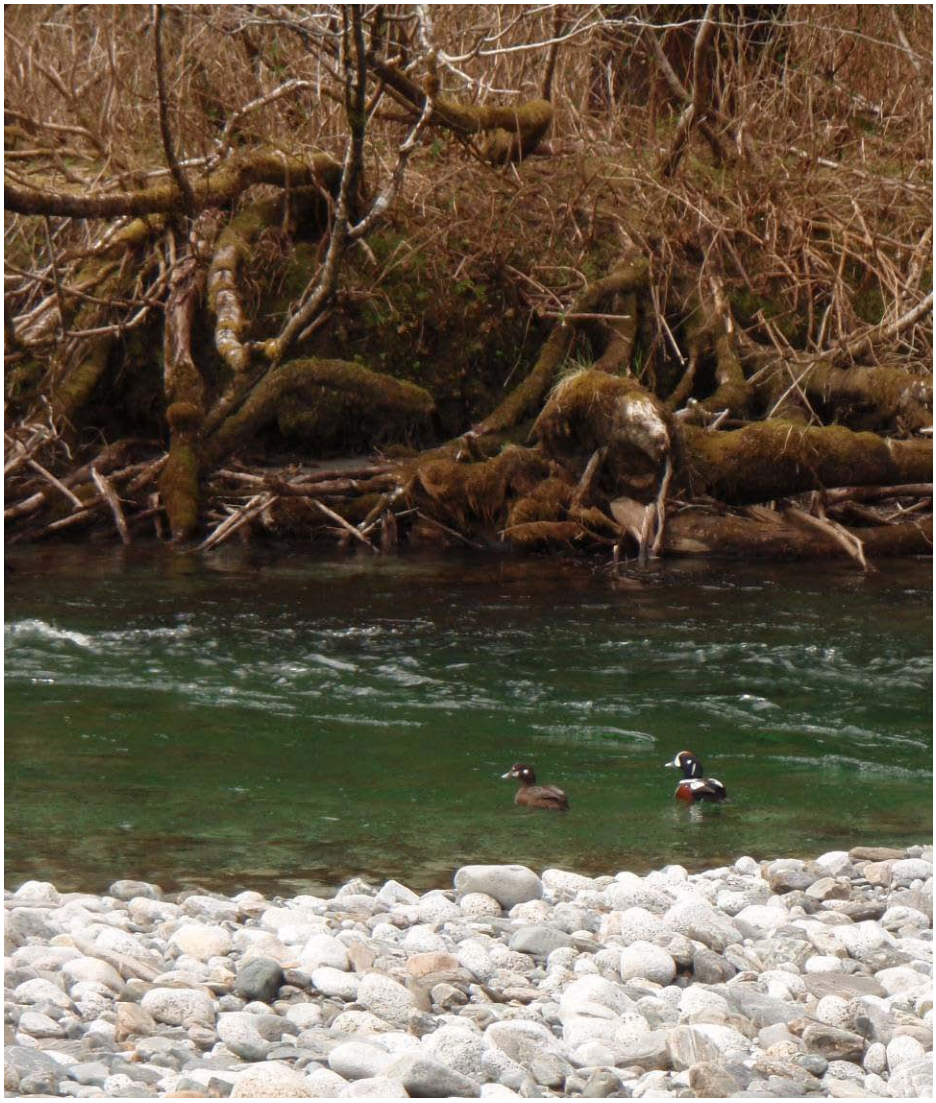

Photo 8. Pair of Harlequin Ducks, Lower Baranof River, Takatz Lake Project, 2010.

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*). One red-throated loon (*Gavia stellata*) was seen in Sadie Lake.

Mew gull nesting colonies occurred in two areas - at the head of Takatz Lake (Photo 9) and O'Neil Island in Baranof Lake (Figure 9) with an estimated total number of birds being 10 and 30, respectively.

Photo 9. Mew Gull Nest at Head of Takatz Lake, Takatz Lake Project, 2010.

Takatz Bay 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 and mew), and marbled murrelet (*Brachyramphus marmoratus*).

Forest and Songbirds

There were 15 species of forest or songbirds observed (Table 11). There was no analysis done as to habitat preference or relative abundance, which will be done in future reports.

Table 10. Forest and Songbirds and Their Relative Abundance, Residency, and Conservation Rank, Takatz Lake Project, 2010.

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

Amphibians

One amphibian, western toad (*Buro boreas*), was observed in the study area. Its conservation ranks are 4 for global and 3, 4 for state level. One adult was observed in a side streamlet flowing along the boardwalk at Baranof Warm Springs (Photo 10). Tadpoles had hatched by mid-April in this area, apparently developing more rapidly due to warmer temperatures. One adult each was 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.) which unfortunately follows the worldwide trend of amphibians.

Photo 10. Western Toad Adult Found in Small Side Spring, Baranof Warm Springs, Takatz Lake Project, 2010.

HABITAT ASSESSMENT

GIS data on habitat types and vegetation maps were obtained from USFS and Southeast Alaska GIS Library (University of Alaska Southeast 2011). Many photos and videos were recorded which will be used to help ground truth this vegetation data and produce maps and summary tables for the project area.

THREATENED and ENDANGERED (T&E) SPECIES

No threatened or endangered species were observed during the 2010 field season (Table 11). Humpback Whales (*Megaptera novaeangliae*), Steller Sea Lions (*Eumetopias jubata*), and Marbled Murrelet (*Brachyramphus marmoratus*) most likely occur along the Marine Transmission Line but field work was not completed in that area during 2010.

Trumpeter Swans (*Cygnus buccinator*), a USFS Sensitive Listed Species, were observed in the beaver ponds in the Baranof River drainage in early spring. Queen Charlotte Goshawk (*Accipiter gentilis laingi*) surveys were done in several of the study subareas with no confirmed sightings.

Table 11. Occurrence of Threatened, Endangered, Candidate and Other Species of Concern in the Project Area, Takatz Lake Project, 2010.

Species Category	Species List	Occurrence in the Project Area
Federal Endangered Species	Humpback Whale (*Megaptera novaeangliae*)	Probable occurrence along Marine Transmission Line
Federal Threatened Species	Steller sea lion (*Eumetopias jubata*)	Probable occurrence along Marine Transmission Line
Federal Candidate Species	Kittlitz's Murrelet (*Brachyramphus brevirostris*)	Not surveyed
USFS Sensitive Listed Species	Queen Charlotte Goshawk (*Accipiter gentilis laingi*)	Surveyed in some areas with no detections
	Osprey (*Pandion haliaetus*)	Not observed
	Peale's Peregrine Falcon (*Falco peregrinus anatum*)	Not observed
	Trumpeter Swan (*Cygnus buccinator*)	Common in spring season in lower Baranof River beaver ponds
USFS Other Species of Concern	Marbled Murrelet (*Brachyramphus marmoratus*)	Observed in Takatz Bay; Probable occurrence along Marine Transmission Line

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LITERATURE CITED

Alaska Department of Fish and Game. "Marbled Murrelets of Southeast Alaska." Undated brochure.

" Alaska Natural Heritage Program." 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, Kent T. 2010. Final 2008 Wildlife Studies Report, Blue Lake Project (FERC No. 2230) Expansion. City and Borough of Sitka Electric Department, January 2010. Website: http://www.cityofsitka.com/government/departments/electric/documents/FINAL2008WILDLIFESTUDIESREPORT_012110.pdf.

Kirchhoff, M.D. and K. Pitcher 1988. Deer pellet-group surveys in southeast Alaska, 1981–1987. Project W-2-6. Douglas, AK: Alaska Department of Fish and Game, Division of Game. 39 p.

Kirchhoff, Matthew D. and Thomas A. Hanley. 1992. A Quick-Cruise Method for Assessing Deer Winter Range in Southeast Alaska. Habitat Hotline, Issue No. 92-1. Juneau, Alaska.

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. 1998. Inventory methods for beaver and muskrat. Standards for Components of British Columbia's Biodiversity. [Online] No. 22. Available: .http://www.for.gov.bc.ca/ric.

Resources Inventory Committee. 2001. Inventory Methods for Raptors: Standards for Components of British Colombia'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.

Sauer, J. R., J. E. Hines, and J. Fallon. 2005. The North American Breeding Bird Survey, Results and Analysis 1966 - 2000. USGS Patuxent Wildlife Research Center, Laurel, MD <http://www.mbr-pwrc.usgs.gov/bbs/grass/t3091.htm> Version 2005.2. Accessed 10 Feb 2007.

"Southeast Alaska GIS Library." University of Alaska Southeast. 1 Mar. 2011 <http://seakgis.alaska.edu>.

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.

Appendix 1. Species List - Major Group, Common Name, Field Code, Scientific Name, Primary Survey Method Used, Relative Abundance, Residency, and Conservation Rankings, Takatz Lake Project, 2010.

Major Group	Common Name	Field Code	Scientific Name	Primary Survey Method	Relative Abundance[2]	Residency[3]	2010 Global (G) and Subnational (S) Rank[4]	
							G	S
Large Mammals	Brown Bear	BRBE	*Ursus arctos*	Field observation	C	R, B	4	4
	Mountain Goat[1]	MOGO	*Oreamnos americanus*	Field observation	C	Summer- alpine Winter-lower elev.	5	4
	Sitka Black-tailed Deer	SIDE	*Odocoileus hemionus sitkensis*	Field observation	C	R, B	5	4
Furbearers	American Beaver[1]	AMBE	*Castor canadensis*	Field Observation	C	R, B	5	5
	American Marten[1]	AMMA	*Martes americana*	Field observation	C	R, B	5	5
	American Mink	AMMI	*Neovison vison*	Field observation	C	R	5	5
	Baranof Island Ermine	ERMI	*Mustela erminea initis*	Field observation	NO	R, B	3	3
	Ermine	ERMI	*Mustela erminea*	Field observation	NO	R, B	5	5
	North American River Otter	NARO	*Lontra canadensis*	Field observation	C	R	5	5
	Red Squirrel[1]	RESQ	*Tamiasciurus hudsonicus*	Field observation	A	R, B	5	5
Small Mammals	Cinereus Shrew	CISH	*Sorex cinereus*	Trapping	U	R, B	5	5
	Little Brown Myotis	LBMY	*Myotis lucifugus*	Field observation	U	R, B	5	4
	Northwestern Deer Mouse	NWDM	*Peromyscus keeni*	Trapping	C	R, B	5	4
	Root vole	ROVO	*Microtus oeconomus*	Trapping	A	R, B	5	5
	Sitka root vole	ROVO	*Microtus oeconomus sitkensis*	Trapping	No ID to subspecies	R, B	2	2
Raptors	Bald Eagle	BAEA	*Haliaeetus leucocephalus*	Field observation	C	R	5	5
	Osprey	OSPR	*Pandion haliaetus*	Field observation	NO	M	5	2B
	Northern Saw-whet Owl	NSOW	*Aegolius acadicus*	Broadcast Survey	VR	R	5	4
	Northern Pygmy Owl	NOPO	*Glaucidium gnoma*	Broadcast Survey	NO	R	5	3
	Red-tailed Hawk	REHA	*Buteo jamaicensis*	Field Observation	U	M	5	5B
	Western Screech Owl	WESO	*Megascops kennicottii*	Broadcast Survey	U	R, B	5	2
Forest and Songbirds	American Robin	AMRO	*Turdus migratorius*	Field Observation	C	M	5	5
	Brown Creeper	BRCR	*Certhia americana*	Field Observation	R	R, B	5	4
	Common Raven	CORA	*Corvus corax*	Field Observation	A	R, B	5	5
	Dark-eyed Junco	DAJU	*Junco hyemalis*	Field Observation	C	R, B	5	5
	Hermit Thrush	HETH	*Catharus guttatus*	Field Observation	A	M, B	5	5
	Northwestern Crow	NOCR	*Corvus caurinus*	Field Observation	C	R	5	5
	Ptarmigan (Rock &/or	UNPT	*Lagopus sp.*	Field Observation	R	M	5	5

	Willow)							
	Red-breasted Sapsucker	RESA	*Sphyrapicus ruber*	Field Observation	U	R, B	5	5
	Rufous Hummingbird	RUHU	*Selasphorus rufus*	Field Observation	C	M, B	5	4
	Song Sparrow	SOSP	*Melospiza melodia*	Field Observation	C	M, B	5	5
	Sooty Grouse	SOGR	*Dendragapus fuliginosus*	Field Observation	NO	R	5	5
	Steller's Jay	STJA	*Cyanocitta stelleri*	Field Observation	U	R	5	5
	Swainson's Thrush	SWTH	*Catharus ustulatus*	Field Observation	A	M, B	5	5
	Tree Swallow	TRSW	*Tachycineta bicolor*	Field Observation	A	M, B	5	5B
	Varied Thrush	VATH	*Ixoreus naevius*	Field Observation	C	M, B	5	5
	Winter Wren	WIWR	*Troglodytes troglodytes*	Field Observation	C	R, B	5	5
Waterfowl and Shorebirds	American Dipper	AMDI	*Cinclus mexicanus*	Field Observation	C	R	5	5
	American Widgeon	AMWI	*Anas americana*	Field Observation	U	M	5	5B, 4N
	Barrow's Goldeneye	BAGO	*Bucephala islandica*	Field Observation	U	R	5	5
	Belted Kingfisher	BEKI	*Megaceryle alcyon*	Field Observation	C	R, B	5	5
	Bufflehead	BUFF	*Bucephala albeola*	Field Observation	U	R	5	5
	Canada Goose	CAGO	*Branta canadensis*	Field Observation	C	R, B	5	5
	Common Loon	COLO	*Gavia immer*	Field Observation	U	R	5	5B, 4N
	Common Merganser	COME	*Mergus merganser*	Field Observation	C	R, B	5	5
	Glaucous-winged Gull	GWGU	*Larus glaucescens*	Field Observation	U	R	5	5
	Great Blue Heron	GBHE	*Ardea herodias*	Field Observation	C	R, B	5	2, 3
	Green-winged Teal	GWTE	*Anas carolinensis*	Field Observation	U	M	5	5B, 4N
	Harlequin Duck	HADU	*Histrionicus histrionicus*	Field Observation	C/R	R, B	4	4
	Herring Gull	HEGU	*Larus argentatus*	Field Observation	U	R	5	5
	Mallard	MALL	*Anas platyrhynchos*	Field Observation	C	R, B	5	5
	Marbled Murrelet	MAMU	*Brachyramphus marmoratus*	Field Observation	U	R	3, 4	2, 3
	Mew Gull	MEGU	*Larus canus*	Field Observation	C	R	5	5
	Red-throated Loon	RTLO	*Gavia stellata*	Field Observation	VR	?	5	4N, 4B
	Ring-necked Duck	RNDU	*Aythya collaris*	Field Observation	U	M	5	2N, 3B
	Spotted Sandpiper	SPSA	*Actitis macularius*	Field Observation	C	R, B	5	5
	Trumpeter Swan	TRSW	*Cygnus buccinator*	Field Observation	C	R	4	3N, 4B
Amphibians	Wilson's Snipe	WISN	*Gallinago delicata*	Field Observation	R	R	5	5B
	Western Toad	WETO	*Buro boreas*	Field Observation	U	R, B	4	3, 4

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[1]Transplanted to Baranof Island

[2]Relative 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

*It should be noted that although the Relative Abundance rankings are included, they are based on only one field season so are subject to change

[3]Residency in Study Area and/or Subareas
R = Resident
B = Breeder - known or thought to breed in study area
M = Migratory - latitudinal and/or altitudinal)

[4]Alaska 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