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Vertebrate Inventory of Lake Roosevelt National Recreation Area 2003

Upper Columbia Basin Network

Natural Resource Technical Report NPS/UCBN/NRTR—2010/283

ON THE COVER
Simple map of Lake Roosevelt National Recreation Area and photos of vertebrates taken during the study
Photo courtesy of Maureen McCaffrey

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Abstract

The 2003 Lake Roosevelt National Recreation Area vertebrate inventory developed species lists and additional information on birds, mammals, and herpetofauna found in Lake Roosevelt National Recreation Area of eastern Washington. The University of Idaho Department of Fish and Wildlife Resources conducted the inventory under a cooperative agreement with the National Park Service Northern Semi-Arid Network (now named the Upper Columbia Basin Network—UCBN). The primary goal of the inventory was to confirm 90% of the species expected to occur in the recreation area. Additional goals included developing baseline data for monitoring as well as providing the National Park Service and the research community-at-large with new and important information on the biodiversity of the region.

Expected species lists were developed from available historic sources and expert opinion. A set of 4 criteria was used to determine the likelihood of detection in the recreation area. Inventory fieldwork relied on a variety of methods to achieve the primary objective, including visual encounter surveys, point counts, and trapping. A significant number of species confirmations came from observations shared by NPS staff and natural resource professionals working in the area. Christmas bird count sightings made on or adjacent to the recreation area were also made available from the Colville Christmas Bird Count. Results from the Sherman Creek Breeding Bird Survey were also included. Species documentation included the collection of voucher photographs, specimens, digital bat call recordings, and field observation records. Fieldwork was conducted in September 2002 and April-May 2003. The percentage of confirmed expected species for the recreation area is 98% for birds, 87% for mammals, and 89% for amphibians and reptiles. One hundred eighty-two species of birds were confirmed in or adjacent to the recreation area, including 2 species not expected to occur there. Highlights of the inventory include the development of a large list of confirmed bird species, including many ducks and grebes. Lake Roosevelt is clearly an important resource for migrating and wintering waterfowl. Another highlight was the discovery of three species of shrews (family Soricidae). This group of cryptic mammals is frequently overlooked and is generally poorly known in the Pacific Northwest. The frequent sightings of the black bear (*Ursus americanus*) and moose (*Alces alces*) in recent years are also important. The rediscovery of the western toad (*Bufo boreas*) in the southern portion of the recreation area was exciting, as this species is believed to be declining in many parts of its range (Corkran and Thoms 1996). The spotted frog (*Rana pretiosa*) was absent during spring searches in 2003, and may be extirpated in the Lake Roosevelt region due to increasing numbers of introduced gamefish and the bullfrog (*Rana catesbiana*) (Corkran and Thoms 1996, Ray Dashiell pers. comm.).

Acknowledgements

The 2003 Lake Roosevelt National Recreation Area vertebrate inventory was made possible through a cooperative agreement between the National Park Service Northern Semi-Arid (now called the Upper Columbia Basin Network-UCBN) Inventory and Monitoring Network and University of Idaho Department of Fish and Wildlife Resources. We would like to extend special thanks to Gerry Wright of the USGS Idaho Cooperative Wildlife Research Unit for providing leadership, direction, and enthusiasm for the project. Special thanks go to the Lake Roosevelt National Recreation Area staff in Kettle Falls for unearthing historic reports, sharing natural history observations, and providing temporary housing to the University of Idaho in 2003. Gig Labrette, North District Ranger, and Alexandra Picavet, North District Interpretive Ranger, provided historical data and helpful assistance in park information. Special thanks go to Dwight Morgan, Kettle Falls fourth grade science teacher and part-time biologist for the Washington Department of Fish and Wildlife. We are grateful to Jerry Cline, and all the volunteers who contributed to the 2002 Colville Christmas Bird Count. We thank Dana Base, Sherman Creek State Wildlife Area, for sharing his results of the 1999-2002 breeding bird survey. Special thanks go to Paul Maier for volunteering his time to assist with fieldwork in 2003.

Introduction

This report summarizes the results of the 2003 inventory of birds, mammals, and herpetofauna, summarizes historic information, and contains brief accounts of each species present or expected to occur in the Lake Roosevelt National Recreation Area (LARO). Information on species that are possible but unlikely to occur in the recreation area is also included.

The University of Idaho Department of Fish and Wildlife Resources conducted the 2003 vertebrate inventory in LARO under a cooperative agreement with the National Park Service Northern Semi-Arid Network (now named the Upper Columbia Basin Network—UCBN). The inventory is part of a nationwide inventory and monitoring (I&M) program initiated by funding from the Natural Resource Challenge. In 2000, the Northern Semi-Arid Network (now the UCBN), in which LARO is part, began implementing the inventory phase of the I&M program in several of the network parks and monuments. Historic information available on plant and animal populations within the network were assembled and an estimate was made of the percent of species expected to occur in each park. LARO was among the majority of network parks that had a low percentage (below 50%) of confirmed species of vertebrates and was in need of a concerted effort to meet I&M goals. This program seeks to increase the National Park Service's (NPS) capacity to assess the current state of the natural resources within the NPS system and to enhance its ability to take a leading role in preserving the nation's biological diversity of plants and animals. Completing basic biological inventories is a crucial first step in achieving that goal.

The primary goal of the inventory phase of the I&M program is to document the presence of 90% of the plant and animal species expected to occur within the park boundary or within a distance to the boundary that is relevant to the biology of the organism and to park management. Secondary goals of the inventory include providing baseline information that will help guide the development of the I&M program's vital signs monitoring strategy. Tertiary goals include providing both the NPS and the research community-at-large information on the distribution, habitat association, and population status of the nation's biological resources. Ultimately, the I&M program is designed to help the NPS take a leading role in the preservation of the nation's biodiversity. Completing basic biological inventories is a crucial first step in achieving that goal.

Study Area

Lake Roosevelt National Recreation Area (LARO) is located along the Columbia, Kettle, and Spokane Rivers in northeastern Washington. Congressional boundaries to the recreation area were established in 1949 and LARO was established in 1970 (Lake Roosevelt Forum 2003). Figure 1 (pg. 15) shows the boundaries of LARO. The recreation area was created around the Franklin D. Roosevelt Lake, which was created in 1942 by the completion of Grand Coulee Dam. The dam, commissioned under President Roosevelt, was part of the Columbia River Basin Project, one of the many public works projects developed during the 1930's (Lake Roosevelt Forum 2003). LARO is located in portions of Okanogan, Lincoln, Ferry, and Stevens counties and contains 81,000 acres, the large majority of which is Lake Roosevelt surface water. The recreation area stretches 150 miles, from Grand Coulee Dam to Island Rock, approximately 10 miles south of the Canadian border. LARO is located within an extremely complex matrix of public and private lands and this has significant implications for conservation and management of biodiversity in the recreation area. Terrestrial lands within the recreation area consist mostly of lake shoreline and isolated campgrounds and historic sites adjacent to the lake. The NPS only manages 61% of the 630 miles of lake shoreline and only 58% of lake surface water. The Colville Confederated Tribes and the Spokane Tribe of Indians manage the majority of the remaining land and lake acreage (Lake Roosevelt Forum 2003). The Bureau of Reclamation manages Coulee Dam and reservoir operations, including water levels (Lake Roosevelt Forum 2003). Additional stakeholders in the management of Lake Roosevelt and its natural resources include the Bureau of Land Management, U.S. Forest Service, and adjacent county and city resource agencies. The nonprofit Lake Roosevelt Forum was recently organized to provide a common organization for all stakeholders to collaborate on common resource issues (Lake Roosevelt Forum 2003).

Lake Roosevelt ranges in depth from 400 feet above the dam to 14 feet at the northern border of the lake. The Columbia, Spokane, Colville, Kettle, and Sanpoil Rivers supply the lake. The southwestern portion of the recreation area is in the Columbia Plateau, which experiences a semi-arid climate and consists primarily of sagebrush steppe vegetation interspersed with agricultural lands. Thirty-year mean annual precipitation available from a weather station in the town of Coulee Dam is 11 inches (Western Regional Climate Center 2003). Thirty-year January and July mean temperatures from Coulee Dam are 26 and 72 degrees Fahrenheit, respectively (Western Regional Climate Center 2003). Thirty-year mean January and July maximum and minimum temperatures are 32 and 22 degrees and 86 and 58 degrees, respectively (Western Regional Climate Center 2003). The northeastern portion of the recreation area is in the Okanogan Highlands, which experiences a cooler and wetter climate and consists primarily of pine forest. Thirty-year mean annual precipitation available from a weather station in the town of Northport is 20 inches (Western Regional Climate Center 2003). Thirty-year January and July mean temperatures from Northport are 25 and 69 degrees Fahrenheit, respectively (Western Regional Climate Center 2003). Thirty-year mean January and July maximum and minimum temperatures are 32 and 21 and 86 and 51 degrees, respectively (Western Regional Climate Center 2003).

These two physiographic regions allow for a large diversity of flora and fauna to exist in the recreation area. The southwestern portion of the recreation area contains many areas with exposed layers of basalt and granite. The northeastern portion contains limestone cliffs, metamorphic rock, and Pleistocene sedimentary features. The ecosystems created along the lake perimeter vary extensively according to the climate and soils of the two physiographic regions. Semi-arid grasslands and sagebrush steppe, interspersed with irrigated agricultural land, dominate the landscape in the southern portion of the recreation area. Common shrub species include sagebrush (*Artemisa tridentata*), bitterbrush (*Purshia tridentata*), gray rabbitbrush (*Chrysothamnus nauseousus*), snowberry (*Gaultheria antipoda*)**,** greasewood (*Sarcobatus vermiculatus*)**,** and serviceberry (*Amelanchier alnifolia*). Perennial bunchgrasses include indian rice grass (*Oryzopsis hymenoides*), western needlegrass (*Stipa occidentalis*), and bluebunch wheatgrass (*Pseudoroegneria spicata*). Much of the native grasses and plants have been replaced by nonnative species such as cheatgrass (*Bromus tectorum*) and crested wheatgrass (*Agropyron cristatum*). The northern portion of the recreation area is forested and is dominated by ponderosa pine (*Pinus ponderosa*) and Douglas fir (*Pseudotsuga menziesii*). Along the lakeshore common species include alders (*Alnus spp.*), willows (*Salix spp.*), cottonwoods (*Populus spp.*), and chokecherry (*Prunus virginiana*). Extensive seasonal wetlands exist along the portions of the shoreline in the northern portion of the recreation area, especially along the Kettle River and the Kettle Falls campground. These wetlands are the result of the annual lake water level fluctuations and are dominated by the non-native canary reed-grass (*Phalaris arundinaceae*).

Methods

The methods utilized in the 2003 inventory generally follow those laid out in the Northern Semi-Arid Network (now the UCBN) Study Plan (Wright et al. unpublished) and published literature on inventory methodologies (i.e., Wilson et al. 1996). Universal Transverse Mercator (UTM) locations given in this report were collected using Garmin 12-channel Etrex hand-held GPS units (Garmin International, Inc, Olathe, KS, USA). Most x and y coordinates (Eastings and Northings) are accurate within 10 meters. Locations taken directly from USGS 7.5 minute topographic maps are accurate within approximately 125 meters. The North American Datum of 1927 (NAD 27) was used as the horizontal datum for all locations.

Scientific and common names used in this report follow the Integrated Taxonomic Information System (ITIS). The ITIS follows closely the American Ornithological Union's 7th edition of the checklist of North American birds and the USGS Biological Resource Division's unpublished and expanded update of the 1987 Checklist of Vertebrates of the United States, the U.S. Territories, and Canada (ITIS 2003).

LARO boundary was used as the primary outer limit of the inventory. However, many species that were observed near LARO were included. This flexibility in boundary was necessary because dispersal abilities of many of the species enable them to move on and off the recreation area. As well, because birds are so mobile, we have relied heavily on bird information collected outside the recreation area boundary but within the Lake Roosevelt area.

Expected Species

A variety of methods and materials were used to determine which species of birds, mammals, and herpetofauna were expected to occur in the recreation area. Expert opinion was used to critically examine published range maps and distribution literature from a variety of sources, historic park service reports and observations, and habitat types occurring in and adjacent to the recreation area. Range, elevation, habitat, and species detectability were considered and developed into a criteria set that was used to place species into "expected" and "possible but not expected" categories. Detectability was included in the consideration in order to address species that naturally occur in low abundances or are in some other way very difficult to confirm through established survey protocols. Species such as the Merriam's shrew (*Sorex merriami*) often require years of consistent trapping to document and these species were considered as "possible but not expected" in this inventory (Kirkland et al. 1997, Verts and Carraway 1998).

The primary sources used to determine the range, habitat, and elevation requirements of birds included the Peterson Field Guide to Western Birds (Peterson 1990), and the National Audubon Society Sibley Guide to the Birds (Sibley 2000). The primary sources used for mammals were the Mammals of Washington and Oregon (Eder 2002), Land Mammals of Oregon (Verts and Carraway 1998), Ground-dwelling squirrels of the Pacific Northwest (Sherman and Yensen 2003), and Opossums, Shrews and Moles of British Columbia (Nagorsen 1996). The primary sources for reptiles and amphibians include the Reptiles of the Northwest (St. John 2002), Amphibians of Oregon, Washington, and British Columbia (Corkran and Thoms 1996), and Amphibians of Washington and Oregon (Leonard and Storm 1993). Additional information came from wildlife observation cards collected from visitors and staff at the recreation area, past

Colville Christmas bird counts (Cline unpublished), the Sherman Creek Wildlife Area breeding bird survey (Base 2002), a U.S. Army Corps of Engineers inventory (U.S. Army Corps of Engineers 1976), and a variety of unpublished technical reports and species lists (i.e., Lindberg unpublished, Washington Water Power unpublished, and O'Malley unpublished). Dwight Morgan, a school teacher and naturalist from Kettle Falls also provided a large amount of important vertebrate observations made in and near the recreation area.

Sampling Site Selection

A subjective, non-random sampling site selection procedure was adopted for the 2003 inventory. This approach was determined to be the most efficient and effective given the primary objective of the inventory and the limited number of field personnel. Specific habitats and locations were identified and targeted for sampling in order to maximize the opportunities to encounter as many previously undocumented species as possible. While a majority of the inventory effort was concentrated near roads and trails due to logistical considerations, effort was made to periodically search more remote portions of LARO in order to ensure adequate dispersion of sampling locations. Seasonal changes in species presence or detectability were also an issue and required the gathering of reliable information from outside studies/surveys.

Visual Encounter Surveys

The visual encounter survey was the primary method used to inventory reptiles and amphibians, and was used extensively in the bird inventory during the 2003 field season. Visual encounter surveys were conducted by methodically searching target habitats. Cover turning was incorporated into the herpetological surveys. Surveys for birds involved the use of both visual and aural cues for documenting species presence. Weather was a significant factor in the herpetological surveys, and surveys were normally conducted during times and days when temperature, wind, and precipitation were optimal for reptile and amphibian activity. Incidental observations made of all vertebrates in or near the recreation area during travel and other inventory activities were included under the visual encounter category as well. Incidental observations contributed significantly to the overall success of the 2003 inventory and enabled participation from volunteers and NPS staff. Visual encounter data was made available to the inventory by outside natural resource professionals as well (i.e., Base 2002, Dwight Morgan pers. comm., Cline unpublished). Ancillary information recorded during visual encounter surveys included age, sex, time, location, habitat, and notes of interest.

Trapping

A variety of trapping techniques were used to inventory small mammals and bats and generally followed procedures outlined in Jones et al. (1996), Cooperrider et al. (1986), Kunz (1988), and the Northern Semi-Arid Network (now the UCBN) Study Plan (Wright et al. unpublished). Capture and handling procedures were consistent with those outlined by the Ad Hoc Committee on Acceptable Field Methods in Mammalogy (1987) and the University of Idaho Institutional Animal Care and Use Committee.

Small Mammals

The primary technique used for small mammals involved the use of Sherman live traps and Museum Special snap traps placed along 150-meter transects. Trap stations were established approximately every 15 meters and 1 live trap and 1 snap trap was placed at each station. Traps were set for three to five consecutive nights and placed within 2 meters of the transect center. The traps were placed non-randomly near microhabitat features and mammal sign in order to maximize capture success. Traps were baited with peanut butter, crimped oats, and black oil sunflower seeds.

Miscellaneous trapping techniques included the use of Havahart wire cage traps targeted for skunks and weasels, and Museum Special snap traps baited for shrews with liver paste and placed near water. Ancillary data collected with small mammal captures included time, date, location, weather, moon phase, topography, age, sex, and habitat.

Bats

One night of mist netting was conducted in the inventory and generally followed methods outlined in Kunz (1988). A 12-meter mist net designed specifically for bats (i.e., 38 mm mesh size with reduced bag) was placed over a wetland pond adjacent to the Kettle River on May 19, 2003. The net was opened at sunset and kept open until midnight. Several night roosting bats were captured by hand under the Highway 395 bridge over Lake Roosevelt in September 2002. Ancillary data collected with bat captures included time of capture, date, location, weather, time of sunset, moon phase, age, sex, reproductive condition, forearm length, and habitat.

Bat Acoustic Surveys

The *Anabat* bat detection system (Titley Electronics, Ballina, NSW, Ausralia; Corben Scientific, Rohnert Park, CA, USA) was used to record and analyze the ultrasonic calls emitted by bats during foraging and commuting. The *Anabat* system consisted of an *Anabat* II bat detector, type 6 standard Zero-Crossings Analysis Interface Module, an IBM-compatible laptop, *Anabat* 6 software, and Analook software. A 12-volt 100-watt handheld spotlight was used during recording sessions to illuminate flying bats and provide visual cues to aid in species identification. Species identification of free-flying bats was the primary application of *Anabat* in the inventory, although information on bat activity was also obtained from the use of *Anabat*. The *Anabat* system was used simultaneously during mist netting sessions and alone in locations where mist netting was impractical or likely to be unsuccessful. Ancillary information collected with *Anabat* recording included time and location. Voucher calls for each species encountered during the inventory can be found in Appendix B of this report.

Bird Playback Surveys

A CD player with a broadcasting device was used to call for owls in the recreation area. Surveys were conducted in April of 2003. These bird species are very secretive and can often be missed if playback techniques are not used. The songs and calls of the target species were obtained from the Peterson Guide to Western Bird Songs (Cornell Laboratory of Ornithology and Interactive Audio 1992). Owl playback surveys were conducted by hiking or driving along a route, such as a road, broadcasting calls, and listening for responses.

Species Documentation Methods

Species encountered during the inventory were documented using photography, collection of voucher specimens, voucher *Anabat* call files, and field observation records. The use of Museum Special snap traps resulted in the killing of some individuals of most species of small mammals. In addition to specimens and photographs, data sheets and field notes were kept on all inventory activities and species encountered. Photocopies have been made of all data sheets and field notes and are permanently housed with the Northern Semi-Arid Network (now the UCBN). The University of Washington Burke Museum of Natural History in Seattle, Washington curated voucher mammal specimens. Voucher calls for each bat species made during 2003 are located in Appendix B in this document.

Results

Historic Information

Three vertebrate surveys have been previously conducted in Lake Roosevelt National Recreation Area. The University of Washington conducted a study of wildlife and plant communities along the lake in 1973-1974 (O'Malley unpublished). In 1975-1976 the U.S. Army Corp of Engineers conducted an inventory along the Columbia River, including Lake Roosevelt, and in 1979 Washington Water Power completed an environmental impact statement that involved the collection of information on vertebrates along Lake Roosevelt (U.S. Army Corps of Engineers 1976, Washington Water Power unpublished). Much of the data found in these reports, as well as the historical sightings by LARO rangers and visitors, was used to determine historic presence of species. It is important to note, however, that these sources did not document species presence well and the rare or unusual species reported are not necessarily reliable. These sources also did not provide precise locations and dates of vertebrate observations. Two additional bird surveys were used in compiling information for this inventory. A breeding bird survey was conducted at Sherman Creek Wildlife Area during 1999-2002 (Base 2002). This wildlife area lies adjacent to the park in the northern region of the lake. Dana Base, associate wildlife biologist for the Washington Department of Fish and Wildlife, conducted the study and provided results. The second source included bird sightings made during the annual Colville Christmas bird count from 1998-2002 (Cline unpublished). The routes traveled during these counts include overlap with the northern portion of Lake Roosevelt. Jerry Cline compiled and published these results. Dwight Morgan, Kettle Falls school teacher and naturalist, also shared his vertebrate observations made during his many years of living and working in and near LARO.

Birds

Expected and Confirmed Species

A total of 183 bird species are currently expected to occur in or adjacent to the lake during a part or all of the year. A count of 182 species has been documented in LARO from University of Idaho inventory fieldwork in 2002-2003, observations reported by Dwight Morgan, the Colville Christmas bird counts, and the Sherman Creek Breeding Bird Survey. Two of these species were unexpected in the recreation area and a total of 180 (98%) of expected species are now confirmed. Table 1 (pg. 17) shows the list of expected and possible bird species and their confirmation status in LARO.

Mammals

Expected and Confirmed Species

A total of 47 species of mammals were expected to occur in or adjacent to the National Recreation Area. Forty-one species were documented by compiling data from University of Idaho inventory fieldwork in 2002-2003, observations reported by Dwight Morgan, and recent reliable observations made by LARO staff. Table 2 (pg. 23) shows a list of expected and possible mammal species and their status in the recreation area.

Mammal Trapping

Trapping effort for small and medium sized non-volant mammals totaled 1797 trap nights. Sherman live traps and Museum Special snap traps represent 95% of these trap nights and Havahart traps represent the remaining 5%. Total capture of non-volant mammals was 139 individuals. Deer mice (*Peromyscus maniculatus*) were the most abundant mammals captured, representing 67% of all captures. Table 3 (pg. 25) shows the location and trapping effort information and Table 4 (pg. 26) shows the results from the 2003 mammal trapping effort. Figure 2 (pg. 16) shows the location of transects and miscellaneous capture locations.

Bat Mist Netting

One mist net session was conducted during 2003. The session took place on May 19 across a wetland pond adjacent to the Kettle River, below the campground. Thirteen little brown myotis (*Myotis lucifugus*) were caught and were the only species caught that evening. Table 3 (pg. 25) and Figure 2 (pg. 16) shows the location of the mist netting session conducted along the Kettle River.

Bat Acoustic Survey Results

Anabat recording sessions were conducted in September of 2002. Over the two-day survey, 7 species were confirmed and 1 tentative identification made through recordings and visual cues. These sessions took place near the footbridge of the Kettle Falls Marina and the Hawk Creek inlet. Four species, the hoary bat (*Lasiurus cinereus*), the fringed myotis (*Myotis thysanodes)*, the long-eared myotis (*Myotis evotis*), and the California myotis (*Myotis californicus*) (tentative identification) were previously undocumented in LARO. The big brown bat (*Eptesicus fuscus*), the Yuma myotis (*Myotis yumanensis*), the little brown bat (*Myotis lucificus*), and the silver haired bat (*Lasionycteris noctivagans*) were also seen and recorded during these sessions.

Amphibians and Reptiles

Expected and Confirmed Species

A total of 12 species of reptiles and 6 amphibians were expected to occur in or adjacent to LARO. Ten species of reptiles and 6 species of amphibians were documented by compiling data from 2002-2003 inventory fieldwork, observations reported by Dwight Morgan, and reliable observations recorded by LARO staff and visitors. Table 5 (pg. 27) shows a list of expected and possible herpetofauna species and their status in LARO.

Discussion

Birds

LARO supports a rich diversity of bird life. This is due in part to the diverse vegetation and climatic conditions that occur along Lake Roosevelt. Another important feature of LARO is the lake itself, and the large number of waterfowl that have been documented in the recreation area indicates the importance of the lake as a migration and wintering resource. Several species of raptors are noteworthy in the Lake Roosevelt area. Peregrine falcons (*Falco peregrinus*) have been reintroduced and become reestablished in Banks Lake, south of Grand Coulee Dam. Nesting has also been documented along Lake Roosevelt itself and migrating falcons rely heavily on waterfowl in the lake. Although the merlin (*Falco columbarius*) is an unlikely breeder along Lake Roosevelt, this falcon also occurs during migration and post-breeding periods along the lake. Both the bald eagle (*Haliaeetus leucocephalus*) and the osprey (*Pandion haliaetus*) nest along the lake and exploit fish resources there. Another important group of birds present in the recreation area include the many species of woodpeckers and secondary cavity nesters such as nuthatches and the screech owl (*Otus kennicotti*). These birds rely on standing dead tree snags, a critical resource to many species of vertebrates. The recruitment of snags may be an important consideration in future LARO resource plans. The black crowned night heron (*Nycticorax nycticorax*) and ferruginous hawk (*Buteo regalis*) were not expected to occur in the recreation area due to range and habitat considerations (Peterson 1990, Sibley 2000) and are probably vagrants into the area.

Mammals

The 2003 inventory began with a good historical base of information. Having many of the larger and more easily identifiable species previously confirmed allowed more effort to be put toward finding the smaller, cryptic species. There were some important discoveries made during the 2003 inventory including the confirmation of many species that were previously undocumented in the park. The most exciting discovery was the presence of the water shrew (*Sorex palustris*). The 2003 inventory confirmed all of the expected species of shrews for the region. An unvouchered vagrant shrew (*Sorex vagrans*) was recorded during the University of Washington study in 1973-1974 but the 2003 inventory provided vouchered confirmation for the dusky shrew (*Sorex monticolus*), vagrant shrew, and the water shrew. Members of the family Soricidae are very small and difficult to study so these discoveries are important for understanding the ecology and future conservation of these secretive animals.

Bats are another group that were under represented in the historical records of the park. The 2003 inventory provided confirmation of four bat species that were previously undocumented. Two nights of *Anabat* surveys and one night of mist netting provided confirmation of seven species with one tentative confirmation of the California myotis (*Myotis californicus*). This identification is tentative because this species produces calls easily confused with those made by Yuma myotis. However, this bat was observed foraging in a manner more typical of California myotis and the call has a much steeper slope and very little break, or “knee”, than what the Yuma myotis typically produce (Gannon et al. 2001).

The discovery of the western jumping mouse (*Zapus princeps*) was also exciting. There was no previous documentation for this species in any park records. It was captured in a riparian willow grove adjacent to the Kettle River.

Finally, we consider the occasional sightings of black bear (*Ursus americanus*) and moose (*Alces alces*) in the recreation area as important and noteworthy.

Amphibians and Reptiles

Of the 18 species of reptiles and amphibians expected to occur in the Lake Roosevelt National Recreation Area, all but 2 species were confirmed. Many of these species were confirmed during the 2002-2003 fieldwork. The remainder of the confirmed species was accounted for by recent sightings. The two species without confirmation are the sagebrush lizard (*Sceloporus graciosus*), and the pigmy short-horned lizard *(Phrynosoma douglasi*). The sagebrush lizard, which is expected to occur in the sagebrush steppe habitat in the southern portion of LARO, may be difficult to find and can be confused with the western fence lizard (*Sceloporus occidentalis*). The pigmy short-horned lizard is also likely to occur in the steppe habitat in the southern portion of LARO. The pigmy short-horned lizard can be difficult to find, as it often spends a great deal of time buried under loose sand or soil (St. John 2002).

The confirmation of the western fence lizard was the first for the park. This individual was sunning on a rock along the Bunchgrass Prairie Trail near Spring Canyon campground. Another first confirmation for the park was the gopher snake (*Pituophis catenifer*) found during 2002 fieldwork. The western toad (*Bufo boreas*) was found north of the upper campground underneath a piece of corrugated plastic. This is an exciting discovery for the park because this species is thought to be declining in many parts of its range (Corkran and Thoms 1996). The northern region of the lake has many areas that act as intermittent wetlands when the water levels are low. These wetlands provide excellent breeding grounds for the Pacific tree frog (*Hyla regilla*). However, fluctuating spring lake levels may interfere with successful reproduction. Nighttime searches for spotted frogs (*Rana pretiosa*) along wetlands adjacent to the Kettle River and northern Lake Roosevelt were unsuccessful. This species apparently occurred in LARO as recently as the 1970's. Historic LARO staff observations report the species in 1977. The species has likely been extirpated in Lake Roosevelt due to increasing numbers of introduced gamefish and the bullfrog (*Rana catesbiana*) (Corkran and Thoms 1996, Ray Dashiell, LARO, pers. comm.).

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Figures

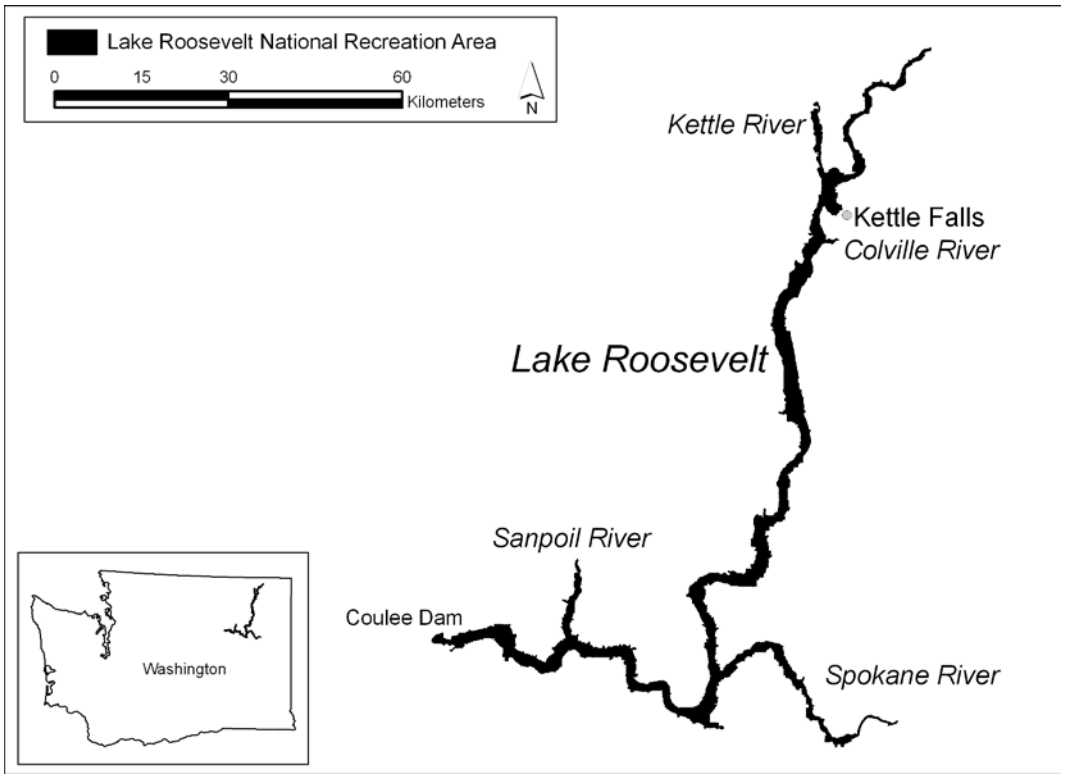

Figure 1. Boundary of Lake Roosevelt National Recreation Area.

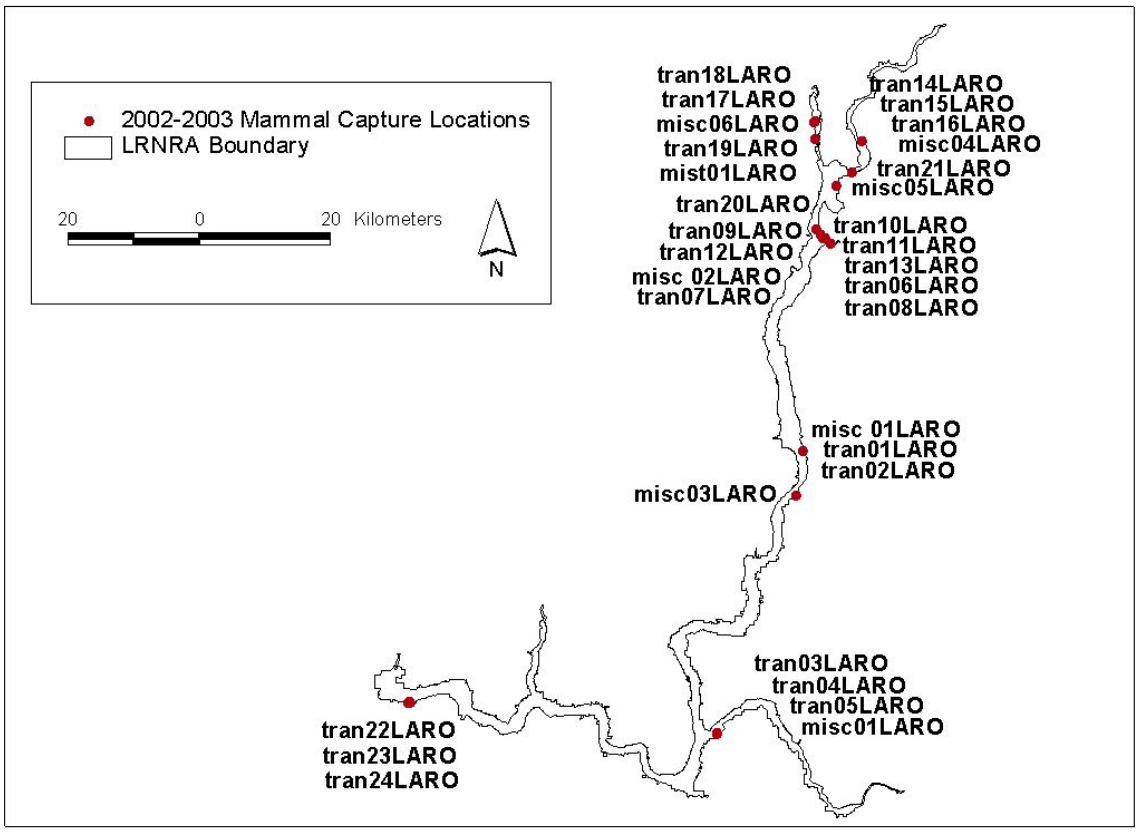

Figure 2. Mammal transect, mist net, and miscellaneous capture locations in Lake Roosevelt National Recreation Area.

Tables

Table 1. Expected and possible bird species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]							
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
common loon	1	1	1	0	1	1	1	1	0	0
horned grebe	1	1	1	0	1	1	1	1	0	1
eared grebe	1	0	1	0	0	1	0	0	0	0
western grebe	1	1	1	1	0	1	1	1	0	0
pied-billed grebe	1	1	0	0	0	1	1	1	0	1
American white pelican	1	1	1	0	0	0	1	0	0	0
double-crested cormorant	0	0	0	0	0	0	0	0	0	0
American bittern	0	0	0	0	0	0	0	0	0	0
great blue heron	1	1	1	1	1	1	1	1	1	1
great egret	0	0	0	0	0	0	0	0	0	0
snowy egret	0	0	0	0	0	0	0	0	0	0
black crowned night heron	0	1	0	0	0	0	1	0	0	0
white-faced ibis	0	0	0	0	0	0	0	0	0	0
turkey vulture	1	1	1	0	1	0	1	1	0	0
Canada goose	1	1	1	0	1	1	1	1	1	1
tundra swan	1	1	1	0	0	0	1	0	0	0
wood duck	1	1	0	0	1	0	1	1	0	0
gadwall	1	1	0	0	1	1	1	1	0	1
American widgeon	1	1	1	0	1	1	1	1	0	1
mallard	1	1	1	1	1	1	1	1	0	1
blue winged teal	1	1	0	0	1	1	1	1	0	0
cinnamon teal	1	1	0	0	1	0	1	1	0	0
northern shoveler	1	1	0	0	1	0	1	0	0	0
northern pintail	1	1	1	0	1	0	1	1	0	1
green winged teal	1	1	0	0	1	1	1	1	0	1
canvasback	1	1	0	0	0	0	1	0	0	0
redhead	1	1	0	0	0	0	1	1	0	0
ring-necked duck	1	1	1	1	1	0	1	1	0	1
lesser scaup	1	1	0	0	1	0	1	0	0	1
bufflehead	1	1	1	0	1	1	1	1	0	1
common goldeneye	1	1	0	0	1	0	1	1	0	1
hooded merganser	1	1	0	0	0	0	1	0	0	1
common merganser	1	1	1	0	1	1	1	1	0	1
red-breasted merganser	1	1	1	0	0	1	1	0	0	0
ruddy duck	1	1	0	0	0	0	1	0	0	0
osprey	1	1	1	0	1	1	1	1	1	0
bald eagle	1	1	0	0	1	1	1	1	1	1
northern harrier	1	1	1	0	0	0	1	0	0	1

Table 1. Expected and possible bird species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]							
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Sharp shinned hawk	1	1	0	1	0	0	1	1	0	1
Cooper's hawk	1	1	0	0	0	0	1	1	0	0
northern goshawk	1	1	0	0	0	0	1	1	1	0
Swainson's hawk	1	1	0	0	0	0	1	0	0	0
red tailed hawk	1	1	1	1	1	0	1	1	1	1
rough-legged hawk	1	1	1	0	0	0	1	0	0	1
ferruginous hawk	0	1	0	0	0	0	1	0	0	0
golden eagle	1	1	1	0	1	0	1	1	0	1
American kestrel	1	1	0	0	1	0	1	1	1	1
merlin	1	1	0	1	0	0	1	0	0	0
peregrine falcon	1	1	0	0	0	0	1	0	0	0
prairie falcon	1	1	0	0	0	0	1	0	0	0
chukar	1	1	1	0	0	0	1	0	0	1
gray partridge	1	1	1	0	0	0	1	0	0	0
ring necked pheasant	1	1	1	0	1	0	1	1	1	1
blue grouse	1	1	0	0	0	0	1	0	0	0
ruffed grouse	1	1	1	0	1	1	1	1	0	1
wild turkey	1	1	1	0	1	0	1	1	1	1
California quail	1	1	1	1	1	0	1	1	1	1
Virginia rail	1	0	0	0	0	0	0	0	0	0
sora	1	0	0	0	0	0	0	1	0	0
American coot	1	1	1	1	0	1	1	1	0	0
sandhill crane	1	1	0	0	0	0	1	0	0	0
semipalmated plover	1	1	0	0	0	0	1	0	0	0
killdeer	1	1	1	1	1	0	1	1	1	1
American avocet	0	0	0	0	0	0	0	0	0	0
spotted sandpiper	1	1	1	0	1	0	1	1	0	0
long-billed curlew	1	1	0	0	0	0	1	0	0	0
common snipe	1	1	0	0	0	0	1	1	0	1
Wilson's phalarope	1	1	0	0	0	0	1	1	0	0
ring-billed gull	1	1	1	1	1	0	1	1	1	1
California gull	1	1	1	0	1	0	1	1	0	1
herring gull	1	1	0	0	0	0	1	0	0	1
black tern	1	0	0	0	0	0	0	0	0	0
rock dove	1	1	1	0	1	0	1	1	0	1
mourning dove	1	1	1	1	1	1	1	1	1	1
flammulated owl	0	0	0	0	0	0	0	0	0	0
western screech owl	1	1	0	0	1	0	1	0	0	0
great horned owl	1	1	1	1	1	0	1	1	0	1
northern pygmy owl	1	1	0	0	0	0	1	1	0	0
barred owl	1	1	0	0	0	0	1	0	0	0

Table 1. Expected and possible bird species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]							
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
long eared owl	1	1	0	0	0	0	1	0	0	0
short eared owl	1	1	0	0	0	0	1	0	0	0
northern saw whet owl	1	1	0	0	0	0	1	0	0	1
common nighthawk	1	1	0	0	0	1	1	1	0	0
common poorwill	1	1	0	0	0	0	1	0	0	0
Vaux's swift	1	1	0	0	0	0	1	0	0	0
white throated swift	1	1	1	0	0	0	1	0	0	0
black chinned hummingbird	1	1	0	0	1	0	1	1		0
calliope hummingbird	1	1	1	0	1	0	1	1	1	0
rufous hummingbird	1	1	1	0	1	0	1	0	1	0
belted kingfisher	1	1	0	0	1	1	1	1	1	1
Lewis's woodpecker	1	1	1	0	0	0	0	1	1	0
Williamsons's sapsucker	0	0	0	0	0	0	0	0	0	0
red naped sapsucker	1	1	0	1	1	0	1	1	1	0
downy woodpecker	1	1	1	0	1	0	1	1	0	1
hairy woodpecker	1	1	1	1	1	1	1	1	1	1
white-headed woodpecker	1	1	1	0	0	0	1	1	0	0
three-toed woodpecker	0	0	0	0	0	0	0	0	0	0
black-backed woodpecker	0	0	0	0	0	0	0	0	0	0
northern flicker	1	1	1	1	1	1	1	1	1	1
pileated woodpecker	1	1	0	0	0	0	1	1	1	1
olive sided flycatcher	1	1	0	0	0	0	1	0	0	0
western wood pewee	1	1	1	0	0	1	1	1	1	0
willow flycatcher	1	1	0	0	0	0	0	0	1	0
Hammond's flycatcher	1	1	0	0	0	0	0	0	1	0
dusky flycatcher	1	1	0	0	0	1	0	1	1	0
gray flycatcher	0	0	0	0	0	0	0	0	0	0
Say's phoebe	1	1	1	0	0	0	0	1	1	0
eastern kingbird	1	1	1	0	0	0	1	1	1	0
western kingbird	1	1	1	0	0	0	1	1	1	0
loggerhead shrike	1	0	0	0	0	0	0	0	0	0
northern shrike	1	1	0	0	0	0	1	0	0	0
Cassin's vireo	1	0	0	0	0	0	0	0	0	0
warbling vireo	1	1	0	0	0	0	1	1	1	0
Red-eyed Vireo	1	1	0	0	0	1	1	1	0	0
gray jay	1	1	0	0	0	0	1	0	1	0
Steller's jay	1	1	0	0	0	0	1	1	0	1
Clark's nutcracker	1	1	1	0	0	1	1	1	1	1
black-billed magpie	1	1	1	0	1	1	1	1	1	1
American crow	1	1	0	1	1	0	1	1	1	1
common raven	1	1	1	1	1	1	1	1	1	1

Table 1. Expected and possible bird species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]							
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
horned lark	1	1	0	0	0	0	1	0	0	0
tree swallow	1	1	0	0	1	0	1	1	1	0
violet green swallow	1	1	1	0	1	0	1	1	1	0
northern rough winged swallow	1	1	1	0	0	0	1	1	1	0
bank swallow	1	1	0	0	1	0	1	1	1	0
cliff swallow	1	1	1	0	0	0	1	1	1	0
barn swallow	1	1	0	0	0	0	1	1	1	0
black capped chickadee	1	1	1	0	1	1	1	1	1	1
mountain chickadee	1	1	1	1	1	1	1	1	1	1
red breasted nuthatch	1	1	0	1	1	1	1	1	1	1
white breasted nuthatch	1	1	0	0	1	1	1	1	1	1
pygmy nuthatch	1	1	1	1	1	0	1	1	1	1
brown creeper	1	1	0	0	0	0	1	1	1	1
rock wren	1	1	1	0	0	0	1	1	0	0
canyon wren	1	1	1	0	0	0	1	0	0	0
house wren	1	1	1	0	0	0	1	0	0	0
winter wren	1	1	0	0	0	1	1	1	0	1
marsh wren	1	1	0	0	0	0	1	1	0	0
American dipper	1	1	0	0	0	0	0	1	0	1
golden crowned kinglet	1	1	0	0	0	1	1	1	1	1
ruby crowned kinglet	1	1	0	0	0	1	1	1	0	0
western bluebird	1	1	0	1	0	0	1	1	0	1
mountain bluebird	1	1	0	0	0	1	1	1	0	0
veery	1	1	0	0	0	0	1	0	0	0
Townsend's solitaire	1	1	1	0	0	0	1	1	0	1
Swainson's thrush	1	1	0	0	0	0	1	1	1	0
hermit thrush	1	1	0	0	0	0	1	0	0	0
American robin	1	1	1	1	0	1	1	1	1	1
varied thrush	1	1	0	0	0	1	1	0	0	1
gray catbird	1	1	0	0	0	1	0	1	1	0
northern mockingbird	0	0	0	0	0	0	0	0	0	0
sage thrasher	1	1	1	0	0	0	1	0	0	0
European starling	1	1	1	1	1	1	1	0	1	1
Bohemian waxwing	1	1	0	0	0	0	1	0	0	1
cedar waxwing	1	1	0	1	0	0	1	1	1	1
orange crowned warbler	1	1	0	0	0	0	1	0	1	0
Nashville warbler	1	1	1	0	0	0	1	1	1	0
yellow warbler	1	1	1	0	0	1	1	1	1	0
yellow rumped warbler	1	1	1	0	0	1	1	1	1	0
Townsend's warbler	1	1	0	0	0	0	1	0	1	0
black throated gray warbler	1	1	0	0	0	0	1	0	0	0

Table 1. Expected and possible bird species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]							
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
American redstart	1	0	0	0	0	0	0	1	0	0
Macgillivray's warbler	1	1	0	0	0	1	1	1	1	0
common yellowthroat	1	1	0	0	0	0	1	0	0	0
Wilson's warbler	1	1	0	0	0	0	1	0	0	0
yellow breasted chat	1	1	1	0	0	0	1	0	0	0
western tanager	1	1	0	0	0	1	1	1	1	0
spotted towhee	1	1	1	1	1	0	1	1	1	0
chipping sparrow	1	1	1	0	0	1	1	1	1	0
Brewer's sparrow	1	1	0	0	0	0	1	0	0	0
American tree sparrow	1	1	0	0	0	0	1	0	0	0
vesper sparrow	1	1	0	0	1	0	1	0	1	0
lark sparrow	*1*	1	1	0	0	0	1	1	0	0
savannah sparrow	1	1	1	0	0	0	1	1	1	0
fox sparrow	1	1	0	0	0	0	1	1	0	0
song sparrow	1	1	1	1	1	1	1	1	0	0
Lincoln's sparrow	1	1	0	0	0	0	1	0	0	0
golden-crowned sparrow	0	0	0	0	0	0	0	0	0	0
white crowned sparrow	1	1	1	1	1	1	1	1	0	1
dark eyed junco	1	1	1	0	1	1	1	1	1	1
Lapland longspur	1	1	0	0	0	0	1	0	0	0
snow bunting	1	1	0	0	0	0	1	0	0	0
black headed grosbeak	1	1	0	0	0	1	1	1	1	0
Lazuli bunting	1	1	1	0	0	1	1	1	1	0
bobolink	1	1	0	0	0	0	1	0	0	0
red winged blackbird	1	1	1	0	1	1	1	1	1	1
western meadowlark	1	1	1	0	1	0	1	1	1	0
yellow headed blackbird	0	0	0	0	0	0	0	1	0	0
Brewer's blackbird	1	1	1	1	1	0	1	1	1	1
brown headed cowbird	1	1	1	1	0	1	1	1	1	0
Bullock's oriole	1	1	1	0	0	1	1	1	1	0
grey-crowned rosy finch	1	1	0	0	0	0	1	0	0	0
purple finch	0	0	0	0	0	0	0	1	0	1
Cassin's finch	1	1	1	0	0	0	1	1	1	1
house finch	1	1	0	0	1	0	1	1	1	1
red crossbill	1	1	1	1	0	1	1	1	0	1
common redpoll	1	1	0	0	0	0	1	0	1	1
pine siskin	1	1	1	1	1	0	1	1	1	1
American goldfinch	1	1	1	0	0	0	1	0	1	1
evening grosbeak	1	1	0	0	0	0	1	1	1	1
house sparrow	1	1	0	0	1	0	1	0	0	1

Table 1. Expected and possible bird species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]							
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Total	**184**	**179**								
Total % Confirmed[b]		**0.96**								

[a] A=U.S. Army Corps of Engineers 1976, B=2002 Field work, C=2003 Field work, D=Washington Water Power unpublished (1979), E=Dwight Morgan personal communication, F=UW 1973-1974, Lindbergh Unpublished (1977), G=Base 2002 (Sherman Creek Breeding Bird Survey 1999-2002), H=Cline unpublished (Colville Christmas Bird Count 1998-2002)

[b] Percentage calculated without 2 confirmed unexpected species, which total 177 species of confirmed expected species.

Table 2. Expected and possible mammal species in and adjacent to Lake Roosevelt National Recreation Area.

			Sources[a]					
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**
Merriam's shrew	0	0	0	0	0	0	0	0
water shrew	1	1	0	0	1	0	0	0
vagrant shrew	1	1	0	0	1	1	0	1
dusky shrew	1	1	0	0	1	0	0	0
California myotis	1	Tentative	0	Tentative	0	0	0	0
western small footed myotis	0	0	0	0	0	0	0	0
long eared myotis	1	1	0	1	0	0	0	0
little brown myotis	1	1	1	1	1	0	0	0
fringed myotis	1	1	0	1	0	0	0	0
long legged myotis	1	0	0	0	0	0	0	1
Yuma myotis	1	1	0	1	1	0	0	1
hoary bat	1	1	0	1	0	0	0	0
silver haired bat	1	1	0	1	0	1	0	1
big brown bat	1	1	1	1	1	1	0	1
spotted bat	0	0	0	0	0	0	0	0
Townsend's big eared bat	1	0	0	0	0	0	0	1
pallid bat	0	0	0	0	0	0	0	0
mountain cottontail	1	1	1	0	1	1	0	1
whitetailed jackrabbit	0	0	0	0	0	0	0	0
snowshoe hare	0	0	0	0	0	0	0	0
least chipmunk	1	0	0	0	0	0	0	1
yellow-pine chipmunk	1	1	1	0	1	1	0	1
redtail chipmunk	0	0	0	0	0	0	0	0
yellow bellied marmot	1	1	0	0	1	0	1	1
woodchuck	0	0	0	0	0	0	0	0
Columbian ground squirrel	1	1	1	0	1	0	1	1
western gray squirrel	0	0	0	0	0	0	0	0
red squirrel	1	1	0	1	1	1	1	1
northern flying squirrel	1	1	0	0	0	0	1	0
northern pocket gopher	1	1	1	0	0	1	1	1
great basin pocket mouse	1	1	1	0	1	0	0	0
beaver	1	1	1	0	1	0	1	1
western harvest mouse	1	0	1	0	0	0	0	0
deer mouse	1	1	1	0	1	1	1	1
northern grasshopper mouse	0	0	0	0	0	0	0	0
bushy tailed woodrat	1	1	0	0	1	0	0	0
southern redback vole	0	0	0	0	0	0	0	0
house mouse	1	1	0	0	0	0	0	1
Norway rat	0	0	0	0	0	0	0	0
long tailed vole	1	1	0	0	1	1	0	0
meadow vole	0	0	0	0	0	1	0	1

Table 2. Expected and possible mammal species in and adjacent to Lake Roosevelt National Recreation Area (continued).

			Sources[a]					
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**
montane vole	1	0	0	0	1	0	0	0
sagerush vole	0	0	0	0	0	0	0	0
muskrat	1	1	0	0	1	0	0	1
western jumping mouse	1	1	0	0	1	0	0	0
porcupine	1	1	1	0	1	1	1	1
coyote	1	1	1	0	1	1	1	1
red fox	0	0	0	0	0	0	0	0
raccoon	1	1	1	0	1	1	1	1
long tailed weasel	1	1	0	0	0	0	1	1
ermine	1	1	0	0	0	0	1	0
mink	1	1	0	0	0	1	1	1
badger	1	1	1	0	0	0	1	1
otter	1	1	0	0	1	1	1	1
western spotted skunk	0	0	0	0	0	0	0	0
striped skunk	1	1	0	1	1	0	1	1
cougar	1	1	0	0	0	0	1	0
bobcat	1	1	1	0	0	0	1	1
black bear	1	1	0	0	0	0	1	1
elk	1	1	0	0	0	0	1	1
mule deer	1	1	1	0	1	1	1	1
whitetail deer	1	1	1	0	1	0	1	1
moose	1	1	0	0	0	0	1	1
pronghorn	0	0	0	0	0	0	0	0
Total	**47**	**41**						
% Confirmed		**0.87**						

[a] A=U.S. Army Corps of Engineers 1976, B=2002 Field work, C=2003 Field work, D=Washington Water Power unpublished (1979) E=Dwight Morgan personal communication, F= O'Malley unpublished (1973-1974), Lindbergh unpublished (1977), Current (2000-2003) LARO observations.

Table 3. Location, date, and trap nights for mammal capture efforts made during 2002 and 2003 inventory fieldwork in Lake Roosevelt National Recreation Area.

Transect	Date	UTM X	UTM Y	Legal Description	Trap Nights	Trap Type
misc 01LARO	4/14/03	415204	5348871	T32N.R39E. Sec 10	4	Havahart
misc01LARO	4/14/03	402196	5305999	T28N.R36E. Sec 29	4	Havahart
misc01LARO	4/14/03			Variable	18	Havahart
tran01LARO	4/14/03	415204	5348871	T32N.R37E. Sec 10	60	Sherman/Snap
tran02LARO	4/14/03	415222	5348876	T32N.R37E. Sec 10	45	Sherman/Snap
tran03LARO	4/16/03	402196	5305999	T28N.R36E. Sec 29	40	Sherman/Snap
tran04LARO	4/16/03	402176	5306020	T28N.R36E. Sec 29	40	Sherman/Snap
tran05LARO	4/14/03	402241	5305806	T28N.R36E. Sec 29	76	Sherman/Snap
misc 02LARO	4/18/03	419486	5380375	T36N.R37E. Sec 30	12	Havahart
tran06LARO	4/18/03	419486	5380375	T36N.R37E. Sec 30	80	Sherman/Snap
tran07LARO	4/18/03	419486	5380375	T36N.R37E. Sec 30	56	Sherman/Snap
tran08LARO	4/18/03	419486	5380375	T36N.R37E. Sec 30	40	Sherman/Snap
misc03LARO	4/18/03	414165	5341984	T32N.R37E. Sec 10	70	Snap
tran09LARO	4/19/03	418034	5381656	T36N.R36E. Sec 26	60	Sherman/Snap
tran10LARO	4/19/03	417895	5381672	T36N.R36E. Sec 26	60	Sherman/Snap
tran11LARO	4/22/03	418262	5381210	T36N.R36E. Sec 35	60	Sherman/Snap
tran12LARO	4/22/03	418414	5381144	T36N.R37E. Sec 35	66	Sherman/Snap
tran13LARO	4/22/03	418636	5381079	T36N.R36E. Sec 35	54	Sherman/Snap
tran14LARO	4/27/03	424278	5395852	T37N.R38E. Sec 16	100	Sherman/Snap
tran15LARO	4/27/03	424305	5395963	T37N.R38E. Sec 16	100	Sherman/Snap
tran16LARO	4/27/03	424158	5395923	T37N.R38E. Sec 16	100	Sherman/Snap
misc04LARO	4/27/03	424278	5395852	T37N.R38E. Sec 16	25	Sherman/Snap
misc05LARO	4/27/03	420266	5389149	T37N.R38E. Sec 6	25	Snap
tran17LARO	5/5/03	417043	5398884	T37N.R37E. Sec 4	100	Sherman/Snap
tran18LARO	5/5/03	416929	5398819	T37N.R37E. Sec 4	100	Sherman/Snap
misc06LARO	5/5/03	417043	5398884	T37N.R37E. Sec 4	10	Havahart
misc06LARO	5/6/03	417107	5396189	T37N.R37E. Sec 9	10	Havahart
tran19LARO	5/5/03	417108	5396190	T37N.R37E. Sec 9	57	Sherman/Snap
tran20LARO	5/7/03	417228	5382587	T36N.R38E. Sec 26	51	Sherman/Snap
tran21LARO	5/7/03	422748	5391154	T28N.R30E. Sec 17	72	Sherman/Snap
tran22LARO	5/14/03	355229	5310453	T28N.R30E. Sec 17	30	Sherman/Snap
tran23LARO	5/14/03	355536	5310609	T28N.R30E. Sec 16	60	Sherman/Snap
tran24LARO	5/14/03	355544	5310540	T28N.R30E. Sec 16	40	Sherman/Snap
tran25LARO	5/14/03	355455	5310412	T28N.R30E. Sec 17	60	Sherman/Snap
misc07LARO	5/14/03			Variable	12	Havahart
mist01LARO	5/19/03	417108	5396190	T37N.R37E. Sec. 9	-	Mist Net
Total					**1797**	

Table 4. Capture results from mammal trapping efforts made during 2003 inventory fieldwork in Lake Roosevelt National Recreation Area.

	Species[a]											
Transect	**SOPA**	**SOVA**	**SOMO**	**TAAM**	**PEPA**	**PEMA**	**NECI**	**MILO**	**MIMO**	**ZAPR**	**MEME**	**TOTAL**
misc 01LARO							1				1	**2**
tran01LARO				7		4						**11**
tran02LARO				5		3						**8**
tran03LARO				1		8						**9**
tran04LARO						11						**11**
tran05LARO				1		4						**5**
misc02LARO												**0**
tran06LARO						1						**1**
tran07LARO						1						**1**
tran08LARO												**0**
misc03LARO		1				2		1				**4**
tran09LARO						2						**2**
tran10LARO												**0**
tran11LARO												**0**
tran12LARO												**0**
tran13LARO						2						**2**
tran14LARO						12						**12**
tran15LARO			1			14			1			**16**
tran16LARO						3						**3**
misc04LARO												**0**
misc05LARO						1						**1**
tran17LARO			5			4						**9**
tran18LARO	1		2			2			4	2		**11**
misc06LARO												**0**
tran19LARO						2						**2**
tran20LARO									4			**4**
tran21LARO						2						**2**
tran22LARO						6						**6**
tran23LARO					3	4						**7**
tran24LARO					3	3						**6**
tran25LARO					2	2						**4**
misc07LARO												**0**
TOTAL	**1**	**1**	**8**	**14**	**8**	**93**	**1**	**1**	**9**	**2**	**1**	**139**
Relative Abundance	**0.01**	**0.01**	**0.06**	**0.10**	**0.06**	**0.67**	**0.01**	**0.01**	**0.06**	**0.01**	**0.01**	

[a] SOPA *Sorex palustris* PEPA *Perognathus parvus* ZAPR *Zapus princeps*
SOVA *Sorex vagrans* PEMA *Peromyscus maniculatus* MEME *Mephitis*
SOMO *Sorex monticolus* NECI *Neotoma cinereal mephitis*
TAAM *Tamias amoenus* MILO *Microtus longicaudus* MIMO *Microtus montanus*

Table 5. Expected and possible reptile and amphibian species in Lake Roosevelt National Recreation Area.

			Source[a]					
Common Name	**Expected**	**Confirmed**	**A**	**B**	**C**	**D**	**E**	**F**
Reptiles								
painted turtle	1	1	0	0	0	1	0	1
western fence lizard	1	1	0	0	1	0	0	0
sagebrush lizard	1	0	0	0	0	0	0	0
western skink	1	1	1	0	1	1	0	0
northern alligator lizard	0	0	0	0	0	0	0	0
pigmy short-horned lizard	1	0	0	0	0	0	0	0
common garter snake	1	1	0	1	0	0	0	0
western terrestrial garter snake	1	1	0	0	1	1	0	1
western rattlesnake	1	1	1	0	0	1	0	1
racer	1	1	1	0	1	1	0	0
gopher snake	1	1	0	1	0	0	0	0
night snake	1	1	0	0	0	0	0	1
rubber boa	1	1	0	0	0	1	1	1
Total Reptiles	**12**	**10**						
Amphibians								
tiger salamander	1	1	0	0	0	0	1	0
long-toed salamander	1	1	0	0	1	1	1	0
Great Basin spadefoot toad	1	1	0	0	0	1	0	1
western toad	1	1	0	0	1	1	0	0
Pacific tree frog	1	1	0	0	1	1	0	0
Columbia spotted frog	0	0	0	0	0	1	0	0
northern leopard frog	0	0	0	0	0	0	0	0
bullfrog	1	1	0	0	1	0	0	0
Total Amphibians	**6**	**6**						
Total Herps	**18**	**16**						
Total % Confirmed		**0.89**						

[a] A=U.S. Army Corp of Engineers 1976, B=2002 Field Work, C=2003 Field Work, D=O'Malley unpublished (1973-1974), Lidbergh unpublished (1977),
E=Dwight Morgan personal communication, F=LARO Wildlife Observation Cards

Appendix A. Species Account

This section lists each expected and unexpected but possible species for Lake Roosevelt National Recreation Area. Species names are followed by a series of codes based on those in use by the National Park Service NPSpecies database. The first code indicates park status, the second code indicates species abundance, and the third code indicates species residency. The information presented here is based on the results assembled during the 2003 inventory results. Abundance is not based on comprehensive population estimates. A key to the codes used after the species names is located on the following page.

NPSpecies Codes

LARO Status

- **(P) Present:**
  Species occurrence in LARO is documented and assumed to be extant.
- **(H) Historic:**
  Species historical occurrence in LAROis documented, but recent investigations indicate that the species is now probably absent.
- **(PP) Probably Present:**
  LARO is within species range and contains appropriate habitat. Documented occurrences of the species in the adjoining region of LARO give reason to suspect that it probably occurs within LARO. The degree of probability may vary within this category, including species that range from common to rare.
- **(E) Encroaching**
  The species is not documented in LARO, but is documented as being adjacent to LARO and has potential to occur in LARO.
- **(U) Unexpected:**
  Included for LARO based on weak (unconfirmed) record or no evidence, giving minimal indication of the species occurrence in LARO.
- **(FR) False Report:**
  Species previously reported to occur within LARO, but current evidence indicates that the report was based on a misidentification, a taxonomic concept no longer accepted, or some other similar problem of interpretation.

Species Abundance

- **(A) Abundant:**
  Animals: May be seen daily, in suitable habitat and season, and counted in relatively large numbers.
  Plants: Large number of individuals; wide ecological amplitude or occurring in habitats covering a large portion of LARO.
- **(C) Common:**
  Animals: May be seen daily, in suitable habitat and season, but not in large numbers.
  Plants: Large numbers of individuals predictably occurring in commonly encountered habitats but not those covering a large portion of LARO.
- **(U) Uncommon:**
  Animals: Likely to be seen monthly in appropriate season/habitat. May be locally common.
  Plants: Few to moderate numbers of individuals; occurring either sporadically in commonly encountered habitats or in uncommon habitats.
- **(R) Rare:**
  Animals: Present, but usually seen only a few times each year.
  Plants: Few individuals, usually restricted to small areas of rare habitat.
- **(O) Occasional:**
  Occurs in LARO at least once every few years, but not necessarily every year. Applicable to animals only.
- **(UNK) Unknown:**
  Abundance unknown.

Residency

- **(B) Breeder:**
  Population reproduces in LARO.
- **(R) Resident:**
  A significant population is maintained in LARO for more than two months each year, but it is not known to breed there.
- **(M) Migratory:**
  Migratory species that occurs in LARO approximately two months or less each year and does not breed there.
- **(V) Vagrant:**
  LARO is outside of the species usual range.
- **(UNK) Unknown:**
  Residency status in LARO is unknown.

Birds

Common name	Scientific Name	Status	Abund.	Resid.
common loon	*Gavia immer*	Present	U	UNK
horned grebe	*Podiceps auritus*	Present	U	UNK
eared grebe	*Podiceps nigricollis*	Probably Present		
western grebe	*Aechmophorus occidentalis*	Present	C	B
pied-billed grebe	*Podilymbus podiceps*	Present	U	B
American white pelican	*Pelecanus erythrorhynchos*	Present	R	UNK
double-crested cormorant	*Phalacrocorax auritus*	Unexpected		
American bittern	*Botaurus lentiginosus*	Unexpected		
great blue heron	*Ardea herodias*	Present	C	B
great egret	*Ardea alba*	Unexpected		
snowy egret	*Egretta thula*	Unexpected		
black crowned night heron	*Nycticorax nycticorax*	Present	UNK	UNK
white-faced ibis	*Plegadis chihi*	Unexpected		
turkey vulture	*Cathartes aura*	Present	C	B
Canada goose	*Branta canadensis*	Present	A	B
tundra swan	*Cygnus columbianus*	Present	U	M
wood duck	*Aix sponsa*	Present	C	B
gadwall	*Anas strepera*	Present	C	B
American widgeon	*Anas americana*	Present	C	B
mallard	*Anas platyrhynchos*	Present	A	B
blue-winged teal	*Anas discors*	Present	C	B
cinnamon teal	*Anas cyanoptera*	Present	C	B
northern shoveler	*Anas clypeata*	Present	C	B
northern pintail	*Anas acuta*	Present	C	B
green-winged teal	*Anas crecca*	Present	U	B
canvasback	*Aythya valisineria*	Present	C	B
redhead	*Aythya americana*	Present	U	UNK
ring-necked duck	*Aythya collaris*	Present	C	UNK
lesser scaup	*Aythya affinis*	Present	C	UNK
bufflehead	*Bucephala albeola*	Present	C	R
common goldeneye	*Bucephala clangula*	Present	C	R
hooded merganser	*Lophodytes cucullatus*	Present	U	UNK
common merganser	*Mergus merganser*	Present	U	R
red-breasted merganser	*Mergus serrator*	Present	U	R
ruddy duck	*Oxyura jamaicensis*	Present	U	R
osprey	*Pandion haliaetus*	Present	U	B
bald eagle	*Haliaeetus leucocephalus*	Present	U	B
northern harrier	*Circus cyaneus*	Present	U	B
sharp-shinned hawk	*Accipiter striatus*	Present	U	B
Cooper's hawk	*Accipiter cooperii*	Present	U	B
northern goshawk	*Accipiter gentilis*	Present	R	R
Swainson's hawk	*Buteo swainsoni*	Present	R	UNK
red-tailed hawk	*Buteo jamaicensis*	Present	C	B
rough-legged hawk	*Buteo lagopus*	Present	U	R
ferruginous hawk	*Buteo regalis*	Present	R	UNK
golden eagle	*Aquila chrysaetos*	Present	R	UNK
American kestrel	*Falco sparverius*	Present	C	B

Common name	Scientific Name	Status	Abund.	Resid.
merlin	*Falco columbarius*	Present	R	M
Peregrine falcon	*Falco peregrinus*	Present	R	B
prairie falcon	*Falco mexicanus*	Present	R	B
chukar	*Alectoris chukar*	Present	U	B
gray partridge	*Perdix perdix*	Present	U	B
ring-necked pheasant	*Phasianus colchicus*	Present	C	B
blue grouse	*Dendragapus obscures*	Present	R	UNK
ruffed grouse	*Bonasa unbellus*	Present	U	B
wild turkey	*Meleagris gallopavo*	Present	C	B
California quail	*Callipepla californica*	Present	A	B
Virginia rail	*Rallus limicola*	Present	UNK	UNK
sora	*Porzana carolina*	Present	UNK	UNK
American coot	*Fulica americana*	Present	C	B
sandhill crane	*Grus canadensis*	Present	UNK	UNK
semipalmated plover	*Charadrius semipalmatus*	Present	R	M
killdeer	*Charadrius vociferous*	Present	C	B
American avocet	*Recurvitrostra americana*	Unexpected		
spotted sandpiper	*Actitis macularia*	Present	U	B
long billed curlew	*Numenius americanus*	Present	R	UNK
common snipe	*Gallinago gallinago*	Present	U	UNK
Wilson's phalarope	*Phalaropus tricolor*	Present	U	M
ring-billed gull	*Larus delawarensis*	Present	C	B
California gull	*Larus californicus*	Present	C	B
herring gull	*Larus argentatus*	Present	U	R
black tern	*Chlidonias niger*	Probably Present		
rock dove	*Columba livia*	Present	C	B
mourning dove	*Zenaida macroura*	Present	C	B
flammulated owl	*Otus flammeolus*	Unexpected		
western screech owl	*Otus kennicottii*	Present	U	B
great-horned owl	*Bubo virginianus*	Present	U	B
northern pygmy owl	*Glaucidium gnoma*	Present	R	B
barred owl	*Strix varia*	Present	R	UNK
long-eared owl	*Asio otus*	Present	R	UNK
short-eared owl	*Asio flammeus*	Present	R	UNK
northern saw whet owl	*Aegolius acadicus*	Present	R	UNK
common nighthawk	*Chordeiles minor*	Present	UNK	B
common poorwill	*Phalaenoptilus nuttallii*	Present	UNK	UNK
Vaux's swift	*Chaetura vauxi*	Present	UNK	UNK
white-throated swift	*Aeronautes saxatalis*	Present	UNK	UNK
black-chinned hummingbird	*Archilochus alexandri*	Present	C	B
Calliope hummingbird	*Stellula calliope*	Present	U	B
rufous hummingbird	*Selasphorous rufus*	Present	C	B
belted kingfisher	*Ceryle alcyon*	Present	C	B
Lewis's woodpecker	*Melanerpes lewis*	Present	U	UNK
Williamson's sapsucker	*Sphyrapicus thyroideus*	Unexpected		
red-naped sapsucker	*Sphyrapicus nuchalis*	Present	U	B
downy woodpecker	*Picoides pubescens*	Present	C	B
hairy woodpecker	*Picoides villosus*	Present	C	B

Common name	Scientific Name	Status	Abund.	Resid.
white-headed woodpecker	*Picoides albolarvatus*	Present	U	UNK
three-toed woodpecker	*Picoides tridactylus*	Unexpected		
black-backed woodpecker	*Picoides arcticus*	Unexpected		
northern flicker	*Colaptes auratus*	Present	C	B
pileated woodpecker	*Dryocopus pileatus*	Present	U	B
olive-sided flycatcher	*Contopus cooperi*	Present	UNK	UNK
western wood pewee	*Contopus sordidulus*	Present	C	B
willow flycatcher	*Empidonax traillii*	Present	UNK	UNK
Hammond's flycatcher	*Empidonax hammondii*	Present	UNK	M
dusky flycatcher	*Empidonax oberholseri*	Present	U	UNK
gray flycatcher	*Empidonax wrightii*	Unexpected		
Say's phoebe	*Sayornis saya*	Present	C	B
eastern kingbird	*Tyrannus tyrannus*	Present	U	UNK
western kingbird	*Tyrannus verticalis*	Present	C	B
loggerhead shrike	*Lanius ludovicianus*	Probably Present		
northern shrike	*Lanius excubitor*	Present	U	R
Cassin's vireo	*Vireo cassinii*	Probably Present		
warbling vireo	*Vireo gilvus*	Present	U	UNK
red-eyed vireo	*Vireo olivaceus*	Present	U	UNK
gray jay	*Perisoreus canadensis*	Present	U	UNK
Steller's jay	*Cyanocitta stelleri*	Present	U	UNK
black-billed magpie	*Pica pica*	Present	C	B
American crow	*Corvus brachyrhyncos*	Present	A	B
common raven	*Corvus corax*	Present	C	B
horned lark	*Eremophila alpestris*	Present	R	UNK
tree swallow	*Tachycineta bicolor*	Present	C	B
violet-green swallow	*Tachycineta thalassina*	Present	A	B
northern rough-winged swallow	*Stelgidopteryx serripennis*	Present	C	B
bank swallow	*Riparia riparia*	Present	C	B
cliff swallow	*Petrochelidon pyrrhonata*	Present	C	B
barn swallow	*Hirundo rustica*	Present	C	B
black-capped chickadee	*Poecile atricapillus*	Present	C	B
mountain chickadee	*Poecile gambeli*	Present	C	B
red-breasted nuthatch	*Sitta canadensis*	Present	C	B
white-breasted nuthatch	*Sitta carolinensis*	Present	C	B
pygmy nuthatch	*Sitta pygmaea*	Present	C	B
brown creeper	*Certhia americana*	Present	U	B
rock wren	*Salpinctes obsoletus*	Present	U	UNK
canyon wren	*Catherpes mexicanus*	Present	R	UNK
house wren	*Troglodytes aedon*	Present	R	B
winter wren	*Troglodytes troglodytes*	Present	U	R
marsh wren	*Cistothorus palustris*	Present	U	UNK
American dipper	*Cinclus mexicanus*	Present	R	M

Common name	Scientific Name	Status	Abund.	Resid.
golden-crowned kinglet	*Regulus satrapa*	Present	U	R
ruby-crowned kinglet	*Regulus calendula*	Present	U	B
western bluebird	*Sialia mexicana*	Present	C	B
mountain bluebird	*Sialia currucoides*	Present	C	UNK
veery	*Catharus fuscescens*	Present	O	UNK
Townsend's solitaire	*Myadestes townsendi*	Present	U	R
Swainson's thrush	*Catharus ustulatus*	Present	U	M
hermit thrush	*Catharus guttatus*	Present	R	M
American robin	*Turdus migratorius*	Present	A	B
varied thrush	*Ixoreus naevius*	Present	R	R
gray catbird	*Dumetella carolinensis*	Present	R	UNK
northern mockingbird	*Mimus polyglottus*	Unexpected		
sage thrasher	*Oreoscoptes montanus*	Present	R	UNK
European starling	*Sturnus vulgaris*	Present	C	B
Bohemian waxwing	*Bombycilla garrulus*	Present	R	M
cedar waxwing	*Bombycilla cedrorum*	Present	U	UNK
orange-crowned warbler	*Vermivora celata*	Present	U	UNK
Nashville warbler	*Vermivora ruficapilla*	Present	U	UNK
yellow warbler	*Dendroica petechia*	Present	U	B
yellow-rumped warbler	*Dendroica coronata*	Present	C	B
Townsend's warbler	*Dendroica townsendi*	Present	U	UNK
black-throated gray warbler	*Dendroica nigrescens*	Present	R	UNK
American redstart	*Setophaga ruticilla*	Probably Present		
Macgillivray's warbler	*Oporornis tolmiei*	Present	U	UNK
common yellowthroat	*Geothlypis trichas*	Present	UNK	UNK
Wilson's warbler	*Wilsonia pusilla*	Present	U	B
yellow-breasted chat	*Icteria virens*	Present	UNK	UNK
western tanager	*Piranga ludoviciana*	Present	U	B
spotted towhee	*Pipilo maculatus*	Present	C	B
chipping sparrow	*Spizella passerine*	Present	C	B
Brewer's sparrow	*Spizella breweri*	Present	R	UNK
American tree sparrow	*Spizella pusilla*	Present	R	M
Vesper sparrow	*Pooecetes gramineus*	Present	U	B
lark sparrow	*Chondestes grammacus*	Present	U	B
savannah sparrow	*Passerculus sandwichensis*	Present	U	B
fox sparrow	*Passerella iliaca*	Present	U	UNK
song sparrow	*Melospiza melodia*	Present	C	B
Lincoln's sparrow	*Melospiza lincolnii*	Present	U	UNK
white-crowned sparrow	*Zonotrichia leucophrys*	Present	C	R
dark-eyed junco	*Junco hyemalis*	Present	C	B
lapland longspur	*Calcarius lapponicus*	Present	O	M
snow bunting	*Plectrophenax nivalis*	Present	O	M
black-headed grosbeak	*Pheucticus melanocephalus*	Present	U	B
Lazuli bunting	*Passerina amoena*	Present	U	B

Common name	Scientific Name	Status	Abund.	Resid.
bobolink	*Dolichonyx oryzivorus*	Present	UNK	UNK
red-winged blackbird	*Agelaius phoeniceus*	Present	A	B
western meadowlark	*Sturnella neglecta*	Present	C	B
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	Unexpected		
Brewer's blackbird	*Euphagus cyanocephalus*	Present	A	B
brown-headed cowbird	*Molothrus ater*	Present	C	B
Bullock's oriole	*Icterus bullockii*	Present	C	B
gray-crowned rosy finch	*Leucosticte tephrocotis*	Present	O	M
Cassin's finch	*Carpodacus cassinii*	Present	U	UNK
house finch	*Carpodacus mexicanus*	Present	C	B
red crossbill	*Loxia curvirostra*	Present	C	B
common redpoll	*Carduelis flammea*	Present	U	M
pine siskin	*Carduelis pinus*	Present	C	UNK
American goldfinch	*Carduelis tristis*	Present	U	UNK
evening grosbeak	*Coccothraustes vespertinus*	Present	U	UNK
house sparrow	*Passer domesticus*	Present	U	B

Mammals

Common name	Scientific Name	Status	Abund.	Resid.
Merriam's shrew	*Sorex merriami*	Unexpected		
water shrew	*Sorex palustris*	Present	R	B
	This species was documented for the first time during the 2003 inventory. It was caught along a creeks edge in a riparian willow grove near the Kettle River.			
vagrant shrew	*Sorex vagrans*	Present	R	B
	This species was caught along small tributaries in the northern region of Lake Roosevelt.			
dusky shrew	*Sorex monticolus*	Present	R	B
	This species was documented for the first time during the 2003 inventory. It was caught in a pine grove off of the Kettle River.			
California myotis	*Myotis californicus*	Present (Tentative)	U	B
	This species was tentatively recorded during the September 2002 *Anabat* session.			
western small-footed myotis	*Myotis ciliolabrum*	Unexpected		
long-eared myotis	*Myotis evotis*	Present	U	B
	This species was recorded foraging over the Kettle Falls Marina in 2002.			
little brown myotis	*Myotis lucifugus*	Present	A	B
	This species was recorded in 2002 near the Kettle Falls marina and captured in 2003 near the Kettle River campground.			
fringed myotis	*Myotis thysanodes*	Present	U	B
	This species was recorded foraging over the Kettle Falls Marina in 2002.			
long-legged myotis	*Myotis volans*	Probably Present		
Yuma myotis	*Myotis yumanensis*	Present	C	B
	This species was recorded foraging over the Kettle Falls Marina in 2002. Roosting Yuma myotis were found in the barn at Fort Spokane in 2002 as well.			
hoary bat	*Lasiurus cinereus*	Present	U	UNK
	This species was recorded along Hawk Creek in 2002.			
silver-haired bat	*Lasionycteris noctivagans*	Present	U	UNK
	This species was recorded foraging over the Kettle Falls Marina in 2002.			
big brown bat	*Eptesicus fuscus*	Present	A	B
	This species was recorded foraging over the Kettle Falls campground and marina in 2002. Roosting brown bats were also found in the barn at Fort Spokane in 2002. Several of these bats were recorded flying over the mist net location along the Kettle River in 2003. Big brown bats were also numerous night roosting under the Highway 395 bridge over Lake Roosevelt in 2002 and one was hand captured and a voucher call was collected from it at that time.			
spotted bat	*Euderma maculatum*	Unexpected		
	Although we consider this species to be "unexpected" due to its rarity and natural low abundance in Washington State, the species has recently been encountered along Banks Lake south of Coulee Dam and in the Moses Coulee area west of the Columbia River Sarrell and McGuiness 1993, Neil Hedges Wenatchee BLM personal communication). The species may occur along Lake Roosevelt, particularly near large cliffs in the southern portion of the lake and additional effort should be made to determine if the species occurs in the recreation area.			
Townsend's big-eared bat	*Corynorhinus townsendii*	Probably Present		
	This species is rare and in decline in many parts of its range. Nonetheless, it remains widespread and should occur in the vicinity of Lake Roosevelt.			
pallid bat	*Antrozous pallidus*	Unexpected		
	This species is rare in Washington and may occur in Lake Roosevelt but is not expected (Sarrell and McGuiness 1993).			

Common name	Scientific Name	Status	Abund.	Resid.
mountain cottontail	*Sylvilagus nuttallii*	Present	C	B
The mountain cottontail occurs throughout the park.				
white-tailed jackrabbit	*Lepus townsendii*	Unexpected		
snowshoe hare	*Lepus americanus*	Unexpected		
least chipmunk	*Tamias minimus*	Probably Present		
yellow-pine chipmunk	*Tamias amoenus*	Present	A	B
This species was found in abundance near Gifford campground in 2003, and in many area of pine forest along the northern portion of Lake Roosevlet.				
redtail chipmunk	*Tamias ruficaudus*	Unexpected		
yellow-bellied marmot	*Marmota flaviventris*	Present	UNK	B
This species was documented in 2003 and has had occasional sightings dating back to the 1973/74 University of Washington study.				
woodchuck	*Marmota monax*	Unexpected		
Columbian ground squirrel	*Spermophilus columbianus*	Present	C	B
This species was observed in all areas of the park.				
western gray squirrel	*Sciurus griseus*	Unexpected		
red squirrel	*Tamiasciurus hudsonicus*	Present	C	B
northern flying squirrel	*Glaucomys sabrinus*	Present	UNK	B
This species was not captured during the 2003 inventory but historical records and recent sightings indicate the species' presence in the recreation area.				
northern pocket gopher	*Thomomys talpoides*	Present	C	B
Mounds and soil casts made by this species are common throughout the recreation area.				
Great Basin pocket mouse	*Perognathus parvus*	Present	C	B
The great basin pocket mouse was captured in the southern region of the lake in sage steppe habitat.				
beaver	*Castor canadensis*	Present	C	B
This species occurs along tributaries of Lake Roosevelt.				
western harvest mouse	*Reithrodontomys megalotis*	Probably Present		
deer mouse	*Peromyscus maniculatus*	Present	A	B
This ubiquitous species was the most abundant mammal in the 2003 inventory and occurs throughout the recreation area.				
northern grasshopper mouse	*Onychomys leucogaster*	Unexpected		
bushy-tailed woodrat	*Neotoma cinerea*	Present	A	B
This species occurs throughout the park.				
southern red-backed vole	*Clethrionomys grapperi*	Unexpected		
house mouse	*Mus musculus*	Probably Present		
Norway rat	*Rattus norvegicus*	Unexpected		
long-tailed vole	*Microtus longicaudus*	Present	UNK	UNK
One individual was found along a small creek in the northern region of the lake.				
meadow vole	*Microtus pennsylvanicus*	Unexpected		
montane vole	*Microtus montanus*	Present	C	B
sagebrush vole	*Lemmiscus curtatu*	Unexpected		

Common name	Scientific Name	Status	Abund.	Resid.
common muskrat	*Ondatra zibethicus*	Present	R	B
This species was observed near the Gifford Campground in 2003 and probably occurs throughout the recreation area.				
western jumping mouse	*Zapus princeps*	Present	U	B
The western jumping mouse was captured along a riparian area along the Kettle River.				
porcupine	*Erethizon dorsatum*	Present	C	B
This species occurs throughout the recreation area.				
coyote	*Canis latrans*	Present	C	B
This species occurs throughout the park.				
red fox	*Vulpes vulpes*	Unexpected		
There is one historical record of a red fox near Singer's Jct. in May of 1972. This observation was made by Don LeDeaux, a park visitor.				
common raccoon	*Procyon lotor*	Present	C	B
This species occurs throughout the recreation area.				
long-tailed weasel	*Mustela frenata*	Present	U	B
Many locals around the area, including LARO ranger Alexandra Picavet, see this unique mammal several times a year in various habitats.				
ermine	*Mustela erminea*	Present	R	B
This species has been recorded in the northern portion of the recreation area in recent years.				
mink	*Mustela vison*	Present	C	B
This species has regularly seen by LARO staff and visitors along Lake Roosevelt.				
American badger	*Taxidea taxus*	Present	U	B
Burrows of this species were found during the 2003 inventory.				
river otter	*Lontra canadensis*	Present	C	B
This species was found along the Kettle River in 2003.				
striped skunk	*Mephitis mephitis*	Present	U	B
This species occurs near riparian areas. One individual was captured at Circle Creek.				
western spotted skunk	*Spilogale gracilis*	Unexpected		
cougar	*Puma concolor*	Present	R	UNK
There have been several sightings of this species within the recreation area and on adjacent private land in recent years.				
bobcat	*Lynx rufus*	Present	R	UNK
There have been several sightings of this species within the recreation area and on adjacent private land in recent years.				
black bear	*Ursus americanus*	Present	R	UNK
Sightings of the black bear have been consistent throughout historical records and have remained positive in recent years.				
elk	*Cervus elaphus*	Present	R	M
This species occurs sporadically in the recreation area.				
mule deer	*Odocoileus hemionus*	Present	C	B
This species occurs throughout the park.				
white-tailed deer	*Odocoileus viginianus*	Present	C	B
This species occurs throughout the park.				
moose	*Alces alces*	Present	R	M
Moose are occasionally seen during the winter in the northern region of the lake.				
pronghorn	*Antilocapra americana*	Unexpected		

Amphibians

Common name	Scientific Name	Status	Abund.	Resid.
tiger salamander	*Ambystoma tigrinum*	Present	R	B
	This species is secretive and not often encountered. It often is found underneath rocks or logs but may also be found deep underneath the ground, sometimes more than a foot below the surface.			
long-toed salamander	*Ambystoma macrodactylum*	Present	U	B
	This amphibian appears to be widespread in LARO. However, it is not frequently encountered because of its secretive habits. Several adults were found near Ft. Spokane under damp logs.			
Great Basin spadefoot	*Spea intermontana*	Present	R	B
	This small toad is well adapted to arid conditions. It is infrequently encountered, however, because it leads a subterranean life when surface conditions are dry. During spring rains or summer thundershowers spadefoot toads can suddenly appear and adults will be seen hopping across roads, both during the day and night. Historic records date sightings back to the 1974 University of Washington study. Recent sightings by LARO visitors have also been reported.			
western toad	*Bufo boreas*	Present	U	B
	One individual was found above the Spring Canyon campground during the 2003 inventory.			
Pacific treefrog	*Hyla regilla*	Present	C	B
	These amphibians were observed in nearly every intermittent wetland. Particularly large breeding choruses of this species were noted in the wetlands near the Kettle Falls marina and the Kettle River campground. Some herpetologists place it in the genus *Pseudacris*.			
bullfrog	*Rana catesbeiana*	Present	C	B
	This species is native to North America east of the Rocky Mountains. The species has invaded several sites in LARO and may have contributed to the extirpation of the spotted frog in Lake Roosevelt.			

Reptiles

Common name	Scientific Name	Status	Abund.	Resid.
painted turtle	*Chrysemys pict*	Present	UNK	B
	Historical data and LARO visitor observation cards indicate this species' presence.			
western fence lizard	*Sceloporus occidentalis*	Present	UNK	B
	The 2003 inventory provided the first confirmation of this species. One individual was found sunning itself on some rocks north of the Spring Canyon campground.			
sagebrush lizard	*Sceloporus graciosus*	Probably Present		
western skink	*Eumeces skiltonianus*	Present	C	B
	Several skinks were found near Ft. Spokane under wooden boards behind the maintenance buildings.			
pigmy short-horned lizard	*Phrynosoma douglasii*	Probably Present		
common garter snake	*Thamnophis sirtalis*	Present	U	B
One individual was found on the edge of the Marcus Island campsite in 2003.				
western terrestrial garter snake	*Thamnophis elegans*	Present	C	B
	This species was confirmed in 2003 and has been frequently recorded by LARO visitors.			
western rattlesnake	*Crotalus viridis*	Present	UNK	B
	This species was not encountered during the 2003 inventory but historic records and recent LARO visitor sightings indicate its presence in the recreation area.			
racer	*Coluber constrictor*	Present	C	B
	One racer was found near the bunchgrass trail near Spring Canyon and a second individual was found near the Kettle River.			
gopher snake	*Pituophis catenifer*	Present	UNK	B
	This species was encountered during fieldwork in 2002.			
night snake	*Hypsiglena torquata*	Probably Present		
rubber boa	*Charina bottae*	Present	UNK	B
	This species occurs throughout the recreation area but is probably more common in the wooded areas in the northern portion.			

Appendix B. Voucher calls for species encountered in Lake Roosevelt National Recreation Area

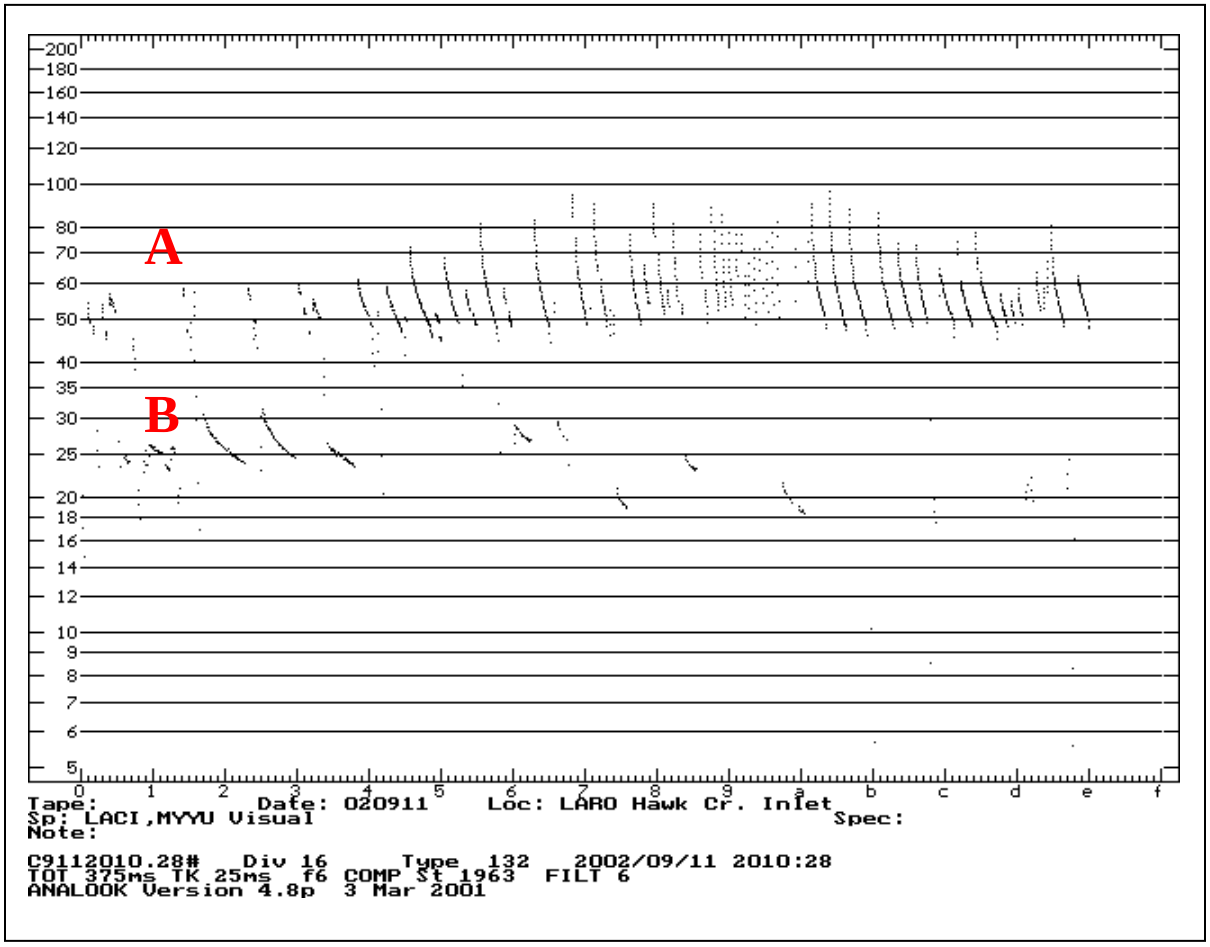

Figure B-1. An *Anabat* recording of a A) Yuma myotis (*Myotis yumanensis*) and a B) hoary bat (*Lasiurus cinereus*) observed flying over the Hawk Creek inlet.

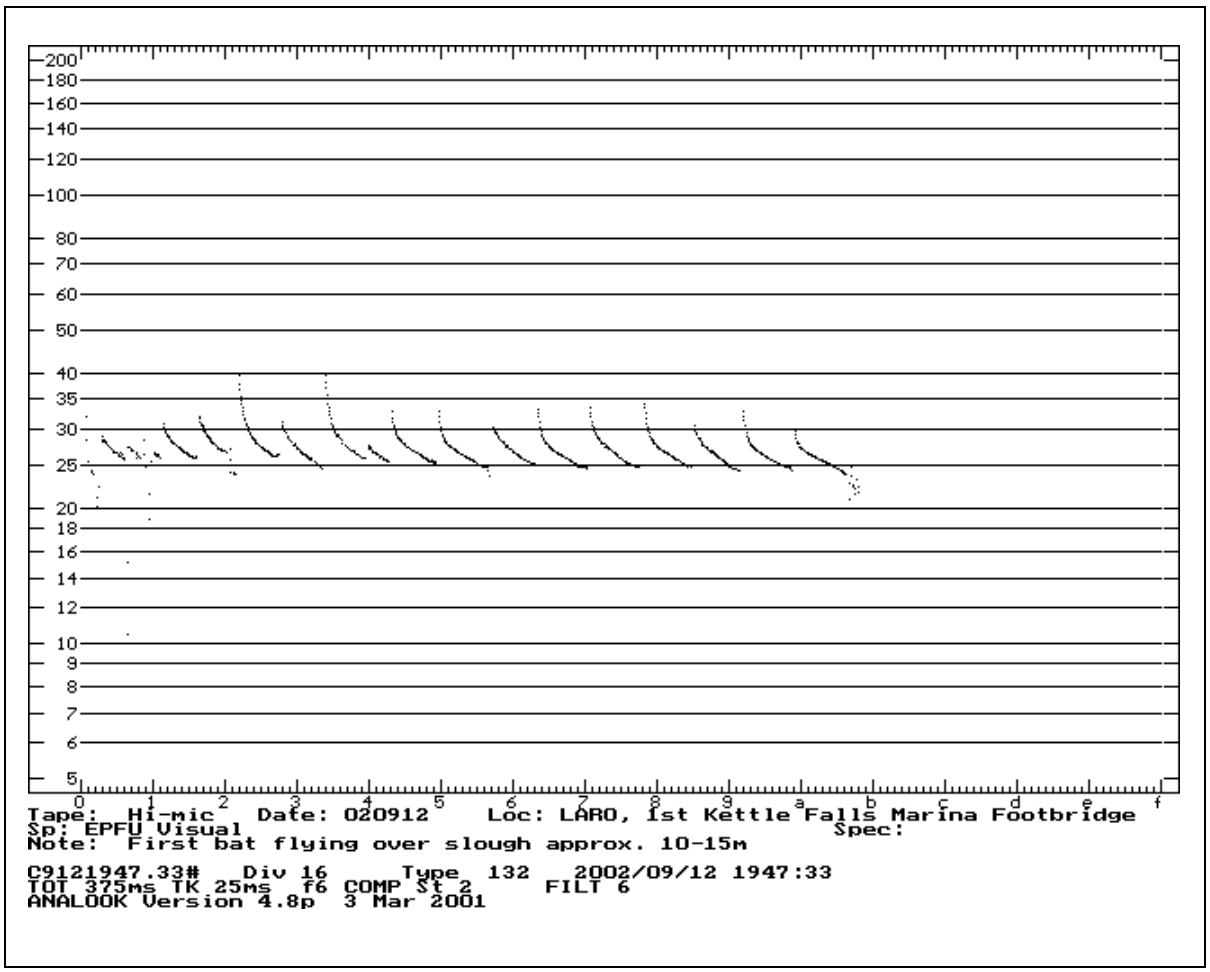

Figure B-2. An *Anabat* recording of a big brown bat (*Eptesicus fuscus*) observed flying near the Kettle Falls Marina.

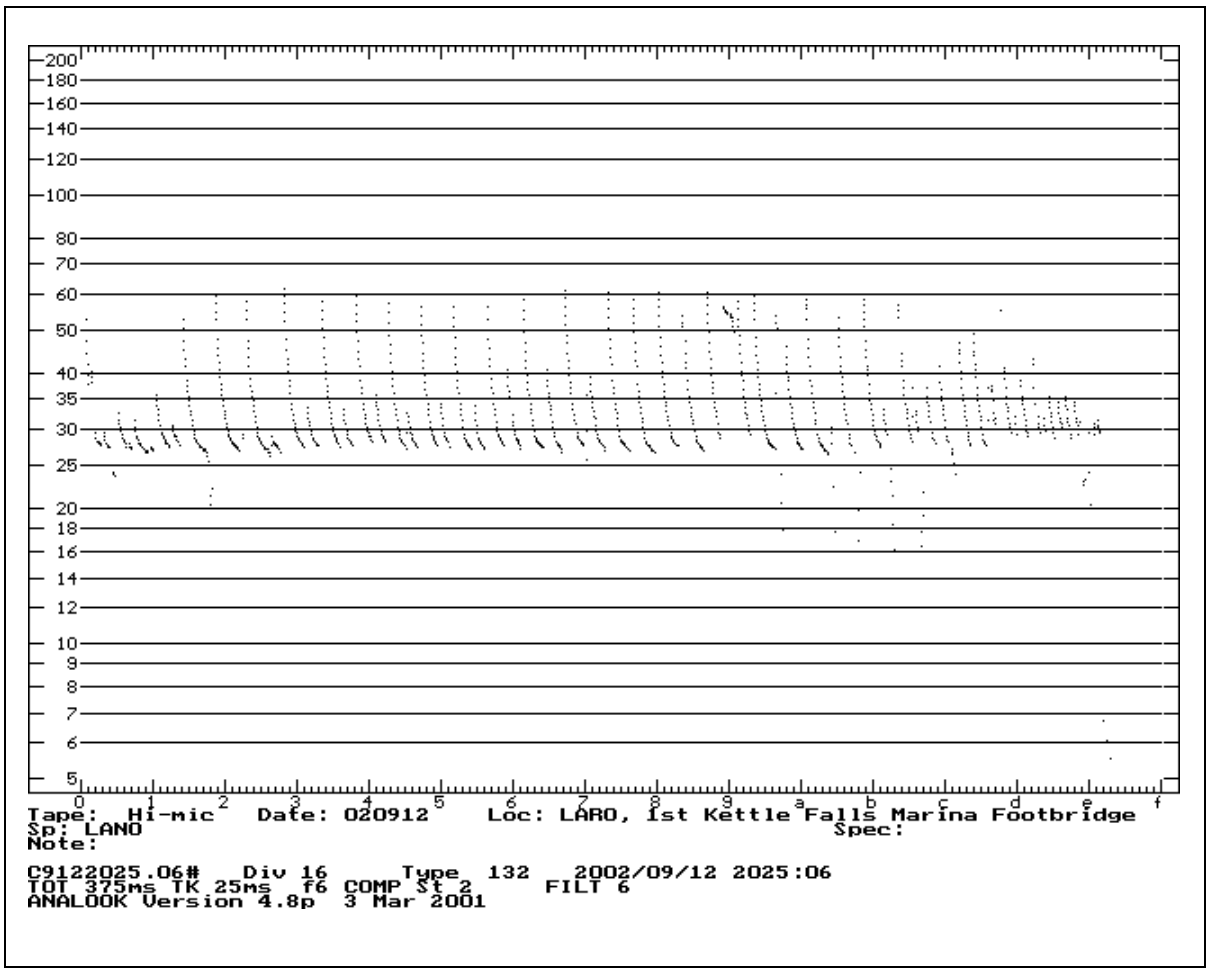

Figure B-3. An *Anabat* recording of a silver-haired bat (*Lasionycteris noctivagans*) observed flying near the Kettle Falls Marina.

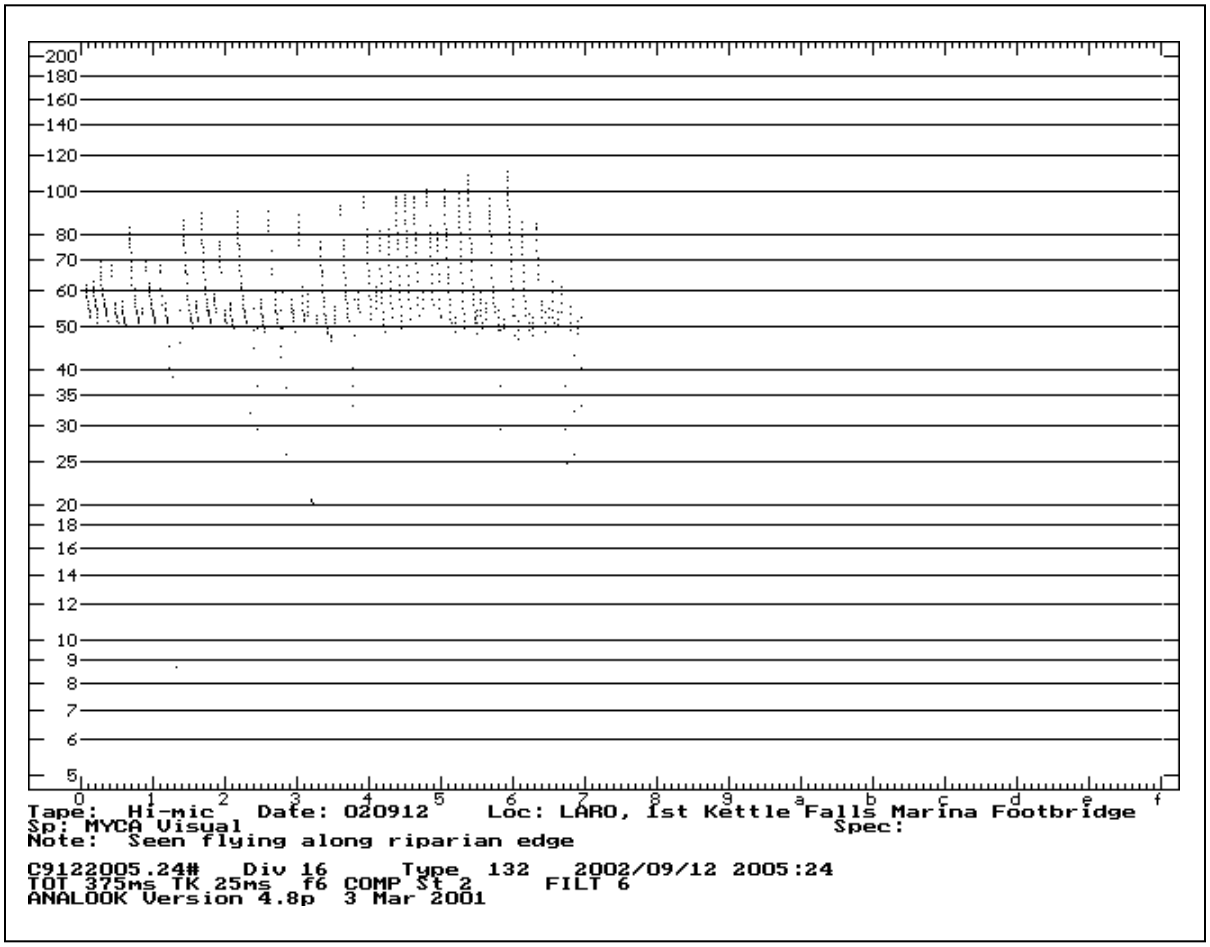

Figure B-4. A California myotis (*Myotis californicus*) recorded flying along an edge of trees near the Kettle Falls marina. This identification is tentative because this species produces calls easily confused with those made by Yuma myotis. However, this bat was observed foraging in a manner more typical of California myotis and the call has a much steeper slope and very little break, or “knee”, than what Yuma myotis typically produce (Gannon et al. 2001).

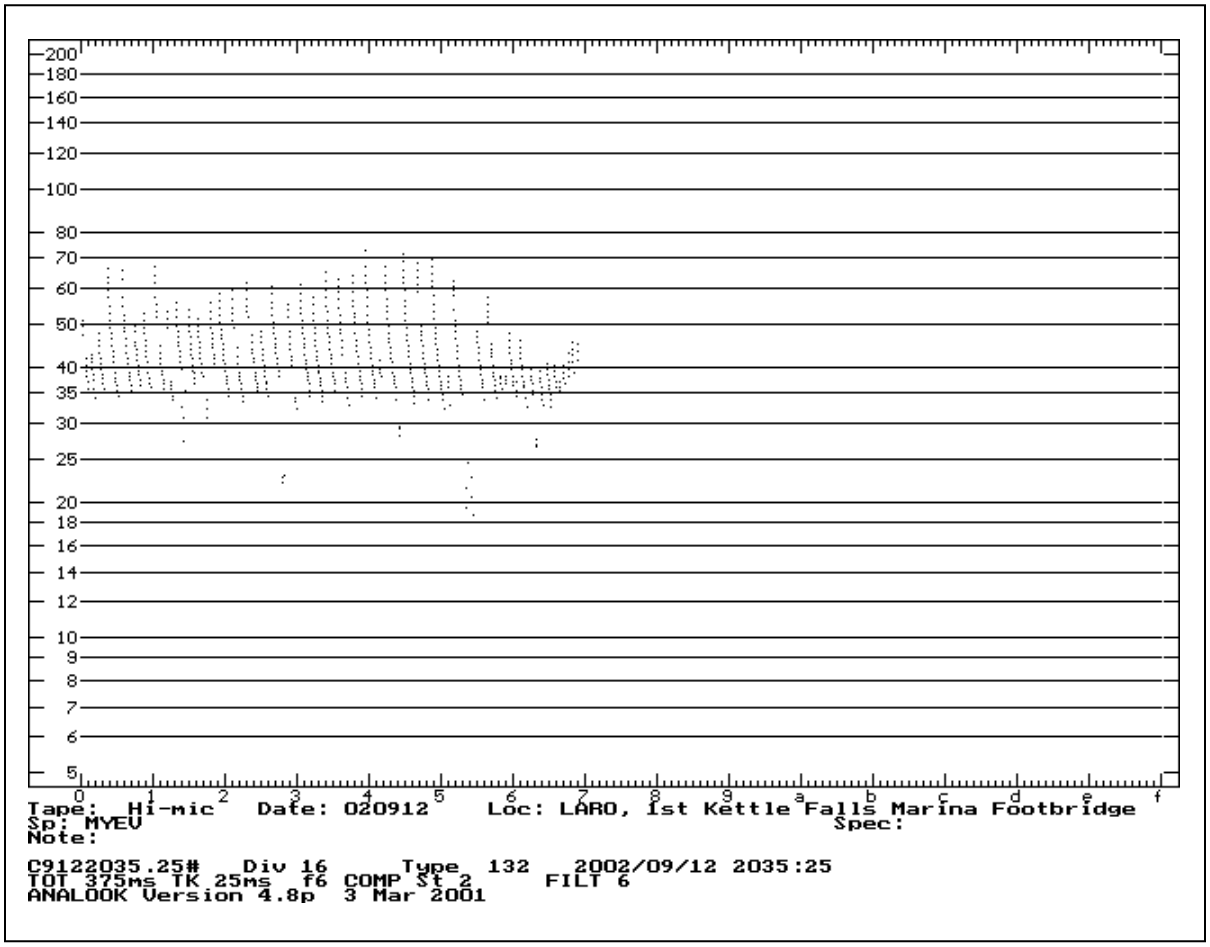

Figure B-5. A long-eared myotis (*Myotis evotis*) recorded near the Kettle Falls Marina.

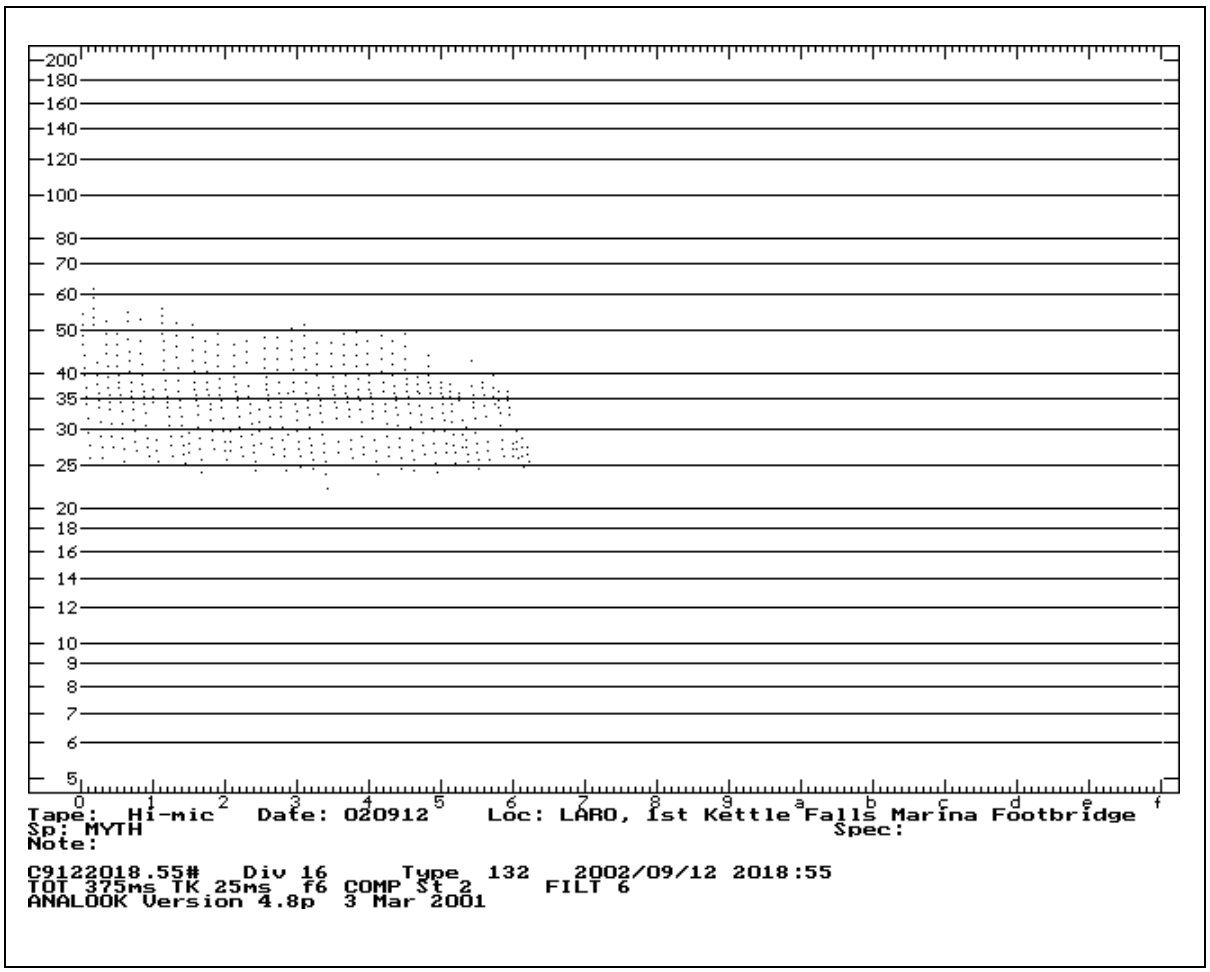

Figure B-6 A fringed myotis (*Myotis thysanodes*) recorded near the Kettle Falls marina.

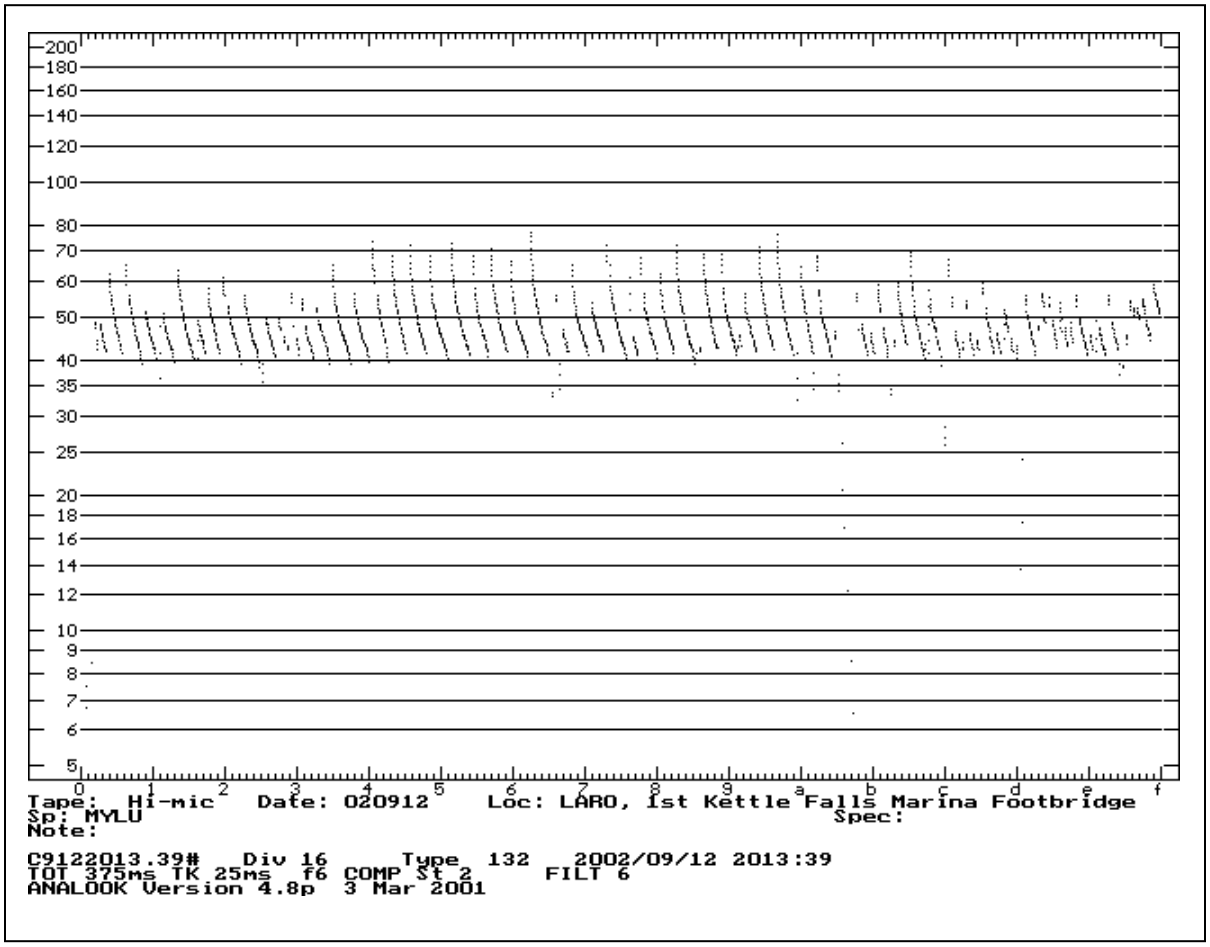

Figure B-7. A little brown myotis (*Myotis lucifugus*) recorded flying along a slough near the Kettle Falls marina.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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