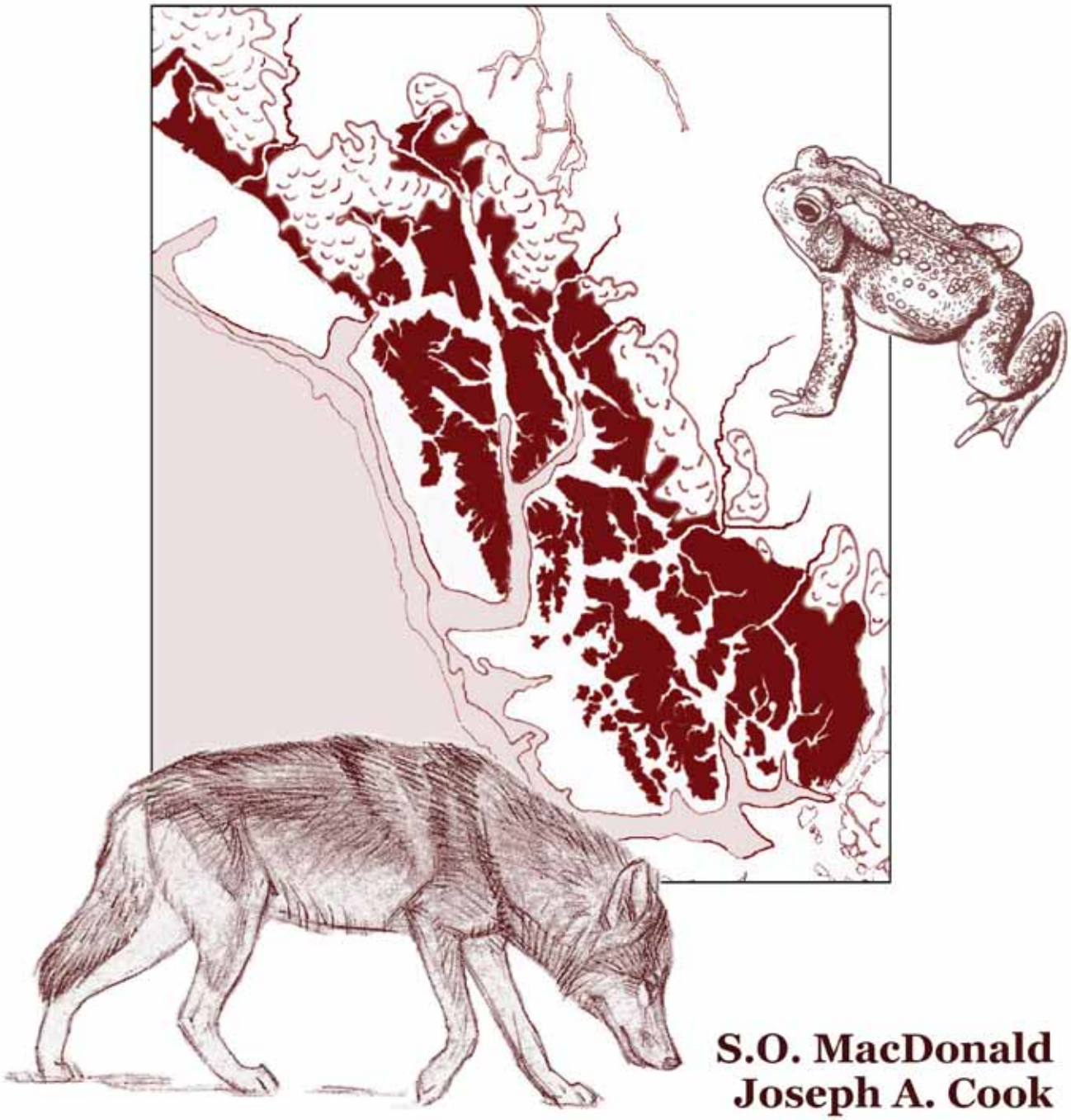
Mammals and Amphibians of Southeast Alaska



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Mammals and Amphibians of Southeast Alaska

by

S. O. MacDonald
and Joseph A. Cook

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The Museum of Southwestern Biology

University of New Mexico
Albuquerque, New Mexico

2007

Haines, Fort Seward, and the Chilkat River on the northern mainland of Southeast Alaska, 1929 (*courtesy of the Alaska State Library, George A. Parks Collection, U.S. Navy Alaska Aerial Survey Expedition, P240-107*).

Looking up the Taku River into British Columbia, 1929 (*courtesy of the Alaska State Library, George A. Parks Collection, U.S. Navy Alaska Aerial Survey Expedition, P240-135*).

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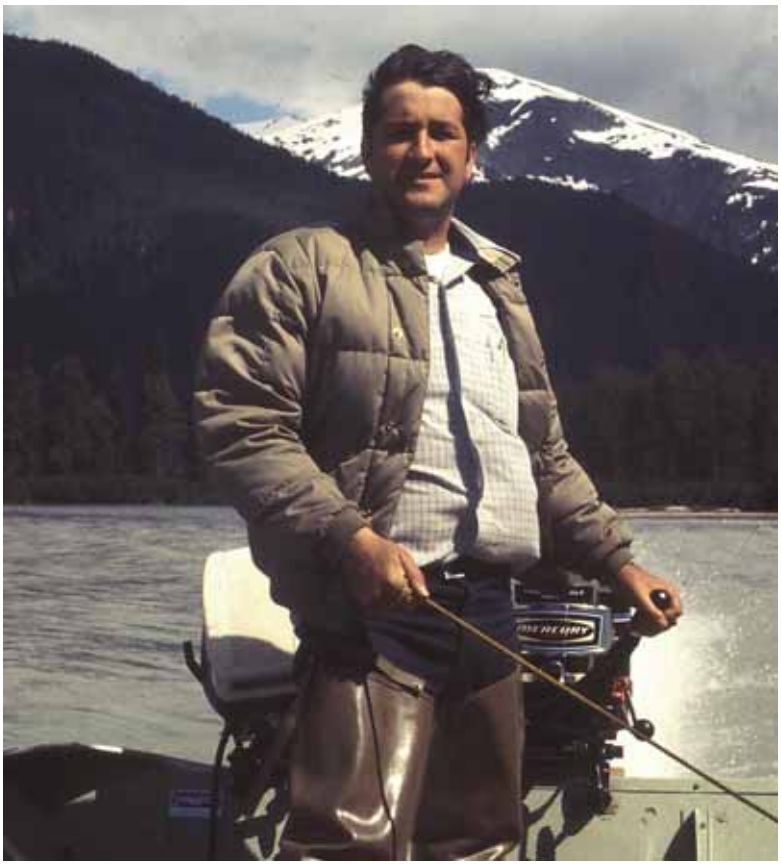
The Haida village at Old Kasaan, Prince of Wales Island (*undated photograph courtesy of the Alaska State Library Place File Collection, Winter and Pond, Kasaan-04*).

Lituya Bay along the northern coast of Southeast Alaska in 1916 (*courtesy of the Alaska State Library Place File Collection, T.M. Davis, LituyaBay-05*).

Dedicated to the Memory of Terry Wills (1943-2000)

A life-long member of Southeast's fauna and a compassionate friend to all.



Terry at the mouth of the Chickamin River, mainland Southeast Alaska, in 1973 (*photograph by S.O. MacDonald*).

Preface

Eleven years have elapsed since we published *The Land Mammal Fauna of Southeast Alaska* (MacDonald and Cook, 1996). We now update that original work and expand it by adding marine mammals and amphibians, reviewing the status of select species based on a series of field, lab and museum-based investigations, and discussing the evolutionary and biogeographic significance of this coastal fauna. We follow the general outline of MacDonald and Cook (1996), with several notable changes. In the individual species accounts, the *Taxonomy* section now includes an overview of recently published phylogeographic studies for a number of taxa. In these accounts, the section on *Distribution* includes specific locality records and distributional maps for all terrestrial species. Tables now detail the occurrence of all species documented with specimens for 111 individual islands, and appendices summarize island size, specimen archives, and our understanding of species distributions, introductions, and conservation status. Accounts are included of additional species that are no longer extant in the region, but that were documented either as fossils or introduced exotics. We also reassess research priorities for amphibians and mammals in the region. We encourage thoughtful discussion of these priorities followed by action to promote the conservation of this outstanding coastal fauna.

We hope this reference work will stimulate further investigations aimed at filling in the numerous pieces of the fascinating biogeographic and evolutionary puzzles underlying the mammals and amphibians of the North Pacific Coast of North America.

Stephen MacDonald and Joseph Cook

The MacDonald boys beaver trapping, Stikine River, Spring 1977.

Joe with skins of a Marten and Fisher (the first documented record of Fisher for Alaska) taken by a local trapper, Taku River, 1994.

Abstract

This report continues the process of documenting the 82 species of mammals and 8 amphibians known to occur, or have recently occurred, in Southeast Alaska. Species accounts are based on a review of the literature, examination of specimens and associated field notes at natural history museums, and a series of expeditions we conducted through 1999 through the University of Alaska Museum of the North. Our primary conclusion from this survey is that information as basic as distribution and taxonomic status is unavailable for most species of mammals and amphibians. Most species are poorly documented with 53% of mammals represented by fewer than 10 specimens for the entire region. Cetacean material is especially lacking. Minimal documentation also characterizes amphibians. Beyond simply documenting the distribution of species, serious investigations of these organisms have been hampered by lack of specimens and associated materials. Many investigations aimed at assessing changes in populations over space and time cannot be completed for the majority of species in this region, effectively obviating attempts to monitor health of these wildlife populations or their response to environmental perturbation.

If we examine particular islands for individual species, a parallel situation arises. Across the archipelago, 111 islands have at least one specimen that documents the occurrence of any species. Of those "species present" islands, however, 41% are represented by ≤10 specimens of any species. This weak foundation will serve as the basis for future management actions, including those aimed at monitoring declining native populations or mitigating the impact of exotics, unless a concerted effort to inventory this biotic diversity is initiated. Now is the time to fill the gaps in our knowledge by building a rigorous, diverse, and well-distributed archive of specimens for the flora and fauna of this coastal region.

This preliminary inventory of the mammals and amphibians reveals serious conservation concerns due to the heavy footprint of humans, particularly on islands with high potential for endemism. In particular, forest fragmentation in the last 50 years has resulted in extensive tracts of closed-canopy forests; these second growth forests support a much less diverse vertebrate fauna. Other human activities may also impact this fauna.

Molecular genetic studies of selected species suggest common biogeographic histories for particular elements of the fauna. High levels of genetic differentiation characterize some species and reflect the influence of a long history of regional fragmentation due to glaciation. In several cases, multiple cryptic species have been identified (e.g., two species of marten) and contact or hybrid zones have been documented. At the population level, low levels of variation for some island populations is attributable to isolation and these populations may be especially vulnerable to disturbance. These metrics indicate the influence of both historical and contemporary processes on structuring biotic diversity. Such complexity also points to the necessity of prioritizing conservation of endemic forms by building a new "island-centered" framework for managing wildlife on the Tongass National Forest and surrounding lands of Southeast Alaska. Such a management paradigm for this complex archipelago should recognize the unique evolutionary and ecological attributes of this isolated region of North America.

Acknowledgments

This monograph is the result of efforts by many people. In particular, we acknowledge the following individuals: *Private* — T. Bethel, R. Bishop, K. Bovee, S. Brewington, L. and J. Carson, R. Carstensen, B. Delehanty, S. Fiscus, J. Florie, C. Garst, S. Geraghty, D. Harbor, B. J. Hayward, R. Himschoot, R. Hunter, P. Isleib, R. Jahnke, C. Jardine, L. Johnson, M. Kirkeminde, , M. MacDonald, O. MacDonald, D. Nagorsen, R. Nelson, B. Norman, J. Owens, J. Pringle, D. Rice, M. Sallee, L. Robertson, N. Smith, G. Streveler, T. and K. Wills; *Alaska Department of Fish and Game* — N. Barten, E. Crain, T. Davis, R. Flynn, J. Gustafson, M. Kirchoff, C. Land, D. Larsen, R. Lowell, D. Parker McNeill, D. Person, B. Porter, M. Robus, M. Sigman, T. Thorton, K. Titus, and J. Whitman; *U.S.D.A. Forest Service* — J. Baichtal, S. Blatt, M. Brown, E. Campbell, J. Canterbury, D. Chester, R. Claire, J. Cristner, C. Crocker-Bedford, G. DeGayner, T. DeMeo, M. Dillman, J. Falk, C. Ford, R. Guhl, T. Hanley, C. Iverson, S. Jacobson, D. Johnson, D. Kuntzch, L. Kvaalen, M. Laker, E. Lance, W. Martin, K. Post, P. Robertson, A. Russell, K. Rutledge, T. Schenck, T. Shaw, W. Smith, T. Suminski, D. Walter, and S. Wise-Eagle; *National Park Service* — B. Anderson, J. Taggart, H. Lentfer, and M. Murray; *U.S. Fish and Wildlife Service* — S. Brockmann, E. Grossman, W. Hanson, K. Hastings, N. Holmberg, B. Jacobsen, D. Klein, J. Lindell, J. Maniscalo, J. McClung, P. Schempf, and Teresa Woods; *Metlakatla Indian Community* — J. Moran; *Sheldon Jackson College* — M. Siefert, B. Colthrap, and M. Ahlgren; *The Nature Conservancy in Alaska* — D. Albert; *Alaska Natural Heritage Program* — E. West; *Institute of Biological Problems of the North (Magadan, Russia)* — N. Dokuchaev and A. Tsvetkova; *Curators of Museums* — M. Carleton, S. George, K. Klitz, D. Nagorsen, J. Patton, R. Timm, C. G. van Zyll de Jong, and T. Yates; *UA Museum of the North/Institute of Arctic Biology* — K. Bagne, M. Ben-David, D. Bender, J. Bender, H. Chen, C. Conroy, J. Demboski, S. Gray, B. Jacobsen, G. Jarrell, J. Levino-Chythlook, S. Lewis, D. McDonald, L. Olson, C. T. Seaton, K. Stone, S. Talbot, and M. Wike; and *Museum of Southwestern Biology/UNM* — L. Couch, N. Dawson, W. Gannon, J. Malaney, and D. Northup. Direct funding, logistical support, and specimens were provided by the US Fish and Wildlife Service, USDA Forest Service (Tongass Region and Pacific Northwest Laboratory), Alaska Department of Fish and Game, and National Science Foundation (0415668). We thank M. Bogan, S. Brunner, N. Dawson, R. Dickerman, C. Jones, A. Koehler, and an anonymous reviewer for critical reviews of the manuscript. All errors are solely the responsibility of the authors.

Illustration Credits. Most of the animal illustrations used to enhance our distribution maps were done by the late Fairbanks artist, William D. Berry (1926-1979), with permission from © BERRY STUDIOS (www.berrystudios.biz). The drawings on pages 30, 65, 69, 80, 84, 87, 88, 92, 97, and 102 are by the late Robert W. Hines (1912-1994); on pages 29, 36, 37, 40, 42, 49, 50, 61, 122, 123, 124, 127, 129, 130, 131, and 132 by Orien O. MacDonald; and on pages 21 and 51 by S.O. MacDonald.

The Haida village of Klinkwan, Prince of Wales Island (1892) is no longer inhabited (*courtesy of the Alaska State Library Place File Collection, H.F.R., Klinkwan-1*).

The town of Wrangell at the north tip of Wrangell Island (1929) is situated near the mouth of the Stikine River (*courtesy of the Alaska State Library, George A. Parks Collection, U.S. Navy Alaska Aerial Survey Expedition, P240-104*).

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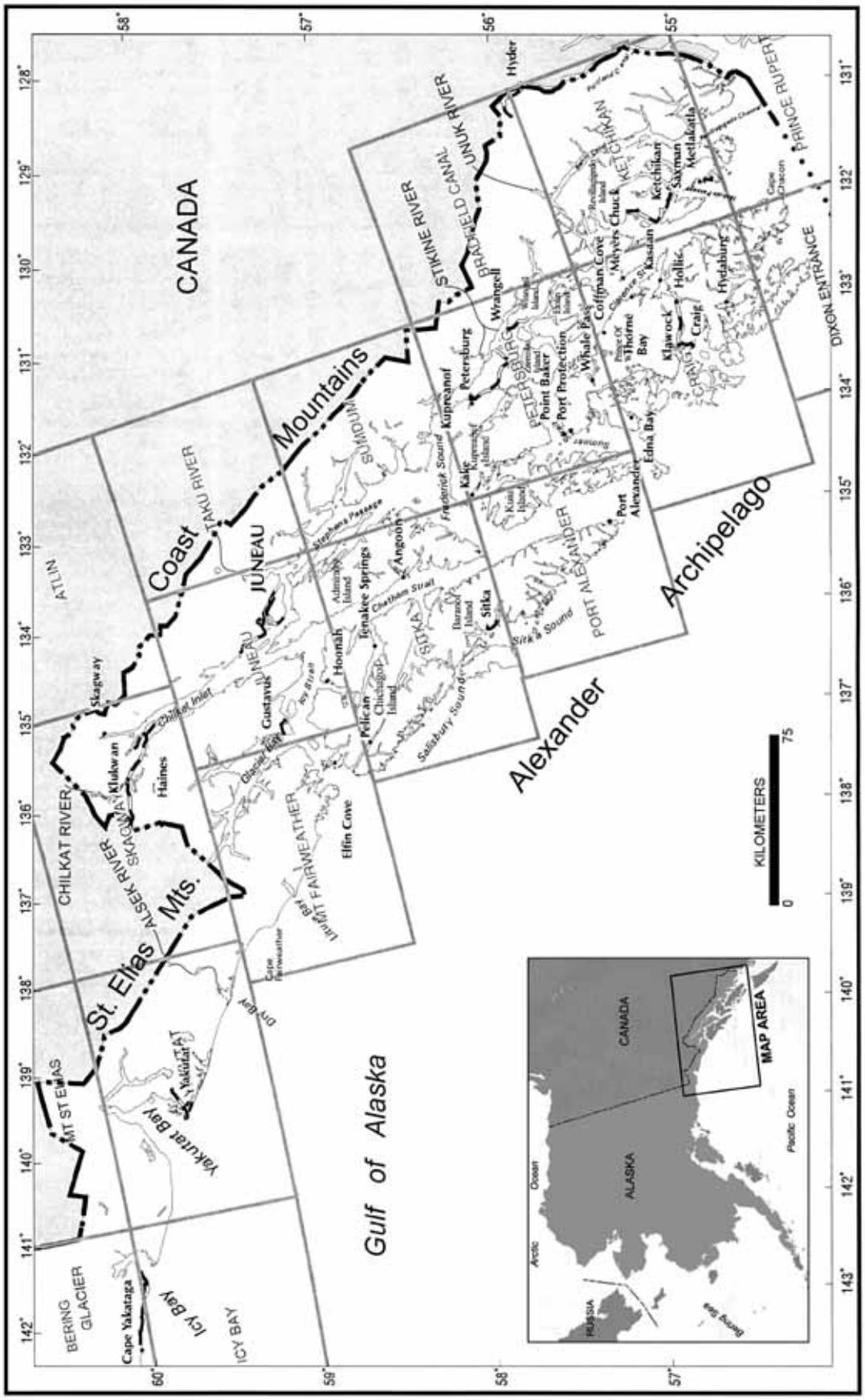


Figure 1. Locality Map of Southeast Alaska showing major towns, roads, and USGS Quadrangle map boundaries.

Introduction

Do you know the Alexander Archipelago should be thoroughly worked again. We have simply located the things that need to be worked out, and there are all sorts of possibilities there yet.

–Letter from H.S. Swarth to Allen Hasselborg, 25 November 1911 (Juneau State Museum Archives, Box 1, Folder 2)

The remote North Pacific Coast of North America has long intrigued humans, from the original Native Americans that first entered the region at least 13,000 years ago, to the early Russian colonists of the 18th century, to trappers, fishermen, naturalists, geologists, and other intrepid explorers of the 19th and 20th centuries. The allure of the coast revolves around its beauty and the richness of a highly productive ecosystem. Despite this long-term interest, there remains much that we do not understand about the dynamic history or contemporary interactions occurring within this immense region (Figure 1). For example, although the prevailing view of human colonization of the Americas from Asia involved an overland route east of the Coast Range (Pielou, 1991), others have suggested that this coastal strip formed an important link connecting the Old and New Worlds (Fladmark, 1979). Evidence that the region played a key role in human invasion of the Americas is growing (e.g., Dalton, 2005) with the discovery of new archaeological sites in the Alexander Archipelago (Dixon, 1999, 2002; Fedje et al., 2004). The coast may have served a key role in connecting Asian and North American faunas and Vancouver Island (Al-Suwaidii et al., 2006).

On a global scale, Southeast Alaska and adjoining British Columbia (Figure 2) comprise the most extensive temperate rainforest worldwide that is still largely intact (Alaback, 1991). The region also includes one of the planet's most extensive archipelagos and these islands have played a primary role as evolutionary hotspots. Isolation, in particular, has influenced the development of the exceptional fauna and flora of the area and stimulated the diversification of a number of endemic taxa (Cook and MacDonald, 2001). In addition to divergent forms on individual islands, the entire coastal region has been largely isolated from the remainder of North America by the nearly impenetrable Coast Range. High endemism stems from dynamic historical climatic events and contemporary barriers to movement created by the complex and highly fragmented landscape of the region (Cook et al., 2006).

Most elements of the biotic diversity of this exceptional coastal forest biome have not been systematically inventoried. Prior to our field studies, knowledge of the distribution and occurrence of mammals and amphibians of Southeast Alaska was based on the results of biological surveys from the late 1800s and early 1900s (Table 1, 2).

Figure 2. The Northwest Coast of North America is home to two-thirds of the world's remaining temperate rainforests (Kirk and Mauzy, 1996).

Despite the restricted coverage of those early studies (only 22 islands sampled), 27 mammalian taxa were described as essentially endemic to this region of North America (Hall, 1981). Our rudimentary knowledge of these vertebrates had hampered attempts to understand the ecological or evolutionary dynamics of this distinctive fauna.

Starting in 1973, one of us (SOM) began assembling a collection of mammal specimens from Southeast Alaska for the University of Alaska Museum (Table 3). In 1992, the two of us initiated a systematic inventory of the mammals of the region and opportunistically collected amphibians. Field and laboratory work since the publication of our first summary of the mammals of the region (MacDonald and Cook, 1996) has substantially changed our understanding of this distinctive fauna. Geo-referenced specimens of mammals and amphibians from this project form a web-accessible database (http://arctos.database.museum/SpecimenSearch.cfm) that provides a foundation for future management and research, including investigations in wildlife biology, molecular biology, evolutionary genetics, contaminants assessment, and pathology, among others. The primary objectives of our inventory were to: 1) collect data relating to mammalian and amphibian occurrence, distribution, and abundance; 2) create and develop an electronic database to assess regional and large-scale biodiversity, biogeography, and facilitate gap-analyses; 3) collect tissues for genetic and isotopic analyses from representatives of each species from each locality visited; 4) collect parasites from mammals; 5) collaborate with and expedite the studies of other investigations of Southeast Alaska biodiversity issues; and 6) produce publications on Southeast Alaska vertebrates based on historical sources, museum specimens, monographs and field expeditions. This paper summarizes our current knowledge of the mammalian and amphibian faunas of this isolated biogeographic region of Alaska. Faunistic information presented earlier (MacDonald and Cook, 1996; MacDonald and Cook, 1999; MacDonald, 2003) is updated to stimulate on-going research efforts and sustainable resource management of the 82 species of mammals and 8 species of amphibians known from the region. The primary purpose of this monograph is to provide an overview of their taxonomy, status, and distribution, with a special emphasis on information that is supported by voucher specimens from the region.

Clinton Hart Merriam (1855-1942) was the first Bureau Chief, in 1905, of the Biological Survey, a federal unit that later became the U.S. Fish and Wildlife Service. Merriam delighted in organizing field expeditons, including the Harriman Expediton to Alaska in 1899 (*photograph from Osgood, 1943*).

Staff and family of the Harriman Alaska Expedition in 1899 at the recently abandoned Cape Fox Tlingit Village at Kirk Point, southern mainland, Southeast Alaska (*U. Washington Libraries, Special Collections, NA2130*).

Merriam gathered around him a circle of talented naturalists and collectors (from left to right, Vernon O. Bailey, Wilfred H. Osgood, Edward W. Nelson, and Albert K. Fisher at the U.S. National Museum at the turn of the last century). Through a combination of field and laboratory studies based on large series of specimens, Merriam and his team revolutionized techniques of specimen preparation and data collection that led to meticulous-prepared publications like the North American Fauna series (*U.S. Fish and Wildlife Service photograph*).

Table 1. The early field collectors in Alaska for the U.S. National Museum, Washington, D.C.

COLLECTOR	YEAR	LOCALITIES VISITED
Clark P. Streator	1895	Yakutat Bay; Sitka, Baranof I.; Juneau; Wrangell, Wrangell I.; Loring, Revillagigedo I.
Clinton Hart Merriam Albert Kenrick Fisher (Harriman Expedition)	1899	Cape Fox; Farragut Bay; Taku Harbor; Juneau-Douglas; Wrangell, Wrangell I.; Skagway-White Pass; Sitka, Baranof I.; Glacier Bay; Yakutat Bay.
Wilfred H. Osgood (with Louis B. Bishop)	1899	Haines, Skagway, Glacier, White Pass.
Wilfred H. Osgood	1900	Wrangell, Wrangell I.; Woronkofski I.
Wilfred H. Osgood (with Ned Hollister)	1903	Kasaan, Prince of Wales I.; near Killisnoo, Admiralty I.; Tenakee, Chichagof I.; Mitkof and Kupreanof Is.
George Willett (U.S. Biological Survey warden; Private)	1912-1926	Baranof I., Forrester I., Prince of Wales I., Wrangell I., Revillagigedo I. Dall I., Kupreanof I., Mitkof I., Suemez I., Grant I.
Ernest P. Walker (with U.S. Bureau of Fisheries) (with U.S. Biological Survey)	 1913-1919 1921-1923	Specimens from various locations including Wrangell, Sitka, Juneau, Haines, Kupreanof I., Mitkof I., Zarembo I., Etolin I., Quadra Lakes, Boca de Quadra.
Alfred M. Bailey	1920-1921	Juneau, Douglas, Wrangell, Admiralty I., Glacier Bay, Forrester I.

Members of the Harriman Alaska Expedition visiting Reid Inlet, Glacier Bay, 11 June 1899 (*University of Washington Libraries, Special Collections, Harriman 41*).

Ernest P. Walker (1891-1969), naturalist, prolific collector, and author (*Mammals of the World*, 1964), got his start in Southeast Alaska, first as a warden and inspector for the U.S. Bureau of Fisheries (*Smithsonian Institution Archives*).

Wilfred H. Osgood (1875-1947) conducted several extensive surveys in Alaska for the U.S. Bureau of Biological Survey (*1898 photograph from Sanborn, 1948*).

George Willett (1879-1945) first arrived in Southeast Alaska in 1912, where he lived and worked until 1926 (*photograph from Howard, 1946*).

Table 2. The early field collectors for the Museum of Vertebrate Zoology, Berkeley, CA

COLLECTOR	YEAR	LOCALITIES VISITED
Frank Stephens, Joseph Dixon, Chase Littlejohn, Annie M. Alexander (Heller, 1909)	1907	Admiralty I., Baranof I., Chichagof I., Glacier Bay, Thomas Bay, Helm Bay.
Harry S. Swarth, Allen Hasselborg (Swarth, 1911)	1909	Kupreanof I., Kuiu I., Prince of Wales I., Coronation I., Warren I., Heceta I., Suemez I., Dall I., Duke I., Annette I., Gravina I., Revillagigedo I., Etolin I., Wrangell I., Zarembo I., Mitkof I., Boca de Quadra, Chickamin R., Bradfield Canal, Thomas Bay, Port Snettisham, Taku R.
H. Swarth, J. Dixon (Swarth, 1922)	1919	Sergief I., mouth of the Stikine River.

Allen E. Hasselborg (1876-1956) participated in both the 1908 and 1909 Alexander Alaska Expeditions and for many years provided specimens to C. H. Merriam (USNM) and J. Grinnell (MVZ). (*Photograph of Hasselborg aboard his hand-made boat, the Ebba* (above)*, during the 1909 expedition courtesy of the Alaska State Library, Hasselborg and Early Prints of Alaska Collections, PCA 01-4303 and 01-2550.*)

Harry Schelwald Swarth (1878-1935) (*above left*) was a pioneer in the faunal analysis of the northwest coastal region of North America. A brief visit to Wrangell and the Stikine River in 1898 when Swarth was only 20 years old sparked a life-long interest in the geographic distribution and variation of birds and mammals of the region and of Southeast Alaska in particular. His first collecting expedition to the region in 1909 (the second of three Alexander Expeditions to southcoastal Alaska) was in the company of Admiralty Island resident, Allen E. Hasselborg. These first major expeditions to the region were organized and supported by Miss Annie M. Alexander and overseen by Joseph Grinnell, first director of the newly-formed Museum of Vertebrate Zoology (MVZ) at Berkeley.

Several outstanding and insightful papers were the result of Swarth's work in southern Alaska and British Columbia, including his 1922 report on an exploration of the Stikine River region with Joseph Dixon in the summer of 1919. (*Photograph of Swarth at timberline on Doch-da-on Creek, Stikine River, 23 July 1919, courtesy of MVZ Archives, UC Berkeley, No. 3073.*)

Kootznahoo Inlet, Admiralty Island, 1929 (*courtesy of the Alaska State Library Place File Collection, MitchellBay-1*).

Frank Stevens skinning a young Brown Bear at Glacier Bay during the 1907 Alexander Expedition to Southeast Alaska (*photograph courtesy of MVZ Archives, UC Berkeley, No. 106).*

From left to right, Louise Kellogg, Joseph Dixon, and Edmund Heller at their camp in Prince William Sound during the 1908 Alexander Alaska Expedition (*photograph on left courtesy of the Smithsonian Institution Archives, Record Unit 7179, Box 1, Folder 60*).

Anne Montague Alexander (1867-1950) was an intrepid explorer, amateur naturalist, collector, and founder and benefactress of both the Museum of Vertebrate Zoology and the University of California Museum of Paleontology on the Berkeley Campus. This remarkable individual not only funded but also participated in two of the three pioneering expeditions to southcoastal Alaska in the early 1900s (*1901 photograph courtesy of UCMP, UC Berkeley*).

Joseph Grinnell, first director of the Museum of Vertebrate Zoology, Berkeley, visits with Southeast Alaska field naturalist George Willett at the museum in 1937 (*photograph from Howard, 1946*).

Materials and Methods

We report on recent distribution and taxonomic information for 82 mammalian and 8 amphibian species that occur, have recently occurred, or are suspected to occur in Southeast Alaska. Except as noted, we present species accounts following the taxonomic outline provided by recent summaries for mammals (Wilson and Reeder, 2005) and amphibians (Crother et al., 2000; Frost et al., 2006). Our report is based primarily on fieldwork conducted by the authors (and collaborators), on a review of literature, and on specimens housed in the University of Alaska Museum of the North (UAM) and other natural history museums. We concluded the first phase of our field inventory of mammals and amphibians in September 1999. Since that time relatively few specimens have been added to museums, although we include significant new records and a comprehensive specimen review through January 2006.

The Setting

Southeast Alaska is immense and geologically complex. With over 17,000 km of shoreline, this region has a longer coast than the states of California, Oregon and Washington combined. Southeast Alaska extends from about Icy Bay in the north, southward over 800 km to the Dixon Entrance. East to west, Southeast Alaska is a mosaic of hundreds of North Pacific islands extending along a thin strip of mainland coast (Figure 4). The region is dominated by the Alexander Archipelago with more than 2,000 named islands, including 7 of the 15 largest islands in the U.S. (http://www.worldislandinfo.com/USlargesttv1.html). Sixty islands are over 1000 hectares in areal extent (Appendix 1), and 11 islands have mountains that rise from sea level to over 1000 meters (the highest is an unnamed peak on Baranof Island at 1641 meters). Mainland is precipitously bordered to the east by the Coast Mountains and Wrangell-Saint Elias ranges that soar to more than 5400 meters. Those mountains extend principally in a north-south orientation and are capped with extensive ice fields and glaciers. Six major rivers (Alsek, Chilkat, Taku, Whiting, Stikine, and Unuk) pass through these rugged mountains from inland British Columbia and form a limited connection to the remainder of North America.

Over 80% of this region is under federal stewardship in the Tongass National Forest, but this large tract of federal land is intertwined with a patchwork of Native allotments and private and state lands (Figure 4). The Tongass was created in 1907 by Theodore Roosevelt, covers more than 6.9 million hectares, and is about three times larger than any other National Forest in the United States. Over sixty percent of the Tongass is either not forested or contains non-commercial, scrub forests (Figure 3). Only a small percent of the entire region supports high volume, old-growth stands of forest (those with more than 30,000 board feet per acre). North Pacific coastal forests can be defined by their major tree species that have distinctive latitudinal distributions (Figure 2; Pojar and MacKinnon, 1994). General overviews and descriptions of the geology and biology of the region can be found in Harris et al. (1974), Klein (1965), Mann (1986), DeMeo (1989), MacDonald and Cook (1996), O'Clair et al. (1997), and Schoen and Dovichin (2007).

Figure 3. Only about four percent of Southeast Alaska's forests comprise high volume, old-growth stands.

Kuiu Island, 1929 (*courtesy of the Alaska State Library, George A. Parks Collection, U.S. Navy Alaska Aerial Survey Expedition, P240-106*).

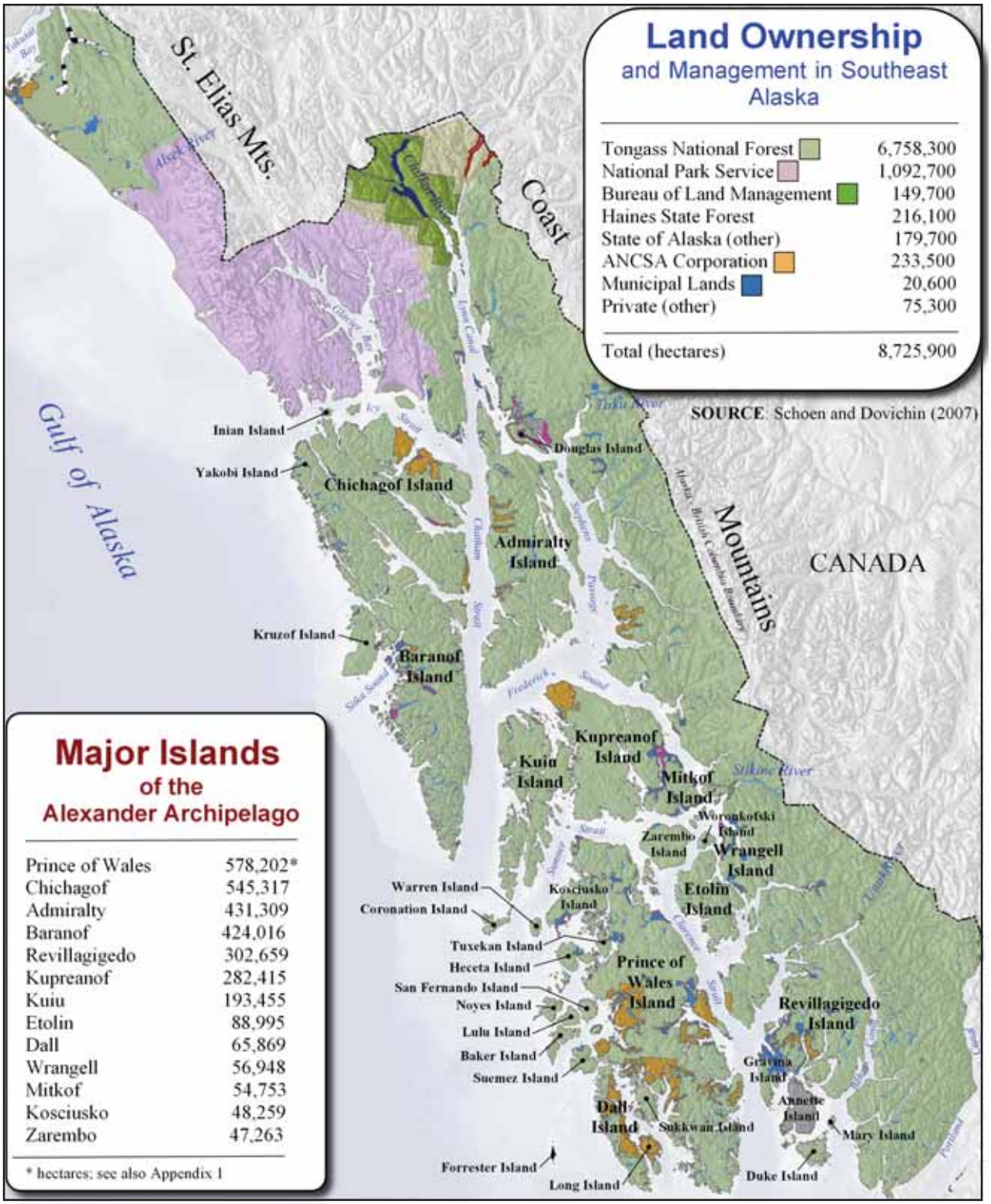


Figure 4. Land ownership and major islands of Southeast Alaska.

Fieldwork

Fieldwork began in 1973 and continued sporadically through 1990 (Table 3). In 1992, we initiated intensive and systematic field, museum, and laboratory studies designed to survey and summarize the mammalian diversity of Southeast Alaska (Table 3). Amphibians were incidentally collected during those surveys. Those efforts were conducted in collaboration with the U.S.D.A. Forest Service, Alaska Department of Fish and Game, U. S. Fish and Wildlife Service, and National Park Service. Greatest activity as demonstrated by collection of two of the most commonly archived species (Figure 5, 6) occurred in the mid-to-late 1990s.

Our field collecting strategy, focused especially on the less-known smaller mammals, was designed to maximize the diversity of samples by using a variety of methods at each locality. Detailed field notes, specimen catalogs, and trapline sheets are deposited at the University of Alaska Museum of the North. Our primary collecting method used snap, live, and pitfall traps (especially important for shrews and amphibians) set along transect lines in a wide diversity of habitats. We generally set traps in pairs with stations placed 10 medium paces apart. Up to 500 traps were set per night. A mixture of peanut butter and rolled oats was the primary bait. We sampled edge and patchy habitats (e.g., the margins of ponds and streams, talus slopes, and blow-down areas) and elevational gradients to maximize diversity of species collected. Particular effort was made to capture rare or undocumented species. Small mammal trapping was generally conducted from early July to August when populations are high and the ability to detect and capture less common species is greatest. Bats were studied at selected field-sites and roosts using nets or sonogram-based bat detectors (Parker et al. 1996; Parker and Cook, 1996; Parker et al., 1997). A shotgun or rifle also was used occasionally to collect squirrels, other medium-sized animals or bats. Series of game species and furbearers were obtained primarily as salvaged frozen carcasses from hunters and trappers through collaboration with the Alaska Department of Fish and Game. Marine mammals were obtained through a series of collaborative efforts with Native communities and the support of the Coastal Marine Institute and National Marine Fisheries Service (Cook et al., 1999).

Specimens were prepared as skeletal preparations, study skins, and/or liquid preservations. The majority of voucher specimens was catalogued into the Mammal and Herp Collections at UAM and forms the basis for the individual Species Accounts. These traditional field preparations were broadly complemented by a variety of ancillary collections that increased the scope and value of the fieldwork. Embryos were preserved in alcohol or liquid nitrogen. Ectoparasites were also preserved. A variety of tissue samples (e.g., heart, liver, spleen, and kidney) from all specimens were frozen in liquid nitrogen in the field. These tissues are stored at –80° C and integrated into the Alaska Frozen Tissue Collection (AF) and Museum of Southwestern Biology, Division of Genomic Resources (DGR).

Associated web-accessible electronic databases (http://www.uaf.edu/museum/mammal) and rigorous curatorial standards make this a significant resource for genetic, ecological, epidemiological, and toxicological research on boreal organisms.

Museum Studies

Traditional. We visited 15 collections to review traditionally preserved specimens (primarily skulls and skins). Electronic databases were verified by reference to voucher specimens. Special attention was paid to records documenting range extensions (e.g., new island records), uncommon species, questionable identification or associated data, and difficult to identify species. We also obtained information from an additional

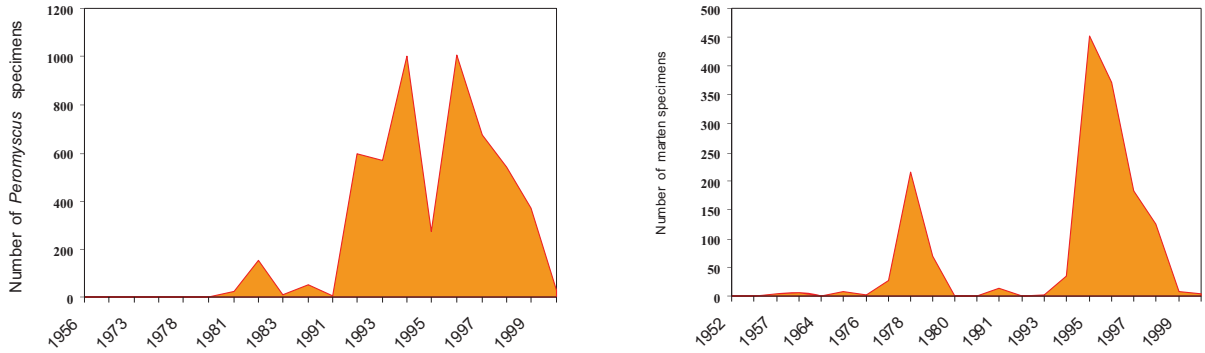


Figure 5. Numbers of deermice (*Peromyscus*) and marten (*Martes*) specimens collected over the years for UAM.

15 collections with smaller holdings and similarly confirmed problematic records. The overwhelming majority of specimens (72%; Appendix 2) was obtained by our fieldwork, identified by us, and subsequently archived at UAM.

Non-Traditional. DNA amplification and analysis of stable isotopes are providing a wealth of new information from these frozen tissues based on investigations supported by state and federal agencies. That support was instrumental to the completion of a series of graduate student theses focused on conservation genetics of a series of mammalian species (e.g., Peacock, 2004). Archived samples also were screened for pathogens (e.g., hantavirus, babesia) by the Centers for Disease Control (Atlanta), Harvard School of Public Health, Tufts University, University of Ha-

Table 3. Our collecting expeditions to Southeast Alaska for UAM.

DATE	LOCALITIES VISITED
1973: June	**Mainland:** Chickamin River
1976-77	**Mainland:** Stikine River
1978: June	**Mainland:** Skagway and Haines areas
1981: June	**Mainland:** Haines area
1982: April-July	**Mainland:** Skagway area
	Alexander Archipelago: Admiralty I., Baranof I., Betton I., Chichagof I., Coronation I., Duke I., Kruzof I., Mitkof I., Revillagigedo I., Wrangell I.
1983: May-June	**Mainland:** Haines area
	Alexander Archipelago: Baker I., Baranof I., Coronation I., Lulu I., Prince of Wales I., Saint Ignace I., San Fernando I., Santa Rita I.
1990: June	**Mainland:** Hyder area
1992: May-July	**Mainland:** Auke Bay, Haines area, Stikine River
	Alexander Archipelago: Etolin I., Kadin I., Kupreanof I., Mitkof I., Prince of Wales I., Shrubby I., Vank I., Woronkofski I., Wrangell I., Zarembo I.
1993: June-August	**Mainland:** Chickamin River, Foggy Bay, Haines area, Nakat Inlet, Union Bay, Unuk River, Willard Inlet
	Alexander Archipelago: Admiralty I., Baranof I., Coronation I., Dall I., Elovoi I., Heceta I., Kosciusko I., Kuiu I., Kupreanof I., Kruzof I., Marble I., Mary I., Noyes I., Prince of Wales I., Revillagigedo I., St. Lazaria Is., San Fernando I., Suemez I., Warren I.
1994: June-August	**Mainland:** Crescent Lake, Gwent Cove, Haines area, Juneau area, Skagway area, Taku River, Turner Lake, Yakutat
	Alexander Archipelago: Admiralty I., Baranof I., Chichagof I., Halleck I., Inian Is., Krestof I., Long I., Moser I., Partofshikof I., Pleasant I., Revillagigedo I., Sukkwan I., Warren I., Yakobi I.
1995: July-August	**Alexander Archipelago:** Anguilla I., Back I., Barrier Is., Betton I., Cap I., Eagle I., El Capitan I., Esquibel I., Grant I., Hoot I., Orr I., Owl I., Prince of Wales I., Revillagigedo I., Sangeo I., Turtle I., Tuxecan I., White Cliff I.
1996: June-August	**Mainland:** Excursion Inlet, Howard Bay, Juneau area
	Alexander Archipelago: Admiralty I., Baranof I., Bushy I., Catherine "I.", Chichagof I., Coronation I., Dall I., Duke I., Forrester I., Goat I., Heceta I., Herbert Graves I., Hill I., Hogan I., Horseshoe I., Hotspur I., Hump I., Kosciusko I., Kruzof I., Kuiu I., Kupreanof I., Level I., Lincoln I., Lulu I., Lydonia I., Marble I., Orr I., Percy Is., Prince of Wales I., San Fernando I., San Juan Bautista I., Santa Rita I., Shelikof I., Shelter I., Shrubby I., Spanish Is., Suemez I., Werlick I., Whale Head I., Yakobi I., Zarembo I.
1997: July-August	**Mainland:** Bradfield Canal, Hyder area, Juneau area, Tap Creek, Thomas Bay, Upper Lynn Canal area, White Pass
	Alexander Archipelago: Deer I., Kupreanof I., Mitkof I.
1998: July-August	**Mainland:** Gwent Cove
	Alexander Archipelago: Dall I., Heceta I., Klakas I., Kosciusko I., Long I., Suemez I.
1999: June-July	**Mainland:** Cleveland Peninsula, Behm Canal
	Alexander Archipelago: El Capitan I., Unnamed island directly south of Garden I., Heceta I., Kassan I., Prince of Wales I., North I., Revillagigedo I., Tuxekan I.

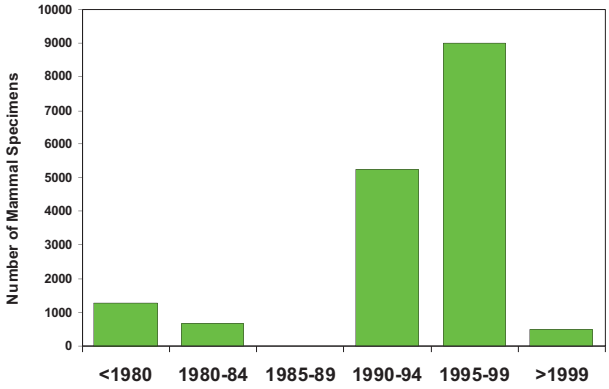


Figure 6. Numbers of mammal specimens collected over the years for UAM.

waii and University of New Mexico. The high cost of sampling fauna in remote locations of Southeast Alaska requires that as much information as possible be archived. These specimens essentially form a library of Alaska's coastal fauna that is serving an expanding number of investigations and is available to the scientific community for a variety of other studies.

Following fieldwork, we began to characterize geographic variation across populations in the region by examining nearly 3000 specimens representing 14 mammal species. The Alexander Archipelago is an excellent system to explore the influence of fragmentation on diversification in insular populations. We used comparable sampling design, molecular markers and analytical approaches across these species (Cook et al., 2006). For each species, we attempted to include specimens of all subspecies described from the region. A mitochondrial gene (usually cytochrome *b*) was sequenced for all specimens and, in several cases, nuclear genetic variation also was assessed. These species, ranging from Black Bears to shrews, vary considerably in body size, life history traits, and ecology. Often these studies were initiated as graduate student projects that resulted in a series of theses at the University of Alaska Fairbanks, Idaho State University, and the University of New Mexico (Lance, 1995; Parker, 1996; Conroy, 1998; Demboski, 1999; Stone, 2000; Bidlack, 2000; Levino-Chythlook, 2000; Runck, 2001; Galbreath, 2002; Lucid, 2003; Weckworth, 2003; Tomasik, 2003; Waltari, 2005; Koehler, 2006; Runck, 2006). Comparative analyses provide insight into general processes that have structured diversity and assembled communities (Hadly et al., 2004; Hewitt, 2004) and these kinds of studies are now being pursued for the Southeast Alaska biota (e.g., Cook et al., 2006).

Species Accounts

Species accounts include all currently recognized species of mammals that occur, or have recently occurred, in Southeast Alaska. Keys adapted from various sources are provided to aid in the identification of species within each mammalian and amphibian Order. For those readers seeking more refined keys, we refer them to the excellent works of Nagorsen (2002) for smaller mammals, Shackleton (1999) for hoofed mammals, Smith (1993) for terrestrial carnivores, Wynne (1993) and Reeves et al. (2002) for marine mammals, and MacDonald (2003) and Matsuda et al. (2006) for amphibians. For most species, the following topics are discussed:

Scientific Name and Authority. Each scientific name is followed by the name of the author and the year in which it was described. Parentheses indicate that, although the specific name has remained the same, the species has since been assigned to another genus. Nomenclature follows Wilson and Reeder (2005) except when noted otherwise.

Common Name. The common or vernacular names generally follow those of Wilson and Reeder (2005) for mammals and Crother et al. (2000) for amphibians. Frequently used alternative names are also included.

Taxonomy. For each species, all subspecies currently recognized in the region are listed. Subspecific taxonomy generally follows Hall (1981) and the original publication, unless otherwise discussed. The locality of type specimens described from Southeast Alaska are noted and located on distribution maps. When applicable, we also review phylogeographic research that may provide additional perspective on diversification and significant geographic variation within the region. When possible, we note the relationship between subspecies classification and phylogeographic variation.

Revisions and Reviews. Important taxonomic revisions published recently are noted. Publications that synthesize information, such as Mammalian Species accounts published by the American Society of Mammalogists, also are cited for each species.

Status. If a taxon or population has special legal status or has been identified as having viability concerns, the appropriate citation is noted. The following conservation sources were accessed

(in December 2006) and reviewed: Alaska Department of Fish and Game (**ADFG**), U.S. Endangered Species Act (**ESA**), International Union for Conservation of Nature and Natural Resources (**IUCN**), Convention on International Trade in Endangered Species of Wild Fauna and Flora (**CITES**), Committee on the Status of Endangered Wildlife in Canada (**COSEWIC**), and the British Columbia (**BC**) Provincial Red and Blue List of British Columbia. See Appendix 8 for a complete listing and source information, and Appendix 9 for a summary of introductions and translocations.

Distribution. A detailed description of a species' geographic range in Southeast Alaska is reported, first for the mainland, followed by its presence on islands in the Alexander Archipelago. Distribution maps outline a species' range within the region with an inset map showing its broader distribution. Our primary source for locality records was the mammal collections at the University of Alaska Museum of the North and from verified specimen holdings in other museum collections, particularly the Museum of Vertebrate Zoology (MVZ) and the U.S. National Museum (USNM). A secondary source was specimens referenced in refereed journals and on personal observations of experienced and knowledgeable residents of the region.

Specimens. Each account lists specimens from our fieldwork supplemented by additional records at the University of Alaska Museum of the North and other institutions identified by acronym (see next page). Specimens are listed alphabetically by USGS Quadrangle Map and presented first by Island locality (listed alphabetically), then by mainland locality. Latitude and longitude are reported in decimal degrees (rounded to the fourth decimal place) with number of specimens and institution following parenthetically. The standard measurements of small mammal specimens from the region are provided in Appendix 10.

Abbreviations

Abbreviations used for museums, universities, and agencies are as follows:

AB, NOAA National Marine Fisheries Service, Auke Bay Laboratory, Auke Bay, AK
ADFG, Alaska Department of Fish and Game
AMNH, American Museum of Natural History, New York, NY
ANSP, Philadelphia Academy of Natural Sciences, Philadelphia, PA
BMNH, British Museum of Natural History, London
CAS, California Academy of Science, San Francisco, CA
CAS-SU, California Academy of Science, Stanford University, CA
CM, Charles R. Conner Museum, Washington State University, Pullman, WA
CMNH, Carnegie Museum, Pittsburgh, PA
CUMV, Cornell University Museum Vertebrates, Ithaca, NY
DMNH, Denver Museum of Natural History, Denver, CO
FMNH, Field Museum of Natural History, Chicago, IL
KU, University of Kansas, Lawrence, KS
LACM, Natural History Museum of Los Angeles County, CA
MCZ, Museum Comparative Zoology, Harvard University, Cambridge, MA
MNHN, Museum National d'Histoire Naturelle, Paris
MSB, Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM
MSUM, Michigan State University Museum, Lansing, MI
MVZ, Museum of Vertebrate Zoology, Berkeley, CA
NMC, National Museum of Canada (Canadian Museum of Nature), Aylmer, Quebec
NPS, National Park Service
PSM, Slater Museum of Natural History, University of Puget Sound, Tacoma, WA
ROM, Royal Ontario Museum, Toronto, ON
SDNHM, San Diego Natural History Museum, San Diego, CA
TCWC, Texas Cooperative Wildlife Collection, College Station, TX
TTU, Texas Tech University, Lubbock, TX
UAM, University of Alaska Museum of the North, Fairbanks, AK
UBC, University of British Columbia, Vancouver, BC
UCB, University of Colorado, Boulder, CO
UCLA, University of California, Los Angeles, CA
UMNH, Utah Museum of Natural History, Salt Lake City, UT
UMMZ, University of Michigan Museum of Zoology, Ann Arbor, MI
USFS, United States Department of Agriculture Forest Service
USFWS, United States Fish and Wildlife Service
USNM, United States National Museum, Washington, DC
UWBM, University of Washington Burke Museum, Seattle, WA

Results

The Mammalian Fauna

Specimen Representation

UAM now houses 16,136 primary specimens of mammals from across the region. Supplementing this major collection is an additional 6351 mammals in 21 other institutions (Figure 7, Appendix 2). These specimens form the basis of the species accounts.

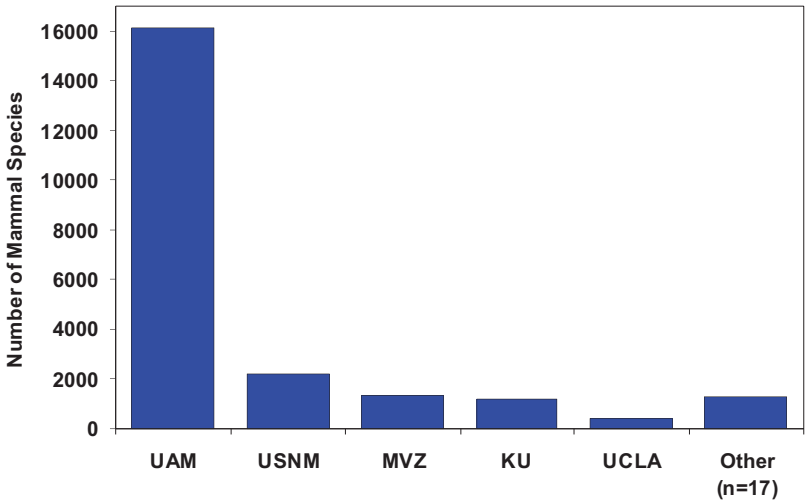


Figure 7. Specimen representation of mammals by institution.

Representation varies considerably among species, with deermice (*Peromyscus keeni*) comprising nearly 30% of all archived specimens (Figure 8). Specimen representation on individual islands is shown in Appendix 4-6. It is important to recognize the limited number of specimens available for most mammals in Southeast Alaska, particularly given the complex landscape of the region (i.e., 2000 named islands).

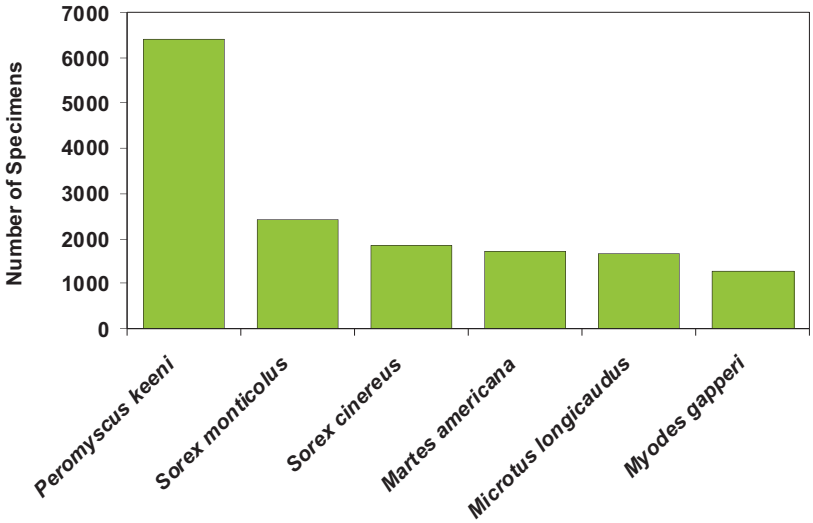


Figure 8. Specimen representation of most commonly archived species.

Faunal Composition

Including human beings, 82 mammal species, representing 63 genera, 28 families, and 8 orders occur or have recently occurred in Southeast Alaska. They comprise 116 subspecies and monotypic species. Ignoring the three subspecies of *Ursus arctos*, 27 of these taxa are essentially endemic to Southeast Alaska. Carnivores and rodents, with 22 and 21 extant species respectively, comprise the most speciose groups, followed closely by whales with 20 species (Figure 9).

Seventy-five species are native and extant. Four extant species are not native to the region: *Rattus norvegicus, Mus musculus, Procyon lotor*, and *Cervus canadensis*. *Vulpes lagopus* is now believed extirpated from the many small islands where it was once commercially farmed on a "turn-loose, run-wild" basis. *Enhydra lutris*, once extirpated from the region, has been successfully re-introduced. Two species, *Mustela nivalis* and *Rangifer tarandus*, probably reside in or occasionally visit the region, but further substantiation is needed. Finally, two marine species not included in our accounting of Southeast Alaska mammals are walrus (*Odobenus rosmarus*), which Fay (1982) reported seen in Yakutat Bay (no further details provided), and hooded seal (*Cystophora cristata*), identified by Fay (1995) from two photographs taken from the west side of Prince of Wales Island near Craig and Klawock in 1979.

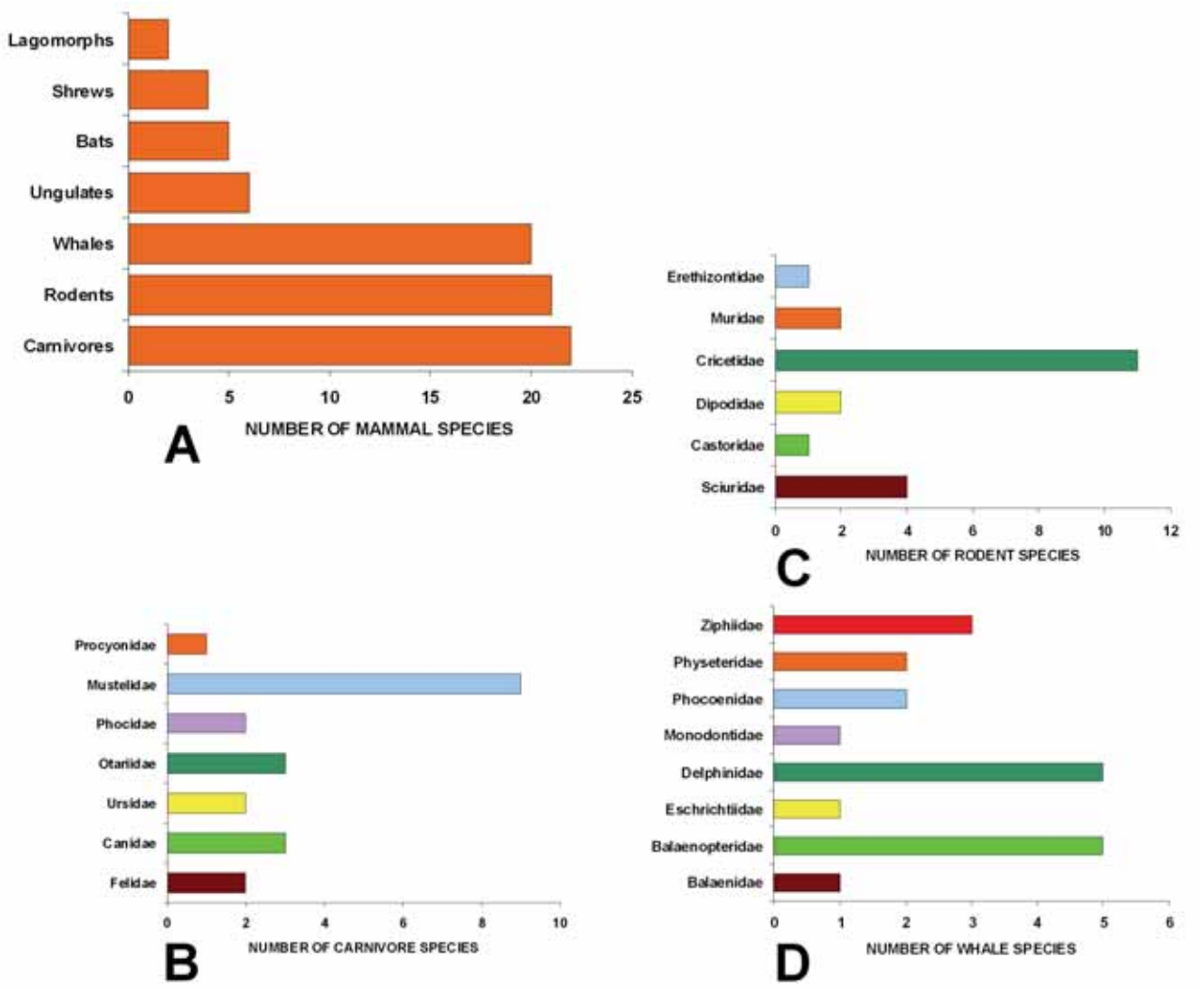


Figure 9. Species richness of Southeast Alaska mammals by A) mammalian order, B) carnivore families, C) rodent families, and D) cetacean families.

Mammal Checklist

Scientific and common names generally follow Wilson and Reeder (2005). Species introduced to the region by human agency are followed by an asterisk (*), and if now extirpated, by a dagger (†). Species in need of further substantiation are enclosed with brackets [ ].

PRIMATES - Primates
- Hominidae
  - *Homo sapiens*, Human

RODENTIA - Rodents
- Sciuridae
  - *Glaucomys sabrinus*, Northern Flying Squirrel
  - *Marmota caligata*, Hoary Marmot
  - *Spermophilus parryii*, Arctic Ground Squirrel
  - *Tamiasciurus hudsonicus*, Red Squirrel
- Castoridae
  - *Castor canadensis*, American Beaver
- Dipodidae
  - *Zapus hudsonius*, Meadow Jumping Mouse
  - *Zapus princeps*, Western Jumping Mouse
- Cricetidae
  - *Lemmus trimucronatus*, Brown Lemming
  - *Microtus longicaudus*, Long-tailed Vole
  - *Microtus oeconomus*, Root Vole
  - *Microtus pennsylvanicus*, Meadow Vole
  - *Myodes gapperi*, Southern Red-backed Vole
  - *Myodes rutilus*, Northern Red-backed Vole
  - *Neotoma cinerea*, Bushy-tailed Woodrat
  - *Ondatra zibethicus*, Common Muskrat
  - *Peromyscus keeni*, Northwestern Deermouse (Keen's Mouse)
  - *Phenacomys intermedius*, Western Heather Vole
  - *Synaptomys borealis*, Northern Bog Lemming
- Muridae
  - *Mus musculus*, House Mouse*
  - *Rattus norvegicus*, Brown Rat*
- Erethizontidae
  - *Erethizon dorsatum*, North American Porcupine

LAGOMORPHA - pikas and hares
- Ochotonidae
  - *Ochotona collaris*, Collared Pika
- Leporidae
  - *Lepus americanus*, Snowshoe Hare

SORICOMORPHA - shrews
- Soricidae
  - *Sorex alaskanus*, Glacier Bay Water Shrew
  - *Sorex cinereus*, Cinereus Shrew
  - *Sorex monticolus*, Dusky Shrew
  - *Sorex palustris*, American Water Shrew

CHIROPTERA - bats
- Vespertilionidae
  - *Lasionycteris noctivagans*, Silver-haired Bat
  - *Myotis californicus*, California Myotis
  - *Myotis keenii*, Keen's Myotis

Myotis lucifugus, Little Brown Myotis
Myotis volans, Long-legged Myotis

CARNIVORA - carnivores
Felidae
Lynx canadensis, Canadian Lynx
Puma concolor, Cougar
Canidae
Canis latrans, Coyote
Canis lupus, Wolf
Vulpes lagopus, Arctic Fox†
Vulpes vulpes, Red Fox
Ursidae
Ursus americanus, American Black Bear
Ursus arctos, Brown Bear
Otariidae
Callorhinus ursinus, Northern Fur Seal
Eumetopias jubatus, Steller's Sea Lion
Zalophus californianus, California Sea Lion
Phocidae
Mirounga angustirostris, Northern Elephant Seal
Phoca vitulina, Harbor Seal
Mustelidae
Enhydra lutris, Sea Otter
Gulo gulo, Wolverine
Lontra canadensis, North American River Otter
Martes americana, American Marten
Martes caurina, Pacific Marten
Martes pennanti, Fisher
Mustela erminea, Ermine
[*Mustela nivalis*, Least Weasel]
Neovison vison, American Mink
Procyonidae
Procyon lotor, Raccoon*

ARTIODACTYLA - ungulates
Cervidae
Alces americanus, Moose
Cervus canadensis, Wapiti (Elk)*
Odocoileus hemionus, Mule Deer (*O. h. sitkensis* as Sitka Black-tailed Deer)
[*Rangifer tarandus*, Caribou]
Bovidae
Oreamnos americanus, Mountain Goat
Ovis dalli, Dall's Sheep

CETACEA - whales
Balaenidae
Eubalaena japonica, North Pacific Right Whale
Balaenopteridae
Balaenoptera acutorostrata, Common Minke Whale
Balaenoptera borealis, Sei Whale
Balaenoptera musculus, Blue Whale
Balaenoptera physalus, Fin Whale
Megaptera novaeangliae, Humpback Whale
Eschrichtiidae
Eschrichtius robustus, Gray Whale

Delphinidae
- *Globicephala macrorhynchus*, Short-finned Pilot Whale
- *Grampus griseus*, Risso's Dolphin
- *Lagenorhynchus obliquidens*, Pacific White-sided Dolphin
- *Orcinus orca*, Killer Whale (Orca)
- *Pseudorca crassidens*, False Killer Whale

Monodontidae
- *Delphinapterus leucas*, Beluga (White Whale)

Phocoenidae
- *Phocoena phocoena*, Harbor Porpoise
- *Phocoenoides dalli*, Dall's Porpoise

Physeteridae
- *Kogia breviceps*, Pygmy Sperm Whale
- *Physeter catodon*, Sperm Whale

Ziphiidae
- *Berardius bairdii*, Baird's Beaked Whale (North Pacific Bottle-nosed Whale)
- *Mesoplodon stejnegeri*, Stejneger's Beaked Whale (Bering Sea Beaked Whale)
- *Ziphius cavirostris*, Cuvier's Beaked Whale (Goose-beaked Whale)

Key to the Mammalian Orders of Southeast Alaska

1. • Hind limbs absent; tail modified as a horizontal fluke ..... **CETACEA**
   • Hind limbs present; tail not modified as a horizontal fluke 2

2. • Forelimbs modified as wings …….. **CHIROPTERA**
   • Forelimbs not modified as wings …… 3

3. • Feet terminating in hooves …..……...…..…… **ARTIODACTYLA**
   • Feet not terminating as hoofs; toes with claws ….....……. 4

4. • First digits of forelimb (thumbs) opposable .....**PRIMATES**
   • First digits not opposable 5

5. • Two pairs of large incisor teeth with space between incisors and cheek teeth …….….. 6
   • Three or more incisor-like teeth in a continuous row ……..……7

6. • Skull with 2 upper incisors …….…..… **RODENTIA**
   • Skull with 4 upper incisors, with second pair behind first …...……**LAGOMORPHA**

7. • Canine teeth no larger than incisors ……..…….. **SORICOMORPHA**
   • Canine teeth larger than incisors …….…… **CARNIVORA**

Order **Primates** Linnaeus, 1758
Family **Hominidae** Gray, 1825

Human
Homo sapiens Linnaeus, 1758

OTHER COMMON NAMES. Human Being, Man.

TAXONOMY. Groves (2005) included 15 families divided into 2 suborders in the order Primates. Under this scheme, the family of man, Hominidae, is shared with the Gorillas, Bonobo, Chimpanzee, and Orangutans.

Homo sapiens

Original Description. 1758. *Homo sapiens* Linnaeus, Syst. Nat., 10th ed., 1:20.
Type Locality. Uppsala, Sweden.
Type Specimen. None designated.

REVISIONS AND REVIEWS. Groves (1989), Watson et al. (2001).

STATUS. The Earth's population of Humans continues to grow at unprecedented rates and now exceeds 6.5 billion (www.census.gov). By the year 2050, the world's population is expected to increase to nearly 9 billion (www.esa.un.org/unpp). The Panhandle of Southeast currently has about 73,000 year round residents.

DISTRIBUTION. Cosmopolitan. Humans have been part of Southeast Alaska's fauna for over 10,000 years. The discovery in 1996 of Human skeletal remains in On Your Knees Cave located at the north tip of Prince of Wales Island have been dated to 10.3 ka BP (9.2 ^{14}C ka BP), the oldest ever found in Alaska or Canada (Fedje et al., 2004). Archeology sites dating earlier than 10.2 ka BP have also been found on Haida Gwaii (the Queen Charlotte Islands), including one at Werner Bay that is positioned on a now drowned part of paleo-Haida Gwaii (Fedje et al., 2004). These discoveries have yielded some of the strongest evidence yet that people who originated in Asia could have migrated into North America at the end of the last glacial (if not before) using watercraft to skirt southward along the Pacific Northwest coast (Heusser, 1960; Fladmark, 1979; Rogers et al., 1991; Dixon, 1999). Mitochondrial and nuclear DNA extracted from teeth of the On Your Knees specimen by Brian Kemp at the University of California, Davis, when compared with more than 3,500 modern and prehistoric Native Americans, found matches in several distinct locations, mostly along the Pacific coastline from California to Mexico, Ecuador, and Chile (Dalton, 2005).

When and from where contemporary indigenous groups in Southeast Alaska (Figure 10) arose is unclear. The western scientific date of 10.3 ka years BP can be contrasted with some Native reports of "since time immemorial." Oral traditions of the Haida of flood and related geologic events suggest that they have inhabited this region since the end of the last ice age and thus constitute one of the oldest traceable populations of any in the New World (MacDonald, 2001).

Contact with Europeans in Southeast Alaska began in the mid-18th Century with disastrous results for the Native populations. When Russia sold Alaska to the United States in 1867 there was neither Native involvement nor consent. Imposition of U.S. control was at times harsh, marked by the shelling of the villages of Kake and Wrangell by the U.S. Navy in 1869 and the destruction of Angoon in 1882.

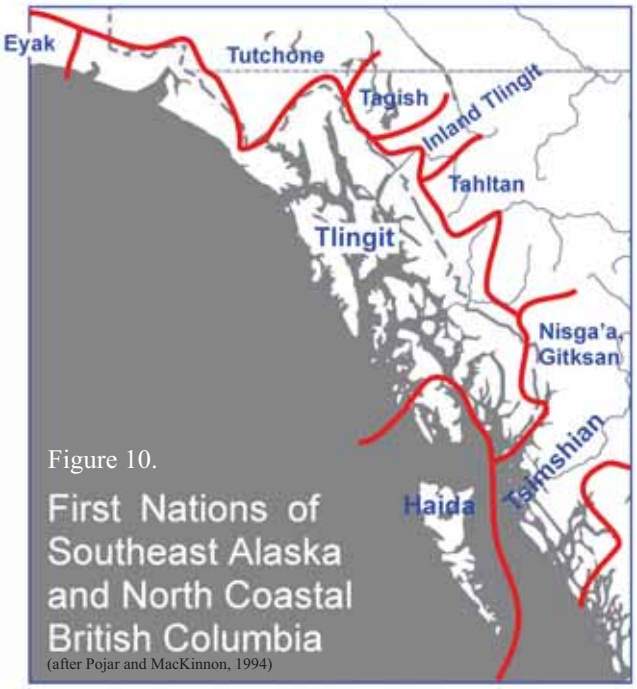


Figure 10.
First Nations of Southeast Alaska and North Coastal British Columbia
(after Pojar and MacKinnon, 1994)

Key to the Rodents of Southeast Alaska

1. • Tail and body covered with quills …..... **North American Porcupine, *Erethizon dorsatum***
   • Tail and body not covered with quills 2

2. • Hind foot webbed …..... 3
   • Hind foot not webbed …..... 4

3. • Tail large, scaly, flattened dorsal-ventrally, paddle-shaped …..... **American Beaver, *Castor canadensis***
   • Scaly tail much smaller, flattened laterally ……..... **Common Muskrat, *Ondatra zibethicus***

4. • Tail long-haired and bushy; prominent postorbital process on skull …..... 5
   • Tail not bushy (or if bushy, underside of tail white); postorbital process weak or absent …..... 8

5. • Loose fold of skin, or gliding membrane, on each side from wrist to hind leg …..... **Northern Flying Squirrel, *Glaucomys sabrinus***
   • No gliding membrane along sides ……..... 6

6. • Size large (total length greater than 600 mm), body stout …. **Hoary Marmot, *Marmota caligata***
   • Size smaller (less than 500 mm), body more slender ……..... 7

7. • Total length usually greater than 350 mm; top of head cinnamon, black flecked with white; underparts yellowish or tawny …..... **Arctic Ground Squirrel, *Spermophilus parryii***
   • Total length usually less than 350 mm; rust-red to grayish-red above, white or grayish-white below ……..... **Red Squirrel, *Tamiasciurus hudsonicus***

8. • Hind legs considerably longer than front legs; tail very long in relation to body size, usually greater than 125 mm; infraorbital canal of skull large and oval; 4 upper cheek-teeth that includes a small premolar ……..... 9
   • Front legs and hind legs equal in size; tail length variable relative to total size; infraorbital canal smaller, being much wider at the top than at the bottom; 3 upper cheek-teeth……..... 10

9. • Length of upper cheek-tooth row greater than 3.7 mm; incisive foramina longer than 4.7 mm; posterior portion of septum dividing the incisive foramina very thin …..... **Western Jumping Mouse, *Zapus princeps***
   • Length of upper cheek-tooth row less than 3.7 mm; incisive foramina shorter than 4.7 mm; posterior portion of septum dividing the incisive foramina broad ... **Meadow Jumping Mouse, *Zapus hudsonius***

10. • Mouse- and rat-like with a slender body, pointed snout, well-developed hind legs, large eyes, prominent ears, and a long tail; cheek-teeth cuspidate or, if cusp pattern not apparent, flat-crowned and prismatic not arranged as alternating triangles 11
    • Vole-like with a stout, furry body, blunt snout, short legs, small eyes, ears frequently hidden by long pelage, and tail relatively short; cheek-teeth without rows of cusps on crown; crowns flat with alternating triangles or "puddles" filled with dentine and surrounded by enamel 14

11. • Cheek teeth appearing prismatic and flat-crowned; tail bushy, underside white ..... **Bushy-tailed Woodrat, *Neotoma cinerea***
    • Cheek teeth clearly cuspidate; tail without hair 12

12. • Two rows of cusps running down the crowns of the tooth row ..... **Northwestern Deermouse, *Peromyscus keeni***
    • Three rows of cusps running down the crowns of the tooth row 13

13. • Total length greater than 300 mm; 1st upper cheek-tooth (M1) about equal to or less than combined length of M2 and M3 ..... **Brown Rat, *Rattus norvegicus***
    • Total length less than 200 mm; M1 length greater than combined length of M2 and M3 .... **House Mouse, *Mus musculus***

14. • Tail very short, about as long as the hind foot; lower incisors set inward from the cheek-teeth, and ending in a horizontal projection opposite or in front of the socket of the last lower molar 15
    • Tail length variable but clearly extending past the hind feet when legs outstretched; lower incisors passing from the tongue to the lip sides of the cheek-teeth and ascending back to within or near the condylar process 16

15. • Pelage uniformly grizzled brown above, grayish below; upper incisors deeply grooved with projecting outer edges ..... **Northern Bog Lemming, *Synaptomys borealis***
    • Pelage chestnut-brown; upper incisors not grooved ..... **Brown Lemming, *Lemmus trimucronatus***

16. • Pelage rust-reddish above; skull relatively rounded and light, zygomatic arches relatively slender and the mandibles week; outer angles of cheek-teeth rounded, without a "heel" projecting posteriorly on the last upper molar (M3) 17
    • Pelage color not as above; skull relatively angular and more massive, zygomatic arches and mandibles more robust; outer angles of cheek-teeth pointed, with a "heel" projecting posteriorly on the M3 18

17. • Tail short, thick, with closely set bristly hairs; post-palatal bridge usually incomplete in adults, and always incomplete up through first year ..... **Northern Red-backed Vole, *Myodes rutilus***
    • Tail longer and more slender, with short hairs except at tip where hairs longer; post-palatal bridge always complete, even in half grown young ..... **Southern Red-backed Vole, *Myodes gapperi***

18. • Cheek-teeth rooted in adults; re-entrant angles on the inner side of the lower molars deeper than those on the outer side (Fig. 3) ..... **Western Heather Vole, *Phenacomys intermedius***
    • Cheek-teeth not rooted in adults; re-entrant angles on the inner side of the lower molars approximately equal in depth 19

19. • Tail averaging 1/3 or more of total length ..... **Long-tailed Vole**, ***Microtus longicaudus***
    • Tail averaging less than 1/3 of total length 20

20. • Second upper molar (M2) with four closed triangles and a posterior loop ..... **Meadow Vole**, ***Microtus pennsylvanicus***
    • M2 with four closed triangles and no posterior loop ..... **Root Vole**, ***Microtus oeconomus***

Order **Rodentia** Bowdich, 1821:7
Family **Sciuridae** Hemprich, 1820

Northern Flying Squirrel
Glaucomys sabrinus (Shaw, 1801)

OTHER COMMON NAMES. Alaska Coast Flying Squirrel, Prince of Wales Flying Squirrel.

TAXONOMY. Two subspecies occur in Southeast Alaska. Flying squirrel populations restricted to Prince of Wales Island are recognized as an endemic subspecies, *G. s. griseifrons* (Osgood, 1905). As is the case with much of the original taxonomic work on the mammals of Southeast Alaska, the description of *G. s. griseifrons* is based on few specimens (Howell, 1934). However, analysis of MtDNA sequences and nuclear microsatellite data revealed diagnostic differences between this subspecies and *G. s. zapheus* (Demboski et al., 1998; Bidlack and Cook, 2001, 2002). The region likely was colonized by this species since the end of Pleistocene and these diagnostic mutations may indicate a "founder event" on the Prince of Wales complex of islands (Prince of Wales Archipelago) and subsequent spread of squirrels to nearby islands. Molecular variation is consistent with the original subspecies designation of *griseifrons* based on morphology.

Glaucomys sabrinus griseifrons

Original Description. 1934. *Glaucomys sabrinus griseifrons* A. H. Howell, J. Mammalogy, 15:64, February 15.

Type Locality. Lake Bay, Prince of Wales Island, Alaska.

Type Specimen. USNM 256993.

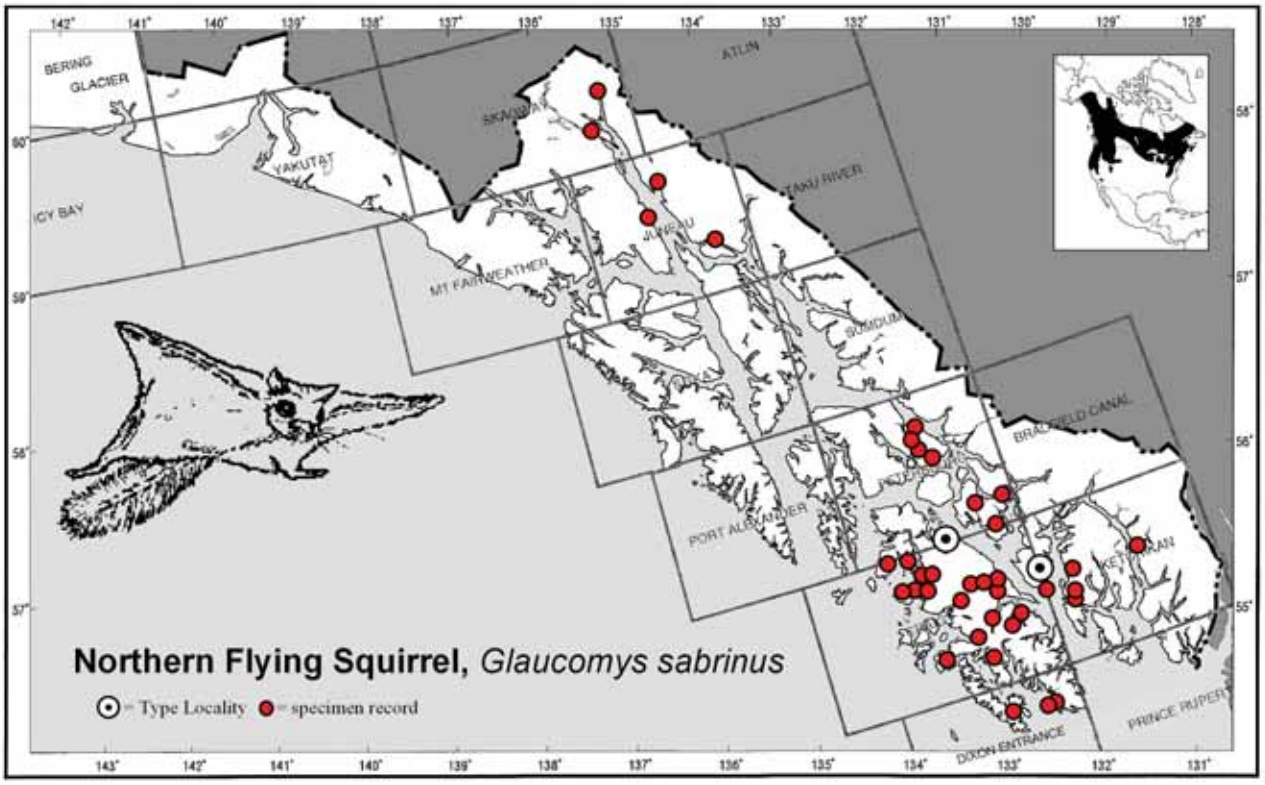
Range. Prince of Wales and adjacent islands, Alexander Archipelago, Southeast Alaska.

Glaucomys sabrinus zaphaeus

Original Description. 1905. *Sciuropterus alpinus zaphaeus* Osgood, Proc. Biol. Soc. Washington, 18:133, April 18.

Type Locality. Helm Bay, Cleveland Peninsula, southeastern Alaska.

Type Specimen. USNM 136137.



Range. Southeast Alaska and the northwestern coastal region of British Columbia.

Remarks. Fourteen specimens representing *zaphaeus* (and *yukonensis*) showed little variation in cytochrome *b* sequences across an extensive geographic range (Demboski et al., 1998).

REVISIONS AND REVIEWS. Wells-Gosling and Heaney (1984), Arbogast (1999).

STATUS. IUCN-Endangered as *G. s. griseifrons*. This subspecies was a ESA Candidate until the late 1980s, and a taxon of concern by West (1991) and Suring et al. (1992). Given the past and projected timber harvests on Prince of Wales and adjacent islands and the potential introduction of exotic species or pathogens to these island populations, the status of this subspecies needs to be carefully monitored.

DISTRIBUTION. The Northern Flying Squirrel has been documented along the coastal mainland from the upper Lynn Canal south to Rudyerd Bay. In the Alexander Archipelago south of Frederick Sound, it has been recorded on three of the Barrier Islands (off SW Prince of Wales Island), Betton (trapper report), Dall, El Capitan, Etolin, larger unnamed island immediately south of Garden, Gravina (M. Sallee, pers. comm.), Heceta, Kosciusko, Mitkof, North, Orr, Prince of Wales, Revillagigedo, Suemez, Thorne, Tuxekan, and Wrangell islands.

SPECIMENS. **CRAIG QUAD:** 55.9167, -133.3333, El Capitan Island (5 UAM); 55.9183, -133.3292, El Capitan Island, south side of Island (7 UAM); 55.9331, -133.3092, El Capitan Island, East side of Island (8 UAM); 55.9556, -133.3219, El Capitan Island, NE tip of Island (3 UAM); 55.9833, -133.3333, El Capitan Island, New Tokeen, (1 UAM); 55.7567, -133.3472, Heceta Island, Tonowek Narrows (2 UAM); 55.7697, -133.3442, Heceta Island, bay N Tonowek Narrows (2 UAM); 55.7881, -133.3206, Heceta Island, unnamed bay S of Chapin Island (7 UAM); 55.7886, -133.3353, Heceta Island, Squam Bay (1 UAM); 55.7981, -133.3353, Heceta Island, NE Peninsula (1 UAM); 55.7981, -133.3519, Heceta Island, NE peninsula (4 UAM); 55.8053, -133.3319, Heceta Island, Karheen Pass S Peep Rocks (2 UAM); 55.7667, -133.4500, Heceta Island, Cone Lake Road (1 UAM); 55.7986, -133.5336, Heceta Island (1 UAM); 55.7986, -133.5336, Heceta Island (1 UAM); 55.8031, -133.5914, Heceta Island, Port Alice (1 UAM); 55.9828, -133.6050, Kosciusko Island, 2 mi N Edna Bay (3 UAM); 55.8997, -133.3092, North Island, North Island (3 UAM); 55.9186, -133.4331, Orr Island, S Orr Is. (1 UAM); 55.9297, -133.4186, Orr Island, E side (1 UAM); 54.6892, -132.5403, Prince of Wales Island, North Thorne Bay (1 UAM); 55.2081, -132.8267, Prince of Wales Island, mile 23 Hydaburg Road (1 UAM); 55.3056, -132.5456, Prince of Wales Island, Polk Inlet (1 UAM); 55.3286, -132.5106, Prince of Wales Island, Polk Inlet (1 UAM); 55.3397, -132.5028, Prince of Wales Island, Polk Inlet (2 UAM); 55.3428, -132.5172, Prince of Wales Island, Polk Inlet (3 UAM); 55.3444, -132.5042, Prince of Wales Island, Polk Inlet (4 UAM); 55.3467, -132.5189, Prince of Wales Island (1 UAM); 55.3467, -132.8356, Prince of Wales Island (2 UAM); 55.3500, -133.6000, Prince of Wales Island (2 UAM); 55.3533, -132.5158, Prince of Wales Island, Polk Inlet (3 UAM); 55.3542, -132.8406, Prince of Wales Island, Cable Creek (2 UAM); 55.3550, -132.5106, Prince of Wales Island, Polk Inlet (4 UAM); 55.3575, -132.5194, Prince of Wales Island, Polk Inlet (2 UAM); 55.3583, -133.6042, Prince of Wales Island (1 UAM); 55.3594, -132.5433, Prince of Wales Island, Polk Inlet (1 UAM); 55.3664, -132.5067, Prince of Wales Island (4 UAM); 55.4092, -132.4044, Prince of Wales Island, Paul Bight, Polk Inlet (2 UAM); 55.4128, -132.3458, Prince of Wales Island (4 UAM); 55.4500, -132.6833, Prince of Wales Island, Harris Creek (1 UAM); 55.4539, -132.3264, Prince of Wales Island, Smith Cove, Skowl Arm (6 UAM); 55.5167, -132.9833, Prince of Wales Island, head of Klawock Lake (5 UAM); 55.6167, -132.9000, Prince of Wales Island, Honker Divide, 1 mile S of Galra Lake (9 UAM); 55.6250, -132.5500, Prince of Wales Island, Lake Ellen (1 UAM); 55.6319, -132.9075, Prince of Wales Island (7 UAM); 55.6686, -132.5075, Prince of Wales Island, Thorne Bay (11 UAM); 55.6750, -132.5000, Prince of Wales Island, South Arm, Thorne Bay (10 UAM); 55.7000, -132.7833, Prince of Wales Island (3 UAM); 55.7019, -132.7911, Prince of Wales Island (2 UAM); 55.7025, -132.8442, Prince of Wales Island, Eagle's Nest campground (1 UAM); 55.7167, -132.8167, Prince of Wales Island, Ball's Lake, 15 mi W Thorne Bay (5 UAM); 55.7500, -133.2500, Prince of Wales Island, Nossuk Creek (2 UAM); 55.7500, -132.4667, Prince of Wales Island, Sandy Beach Road, 28 m from Slide Creek (1 UAM); 55.7589, -132.8389, Prince of Wales Island, Prince of Wales Island (5 UAM); 55.7667, -132.4833, Prince of Wales Island (2 UAM); 55.7667, -132.8333, Prince of Wales Island (5 UAM); 55.7683, -132.6000, Prince of Wales Island, North Thorne Falls. (2 UAM); 55.7847, -132.8556, Prince of Wales Island (6 UAM); 55.7853, -132.7911, Prince of Wales Island (1 UAM); 55.8153, -133.1319, Prince of Wales Island, S fork of Stanley Creek (2 UAM); 55.8333, -133.1500, Prince of Wales Island, Stanley Cr Cabin, 25 mi WNW Thorne Bay (1 UAM); 55.8569, -133.1672, Prince of Wales Island, South side of Naukati Bay, Prince of Wales Island (5 UAM); 55.8914, -133.1657, Prince of Wales Island, Near Nankati Bay (1 UAM); 55.8917, -133.2506, Prince of Wales Island, old Tuxekan village (1 UAM); 55.9000, -133.3333, Prince of Wales Island, Kihani Point (2 UAM); 55.9014, -133.2486, Prince of Wales Island (3 UAM); 55.9017, -133.2486, Prince of Wales Island (2 UAM); 55.9122, -133.2600, Prince of Wales Island, Dargun Point, Prince of Wales Island (5 UAM); 55.9125, -133.2583, Prince of Wales Island, Dargun Point, Prince of Wales Island (1 UAM); 55.9333, -133.3000, Prince of Wales Island, near New Tokeen (1 UAM); Prince of Wales Island, RD #2059; T69S R80E S8 (1 UAM); 55.6167, -133.0000, Prince of Wales Island, Big Salt Lake (1 UAM); 55.7667, -132.6833, Prince of Wales Island, North Thorne Falls (N Thorne River or Falls Creek drainage) (1 UAM); 55.8917, -133.2506 (6 UAM); 55.8981, -133.3156 (2 UAM); 55.9069, -133.2794 (1 UAM); 55.9083, -133.2022, Prince of Wales Is., FS boundary north of Naukati (2 UAM); 55.2667, -133.3500, Suemez Island, SE part of island, near Ridge Island (1 UAM); 55.2769, -133.2775, Suemez Island, SE arm of Port Refugio (4 UAM); 55.2847, -133.3344, Suemez Island, Port Refugio, (4 UAM); 55.2914, -133.2983, Suemez Island, 1mi west of Pt. Bocas, Port Refugio (1 UAM); 55.2928, -133.3231, Suemez Island, NW corner of Port Refugio (7 UAM); 55.3000, -133.3000, Suemez Island, SW corner of Port Refugio (3 UAM); 55.3031, -133.3000, Suemez Island, Port Refugio (2 UAM); 55.3039, -133.3011, Suemez Island, Point Verde (6 UAM); 55.8281, -133.2181, Tuxekan Island, Kugun Pt. (3 UAM); 55.8281, -133.2186, Tuxekan Island, Kugun Pt. (1 UAM); 55.8464, -133.2231, Tuxekan Island, E side of Nichin Cove (6 UAM); 55.8500, -133.2833, Tuxekan Island (1 UAM); 55.8531, -133.2275, Tuxekan Island, Nichin Cove (3 UAM); 55.8658, -133.2261, Tuxekan Island, across from Naukati (3 UAM); 55.8778, -133.2950, Tuxekan Island, Jinhi Bay (4 UAM); 55.8972, -133.3264, Tuxekan Island, NW tip (5 UAM); 55.8981, -133.3156, Tuxekan Island, NW bay of Island (1 UAM); 55.8069, -133.3678, unnamed island, S of Garden Island (2 UAM). **DIXON ENTRANCE QUAD:** 54.7833, -132.4000, Barrier Islands, unnamed island SE of Middle Island (14 UAM); 54.8069, -132.7692, Dall Island, Pond Bay (1 UAM); 54.8000, -132.4333, Barrier Islands, Middle Island, E side (4 UAM); 54.9075, -132.4147, Prince of Wales Island, Ruth Cutoff (1 UAM). **JUNEAU QUAD:** 58.3000, -134.4000, 17 miles out road from Juneau (2 UAM); 58.5750, -135.1583, Juneau, St James Bay, W side Lynn Canal, (1 UAM);

58.7881, -134.9356 (1 UAM); Chilkat Range (1 UAM). **KETCHIKAN QUAD:** 55.3417, -131.6458, Revillagigedo Island, Milles Ridge above downtown Ketchikan (2 UAM); 55.4000, -131.7000, Revillagigedo Island, Ward Lake (1 UAM); 55.4333, -131.6333, Revillagigedo Island, Pond Reef Road, Ketchikan (1 UAM); 55.5708, -131.6583, Revillagigedo Island, Long Arm, Moser Bay (1 UAM); 55.5317, -131.9586, Bond Bay, Cleveland Peninsula (1 UAM); 55.6167, -131.9667, Helm Bay, Cleveland Peninsula (28 UAM); 55.7500, -132.0000, Cleveland Peninsula (10 UAM); 55.5544, -130.8592, Rudyerd Bay (1 UAM). **PETERSBURG QUAD:** 56.1833, -132.4167, Etolin Island, Anita Bay, South (1 UAM); 56.0978, -132.3603, Etolin Island (1 MVZ); 56.5410, -132.7340, Mitkof Island, Blind Slough (1 UAM); 56.6167, -132.8333, Mitkof Island, Blind Slough (2 UAM); 56.6306, -132.9417, Mitkof Island, Spruce Point, Blind Slough (1 UAM); 56.6333, -132.8806, Mitkof Island, Blind Slough (1 UAM); 56.6375, -132.9167, Mitkof Island, Blind Slough (4 UAM); 56.6625, -132.9156, Mitkof Island, Danger Point (1 UAM); 56.6667, -132.8333, Mitkof Island (7 UAM); 56.7206, -132.9294, Mitkof Island, Twin Creeks (1 UAM); 56.7210, -132.9290, Mitkof Island, Twin Creek (4 UAM); 56.7944, -132.8222, Mitkof Island, Frederick Point (1 UAM); 56.1167, -133.1333, Prince of Wales Island, Whale Pass (1 UAM); 56.0833, -133.0333, Thorne Island (2 UAM); 56.1667, -132.1333, Wrangell Island, 3 mi north of Thoms Creek (1 UAM). **SKAGWAY QUAD:** 59.2617, -135.5597, Haines area (1 UAM); Skagway area, Taiya River (1 UAM).

Hoary Marmot
Marmota caligata (Eschscholtz, 1829)

OTHER COMMON NAMES. Glacier Marmot, Northern Hoary Marmot, whistler.

TAXONOMY. Two subspecies are currently recognized, one endemic to Glacier Bay (Hall, 1981).

Marmota caligata caligata

Original Description. 1829. *Arctomys caligatus* Eschscholtz, Zool. Atlas, Part 2, p. 1, pl. 6.

Type Locality. Near Bristol Bay, Alaska.

Type Specimen. Not known to exist.

Range. Central and southern Alaska, Yukon Territory, Mackenzie River Valley in western NWT, northwestern British Columbia.

Marmota caligata vigilis

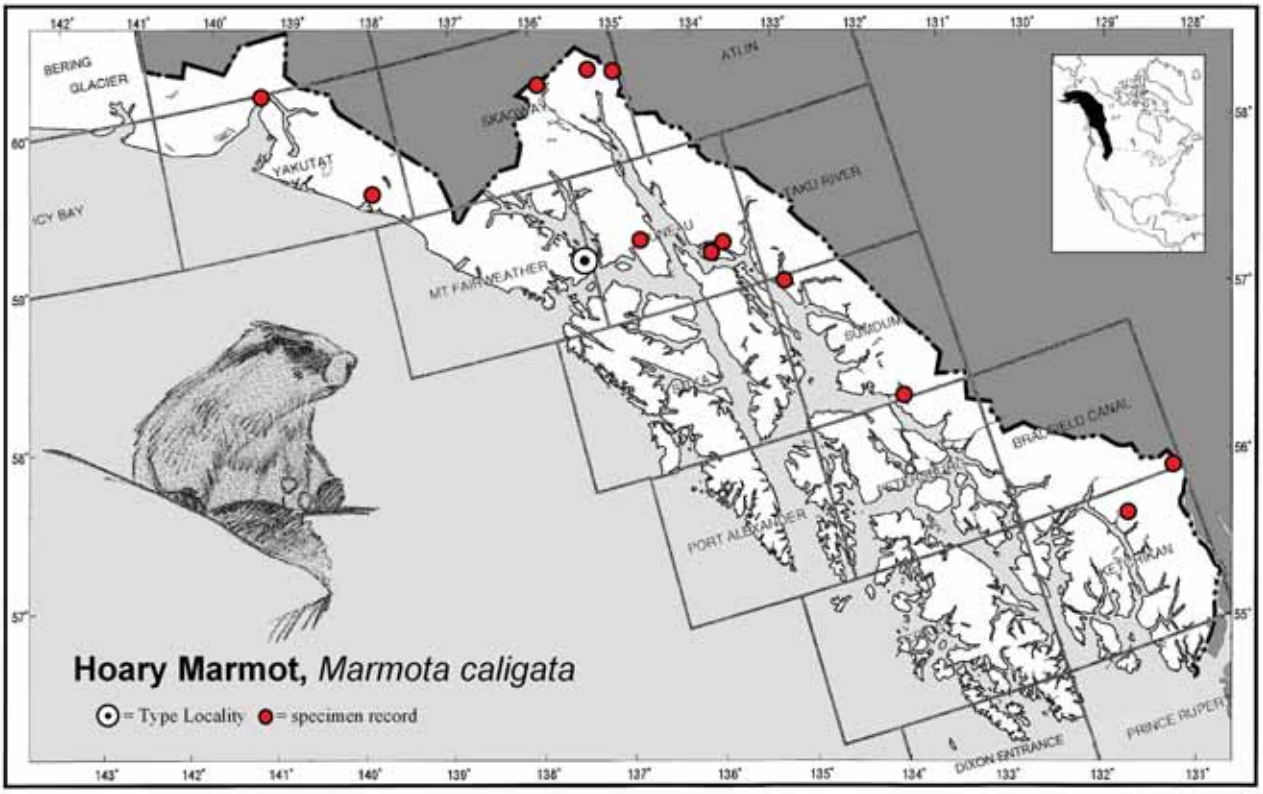
Original Description. 1909. *Marmota vigilis* Heller, Univ. California Publ. Zool, 5:248, February 18.

Type Locality. W shore Glacier Bay, Alaska.

Type Specimen. MVZ 418.

Range. Known only from the type locality.

Remarks. Many of the specimens from Glacier Bay in MVZ and USNM are distinctly melanistic. Three marmots recently collected in the Chilkat Range above Excursion Inlet are also melanistic.



REVISIONS AND REVIEWS. Hoffmann et al. (1979).

STATUS. IUCN-Data deficient as *M. c. vigilis* (Cook, 1998b).

DISTRIBUTION. Hoary Marmots can be found at various elevations along Southeast Alaska's mainland coast from Hyder and Portland Canal to Yakutat (MacDonald and Cook, 1996). Specimens collected in 1992 and 1995 on Douglas Island are the only insular records in the region.

Marmot remains predating the last glacial maximum have been discovered in cave deposits on Prince of Wales Island (Heaton and Grady, 2003).

SPECIMENS. **BRADFIELD CANAL QUAD:** 56.0167, -130.0669, Salmon River, mouth of Texas Creek (1 UAM); 56.0339, -130.0433, 2.8 km NE mouth of Texas Creek (1 UAM). **JUNEAU QUAD:** 58.2839, -134.5203, Douglas Island (2 UAM); 58.2839, -134.5203, Douglas Island (1 UAM); 58.3042, -134.4083, Juneau road system, 1 mile south of Thane (1 UAM); 58.3042, -134.4083, Juneau (7 USNM); 58.5505, -135.4792, Chilkat Range, 6.5 km NNE Excursion Inlet (3 UAM). **KETCHIKAN QUAD:** 55.9833, -130.6500, Chickamin River (2 MVZ). **MT. FAIRWEATHER QUAD:** 58.5167, -136.2000, Glacier Bay (8 USNM); 58.4670, -136.0670, Glacier Bay, Coppermine Cove (3 MVZ). **SKAGWAY QUAD:** 59.6162, 135.1383, White Pass (1 UAM); 59.6374, -136.1291, Mount Ashmun (2 UAM); 59.5500, -135.1227, Glacier, White Pass (4 USNM). **SUMDUM QUAD:** 57.0833, -132.7333, creek between Fighting John Peak and Swan Lake (1 UAM); 57.9667, -133.7833, Port Snettisham (1 MVZ). **YAKUTAT QUAD:** 59.6670, -140.0000, Yakutat Bay (1 UAM); 59.9333, -139.5667, Disenchantment Bay (1 MVZ); Dry Bay (2 FMNH); Bancas Point (2 ROM).

Arctic Ground Squirrel
Spermophilus parryii (Richardson, 1825)

OTHER COMMON NAMES. Parry's ground squirrel, Yukon ground squirrel.

TAXONOMY. The type locality of the subspecies, *S. p. plesius*, is Lake Bennett, British Columbia, not far from the Alaska border (Osgood, 1900; Howell, 1938). Five specimens collected at White Pass on the Alaska/British Columbia border were also included in Osgood's (1900) revision.

Spermophilus parryii plesius

Original Description. 1825. *Spermophilus empetra plesius* Richardson, *in* Parry, Journal of a second voyage ... , p. 316, October 6.

Type Locality. Bennett City, head of Lake Bennett, British Columbia.

Type Specimen. USNM 98931.

Range. Southcentral Alaska, southern Yukon Territory, southwestern NWT, and northern British Columbia including Southeast Alaska in the mountains near Haines and Skagway.

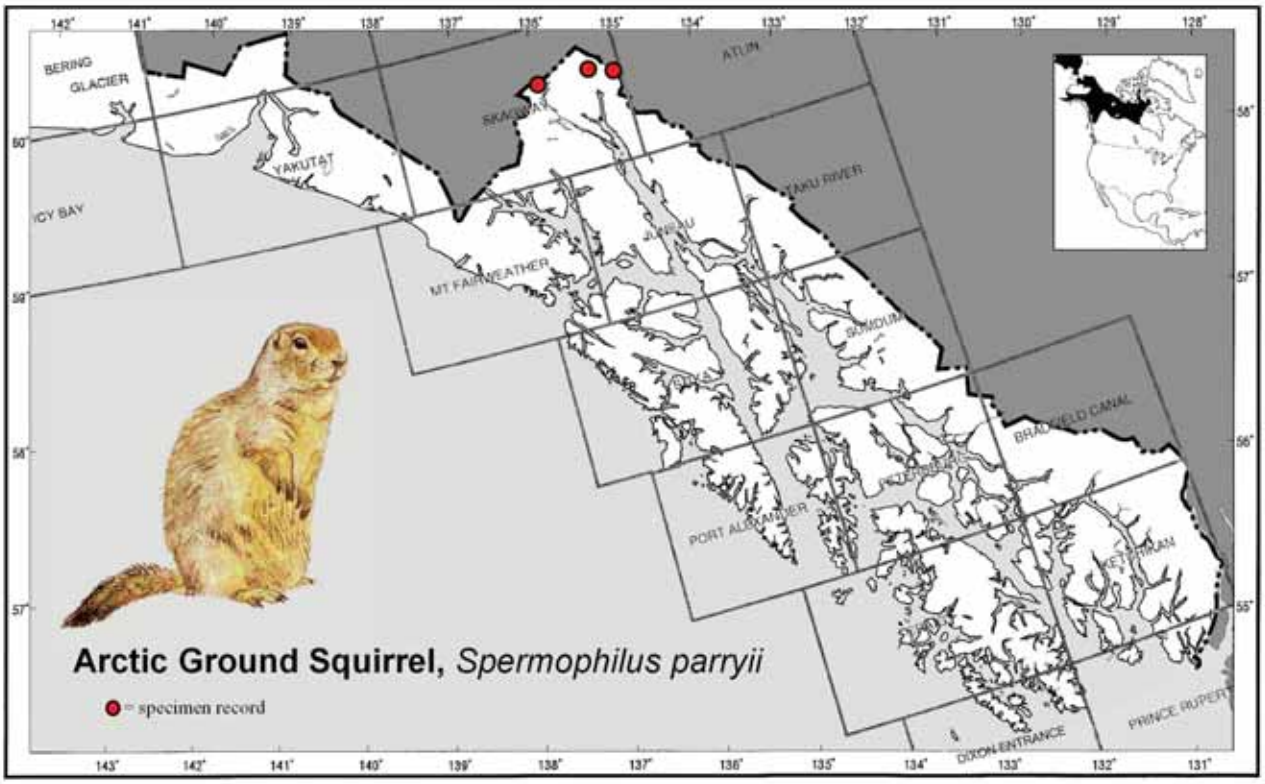
REVISIONS AND REVIEWS. Nadler and Hoffmann (1977), Pearson (1981), Cook (1998a), Eddingsaas et al. (2004).

STATUS. IUCN-Least concern.

DISTRIBUTION. The only confirmed records for this species in the region are from the mountains in the vicinities of Haines and Skagway.

SPECIMENS. **SKAGWAY QUAD:** 59.6044, -136.0440, Tohitkah Mountain (1 UAM); 59.6142, -135.1669, White Pass (3 UAM); 59.6158, -135.1683, White Pass (1 UAM); 59.625, -135.1347222, White Pass (1 UAM); 59.6253, -136.0893, Tohitkah Mountain (3 UAM); 59.6374, -136.1291, Mount Ashmun (1 UAM).

Cutting railroad grade near White Pass, c. 1898 (*courtesy of the Alaska State Library, A Souvenir of Alaska and Tribute to the Man M.J. Heney, H.C. Barley, P340-023*).



Red Squirrel

Tamiasciurus hudsonicus (Erxleben, 1777)

OTHER COMMON NAMES. Pine Squirrel, Alaska Red Squirrel, Kupreanof Red Squirrel.

TAXONOMY. Two subspecies are currently recognized in the region (Swarth, 1921; Hall, 1981).

Tamiasciurus hudsonicus petulans

Original Description. 1900. *Sciurus hudsonicus petulans* Osgood, N. Amer. Fauna, 19:27, October 6.

Type Locality. Glacier, 1870 ft., White Pass, southern Alaska.

Type Specimen. USNM 97457.

Range. Southern Yukon Territory, extreme northwestern British Columbia and northern Southeast Alaska.

Tamiasciurus hudsonicus picatus

Original Description. 1921. *Sciurus hudsonicus picatus* Swarth, J. Mammal., 2:92, May 2.

Type Locality. Kupreanof Island, 25 mi. S. Kake Village, at southern end of Keku Straits, SE Alaska.

Type Specimen. MVZ 8767.

Range. Southeast Alaska, northwestern coast of British Columbia.

REVISIONS AND REVIEWS. Steele (1998).

STATUS. IUCN-Least concern. The Red Squirrel is a Management Indicator Species for the USDA Forest Service, Tongass National Forest (Sidle and Suring, 1986; TLMPR, 1997). The impact of this species on the native flora and fauna (especially birds) on the numerous islands in the archipelago where it has been introduced has never been assessed.

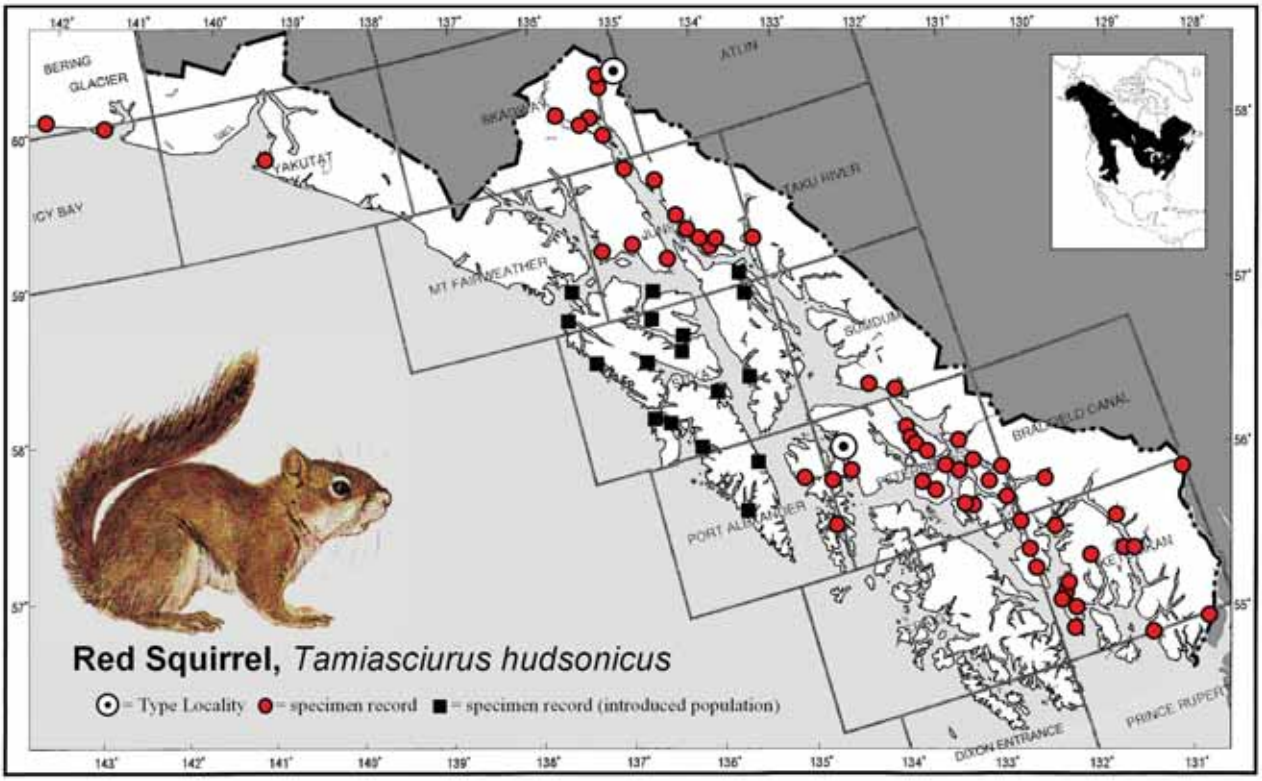
DISTRIBUTION. Red Squirrels are native inhabitants of forested habitats throughout the coastal mainland of Southeast Alaska. Before the days of game transplanting, they were also found on islands in the Alexander Archipelago south of Frederick Sound and east of Clarence Strait, specifically Betton, Deer, Douglas, Etolin, Gedney, Grant, Hassler, Horseshoe, Kuiu, Kupreanof, Mitkof, Read, Revillagigedo, Sullivan, Tatoosh, Tongass, Vank, Woronkofski, Wrangell, and Zarembo. Present day populations on Gravina and Annette islands may be the result of

human translocations (see Swarth, 1911:Figure 1).

Most evidence suggests that this species was unofficially planted on Admiralty Island sometime in the late 1940s or early 1950s (MacDonald and Cook, 1996). In 1993, the Red Squirrel was reported as far south as Angoon (R. Carstensen, pers. comm., 1994), and in 1995 at Hood Bay (UAM specimen). By 1999, the species was believed to have successfully colonized the entire island (E. Grossman, pers. comm.).

Red Squirrels from the Juneau area were successfully transplanted to Baranof and Chichagof islands in 1930 and 1931 (Burris and McKnight, 1973). Since then, Red Squirrels have been found on Hill, Inian, Kruzof, Moser, Partofshikof, Yakobi islands, and on the smaller islands in Sitka Sound (MacDonald and Cook, 1996). An apparently unsuccessful transplant occurred on Prince of Wales Island (Fay and Sease, 1985).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (4 CAS). **BRADFIELD CANAL QUAD:** 56.1886, -131.5811, Duck Point, (1 UAM). **JUNEAU QUAD:** 57.9575, -135.4928, Chichagof Island, Salt Lake Bay (4 UAM); 58.0500, -134.3000, Chichagof Island, Game Creek (1 UAM); 58.0667, -135.5500, Chichagof Island, Salt Lake Bay (1 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (6 UAM); 58.1083, -135.4417, Chichagof Island, south of Hoonah (1 UAM); 58.2822, -134.5186, Douglas Island (3 UAM); 58.2833, -135.05 (2 UAM); Sullivan Island (1 KU); 58.3000, -134.4 (1 UAM); 58.3333, -134.6 Mendenhall area (5 UAM); 58.4000, -134.7333, 17.7 mile Glacier Highway (3 UAM); 58.4333, -135.4500, Excursion Inlet, W side (2 UAM); 58.4500, -135.8833, 10 km NW Gustavus Airport, Bartlett Cove (1 UAM); 58.4564, -135.8992, Bartlett Cove, 10 km NW of Gustavus airport (1 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (2 UAM); 58.5269, -134.8217, Eagle River (1 UAM); 58.7881, -134.9355556 (6 UAM); 58.7889, -135.0278, mouth of Slate Creek (1 UAM); 59.5292, -134.9078, Echo Cove (3 UAM); 61.3311, -149.6858, Turner Lake (1 UAM). **ICY BAY QUAD:** Icy Bay (1 CAS). **KETCHIKAN QUAD:** 55.5333, -131.8000, Betton Island (2 UAM); 55.8561, -131.7061, Gedney Island (2 UAM); 55.5500, -131.7167, Grant Island (3 UAM); 55.1783, -131.8058, Gravina Island, Phocena Bay (2 UAM); 55.4667, -131.7833, Revillagigedo Island, Knutson Cove, Clover Pass (1 UAM); 55.5903, -130.9714, Revillagigedo Island, Manzanita Bay (2 UAM); 55.6333, -131.3667, Revillagigedo Island, head of Carroll Inlet (1 UAM); 55.5167, -131.8333, Tatoosh Island (1 UAM); 55.0080, -131.0040, Cape Fox village (1 USNM); 55.3417, -131.7333 (1 UAM); 55.5450, -130.8703, Point Louise, Rudyerd Bay (2 UAM); 55.5544, -130.8592, Rudyerd Bay (6 UAM); 55.6167, -131.9667, Helm Bay, Cleveland Peninsula (1 UAM); 55.7056, -130.8928, Ledge Point, Walker Cove (1 UAM); 55.7500, -132.0000, Cleveland Peninsula (3 UAM); 55.7667, -130.8833, Chickamin River, Wolf cabin (1 UAM); 55.9167, -130.0167, Hyder (1 UAM); 55.9333, -130.0333, Hyder, N of town (2 UAM). **MT. FAIRWEATHER QUAD:** 58.2583, -136.2986, Inian Island (1 UAM); 58.1000, -136.4667, Yakobi Island, Soapstone Cove (2 UAM). **PETERSBURG QUAD:** 56.0333, -132.0167, Deer Island, S. side of Island (1 UAM); 56.1667, -132.4500, Etolin Island (1 UAM); 56.1833, -132.4500, Etolin Island, Anita Bay area (5 UAM); 56.2211, -132.5089, Etolin Island (1 UAM); 56.8000, -133.7333, Horseshoe Island, in Rocky Pass near Kupreanof (1 UAM); 56.3667, -133.3167, Kupreanof Island (2 UAM); 56.4500, -132.9500, Kupreanof Island, Big John Bay, Rocky Pass (1 UAM); 56.5833, -133.6833, Kupreanof Island, 25 mi. S Kake Village, at southern end of Keku Straits (1 MVZ); 56.6931, -132.9556, Kupreanof Island (2 UAM); 56.9500, -133.9000, Kupreanof Island, Kake, near Kake Forest Service cabin (1 UAM); 56, -132.0000, Mitkof Island, Blind Slough (1 UAM); 56.5410, -132.7340, Mitkof Island, Blind Slough (12 UAM); 56.5980, -132.8090, Mitkof Island (4 UAM); 56.6167, -132.8333, Mitkof Island, Blind Slough (5 UAM); 56.6167, -132.8806, Mitkof Island, Blind Slough (1 UAM); 56.6333, -132.8806, Mitkof Island, Blind Slough (3 UAM); 56.6333, -132.9167, Mitkof Island, Blind Slough (2



UAM); 56.6333, -132.8333, Mitkof Island, Hangs Dog (2 UAM); 56.6500, -132.8500, Mitkof Island, Rifle Range (1 UAM); 56.6667, -132.8333, Mitkof Island (4 UAM); 56.6833, -132.8167, Mitkof Island, Falls Creek (2 UAM); 56.7210, -132.9290, Mitkof Island, Twin Creek (23 UAM); 56.7333, -132.9667, Mitkof Island, Wrangell Narrows (2 UAM); 56.7944, -132.8222, Mitkof Island, Frederick Point (1 UAM); 56.8000, -132.9167, Mitkof Island, Frederick Point (1 UAM); 58.6333, -132.9167, Mitkof Island, Blind Slough (1 UAM); 56.4528, -132.6028, Vank Island, Mud Bay (2 UAM); 56.4353, -131.4967, Woronkofski Island (1 UAM); 56.1400, -132.0800, Wrangell Island, southern tip of island (1 UAM); 56.2667, -132.2500, Wrangell Island, McCormick Creek (1 UAM); 56.2833, -132.1667, Wrangell Island (1 UAM); 56.4500, -132.2833, Wrangell Island (1 UAM); 56.5000, -132.2833, Wrangell Island (2 UAM); 56.3333, -132.8333, Zarembo Island, east side (2 UAM); 56.4167, -133.0000, Zarembo Island, Saint John Harbor (4 UAM); 56.4500, -132.9500, Zarembo Island, Saint John Harbor (1 UAM); 56.3636, -132.0081, Berg Bay (1 UAM); 56.6167, -132.4333, Stikine River, Farm Island (7 UAM); 56.7728, -132.6075, Jap Creek (2 UAM). **PORT ALEXANDER QUAD:** 56.5903, -134.8603, Baranof Island, Plotnikof Lake (4 UAM); 56.8333, -134.7000, Baranof Island, Red Bluff Bay (2 UAM); 56.3214, -134.0717, Kuiu Island, head of Affleck Canal (2 UAM); 56.5833, -134.0000, Kuiu Island, Camden Bay Portage (1 UAM). **PRINCE RUPERT QUAD:** 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (3 UAM). **SITKA QUAD:** 57.4333, -134.5500, Admiralty Island, N side Hood Bay (1 UAM); 57.0500, -135.3333, Baranof Island (1 UAM); 57.3667, -134.8833, Baranof Island, Catherine "Island" (2 UAM); 57.7000, -135.2167, Chichagof Island, Trap Bay, Tenakee Inlet (10 UAM); 57.7833, -135.1500, Chichagof Island, 4.5 km E Tenakee Springs (2 UAM); 57.8167, -136.1500, Chichagof Island, Otter Lake (3 UAM); 57.8167, -136.1606, Chichagof Island, Otter Lake (1 UAM); 57.9575, -135.4900, Chichagof Island, Salt Lake Bay, Port Frederick (4 UAM); 57.9575, -135.4928, Chichagof Island, Salt Lake Bay, Port Frederick (3 UAM); 57.7497, -136.2922, Hill Island (1 UAM); 57.7500, -136.2833, Hill Island, 9 miles NW of Chichagof Island (1 UAM); 57.3031, -135.8247, Kruzof Island, Sea Lion Cove (4 UAM); 57.7000, -135.7000, Moser Island (3 UAM); 57.2494, -135.6514, Partofshikof Island, S tip of island at narrows across from Kruzof Island (1 UAM); 57.8658, -136.4511, Yakobi Island, Greentop cabin (2 UAM). **SKAGWAY QUAD:** 59.1625, -135.3578, Chilkat Peninsula; Mud Bay (1 UAM); 59.2500, -135.4167, Haines area (2 UAM); 59.2617, -135.5597, (2 UAM); 59.4108, -136.0025 (1 UAM); 59.5000, -135.3333, Dyea (1 UAM); 59.5067, -135.3478, Dyea, campground (1 UAM); 59.5113, -135.1222, White Pass, Glacier (1 USNM); 59.5317, -135.3481, Taiya River, mouth of W branch (3 UAM). **SUMDUM QUAD:** 57.1250, -133.1917, Read Island (1 UAM). **YAKUTAT QUAD:** 59.5500, -139.7333, Yakutat (1 USNM).

Family **Castoridae** Hemprich, 1820

American Beaver
Castor canadensis Kuhl, 1820

OTHER COMMON NAMES. Admiralty Beaver, Beaver, Pacific Beaver.

TAXONOMY. Two subspecies of beavers have been described from Southeast Alaska. The endemic subspecies, *C. c. phaeus*, is restricted to Admiralty Island (and presumably Chichagof and Baranof Islands) and was based on only six specimens (three adults) (Heller, 1909). Specimens of beaver from Southeast Alaska are few. A revision of beaver in Southeast Alaska with adequate specimens and modern techniques is needed (Hafner et al., 1998).

Castor canadensis belugae

Original Description. 1916. *Castor canadensis belugae* Taylor, Univ. California Publ. Zool., 12:429, March 20.

Type Locality. Beluga River, Cook Inlet region, Alaska.

Type Specimen. MVZ 4224.

Range. Alaska, Yukon Territory and coastal British Columbia.

Castor canadensis phaeus

Original Description. 1909. *Castor canadensis phaeus* Heller, Univ. California Publ. Zool., 5:250, February 18.

Type Locality. Pleasant Bay, Admiralty Island, Alaska.

Type Specimen. MVZ 209.

Range. Admiralty Island and perhaps Chichagof and Baranof islands, Alexander Archipelago (Heller 1909).

REVISIONS AND REVIEWS. Jenkins and Busher (1979).

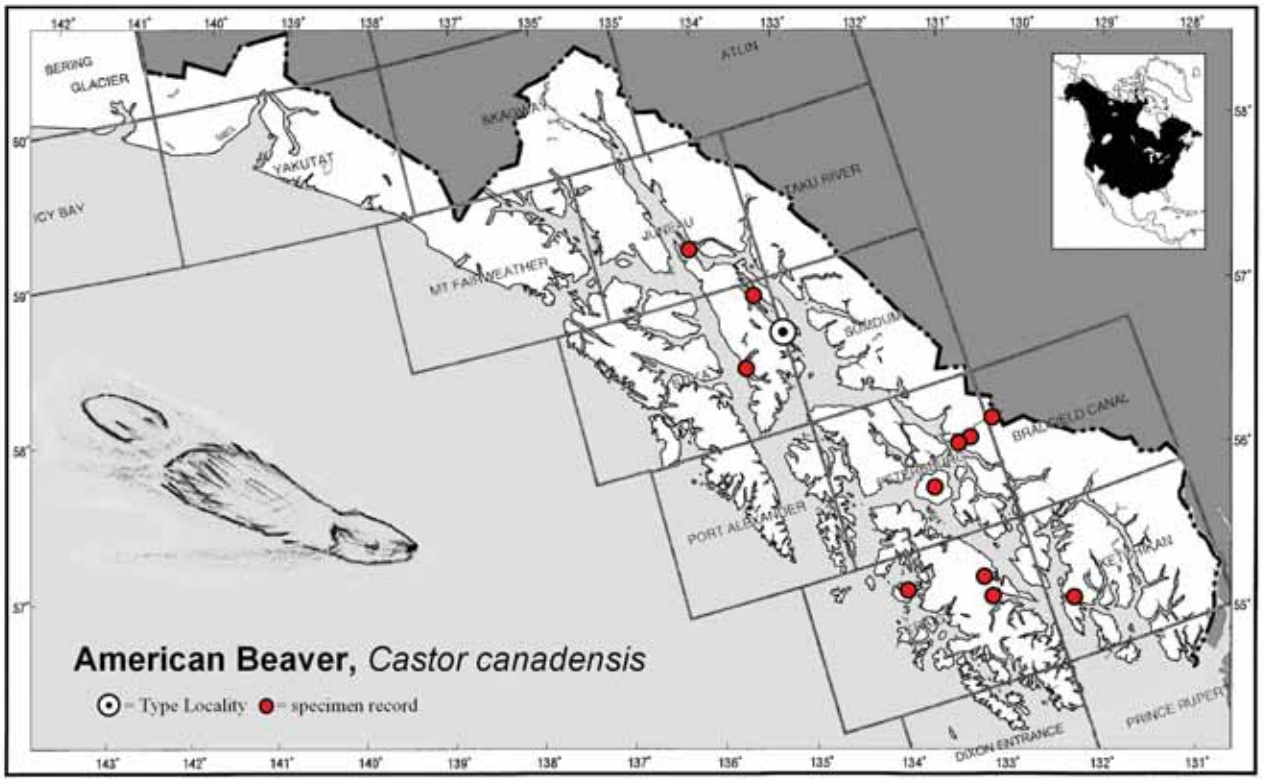
STATUS. IUCN-Data deficient as *C. c. phaeus* (MacDonald and Cook, 1998). It appears that around the turn of the 20th Century heavy trapping pressures and other impacts temporarily reduced or eliminated beaver from a number of localities, including Baranof and Chichagof islands (MacDonald and Cook, 1996).

DISTRIBUTION. Beaver occupy suitable habitat along the mainland and on most of the islands of Southeast Alaska, except Coronation, Warren, Forrester and perhaps other small, remote islands in the archipelago. They are abundant along the major rivers of the mainland.

Ten animals from Prince of Wales Island were successfully (re-)introduced to Baranof Island in 1927 (Burris and McKnight, 1973).

Beaver may have been introduced to Kruzof Island in 1925 (Burris and McKnight, 1973).

SPECIMENS. **BRADFIELD CANAL QUAD:** 56.7000, -131.9333, Stikine River, Ketili Creek (3 UAM). **CRAIG QUAD:** 55.7667, -133.4500, Heceta Island, Chuck Lake (1 UAM); Prince of Wales Island, Kasaan Bay (8 USNM); Prince of Wales Island, Karta River (1 USNM); Prince of Wales Island, E Coast Thorne River (5 USNM). **JUNEAU QUAD:** 58.3167, -134.8000, Admiralty Island, near Piling Point (1 UAM). **KETCHIKAN QUAD:** Revillagigedo Island, Ketchikan (1 UCM). **PETERSBURG QUAD**: 56.3333, -132.8333, Zarembo Island (1 UAM); 56.6500, -132.2167, Stikine River, South Fork Andrew Creek (1 UAM). **SUMDUM QUAD:** 57.6406, -133.9942, Admiralty Island, Pleasant Bay (1 MVZ).



Family **Dipodidae** Fisher, 1817

Meadow Jumping Mouse
Zapus hudsonius (Zimmermann, 1780)

OTHER COMMON NAMES. Alaska Jumping Mouse, kangaroo mouse.

TAXONOMY. One subspecies has been recognized in Southeast Alaska (Krutzsch, 1954). Minimal variation in the cytochrome *b* gene was found in a study comparing individuals from localities throughout Alaska (including our samples from Revillagigedo Island) and British Columbia, suggesting a relatively recent colonization of Southeast Alaska (Cook et al., unpublished).

Zapus hudsonius alascensis

Original Description. 1897. *Zapus hudsonius alascensis* Merriam, Proc. Biol. Soc. Wash., 2:223, July 15.

Type Locality. Yakutat Bay, Alaska.

Type Specimen. USNM 73584.

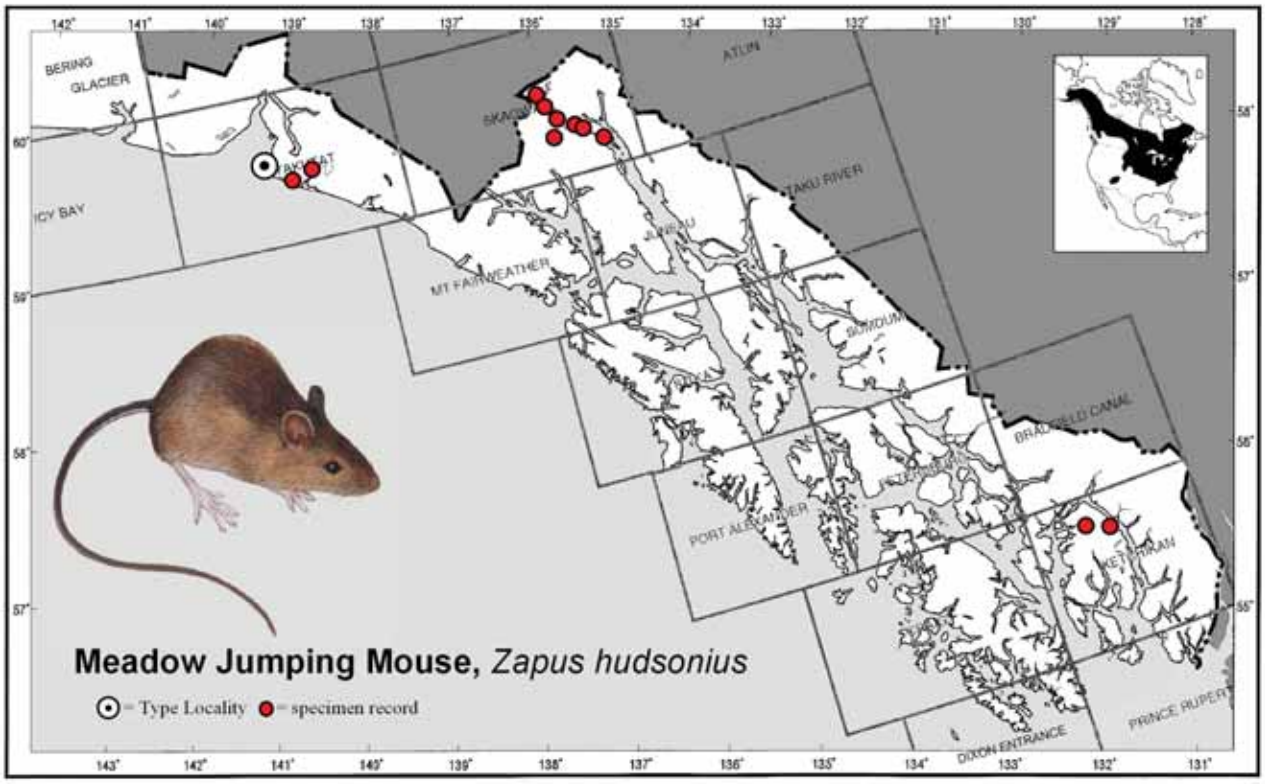
Range. Southern Alaska and extreme southern Yukon and northwestern British Columbia.

REVISIONS AND REVIEWS. Whitaker (1972), Jones (1981).

STATUS. IUCN-Least concern.

DISTRIBUTION. In Southeast Alaska, Meadow Jumping Mice have been found in the vicinities of Haines and Yakutat on the northern mainland, and, curiously, about 400 km farther south at two separate localities on Revillagigedo Island (MacDonald and Cook, 1996).

SPECIMENS. **KETCHIKAN QUAD:** 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (1 UAM); 55.7667, -131.0833, Revillagigedo Island, Portage Cove (6 UAM, 1 MVZ). **SKAGWAY QUAD:** 59.3661, -135.7994, 10 km E, 9 km S Klukwan (1 UAM); 59.3000, -135.7333, 10 mile Haines Highway (6 UAM); 59.3456, -135.7697, 11 km E, 12 km S Klukwan (6 UAM); 59.3456, -135.7697, 11 km E, 2 km S Klukwan (1 UAM); 59.3456, -135.7697, 11 km East, 12 km South Klukwan (2 UAM); 59.3500, -135.7667, 15.3 mile Haines Highway (10 UAM); 59.3666, -135.7982, 17 mile Haines Highway (2 UAM); 59.3667, -135.8000, 18 mile Haines Highway (1 UAM); 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (9 UAM); 59.4950, -136.0717, 9 km W, 10 km N Klukwan (1 UAM); 59.1625, -135.3578, Chilkat Peninsula, Mud Bay (3 UAM); 59.4108, -136.0025, Klehini R, 5 km W Klukwan (1 UAM); 59.4147, -136.0619, Porcupine River (2 UAM); 59.2861, -136.1085, west end of Takhin Ridge (1 UAM); 59.4108, -136.0025 (1 UAM); 59.5747, -136.1567 (1 UAM). **YAKUTAT QUAD:** 59.4333, -139.5667, Yakutat, beach near Situk R (1 UAM); 59.4500, -139.2000, Yakutat, near Antlen Creek (3 UAM).



Western Jumping Mouse
Zapus princeps J.A. Allen, 1893

OTHER COMMON NAMES. None.

TAXONOMY. The subspecies of *Z. princeps* that encompasses Southeast Alaska is *saltator*, according to Krutzsch (1954). Jones (1981) considered this taxon indistinct from *Z. p. princeps*.

In a study of geographic variation in the mitochondrial cytochrome *b* gene, Cook et al. (unpubl.) found minimal levels of sequence divergence between individuals from Southeast Alaska and individuals from southern Canada.

Zapus princeps saltator

Original Description. 1899. *Zapus saltator* Allen, Bull. Amer. Mus. Nat. Hist., 12:3, March 4.

Type Locality. Telegraph Creek, British Columbia.

Type Specimen. AMNH 14408.

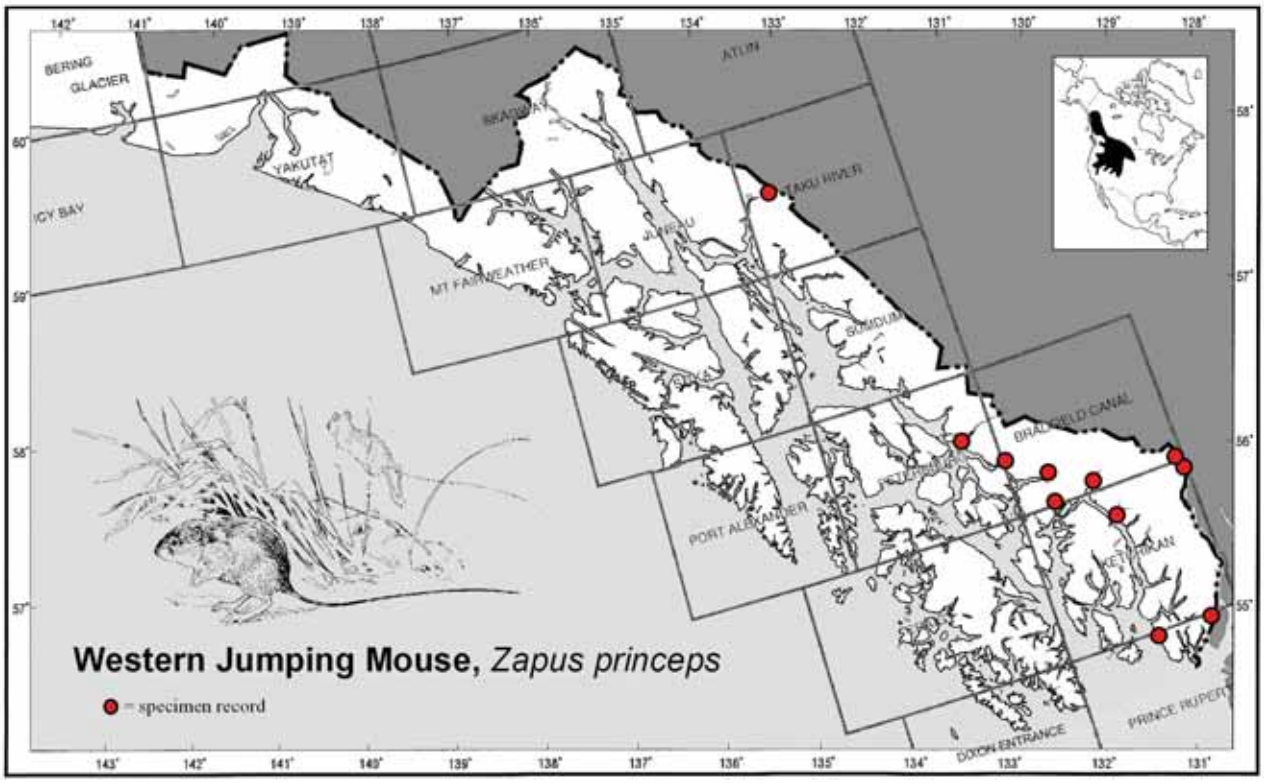
Range. Southern Yukon Territory, southeast Alaska, British Columbia, and western Alberta.

REVISIONS AND REVIEWS. Krutzsch (1954), Jones (1981), Hart et al. (2004).

STATUS. IUCN-Least concern.

DISTRIBUTION. *Zapus princeps*, which superficially looks very similar to *Z. hudsonius*, inhabits the mainland of Southeast Alaska from Portland Canal northward to the Taku River (MacDonald and Cook, 1996).

SPECIMENS. **BRADFIELD CANAL:** 55.9997, -131.5664, SW side Reflection Lake (1 UAM); 56.0108, -131.5672, E side Reflection Lake (1 UAM); 56.0833, -131.1000, mouth of Unuk River (7 UAM); 56.2206, -131.4736, Tyee (1 UAM); Arron Creek mouth (1 CAS). **KETCHIKAN QUAD:** 55.7667, -130.8833, Chickamin River, Wolf cabin (18 UAM); 55.9667, -130.0667, Hyder (2 UAM). **PETERSBURG QUAD:** 56.6333, -132.4333, Stikine River, Farm Island (4 UAM); 56.3500, -131.9833, mouth Aaron Creek (1 CAS). **PRINCE RUPERT QUAD:** 54.9833, -131.0000, Foggy Bay, Kirk Point (1 UAM); 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (15 UAM). **TAKU RIVER QUAD:** 58.5500, -133.6833, Taku River, 0.8 km N Fish Creek (3 UAM).



Family **Cricetidae** Fischer, 1817

Brown Lemming
Lemmus trimucronatus (Richardson, 1825)

OTHER COMMON NAMES. Nearctic Brown Lemming, Siberian Lemming.

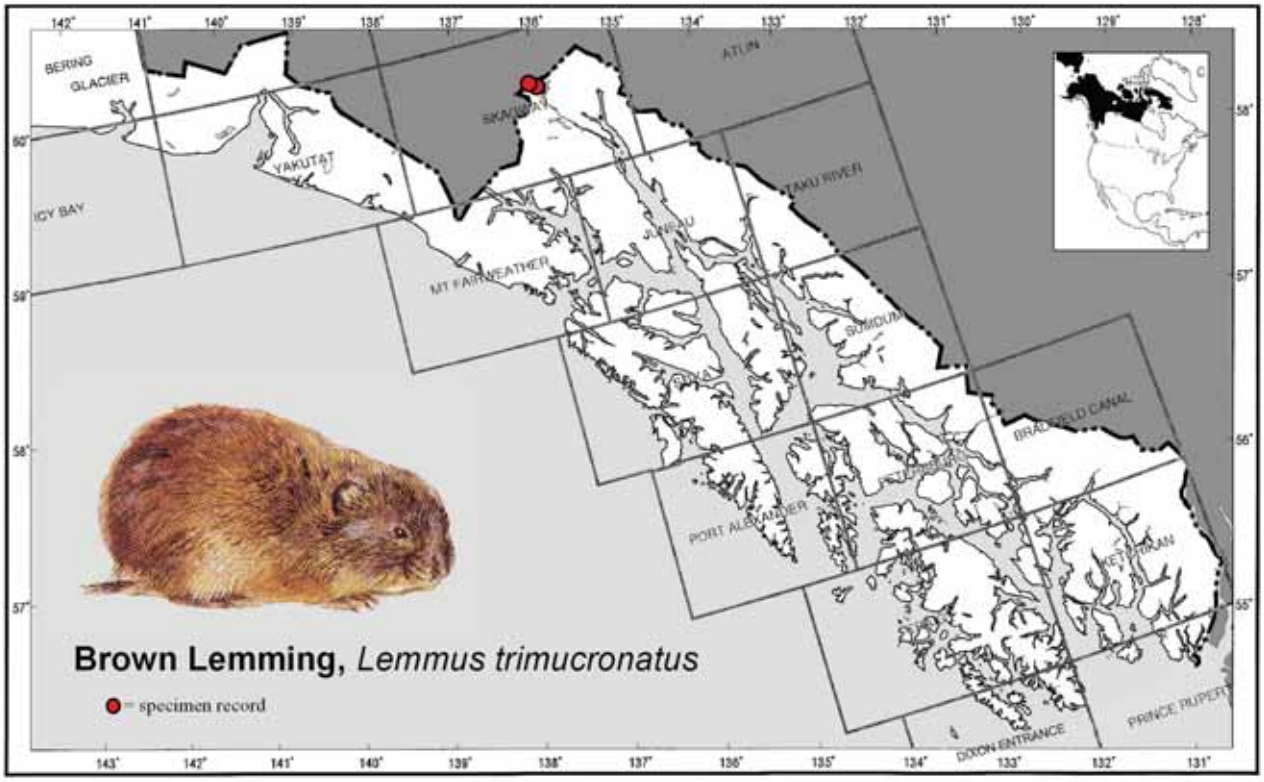
TAXONOMY. The taxonomic affinity of the two Brown Lemmings recently collected just inside Alaska near Haines is unknown. According to Hall (1981:Map 470), the range of either *L. t. helvolus* or *L. s. yukonensis* may include this area.

REVISIONS AND REVIEWS. Jarrell and Fredga (1993), Fedorov et al. (1999).

STATUS. IUCN-Least concern.

DISTRIBUTION. Brown Lemmings were recently (2004) discovered in Southeast Alaska at two separate localities in the mountains northwest of Haines. Remains of this species are common in pre-glacial cave deposits on Prince of Wales Island (Heaton and Grady, 2003).

SPECIMENS. **SKAGWAY QUAD:** 59.6253, -136.0893, Tohitkah Mountain (1 UAM); 59.6374, -136.1291, Mount Ashmun (1 UAM).



Long-tailed Vole
Microtus longicaudus (Merriam, 1888)

OTHER COMMON NAMES. Olympic Meadow-Mouse, Coronation Island Vole.

TAXONOMY. Two subspecies have been recognized in the region (Hall, 1981). A third subspecies is *M. l. coronarius*, originally described as a distinct species, *M. coronarius* (Swarth, 1911) from specimens collected on Coronation, Warren and Forrester islands (Swarth, 1933). MacDonald and Cook (1996) and Conroy and Cook (2000) presented evidence suggesting full species status for this island population is not warranted.

Specimens from 16 islands (including Coronation, Warren, and Forrester) were included in Conroy and Cook's (2000) examination of mitochondrial sequence variation, a study that identified distinctive coastal and continental clades of Long-tailed Voles in Southeast Alaska. The coastal island clade included populations on islands and north coast of Southeast Alaska (near Haines) and extended marginally into the Wrangell Mountains. The other clade included individuals from near Haines, south along the mainland, and then on the eastern slope of the coast ranges from central Alaska, through British Columbia south to Washington. Conroy and Cook (2000) and Lessa et al. (2003) suggested that the pattern of genetic variation in the northern populations indicated recent (post-Pleistocene) colonization of Southeast Alaska by ancestors of both of these clades. The absence of *M. longicaudus* in cave deposits older than the Holocene (Heaton and Grady, 2003) also supports a hypothesis of post-glacial expansion into the region.

Microtus longicaudus coronarius

Original Description. 1911. *Microtus coronarius* Swarth, Univ. California Publ. Zool., 7:131, January 12.

Type Locality. Egg Harbor, Coronation Island, Alaska.

Type Specimen. MVZ 8721.

Range. Coronation, Warren, and Forrester islands, Alexander Archipelago.

Microtus longicaudus littoralis

Original Description. 1933. *Microtus mordax littoralis* Swarth, Proc. Biol. Soc. Washington, 46:209, October 26.

Type Locality. Shakan, Prince of Wales Island, Alaska (locality unclear as Shakan is on Kosciusko Island).

Type Specimen. MVZ 8642.

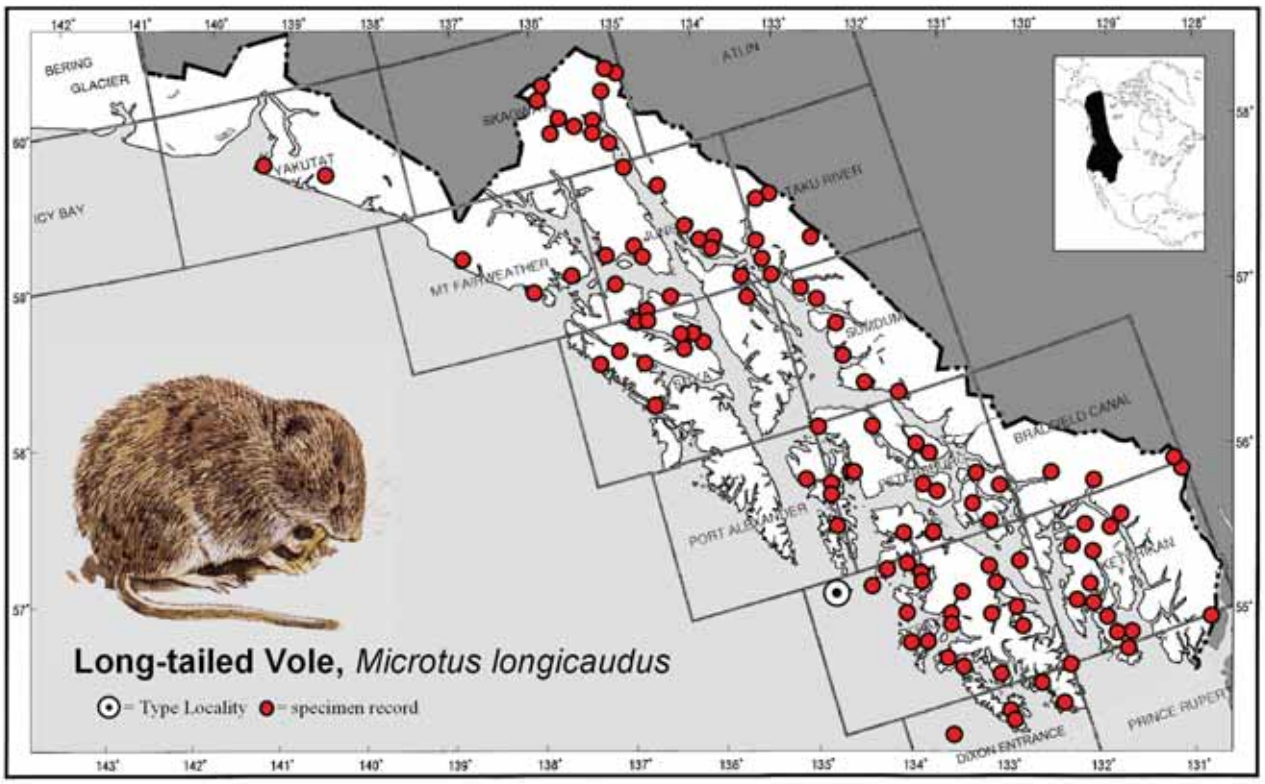
Range. Southeast Alaska and adjacent coastal British Columbia.

REVISIONS AND REVIEWS. Smolen and Keller (1987).

STATUS. IUCN-Data deficient as *M. l. coronarius* (Conroy and Cook, 1998). Species of Ecological Concern as *M. coronarius* by West (1991).

DISTRIBUTION. The Long-tailed Vole has been documented on the coastal mainland from Portland Canal to Yakutat and including nunatak "islands" in the Juneau Ice Fields (PSM), and on islands of the Alexander Archipelago that include Admiralty, Anguilla, Annette, Chichagof, Coronation, Dall, Dog, Douglas, Etolin, Forrester, Hoot, Kosciusko, Kuiu, Kupreanof, Lester, Marble, Mary, Mitkof, Moser, Noyes, Orr, Owl, Prince of Wales, Revillagigedo, Santa Rita, Shelikof, Stevenson, Suemez, Sukkwan, Sullivan, Thorne, Tuxekan, Warren, Woewodski, Wrangell, and Zarembo islands. Sign of *Microtus* have been noted on Baker Island. Long-tailed Voles have not been found on Baranof Island.

SPECIMENS. **BRADFIELD CANAL QUAD:** 56.0269, -130.0706, Salmon River mouth of Texas Creek (8 UAM); 56.0833, -131.1000, mouth of Unuk River (5 UAM); 56.2289, -131.4517, Tyee (1 UAM). **CRAIG QUAD:** 55.6667, -133.5167, Anguilla Island (1 UAM); 55.8833, -134.2333, Coronation Island, Aat To Go Cave (1 UAM); 55.9000, -134.2333, Coronation Island, Aats Bay (1 UAM); 55.9167, -134.2500, Coronation Island, Aats Bay, S shore (1 UAM); 55.9250, -134.3208, Coronation Island, Egg Harbor (10 UAM); 55.9250, -134.3167, Coronation Island, Egg Harbor (1 UAM); 55.9250, -134.3214, Coronation Island, Egg Harbor (2 UAM); 55.1228, -133.1117, Dall Island, Hook Arm, Sea Otter Harbor (6 UAM); 55.2000, -133.2333, Dall Island, Bobs Bay (8 UAM); 55.8833, -133.3833, Hoot Island (5 UAM); 55.9189, -133.6850, Kosciusko Island (1 UAM);56.0000, -133.4000, Marble Island (2 UAM); 55.4611, -133.6389, Noyes Island, Kelly Cove (1 UAM); 55.9500, -133.3833, Orr Island (2 UAM); 55.8833, -133.4167, Owl Island (2 UAM); 54.6892, -132.5403, Prince of Wales Island, North Thorne Bay (1 UAM);55.0000, -131.9667, Prince of Wales Island, Polk Inlet Road (1 UAM); 55.3333, -132.3333, Prince of Wales Island, Polk Inlet, by Forest Service camp (1 UAM); 55.3467, -132.8356, Prince of Wales Island, Polk Inlet Road (7 UAM); 55.4500, -133.1500, Prince of Wales Island, between Cape Suspiro and Craig (1 UAM); 55.4539, -132.3264, Prince of Wales Island, Smith Cove, Skowl Arm (3 UAM); 55.4611, -132.6917, Prince of Wales Island (2 UAM); 55.4667, -133.0667, Prince of Wales Island, head of Crab Bay (2 UAM); 55.4861, -132.6653, Prince of Wales Island, Maybeso Valley, Area C (2 UAM); 55.5667, -133.0667, Prince of Wales Island, Klawock airport (5 UAM); 55.6667, -132.5000, Prince of Wales Island, Turn Creek, Thorne Bay (1 UAM); 55.6917, -132.8653, Prince of Wales Island, Control Lk Cabin, 16 mi W Thorne Bay (1 UAM); 55.7667, -132.4833, Prince of Wales Island (1 UAM); 55.4072, -133.4667, Santa Rita Island (4 UAM); 55.2639, -133.0019, Shelikof Island (2 UAM); 55.2667, -133.3500, Suemez Island, SE, near Ridge Island (3 UAM); 55.2789, -133.3139, Suemez Island (1 UAM); 55.2833, -133.3000, Suemez Island, Port Refugio, Grassy Point (1 UAM); 55.2847, -133.3344, Suemez Island, Port Refugio (1 UAM); 55.3031, -133.3000, Suemez Island, Port Refugio (1 UAM); 55.1000, -132.8333, Sukkwan Island, Dunbar Inlet (4 UAM); 55.8833, -133.3667, Tuxekan Island, NW side, S of Captian Island (4 UAM); 55.8972, -133.3264, Tuxekan Island, NW tip of Island (7 UAM); 55.9000, -133.3333, Tuxekan Island (1 UAM); 55.8417, -133.8417,



Warren Island, Warren Cove (1 UAM); 55.8750, -133.8417, Warren Island, Warren Cove (7 UAM); 55.7500, -132.1833, Union Bay, N shore at mouth (3 UAM). **DIXON ENTRANCE QUAD:** 54.7442, -132.7711, Dall Island (2 UAM); 54.8000, -132.8500, Dall Island, Essowah Lakes (1 UAM); 54.8069, -132.7692, Dall Island, Pond Bay (2 UAM); 55.2094, -133.1381, Dall Island, North Bay (2 UAM); 54.8214, -133.5281, Forrester Island, Eagle Harbor (1 UAM); 54.8214, -133.5167, Forrester Island, Eagle Harbor (1 UAM); 54.8214, -133.5208, Forrester Island (2 UAM); 54.7667, -132.1833, Prince of Wales Island, Nichols Lake (3 UAM); 54.8883, -132.3661, Prince of Wales Island, Klinkwan village site (1 UAM). **JUNEAU QUAD:** Admiralty Island, Windfall Harbor (3 MVZ); Admiralty Island, Mole Harbor (1 MVZ); 58.0500, -134.3000, Chichagof Island, Game Creek (3 UAM); 58.0667, -135.2333, Chichagof Island (1 UAM); 58.0667, -135.4667, Chichagof Island, Game Creek (3 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (18 UAM); 58.1833, -135.5500, Chichagof Island, mouth of Gallagher Cr, 7 mi NW of Hoonah (2 UAM); 58.2333, -135.8167, Chichagof Island, 4.3 mi SSW of Pt Adolphus (2 UAM); 58.2667, -134.3833, Douglas Island, Douglas (2 UAM); 58.2667, -134.4000, Douglas Island, Douglas (1 UAM); Lester Island, Glacier Bay (2 KU); Sullivan Island (1 USNM, 6 KU); 57.8833, -133.6500, Williams Cove Tracy Arm (1 UAM); 58.1778, -133.9583, Turner Creek (2 UAM); 58.2708, -134.3208, Sheep Creek Valley, I mi NE of mile 3 Thane Rd. (1 UAM); 58.3000, -134.4000, Juneau mainland, Aurora Boat High School (10 UAM); 58.3000, -134.4167, Aurora Harbor, next to UAS Marine Tech Center (6 UAM); Juneau Ice Fields (9 PSM); 58.3111, -133.9583, Turner Lake (3 UAM); 58.3333, -134.6000, Mendenhall area (1 UAM); 58.3846, -134.6592, Auke Bay (1 UAM); 58.4167, -135.4333, Excursion Inlet, W side (2 UAM); 58.4500, -135.9167, Glacier Bay, Bartlett Cove, 10 km NW Gustavus Airport (1 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (102 UAM); 58.5506, -135.4792, Chilkat Range, 6.5 km NNE Excursion Inlet (1 UAM); 58.7881, -134.9356, creek South of Antler River (1 UAM); 58.7889, -135.0278, mouth of Slate Creek (28 UAM); 58.9833, -134.7667, Peterson Creek, mile 25 N Glacier Hwy. (46 UAM); 59.5292, -134.9078, Echo Cove (2 UAM); Cowee Creek (1 UAM). **KETCHIKAN QUAD:** 55.1108, -131.37049, Annette Island, Crab Bay (2 MSB); 55.0833, -131.2333, Mary Island, Customhouse Cove (13 UAM); 55.2167, -131.4292, Pow Island, Tongass National Forest (1 UAM); 55.3419, -131.6478, Revillagigedo Island, Tongass Ave, Ketchikan (1 UAM); 55.3439, -131.4983, Revillagigedo Island, South Tongass Highway (4 UAM); 55.4125, -131.7000, Revillagigedo Island, Ward Lake (1 UAM); 55.4492, -131.4983, Revillagigedo Island, Talbot Lake (1 UAM); 55.5000, -131.0000, Revillagigedo Island, Ella Creek (1 UAM); 55.6333, -131.3667, Revillagigedo Island, head of Carroll Inlet (1 UAM); 55.7333, -131.5167, Revillagigedo Island, Traitors Creek Mouth (1 UAM); 55.7667, -131.0167, Revillagigedo Island, Behm Canal, Portage Cove (1 UAM); 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (10 UAM); 55.7667, -130.8833, Chickamin River, Wolf cabin (41 UAM); 55.8167, -130.9000, mouth of Chickamin R, near Wolf Cabins (1 UAM); 55.8833, -130.7667, Chickamin River, near Leduc Junction (1 UAM); 55.9167, -130.0167, Hyder (2 UAM); 55.9333, -130.0333, Hyder area (2 UAM); 55.9667, -130.0667, Hyder area (4 UAM);56.0000, -130, Hyder, Salmon River valley (1 UAM); 56.0269, -130.0706 (1 UAM); Walker Cove (T71S, R94E, S18 SE1/4 of NE1/4) (2 UAM). **MT FAIRWEATHER QUAD:** N. Lituya Bay, Glacier Bay NP (16 KU); Torch Bay, Glacier Bay NP (194 KU); Dundas Bay, Glacier Bay NP (37 KU). **PETERSBURG QUAD:** 56.0833, -132.3500, Etolin Island (1 UAM); 56.1667, -132.4500, Etolin Island, Anita Bay (5 UAM); 56.1833, -132.4167, Etolin Island, Anita Bay, South. (2 UAM); 56.2333, -132.3833, Etolin Island, Anita Bay (1 UAM); 56.1500, -133.3500, Kosciusko Island (5 UAM); 56.8667, -133.3167, Kupreanof Island (2 UAM); 56.9500, -133.9000, Kupreanof Island, Kake, near Kake Forest Service cabin (2 UAM); 56.5833, -132.8333, Mitkof Island (1 UAM); 56.6000, -132.7000, Mitkof Island, Upper Ohmer Cr (2 UAM); 56.6667, -132.8333, Mitkof Island, 19.25 mi Mitkof Highway (1 UAM); 56.1667, -133.3167, Prince of Wales Island, trail outside El Capitan Cave (1 UAM); 56.1744, -133.3692, Prince of Wales Island, Turn Creek, El Capitan area (3 UAM); 56.1833, -133.3083, Prince of Wales Island, near El Capitan (1 UAM); Stevenson Island (2 USNM) 56.0833, -133.0333, Thorne Island (4 UAM); Woewodski Island (1 AMNH); 56.2333, -132.1333, Wrangell Island (1 UAM); 56.3183, -132.2861, Wrangell Island (3 UAM); 56.3500, -132.3333, Wrangell Island, Trout Lake (1 UAM); 56.3333, -132.8333, Zarembo Island, Saint John Harbor (3 UAM); 56.4167, -133.0000, Zarembo Island, Saint John Harbor (1 UAM); 57.0083, -132.9833, Thomas Bay (4 UAM). **PORT ALEXANDER QUAD:** 56.3214, -134.0717, Kuiu Island, Affleck Canal (1 UAM); 56.5000, -134.0333, Kuiu Island, Alecks Creek (5 UAM); 56.5833, -134.0000, Kuiu Island, tributary of Brown Creek (1 UAM); 56.5833, -134.0000, Kuiu Island, Point Decision, next to lighthouse (1 UAM); 56.7100, -134.2317, Kuiu Island, Rowan Bay (2 UAM). **PRINCE RUPERT QUAD:** 54.9722, -131.3386, Dog Island (1 UAM); 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (3 UAM). **SITKA QUAD:** Admiralty Island, Mole Harbor (1 MVZ); Admiralty Island, Windfall Harbor (3 MVZ); 57.4197, -135.7200, Chichagof Island, Suloia Lake (2 UAM); 57.7000, -135.0000, Chichagof Island, unnamed mt near jct of Chatham Stream & Tenakee Inlet (1 UAM); 57.7000, -135.2167, Chichagof Island, Tenakee Inlet, Kadashan River (41 UAM); 57.7833, -135.6333, Chichagof Island, Tenakee Inlet, Seal Bay drainage (1 UAM); 57.7833, -134.9500, Chichagof Island, Tenakee Inlet (1 UAM); 57.7833, -135.1500, Chichagof Island, 4.5 km E Tenakee Springs (4 UAM); 57.8000, -135.9167, Chichagof Island, Lisianski River (2 UAM); 57.8011, -136.1375, Chichagof Island, Otter Lake (2 UAM); 57.8167, -136.1500, Chichagof Island, Otter Lake (12 UAM); 57.8333, -135.0500, Chichagof Island, Pavlof River drainage (13 UAM); 57.9333, -135.6000, Chichagof Island, Salt Lake Bay, Port Frederick (8 UAM); 57.9397, -135.6072, Chichagof Island, NE side of Island (1 UAM); 57.9500, -135.6333, Chichagof Island, Salt Lake Bay, Port Frederick (35 UAM); 57.9572, -134.3072, Chichagof Island, Salt Lake Bay, Port Frederick (1 UAM); 57.9575, -135.4900, Chichagof Island, Salt Lake Bay, Port Frederick (3 UAM); 57.9575, -134.3072, Chichagof Island, Salt Lake Bay, Port Frederick (9 UAM); 57.9575, -135.4900, Chichagof Island, Salt Lake Bay, Port Frederick (2 UAM); 57.9750, -135.6583, Chichagof Island, Salt Lake Bay, Port Frederick (7 UAM); 57.9833, -135.4167, Chichagof Island, upper Game Creek (1 UAM); Chichagof Island, Kadashan River, Tenakee Inlet (4 UAM); Chichagof Island, Salt Lake Bay (1 UAM); 57.6833, -135.6667, Moser Island (5 UAM); 57.7000, -135.7000, Moser Island, Moser Island cabin (12 UAM); 57.7028, -135.7156, Moser Island, Hoonah Sound (13 UAM). **SKAGWAY QUAD:** 59.1333, -135.3333, West Chilkat State Park (1 UAM); 59.1333, -135.3667, West Chilkat State Park (1 UAM); 59.1625, -135.3578, Chilkat Peninsula; Mud Bay (1 UAM); 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (4 UAM); 59.2861, -136.1085, west end of Takhin Ridge (14 UAM); 59.3167, -135.5667, Haines, Chilkoot Lk (1 UAM); 59.3456, -135.7697, 11 km E, 12 km S Klukwan (1 UAM); 59.3661, -135.7994, 10 km E, 9 km S Klukwan (3 UAM); 59.3666, -135.7982, 17 mile Haines Highway (2 UAM); 59.4108, -136.0025, Klehini R, 5 km W Klukwan (1 UAM); 59.4147, -136.0972, Porcupine River (4 UAM); 59.4333, -135.9500 (2 UAM); 59.5003, -135.3542, Taiya River tidal flats (8 UAM); 59.5333, -135.3500, Taiya R drainage, N of West Cr; 5 mi N, 2 mi W of Skagway (1 UAM); 59.5397, -136.1056 (2 UAM); 59.5397, -136.1056, confluence of Chilkat River and Nataga Creek (11 UAM); 59.5500, -135.1000, Skagway Glacier (7 UAM); 59.5667, -135.1167, Glacier, 15km NE Skagway (2 UAM); 59.5747, -136.1567,(11 UAM); 59.6142, -135.1669, White Pass, 1.6 km S USA/Canada border on Klondike Highway (7 UAM); 59.6232, -136.0750, Tohitkah Mountain (6 UAM); 59.6253, -136.0893, Tohitkah Mountain (3 UAM); Dyea (1 UAM). **SUMDUM QUAD:** 57.1669, -133.2531, Farragut Bay North Arm (1 UAM); 57.3667, -133.4667, 8.5 mi SE Goldbelt logging camp, Hobart Bay (21 UAM); 57.5833, -133.3667, Chuck River (1 UAM); 57.7667, -133.5167, Power's Creek, Endicott Arm (3 UAM). **TAKU RIVER QUAD:** 58.0333, -133.9667, Stephens Passage, Limestone Inlet (1 UAM); 58.0367, -133.9583, Limestone Inlet (2 UAM); 58.1833, -133.3167, Crescent Lake (22 UAM); 58.2000, -133.4000, Whiting River drainage, Crescent Lake (1 UAM); 58.5333, -133.6833, Taku River, Fish Creek (10 UAM). **YAKUTAT QUAD:** 59.4153, -139.0086, Yakutat, near Forest Service bunkhouse (1 UAM); 59.4158, -139.0222, Harlequin Lake Trail (1 UAM); 59.4936, -139.7289, 3 mi SE Yakutat, Cannon Beach (4 UAM); 59.4969, -139.7222, 3 mi SE Yakutat (4 UAM); 59.5000, -139.8333, Yakutat, beach near Cannon Beach Picnic Area (2 UAM); 59.5000, -139.6667, Yakutat, Cannon Beach (12 UAM);

59.5131, -139.6794, Yakutat, near Forest Service bunkhouse (26 UAM); 59.5167, -139.6833, Yakutat, near Forest Service bunkhouse (1 UAM); 59.5500, -139.7333, Yakutat, Hardy Lake (5 UAM).

Root Vole
Microtus oeconomus (Pallas, 1776)

OTHER COMMON NAMES. Tundra Vole, Sitka Meadow Mouse, Yakutat Meadow Mouse.

TAXONOMY. Two subspecies are generally recognized in Southeast Alaska (Hall, 1981). A revision of this species by Antell (1987) did not corroborate an earlier revision by Paradiso and Manville (1961). Antell (1987) suggested the designation of a new subspecies, *M. o. littoralis* (Type from Yakutat, Alaska, CM 85-315), for populations of Root Voles from Bartlett Cove northward along the coast but not including the area immediately north of Yakutat Bay, which he retained as *M. o. yakutatensis*. He also concluded that populations of Root Voles in the vicinity of Skagway (previously as *M. o. yakutatensis*) and from Haines Junction, Yukon Territory (previously included under *M. o. macfarlani*), warrant recognition as a new, and as yet undescribed subspecies.

Mitochondrial DNA sequence variation is minimal when compared to Beringian populations and suggests colonization of Southeast Alaska from the north during the Holocene (Galbreath and Cook, 2004).

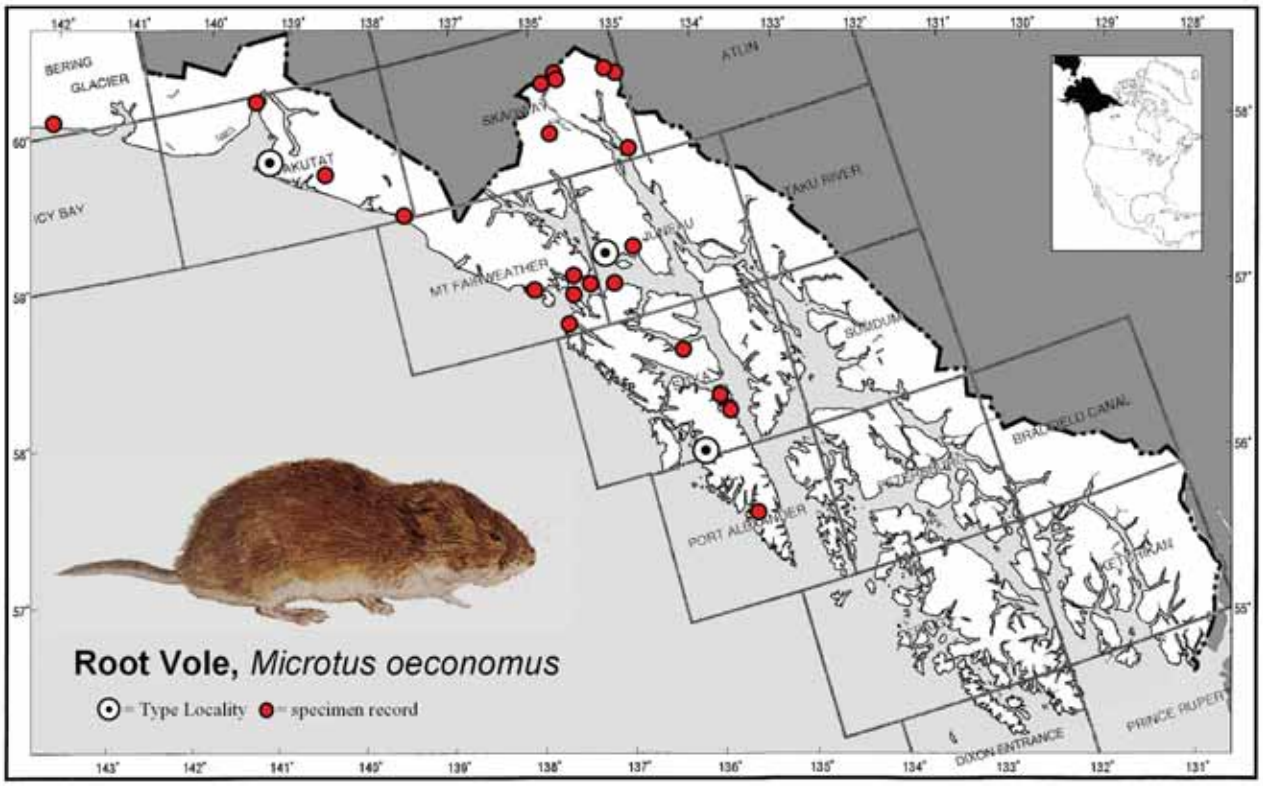
Microtus oeconomus sitkensis

Original Description. 1897. *Microtus sitkensis* Merriam, Proc. Biol. Soc. Washington, 11:221, July 15.
Type Locality. Sitka, Alaska.
Type Specimen. USNM 73839.
Range. Northern outer islands of the Alexander Archipelago, Southeast Alaska.

Microtus oeconomus yakutatensis

Original Description. 1900. *Microtus yakutatensis* Merriam, Proc. Washington Acad. Sci., 2:22, March 14.
Type Locality. N shore Yakutat Bay, Alaska.
Type Specimen. USNM 98005.
Range. Northern coast of southeast Alaska.

REVISIONS AND REVIEWS. Paradiso and Manville (1961), Antell (1987).



STATUS. IUCN-Data deficient as *M. o. sitkensis* (Lance and Cook, 1998).

DISTRIBUTION. Root Voles occur along the northern mainland of Southeast Alaska from Yakutat Bay south to the east side of upper Lynn Canal, and in the northwestern Alexander Archipelago on Baranof (including Catherine "Island", which is actually connected to Baranof), Chichagof, Inian, Lemesurier, and Yakobi islands. Those islands are the southern limit of this Holarctic species' range in North America.

Several fossil remains of Root Voles that date from the early Holocene have been recovered from caves on Prince of Wales Island, an area south of their present known distribution (Heaton and Grady, 2003).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakutaga (2 CAS). **JUNEAU QUAD:** 58.2333, -135.8167, Chichagof Island, 4.3 mi SSW of Pt Adolphus (1 UAM); Chichagof Island, 15 miles SE Hoonah, near upper end Freshwater Bay (3 UAM); 58.4167, -135.4333, Excursion Inlet, E side (20 UAM). **MT. FAIRWEATHER QUAD:** Inian Is. (6 UCLA); 58.3011, -136.0958, Lemesurier Island (1 UAM); 58.1000, -136.4667, Yakobi Island, Soapstone Cove (1 UAM); Torch Bay, Glacier Bay NP (72 KU); Dundas Bay, Glacier Bay NP (43 KU). **PORT ALEXANDER QUAD:** 56.5903, -134.8603, Baranof Island, Plotnikof Lake (28 UAM); 56.5903, -134.8589, Baranof Island, Plotnikof Lake (6 UAM). **SITKA QUAD:** 57.0500, -135.3333, Baranof Island, Sitka (1 USNM); 57.2667, -134.8333, Baranof Island, Kelp Bay, head of South arm (8 UAM); 57.3667, -134.8833, Baranof Island, "Catherine Island" (32 UAM); 57.7000, -135.2167, Chichagof Island, Kadashan River, Tenakee Inlet (1 UAM). **SKAGWAY QUAD:** 59.0833, -135.1750, alpine ridge, 500 meters south of Yeldegalga Creek (1 UAM); 59.2861, -136.1085, west end of Takhin Ridge (2 UAM); 59.5500, -135.1000 (3 UAM); 59.5833, -135.1500, Skagway Glacier (1 UAM); 59.5926, -135.8921, Klukwah Mountain (35 UAM); 59.6158, -135.1683, White Pass (3 UAM); 59.6232, -136.0750, Tohitkah Mountain (1 UAM); 59.6374, -136.1291, Mount Ashmun (23 UAM); 59.6598, -135.9151, Mount Raymond (3 UAM). **YAKUTAT QUAD:** 59.1000, -138.2667, Doame River (23 UAM); 59.0694, -138.3486, Doame River, beach side (1 UAM); 59.4153, -139.0086, Harlequin Lake (14 UAM); 59.4158, -139.0222, Harlequin Lake Trail (2 UAM); 59.5000, -139.6667, 3 mi SE Yakutat (1 UAM); 59.9167, -139.7500, N. shore Yakutat Bay (1 USNM).

Meadow Vole
Microtus pennsylvanicus (Ord, 1815)

OTHER COMMON NAMES. Admiralty Meadow Mouse.

TAXONOMY. Dale (1940) and Hall (1981) defined three subspecies of *Microtus pennsylvanicus* for Southeast Alaska. The taxonomy of Admiralty Island populations need to be reevaluated using modern techniques. Snell and Cunnison (1983) found little intraspecific variation and indicated that subspecific designations were invalid.

Microtus pennsylvanicus admiraltiae

Original Description. 1909. *Microtus admiraltiae* Heller, Univ. California Publ. Zool., 5:256, February 18.

Type Locality. Windfall Harbor, Admiralty Island, Alaska.

Type Specimen. MVZ 118.

Range. Known only from type locality.

Microtus pennsylvanicus alcorni

Original Description. 1951. *Microtus pennsylvanicus alcorni* Baker, Univ. Kansas Publ., Mus. Nat. Hist., 5:105, November 28.

Type Locality. 6 mi. SW Kluane, 2550 ft., Yukon.

Type Specimen. KU 21552.

Range. Southern Alaska, extreme northwestern British Columbia, and southern Yukon Territory.

Microtus pennsylvanicus rubidus

Original Description. 1940. *Microtus pennsylanicus rubidus* Dale, J. Mammal., 21:339, August 13.

Type Locality. Sawmill Lake, near Telegraph Creek, British Columbia.

Type Specimen. MVZ 30738.

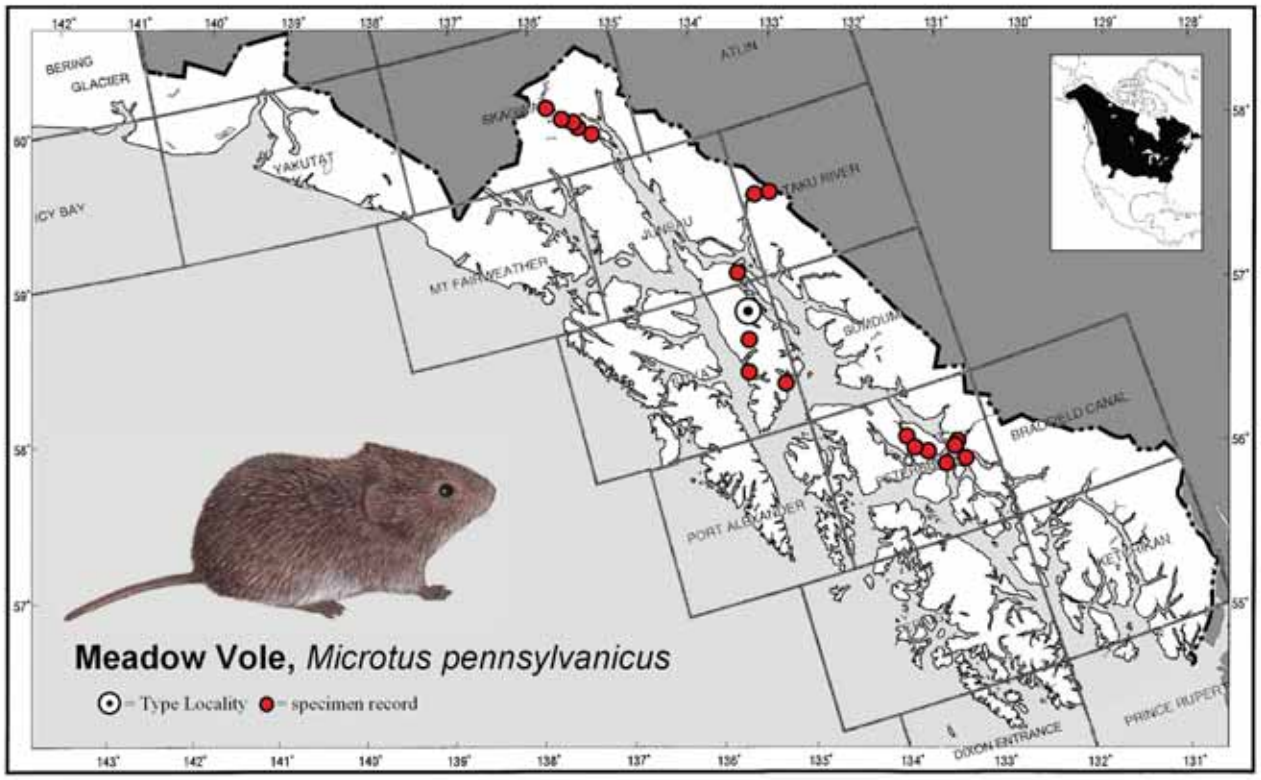
Range. Southeast Alaska, northwestern British Columbia.

Remarks. This taxon was synonymized with *M. p. drummondii* by Anderson (1946) and Cowan and Guiguet (1965).

REVISIONS AND REVIEWS. Reich (1981).

STATUS. IUCN-Near threatened as *M. p. admiraltiae* (MacDonald et al., 1998).

DISTRIBUTION. The Meadow Vole occurs along the mainland valleys of the Chilkat, Taku, and Stikine rivers, and in the Alexander Archipelago on Admiralty, Mitkof, Wrangell, and near the delta of the Stikine River on Kadin, Sergief and Vank islands.



SPECIMENS. **JUNEAU QUAD:** 58.1000, -134.3167, Admiralty Island, head of Seymour Canal (23 UAM). **PETERSBURG QUAD:** 56.5167, -132.4500, Kadin Island, North Kadin Island (12 UAM); 56.5333, -132.4500, Kadin Island (12 UAM); 56.5667, -132.7167, Mitkof Island, Ohmer Creek (14 UAM); 56.6667, -132.8333, Mitkof Island, S Mitkof Island (1 UAM); 56.7333, -132.9667, Mitkof Island, Wrangell Narrows (1 UAM); Sergief Island (4 MVZ); 56.4528, -132.6028, Vank Island, Mud Bay (2 UAM); Wrangell Island, Wrangell, (1 USNM, 1 LACM). **SITKA QUAD:** 57.2814, -134.0961, Admiralty Island, Pybus Bay, S Cannery Cove (1 UAM); 57.4333, -134.5500, Admiralty Island, Hood Bay N side of mouth (4 UAM); 57.6314, -134.3808, Admiralty Island, Distin Lake (11 UAM); 57.8361, -134.3072, Admiralty Island, Windfall Harbor (13 UAM). **SKAGWAY QUAD:** 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (2 UAM); 59.3000, -135.7333, 10 mi Haines Hwy (1 UAM); 59.3456, -135.7697, 11 km E, 12 km S Klukwan River (31 UAM); 59.3661, -135.7994, 10 km E, 9 km S Klukwan (15 UAM); 59.3667, -135.8000 (2 UAM); 59.4108, -136.0025, Klehini R, 5 km W Klukwan (5 UAM); 59.4275, -136.0025, Klehini R, 5 km W Klukwan (2 UAM); 59.4950, -136.0717, 9 km W, 10 km N Klukwan (2 UAM). **SUMDUM QUAD:** 57.8361, -134.3072, Admiralty Island, Windfall Harbor (1 UAM). **TAKU RIVER QUAD:** 58.5333, -133.6833, Taku River, Fish Creek (7 UAM); 58.5500, -133.8500, Taku River, Fish Creek (5 UAM); 58.5444, -133.6806, Taku River, mouth of Fish Creek (4 UAM); 58.5500, -133.6833, Taku River, Canyon Island (5 UAM).

Southern Red-backed Vole
Myodes gapperi (Vigors, 1830)

OTHER COMMON NAMES. Gapper's Red-backed Vole, Southern Red-backed Mouse, Wrangell Island Red-backed Mouse.

TAXONOMY. Musser and Carleton (2005), after a careful review of Pallas (1811) and other authorities, resurrected *Myodes* as the long overlooked and valid genus for red-backed voles, thus relegating the more familiar *Clethrionomys* to the status of junior synonym.

Bee and Hall (1956) and Youngman (1975) considered *gapperi* and *rutilus* conspecific; however, Cook et al. (2004) established that these distinct species form a broad contact zone from roughly the Stikine River eastward to Hudson Bay. More specimens are needed from areas of contact, specifically in the vicinity of the Stikine River.

Intraspecific variation across the range of this species was assessed using the cytochrome *b* gene (Cook et al., 2004; Runck and Cook, 2005) and indicated that *M. gapperi* as currently recognized (Hall, 1981) likely consists of at least three cryptic species in North America. Southeast Alaska likely was colonized during the Holocene by voles that expanded from Pleistocene refugia in the midwestern United States (Runck and Cook, 2005). This post-Pleistocene colonization into the region likely occurred along the drainages that bisect the

Coast Range. Minimal (but diagnostic) genetic variation distinguishes the island forms from the mainland populations indicating low levels of exchange among these populations.

Four, possibly five, subspecies of *M. gapperi* have been recognized in Southeast Alaska (Hall and Cockrum, 1952, 1953).

Myodes gapperi phaeus

Original Description. 1911. *Evotomys phaeus* Swarth, Univ. California Publ. Zool., 7:127, January 12.

Type Locality. Marten Arm, Boca de Quadra, Alaska.

Type Specimen. MVZ 8742.

Range. Extreme southern mainland of southeast Alaska and adjacent British Columbia.

Myodes gapperi saturatus

Original Description. 1894. *Evotomys gapperi saturatus* Rhoads, Proc. Acad. Nat. Sci. Philadelphia, 46:284, October 23.

Type Locality. Nelson, on the banks of a small stream flowing into Kootenai [*sic*] Lake, British Columbia.

Type Specimen. ANSP 7483.

Range. Central British Columbia southward into northeastern Washington, northern Idaho, and extreme northwestern Montana.

Remarks. This taxon may occur in the upper reaches of Portland Canal based on the range map in Hall (1981).

Myodes gapperi solus

Original Description. 1952. *Clethrionomys gapperi solus* Hall and Cockrum, Univ. Kansas Publ., Mus. Nat. Hist., 5:304, November 17.

Type Locality. Loring, Revillagigedo Island, Alaska.

Type Specimen. USNM 74939.

Range. Restricted to Revillagigedo Island.

Myodes gapperi stikinensis

Original Description. 1952. *Clethrionomys gapperi stikinensis* Hall and Cockrum, Univ. Kansas Publ., Mus. Nat. Hist., 5:305, November 17.

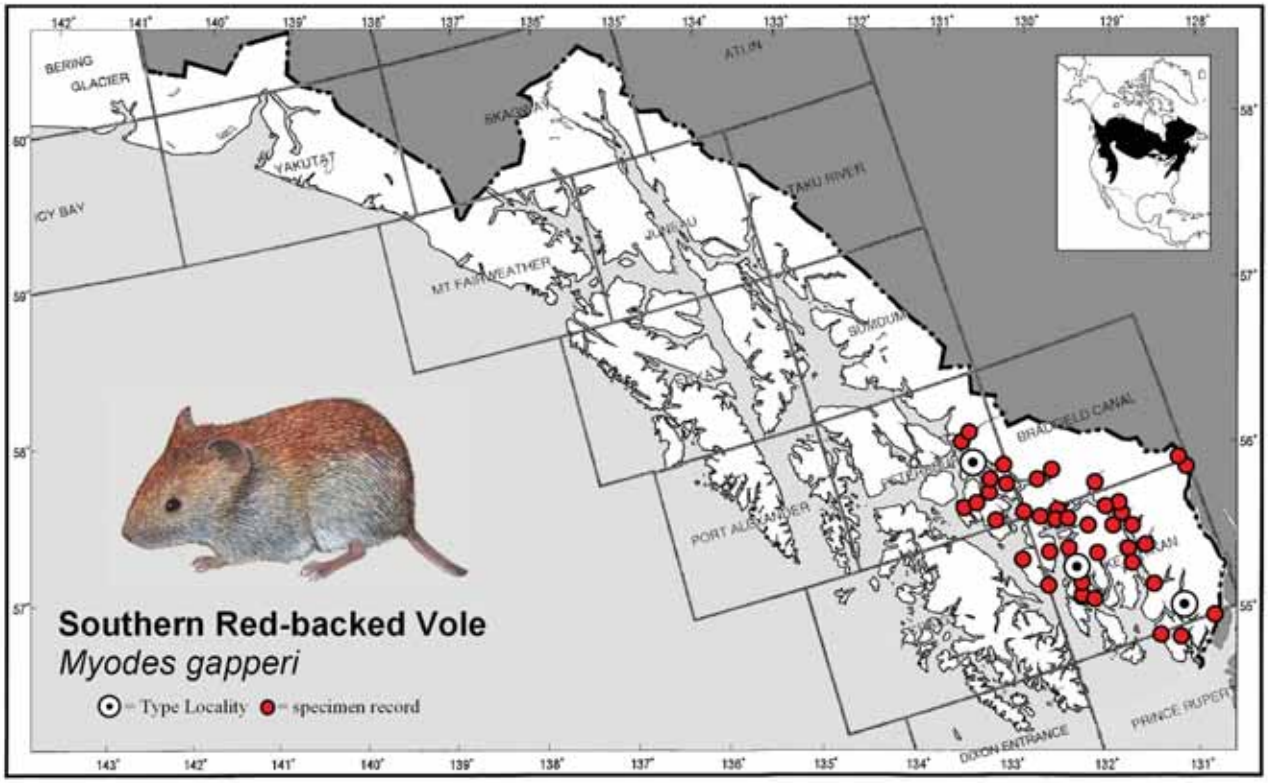
Type Locality. Stikine River at Great Glacier, British Columbia.

Type Specimen. MVZ 30735.

Range. Stikine River south from Flood Glacier, British Columbia (but not including Sergief, a delta Island) south to Cleveland Peninsula.

Myodes gapperi wrangeli

Original Description. 1897. *Evotomys wrangeli* V. Bailey, Proc. Biol. Soc. Washington, 11:130, May 13.



Type Locality. Wrangell, Wrangell Island, Alaska.
Type Specimen. USNM 74724.
Range. Wrangell Island and nearby Sergief Island at the mouth of the Stikine River.

REVISIONS AND REVIEWS. Merritt (1981), Runck and Cook (2005).

STATUS. IUCN-Data deficient as *C. g. solus* (Cook and Kirkland, 1998).

DISTRIBUTION. *Myodes gapperi* is believed to occur on the mainland of Southeast Alaska from about the Stikine River south, and on a few islands south of Stikine Strait and east of Clarence Strait, namely Bell, Black, Deer, Etolin, Hassler, Misery, Revillagigedo, and Wrangell islands.

SPECIMENS. **BRADFIELD CANAL QUAD:** 56, -131.1667, Grant Creek (3 UAM); 56.0092, -131.5756, W side Reflection Lake (3 UAM); 56.0108, -131.5672, E side Reflection Lake (24 UAM); 56.0233, -130.0714 (2 UAM); 56.0578, -131.9669, South side Frosty Bay (30 UAM); 56.0833, -131.1000, mouth of Unuk River (32 UAM); 56.1847, -131.6297, Eagle Bay (23 UAM); 56.1886, -131.5811, Duck Point (40 UAM); 56.1914, -131.6781, Hoya Creek drainage (15 UAM); 56.2206, -131.4736, Tyee (46 UAM). **CRAIG QUAD:** Misery Island, near Myers Chuck, Cleveland Peninsula (1 UMMZ); 55.75, -132.1833, Union Bay, N shore at mouth (26 UAM). **KETCHIKAN QUAD:** 55.91944444, -131.5131, Bell Island, 300 m W of benchmark (9 UAM); 55.8878, -131.6847, Black Island (3 UAM); 55.9169, -131.6653, Hassler Island, 2.5 km N Fin Point (2 UAM); 55.3167, -131.6000, Revillagigedo Island, Forest Park Drive (3 UAM); 55.3333, -131.6333, Revillagigedo Island, Ketchikan (14 UAM); 55.3439, -131.6372, Revillagigedo Island, South Tongass Highway (3 UAM); 55.3439, -131.4983, Revillagigedo Island, South Tongass Highway (6 UAM); 55.4125, -131.7000, Revillagigedo Island, Ward Lake, Grassy Point (5 UAM); 55.4147, -131.6958, Revillagigedo Island, Ward Lake (9 UAM); 55.4167, -131.7000, Revillagigedo Island, Ketchikan, frog pond near Ward Lake (3 UAM); 55.4492, -131.6372, Revillagigedo Island, Talbot Lake (3 UAM); 55.4894, -131.5986, Revillagigedo Island, Lake Harriet Hunt (4 UAM); 55.5000, -131.7167, Revillagigedo Island, mouth of Lunch Creek (1 UAM); 55.5000, -131.0000, Revillagigedo Island, Ella Bay (1 UAM); 55.5825, -130.9669, Revillagigedo Island, SW Manzanita Bay (8 UAM); 55.5911, -130.9850, Revillagigedo Island, Manzanita Creek (1 UAM); 55.6033, -131.6333, Revillagigedo Island, Loring (1 MVZ); 55.6333, -131.3667, Revillagigedo Island, head of Carroll Inlet (3 UAM); 55.6947, -131.6281, Revillagigedo Island, Margaret Cove (2 UAM); 55.7667, -131.0167, Revillagigedo Island, Behm Canal, Portage Cove (2 UAM); 55.7678, -131.0833, Revillagigedo Island, Portage Cove (1 UAM); 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (2 UAM); 55.1167, -130.7000, Marten Arm, Boca de Quadra (1 MVZ); 55.2908, -130.8236, E Skull Creek, Smeaton Bay (4 UAM); 55.3025, -130.8439, mouth of Smeaton Bay (13 UAM); 55.5317, -131.9586, Bond Bay (24 UAM); 55.5450, -130.8703, Point Louise, Rudyerd Bay (30 UAM); 55.5544, -130.8592, Rudyerd Bay (22 UAM); 55.6811, -130.4894, Rudyerd Bay (2 UAM); 55.7056, -130.8928, Ledge Point, Walker Cove (7 UAM); 55.7133, -130.9011, Hut Point, Walker Cove (20 UAM); 55.7289, -131.8539, Port Stewart (14 UAM); 55.7444, -131.1103 (1 UAM); 55.7667, -130.8833, Chickamin River, Wolf Cabin (12 UAM); 55.8511, -130.9347 (1 UAM); 55.8833, -130.7667, Chickamin River near Leduc Junction (2 UAM); 55.8847, -131.0778 (1 UAM); 55.9167, -130.0167, Hyder, Forest/estuarine meadow edge (1 UAM); 55.9333, -130.0333 (1 UAM); 55.9667, -131.6167, Cleveland Pen., 43.5 mi N of Ketchikan, Bailey Bay (4 UAM); 56.0000, -130.0000, Hyder Salmon River Valley (12 UAM). **PETERSBURG QUAD:** 56.0333, -132.0167, Deer Island (1 UAM); 56.0833, -132.3500, Etolin Island (4 UAM); 56.1667, -132.4500, Etolin Island, Anita Bay (15 UAM); 56.1833, -132.4833, Etolin Island, Anita Bay area (1 UAM); 56.1833, -132.4500, Etolin Island, Anita Bay (4 UAM); 56.1833, -132.4833, Etolin Island, Anita Bay area (4 UAM); 56.1833, -132.4500, Etolin Island, Anita Bay (11 UAM); 56.1833, -132.4167, Etolin Island, Anita Bay, South (1 UAM); 56.1867, -132.6328, Etolin Island (6 UAM); 56.2000, -132.4667, Etolin Island, Anita Bay, North (2 UAM); 56.2211, -132.5089, Etolin Island (29 UAM); 56.2333, -132.1333, Wrangell Island (82 UAM); 56.2500, -132.3167, Wrangell Island, Nemo (9 UAM); 56.2561, -132.3303, Wrangell Island, Nemo (51 UAM); 56.2667, -132.1333, Wrangell Island, Earl West Marsh (2 UAM); 56.2667, -132.2500, Wrangell Island, McCormick Creek (4 UAM); 56.2697, -132.0706, Wrangell Island, Fools Creek (13 UAM); 56.3183, -132.2861, Wrangell Island (129 UAM); 56.3183, -132.3083, Wrangell Island, 2 mi S McCormick Creek, N side of Main Line Rd. (2 UAM); 56.3333, -132.3333, Wrangell Island, Pat Creek (4 UAM); 56.3486, -132.1347, Wrangell Island (8 UAM); 56.3500, -132.3333, Wrangell Island, Trout Lake (10 UAM); 56.4500, -132.2667, Wrangell Island (9 UAM); 56.4670, -132.3778, Wrangell Island, Wrangell (1 USNM); 56.4692, -132.4789, Wrangell Island, Wrangell, grid 06206 (19 UAM); 56.5000, -132.2833, Wrangell Island (7 UAM); 56.2333, -132.1333 (13 UAM); 56.3636, -132.0081, Berg Bay (5 UAM); 56.6167, -132.4333, Stikine River, Farm Island, Binkley Slough (4 UAM); 56.6333, -132.4167, Stikine River, Farm Island (20 UAM); 56.6750, -132.2833, Stikine River, Limb Island (3 UAM); 56.7000, -132.2500, Stikine River, Figure Eight Lake (4 UAM); 56.6633, -134.9058, Stikine River, Mallard Slough (36 UAM). **PRINCE RUPERT QUAD:** 54.95, -130.7500, head of Nakat Inlet (2 UAM); 54.9833, -131.0000, Foggy Bay, Kirk Point (9 UAM); 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (10 UAM).

Northern Red-backed Vole
Myodes rutilus (Pallas, 1779)

OTHER COMMON NAMES. Dawson Red-backed Mouse, Northern Red-backed Mouse, Tundra Redback Vole.

TAXONOMY. See Southern Red-backed Vole account on the use of *Myodes* as the valid genus for red-backed voles. Two subspecies of *M. rutilus* occur in Southeast Alaska (Hall, 1981). An unpublished revision of Southeastern populations by Antell (1987) extended the distribution of the subspecies *M. r. glacialis* to include all populations from Yakutat south to Bartlett Cove. Populations of this species in the Haines/Skagway area south to Juneau were included under *M. r. dawsoni.*

Mitochondrial DNA variation has been examined across a number of populations of this species along the North Pacific Coast. These populations show minimal levels of differentiation suggesting recent colonization of the region from Beringia (Cook et al., 2004; Runck and Cook, unpubl.).

Myodes rutilus dawsoni

Original Description. 1888. *Evotomys dawsoni* Merriam, Amer. Nat., 22:650, July.

Type Locality. Finlayson River, 3000 ft., a northern source of Liard River, lat. 61º 30' N, long. 129º 30' W, Yukon.

Type Specimen. NMC 92.

Range. Most of Alaska, northwestern Canada.

Remarks. Includes *Evotomys alascensis* Miller, 1898, Proc. Acad. Nat. Sci. Philadelphia, 50:364, October 15, type from St. Michael, Norton Sound, Alaska (USNM 14359/22226) (*see* Osgood 1904:34).

Myodes rutilus glacialis

Original Description. 1945. *Clethrionomys dawsoni glacialis* Orr, J. Mammal., 26:71, February 27.

Type Locality. Glacier Bay, Alaska.

Type Specimen. MVZ 388.

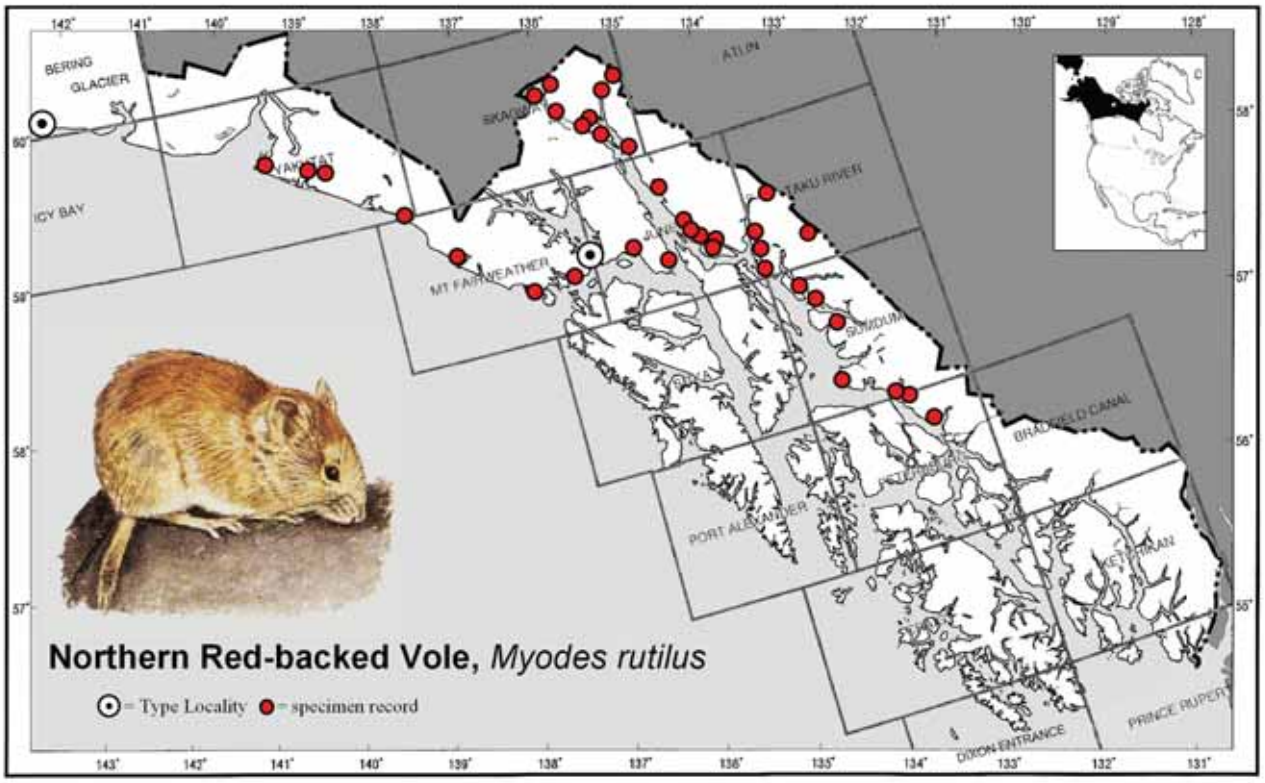
Range. Glacier Bay area of Southeast Alaska.

REVISIONS AND REVIEWS. Rausch and Rausch (1975), Antell (1987), Runck (2001).

STATUS. IUCN-Least concern.

DISTRIBUTION. This Holarctic species occurs along the northern mainland of Southeast Alaska east and south to LeConte Bay (Runck, 2001). The only insular populations in the region are nearshore Douglas and Young islands (one of the Beardslee Islands in Yakutat Bay).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (17 CAS). **JUNEAU QUAD:** 58.3000, -134.4000, Douglas Island (1 UAM); 58.3169, -134.5533, Douglas Island, Fish Creek (9 UAM); 58.3333, -134.5000, Douglas Island (2 UAM); Young Island, Beardslee Islands (1 KU); 57.8833, -133.6500, Williams Cove, Tracy Arm (1 UAM); 58.1778, -133.9583, Turner Creek (4 UAM); 58.2833, -135.0500 (1 UAM); 58.3000, -135.2000 (2 UAM); 58.3000, -134.4000, Juneau harbor (10 UAM); 58.3111, -133.9583, Turner Lake (14 UAM); 58.3333, -134.6000, Auke Bay area, Mendenhall River (1 UAM); 58.3833, -134.7000, John Muir Cabin, 20 km NW Juneau (3 UAM); 58.4000, -134.7333, 17.7 mile Glacier Highway (9 UAM); 58.4167, -135.4333, Excursion Inlet, E side (6 UAM); 58.4500, -135.8833, Bartlett Cove, 10 km NW Gustavus Airport (3 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (9 UAM); 58.5333, -134.8000, Eagle River Beach, 15 1/2 mi N, 15 3/4 mi W of Juneau (1 UAM); 58.7881, -134.9356, creek South of Antler River (3 UAM); 58.7889, -135.0278, mouth of Slate Creek (2 UAM); 58.9833, -134.7667, Peterson Creek, mile 25 N Glacier Hwy. (8 UAM); 59.5292, -134.9078, Echo Cove (34 UAM); 59.5292, -134.3661, Echo Cove (13 UAM); 15 mi N Juneau, 1 mi N Auke Bay (2 UAM); Auke Bay; Dairy Farm Road (1 UAM). **MT FAIRWEATHER QUAD:** Dundas Bay, Glacier Bay NP (14 KU); Torch Bay, Glacier Bay NP (14 KU); N. Lituya Bay, Glacier Bay NP (168 KU). **PETERSBURG QUAD:** 56.7728, -132.6075, Jap Creek (2 UAM); 56.9661, -132.8167 (9 UAM); 57.0083, -132.9833, Thomas Bay (4 UAM). **SKAGWAY QUAD:** 59.0833, -135.1750, alpine ridge, 500 meters south of Yeldegalga Creek (1 UAM); 59.0992,



-135.2103, mouth of Yeldagalga Creek (4 UAM); 59.1625, -135.3578, Chilkat Peninsula; Mud Bay (27 UAM); 59.2500, -135.4167, Haines area (3 UAM); 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (7 UAM); 59.3167, -135.5667, Haines, .2 mi from Chilkoot Lk Pk (1 UAM); 59.3456, -135.7697, 11 km E, 12 km S Klukwan (1 UAM); 59.4083, -135.9556, 24 mile Haines Highway (3 UAM); 59.4147, -136.0619, Porcupine River (1 UAM); 59.4522, -136.0272, Mosquito Lake (10 UAM); 59.4667, -135.3500, W side Dyea Point, 1.2 mi N, 1.2 mi W of Skagway (3 UAM); 59.5000, -135.2667 (1 UAM); 59.5031, -135.3456, 500m S Taiya River bridge (2 UAM); 59.5317, -135.3481, Dyea, mouth W branch Taiya River (3 UAM); 59.5333, -135.0833, Laughton Glacier (3 UAM); 59.5333, -135.3500 (8 UAM); 59.5500, -135.1000 (3 UAM); 59.5667, -135.1167, Glacier, 15km NE Skagway (4 UAM); 59.5747, -136.1567 (6 UAM); 59.6066, -135.8535, Klukwah Mountain (1 UAM). **SUMDUM QUAD:** 57.2164, -133.5014, Cape Fanshaw (29 UAM); 57.5833, -133.3667, Chuck River (1 UAM); 57.7667, -133.5167, Power's Creek, Endicott Arm (2 UAM); 57.8833, -133.6500 (1 UAM). **TAKU RIVER QUAD:** 58.5500, -133.6833, Taku River, Canyon Island (2 UAM); 58.5444, -133.6805, Limestone Inlet (8 UAM); 58.1833, -133.3167, Crescent Lake (2 UAM); 58.2000, -133.4000, Whiting River drainage, Crescent Lake (2 UAM). **YAKUTAT QUAD:** 59.1000, -138.2667, Doame River (1 UAM); 59.4139, -139.0086, Harlequin Lake (16 UAM); 59.4153, -139.0114, Horsetail Bog on Harlequin Lake Trail (2 UAM); 59.4158, -139.0222, Harlequin Lake Trail (3 UAM); 59.4500, -139.2 (1 UAM); 59.4936, -139.7289, Yakutat, Cannon Beach (2 UAM); 59.5000, -139.6667, Yakutat, near Forest Service bunkhouse (8 UAM); 59.5131, -139.6794, 3 mi SE Yakutat (17 UAM); 59.5333, -139.9000 (2 UAM); 59.5411, -139.8385, Yakutat, Ankaw Saltchuck (2 UAM); 59.5500, -139.7333, Yakutat, edge of community airstrip (1 UAM).

Bushy-tailed Woodrat
Neotoma cinerea (Ord, 1815)

OTHER COMMON NAMES. Osgood Bushy-tailed Woodrat, pack rat.

TAXONOMY. Populations of Bushy-tailed Woodrats in Southeast Alaska are included under a single subspecies (Hall, 1981).

Neotoma cinerea occidentalis

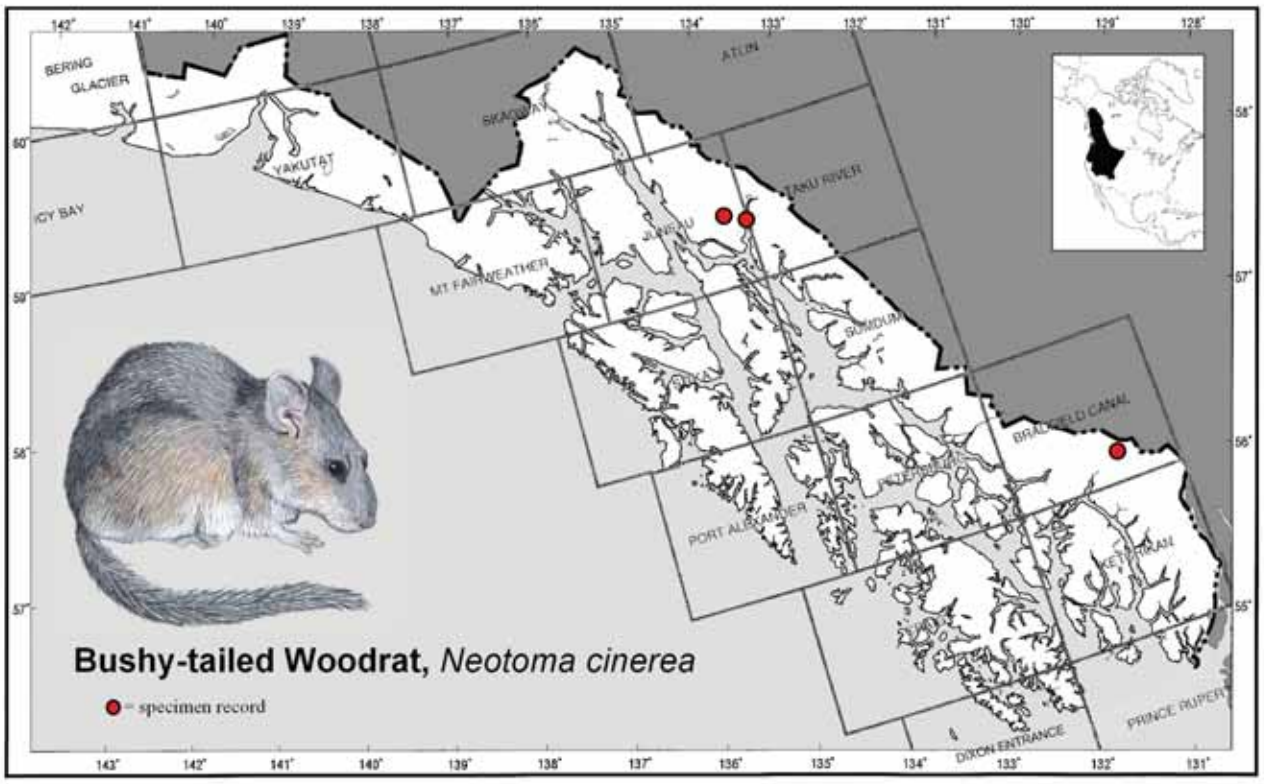
Original Description. 1855. *Neotoma occidentalis* Baird, Proc. Acad. Nat. Sci. Philadelphia, 7:335, April.

Type Locality. Shoalwater [= Willapa] Bay, Pacific Co., Washington.

Type Specimen. USNM 572.

Range. Mackenzie, Northwest Territories, southward along coastal Southeast Alaska, coastal and central British Columbia to central Oregon.

Remarks. Includes *Neotoma saxamans* Osgood, 1900, N. Amer. Fauna, 19:33, October 6, type from Bennett City, head Lake Bennett, British Columbia (USNM 98923). That taxon was regarded as inseparable from *N. c. occidentalis* by Cowan and Guiguet (1965) and Youngman (1975).



REVISIONS AND REVIEWS. Smith (1997).

STATUS. IUCN-Least concern.

DISTRIBUTION. Little is known about *Neotoma cinerea* in Southeast Alaska. The only published specimen records of this species in the region are those reported by Shaw (1962) from the Unuk River (in 1925) and the Taku River (in 1940). In 1963 and 1969, specimens were taken on isolated nunataks in the Juneau Ice Fields (PSM).

A Bushy-tailed Woodrat collected at the head of Lake Bennett, British Columbia, and one observed at Glacier inside Alaska (Osgood, 1900) indicate a possible mainland distribution at least this far north. Dufresne (1946:138-139) stated that woodrats were "fairly common near the head of Portland Canal and along the Unuk River. It has also been reported from the Stikine and Taku River watersheds."

SPECIMENS. **BRADFIELD CANAL QUAD:** Unuk River (1 USNM). **JUNEAU QUAD:** Juneau Ice Fields (4 PSM). **TAKU RIVER QUAD:** mouth lower Taku River (1 USNM).

Common Muskrat
Ondatra zibethicus (Linnaeus, 1766)

OTHER COMMON NAMES. Muskrat, Northwestern Muskrat.

TAXONOMY. All Southeast Alaska muskrats are presumed to be included under the subspecies *Ondatra zibethicus spatulatus* (Hall, 1981), however, this should be reviewed.

Ondatra zibethicus spatulatus

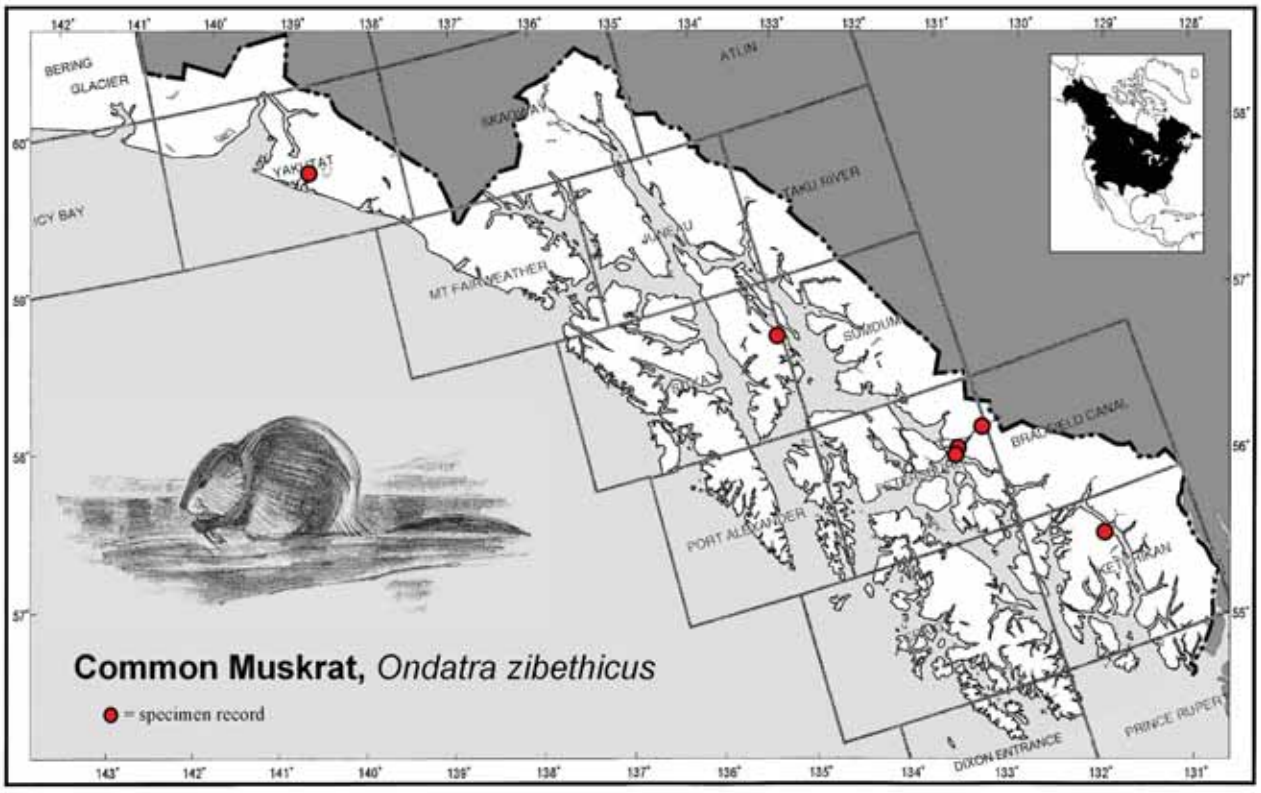
Original Description. 1900. *Fiber spatulatus* Osgood, N. Amer. Fauna, 19:36, October 6.

Type Locality. Lake Marsh, Yukon Territory.
Type Specimen. USNM 98567.
Range. Western Alaska and northwestern Canada.

REVISIONS AND REVIEWS. Perry (1982), Willner et al. (1980).

STATUS. IUCN-Least concern.

DISTRIBUTION. Muskrats are relatively uncommon in Southeast Alaska. Documented



reports include near Yakutat and Haines, the Taku River, Stikine River (including the delta islands, Farm and Sergief; Swarth, 1922), Admiralty Island, and Revillagigedo Island. Muskrats have also been reported but no specimens secured from Thomas Bay and Kuiu, Kupreanof , Mitkof, Woewodski, and Wrangell islands (Curatolo et al., 1981; MacDonald and Cook, 1996).

There were unsuccessful attempts in 1929 to transplant muskrats from Haines to Klawock Lake, Prince of Wales Island (Burris and McKnight, 1973).

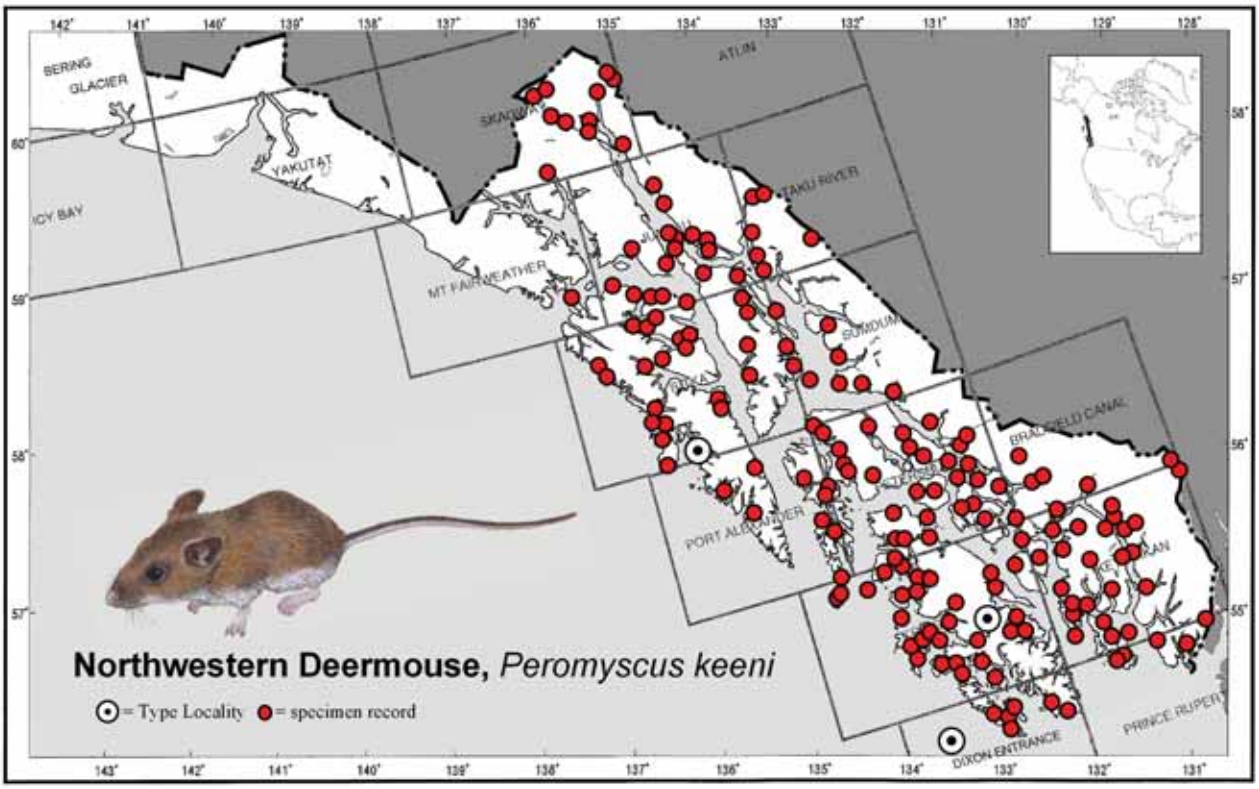
SPECIMENS. **JUNEAU QUAD:** 57.6651, -134.0606, Admiralty Island, Mole Harbor (1 MVZ). **KETCHIKAN QUAD:** 55.7728, -131.0436, Revillagigedo Island, Portage Cove (5 MVZ). **PETERSBURG QUAD:** 56.6167, -132.4330, Stikine River, Farm Island (18 UAM); 56.5897, -132.4256, Stikine River, Sergief Island (6 MVZ); Stikine River, Hot Springs (2 USNM). **YAKUTAT QUAD:** 59.4075, -139.1762, Dangerous River, Yakutat Bay region (1 MVZ); 59.4241, -139.294, Antlen (sic) River (2 MVZ).

Northwestern Deermouse
Peromyscus keeni (Rhoads, 1894)

OTHER COMMON NAMES. Keen's Mouse, Alaska White-footed Mouse, Yukon White-footed Mouse, Skeena White-footed Mouse, Deer Mouse, Forest Deer Mouse, Sitka Mouse, Sitka White-footed Mouse.

TAXONOMY. Two species and five subspecies of *Peromyscus* were once recognized in Southeast Alaska (Hall, 1981). All are now included under a single species name, *P. keeni* (Hogan et al., 1993; MacDonald and Cook, 1996).

Lucid and Cook (2004) analyzed cytochrome *b* sequences of 257 *P. keeni* from 23 islands and 6 mainland locations in Southeast Alaska and western Canada. Although *P. keeni* is ubiquitous across this region, most island populations were genetically distinctive, suggesting limited movement among islands. Areas with divergent populations were discovered, but were largely inconsistent with 3 of 5 currently recognized subspecies. Cryptic variation was detected in 8 areas not previously identified by morphologic analyses.



Peromyscus keeni algidus

Original Description. 1909. *Peromyscus maniculatus algidus* Osgood, N. Amer. Fauna, 28:56, April 17.

Type Locality. Head of Lake Bennett (site of old Bennett City), British Columbia.

Type Specimen. USNM 130013.

Range. Between upper Lynn Canal, Alaska, and southcentral Yukon Territory.

Remarks. Mitochondrial-DNA work on *Peromyscus* from northwestern British Columbia and southern Yukon Territory (roughly the range of *algidus*) uncovered a cryptic lineage (Wike, 1998; Lucid and Cook, unpubl. data).

Peromyscus keeni hylaeus

Original Description. 1908. *Peromyscus hylaeus* Osgood, Proc. Biol. Soc. Washington, 21:141, June 9.

Type Locality. Hollis, Kasaan Bay, Prince of Wales Island, Alaska.

Type Specimen. USNM 127038.

Range. Prince of Wales Island northward through the central Alexander Archipelago to Glacier Bay.

Peromyscus keeni macrorhinus

Original Description. 1894. *Sitomys macrorhinus* Rhoads, Proc. Acad. Nat. Sci. Philadelphia, 46:259, October.

Type Locality. Mouth of Skeena River, British Columbia.

Type Specimen. ANSP 8381.

Range. Mainland coast and adjacent islands of southeast Alaska and British Columbia.

Peromyscus keeni oceanicus

Original Description. 1935. *Peromyscus sitkensis oceanicus* Cowan, Univ. California Publ. Zool., 40:432, November 14.

Type Locality. Forrester Island, Alaska.

Type Specimen. MVZ 20890.

Range. Known only from type locality.

Peromyscus keeni sitkensis

Original Description. 1897. *Peromyscus sitkensis* Merriam, Proc. Biol. Soc. Washington, 11:223, July 15.

Type Locality. Sitka, Alaska.

Type Specimen. USNM 73809.

Range. Baranof, Chichagof, Warren, Coronation, and Duke islands of the Alexander Archipelago.

REVISIONS AND REVIEWS. Hooper (1968), Pengilly et al. (1983), Hogan et al. (1993), Lucid and Cook (2004).

STATUS. IUCN-Least concern as *P. sitkensis*.

DISTRIBUTION. The Northwestern Deermouse is one of the more widely distributed mammals in the region, occurring on the mainland at Glacier Bay from Muir Glacier and Tlingit Point (USNM; Home, 1973) eastward to Haines and Skagway and then southward along the coast (MacDonald and Cook, 1996). In the Alexander Archipelago, it has been documented on the following islands: Admiralty, Anguilla, Annette, Baker, Baranof, Betton, the Brothers (E. and W.), Bushy, Cat, Chichagof, Coronation, Dall, Deer, Dog, Douglas, Duke, Esquibel, Etolin, Forrester, Goat, Gravina, Heceta, Inian, Kadin, Kosciusko, Kruzof, Kuiu, Kupreanof, Lincoln, Long, Lowrie, Lulu, Marble, Mary, Mitkof, Moser, Noyes, Orr, Partofshikof, Pow, Prince of Wales, Revillagigedo, Saint Ignace, San Fernando, San Juan Bautista, Santa Rita, Sergief, Shelter, Shrubby, Spanish, Suemez, Sukkwan, Swan, Thorne, Tuxekan, Vank, Warren, Woewodski, Woronkofski, Wrangell, and Zarembo islands.

SPECIMENS. **BRADFIELD CANAL QUAD:** 56.0031, -131.9847, Deer Island (17 UAM); 56.0122, -131.9958, Deer Island (1 UAM); 55.9997, -131.5664, SW side Reflection Lake (15 UAM); 56.0092, -131.5756, W side Reflection Lake (24 UAM); 56.0108, -131.5672, Reflection Lake (40 UAM); 56.0167, -130.0667 (2 UAM); 56.0233, -130.0714 (17 UAM); 56.0333, -132.0500 (3 UAM); 56.0578, -131.9669, south side of Frosty Bay (6 UAM); 56.0833, -131.1000, mouth of Unuk River (65 UAM); 56.1833, -131.6781 (3 UAM); 56.1833, -131.6667 (1 UAM); 56.1847, -131.6297, Eagle Bay (25 UAM); 56.1886, -131.5811, Duck Point (9 UAM); 56.1914, -131.6781, Hoya Creek (7 UAM); 56.2206, -131.4736, Tyee (23 UAM); 56.2289, -131.4517, Tyee (41 UAM). **CRAIG QUAD**: 55.6667, -133.5833, Anguilla Island (10 UAM); 55.3667, -133.6000, Baker Island (18 UAM); 55.4500, -132.6667, Cat Island, near Hollis (1 UAM); 55.8833, -134.2333, Coronation Island, NE side, across from Spanish Islands (7 UAM); 55.9167, -134.2500, Coronation Island, Aats Bay, E shore (3 UAM); 55.9178, -134.3200, Coronation Island, Egg Harbor (2 UAM); 55.9222, -134.3000, Coronation Island, Alikula Bay (3 UAM); 55.9250, -134.3208, Coronation Island, Egg Harbor (2 UAM); Coronation Island, S side of Windy Bay, E of Main Creek (1 UAM); 55.2000, -133.2333, Dall Island, Bobs Bay (9 UAM); 55.2092, -133.1381, Dall Island, North Bay (2 UAM); 55.2094, -133.1381, Dall Island, North Bay (5 UAM); 55.2600, -133.1239, Dall Island, Tlevak Narrows (11 UAM); Dall Island, Diver Bay (22 UAM); 55.9919, -132.0178, Deer Island, south part of island (1 UAM); 55.6333, -133.5833, Esquibel Island (2 UAM); 55.2172, -132.8978, Goat Island (9 UAM); 55.7500, -133.5167, Heceta Island (6 UAM); 55.7567, -133.3472, Heceta Island, Tonowek Narrows (4 UAM); 55.7697, -133.3442, Heceta Island, bay N Tonowek Narrows (10 UAM); 55.7881, -133.3206, Heceta Island, unnamed bay S of Chapin Island (11 UAM); 55.7883, -133.3353, Heceta Island, Squam Bay (9 UAM); 55.7981, -133.3519, Heceta Island, NE Peninsula (4 UAM); 55.8031, -133.3253, Heceta Island, Karheen Pass (1 UAM); 55.7167, -133.4167, Heceta Island, Crooked Hook Lake (10 UAM); 55.7500, -133.5000, Heceta Island, Port Alice (18 UAM); 55.7500, -133.4833, Heceta Island, Warm Chuck Inlet (7 UAM); 55.7667, -133.4500,

Heceta Island, Chuck Lake (5 UAM); 55.7786, -133.4872, Heceta Island, Chuck Lake (1 UAM); 55.7833, -133.5333, Heceta Island, road toward Bald Mountain (6 UAM); 55.7986, -133.5336, Heceta Island (3 UAM); 55.8000, -133.6667, Heceta Island, Port Alice, Mint Lake (27 UAM); 55.9167, -133.7667, Kosciusko Island, Halibut Harbor (1 UAM); 55.9189, -133.6850, Kosciusko Island (1 UAM); 55.9692, -133.6458, Kosciusko Island, Charley Creek, Edna Bay (1 UAM); 55.9692, -133.6469, Kosciusko Island, Charley Creek, Edna Bay (7 UAM); 55.9828, -133.6050, Kosciusko Island, 2 mi NE Edna Bay (3 UAM); 55.4397, -133.4553, Lulu Island (8 UAM); 55.4500, -133.4500, Lulu Island, SE side near Pine Island (13 UAM); 55.9500, -133.4417, Marble Island (2 UAM); 55.9667, -133.4500, Marble Island (12 UAM);56.0000, -133.4000, Marble Island (1 UAM);56.0000, -133.4000, Marble Island, near Old Tokeen (12 UAM); 55.4500, -133.6500, Noyes Island, Kelly Cove (6 UAM); 55.4611, -133.6389, Noyes Island, Kelly Cove (4 UAM); 55.9167, -133.4167, Orr Island (15 UAM); 55.9500, -133.4000, Orr Island (3 UAM); 55.9500, -133.3833, Orr Island (1 UAM); 55.9833, -133.3167, Orr Island, N end of island (6 UAM); 54.6892, -132.5403, Prince of Wales Island, North Thorne Bay (105 UAM); 55.2667, -133.1167, Prince of Wales Island, Tlevac Narrows (4 UAM); 55.2678, -133.1858, Prince of Wales Island, Tlevak Pass (8 UAM); 55.2794, -133.1858, Prince of Wales Island (9 UAM); 55.3333, -132.3333, Prince of Wales Island, Polk Inlet, by Forest Service camp (1 UAM); 55.3467, -132.8356, Prince of Wales Island, Polk Inlet Road (21 UAM); 55.3542, -132.8406, Prince of Wales Island, Cable Creek (1 UAM); 55.3583, -133.6042, Prince of Wales Island, Turn Creek (1 UAM); 55.3833, -132.4833, Prince of Wales Island, Polk Inlet (4 UAM); 55.3961, -132.4578, Prince of Wales Island, Old Tom Creek (42 UAM); 55.3961, -132.4578, Prince of Wales Island, Goose Bay (1 UAM); 55.3992, -132.4094, Prince of Wales Island, Old Tom Creek (38 UAM); 55.4167, -132.4667, Prince of Wales Island, Polk Inlet, by Forest Service camp (4 UAM); 55.4167, -132.4333, Prince of Wales Island, Polk Inlet (2 UAM); 55.4167, -132.4667, Prince of Wales Island, Polk Inlet (2 UAM); 55.4333, -132.8267, Prince of Wales Island, Hydaburg Road, One Duck Trail (5 UAM); 55.4500, -132.8500, Prince of Wales Island, 19km East of East side of Harris River (4 UAM); 55.4611, -132.6917, Prince of Wales Island (7 UAM); 55.4667, -133.0667, Prince of Wales Island, Crab Bay (10 UAM); 55.4790, -132.6560, Prince of Wales Island, Hollis Anchorage (2 UAM); 55.4861, -132.6680, Prince of Wales Island, Hollis (1 UAM); 55.4861, -132.6653, Prince of Wales Island, Maybeso Valley (3 UAM); 55.5167, -133.0833, Prince of Wales Island, Klawock city campground, 0.3 mi Thorne Bay Rd. (5 UAM); 55.5500, -133.0833, Prince of Wales Island, Klawock (4 UAM); 55.5500, -133.0742, Prince of Wales Island, Klawock Lake, along beach fringe, Fireweed Lodge (4 UAM); 55.5542, -133.0958, Prince of Wales Island, Klawock, Fireweed Lodge (7 UAM); 55.5667, -133.0667, Prince of Wales Island, Klawock airport (10 UAM); 55.6167, -132.9000, Prince of Wales Island, El Capitan Passage (1 UAM); 55.6319, -132.9075, Prince of Wales Island (11 UAM); 55.6667, -132.5000, Prince of Wales Island, Turn Creek, Thorne Bay (23 UAM); 55.6686, -132.5075, Prince of Wales Island, Thorne Bay (29 UAM); 55.6833, -132.5000, Prince of Wales Island, Turn Creek, Thorne Bay (23 UAM); 55.6917, -132.8653, Prince of Wales Island, S shore, Control Lk, 16 mi W Thorne Bay (7 UAM); 55.6975, -132.7731, Prince of Wales Island, Rio Roberts (5 UAM); 55.7000, -132.8333, Prince of Wales Island, Eagle's Nest Campground (2 UAM); 55.7167, -132.8167, Prince of Wales Island, Eagle Nest Campground, W Thorne Bay (8 UAM); 55.7667, -132.4833, Prince of Wales Island (5 UAM); 55.7667, -132.4833, Prince of Wales Island, Sandy Beach Picnic Area, 7 mi N Thorne Bay (1 UAM); 55.8333, -133.1500, Prince of Wales Island, Staney Cr Cabin, 25 mi WNW Thorne Bay (17 UAM); 55.9000, -133.3333, Prince of Wales Island, Klhani Point (15 UAM); 55.9014, -133.2486, Prince of Wales Island, , (11 UAM); 55.9083, -133.2022, Prince of Wales Island, FS boundary N. of Naukati on FS20 (2 UAM); 55.9122, -133.2600, Prince of Wales Island, Dargun Point, Prince of Wales Island (1 UAM); 55.9203, -133.1969, Prince of Wales Island, .5 mile from intersection (11 UAM); Prince of Wales Island, Craig-Klawock area (2 UAM); Prince of Wales Island, north Thorne (1 UAM); 55.4333, -133.4167, Saint Ignace Island, north side of island (18 UAM); 55.4500, -133.3583, San Fernando Island, Pt. Amargura (35 UAM); 55.4500, -133.3667, San Fernando Island, 2mi S Amagura cabin (9 UAM); 55.4672, -133.3894, San Fernando Island (21 UAM); 55.4258, -133.3186, San Juan Bautista Island, Point Cambon (44 UAM); 55.4433, -133.2947, San Juan Bautista Island, Point Eugenia (24 UAM); 55.4072, -133.4667, Santa Rita Island (10 UAM); 55.4100, -133.4667, Santa Rita Island (2 UAM); 55.4167, -133.4583, Santa Rita Island, west side of island (5 UAM); 55.9631, -134.1222, Spanish Islands (2 UAM); 55.2667, -133.3500, Suemez Island, SE, near Ridge Island (14 UAM); 55.2789, -133.3139, Suemez Island (3 UAM); 55.2789, -133.3161, Suemez Island, Port Refugio (6 UAM); 55.2833, -133.3000, Suemez Island, Port Refugio (3 UAM); 55.2847, -133.3344, Suemez Island, Port Refugio (2 UAM); 56.2667, -133.3000, Suemez Island (4 UAM); 55.1000, -132.8333, Sukkwan Island, Dunbar Inlet (36 UAM); 55.8464, -133.2231, Tuxekan Island, E side of Nichin Cove (6 UAM); 55.8467, -133.2231, Tuxekan Island, E side of Nichin Cove (2 UAM); 55.8500, -133.2833, Tuxekan Island, NW side, E of El Capitan Island (6 UAM); 55.8531, -133.2275, Tuxekan Island, Nichin Cove (11 UAM); 55.8778, -133.2950, Tuxekan Island, Jinhi Bay (16 UAM); 55.8833, -133.3667, Tuxekan Island, Northwest side, South of Cape Island (2 UAM); 55.8972, -133.3264, Tuxekan Island, NW tip of Island (3 UAM); 55.8981, -133.3156, Tuxekan Island (1 UAM); 55.9069, -133.2794, Tuxekan Island, 0.5 miles south of Shikat Point (6 UAM); 55.9167, -133.3000, Tuxekan Island, north end of island (2 UAM); 55.9167, -130.3333, Tuxekan Island, north end of island (2 UAM); 55.9606, -134.1258, unnamed island (1 UAM); 55.9694, -134.1180, unnamed island, island directly SW of the northern-most island (5 UAM); 55.8750, -133.8417, Warren Island, Warren Cove (4 UAM); 55.8750, -133.9250, Warren Island, Warren Cove (3 UAM); 55.8750, -133.8417, Warren Island, Warren Cove (47 UAM); 55.8833, -133.8667, Warren Island, Warren Cove (2 UAM); 55.4333, -133.6500 (8 UAM); 55.7500, -132.1833, Union Bay, N shore at mouth (4 UAM); 55.8917, -133.2505556 (2 UAM); 55.9069, -133.2794444 (8 UAM); Emerald Bay, Cleveland Peninsula (2 UAM); Emerald Bay, Cleveland Peninsula (1 UAM). **DIXON ENTRANCE QUAD:** 54.6853, -132.7644, Dall Island, Wolk Harbor (3 UAM); 54.7428, -132.8433, Dall Island, Security Cove (9 UAM); 54.7442, -132.7711, Dall Island (22 UAM); 54.7667, -132.1833, Dall Island, Essowah Lakes (2 UAM); 54.7833, -132.8667, Dall Island, Essowah Lakes (12 UAM); 54.8000, -132.8500, Dall Island, Essowah Lakes (21 UAM); 54.8069, -132.7692, Dall Island, Pond Bay (5 UAM); 54.8319, -132.9217, Dall Island, Port Bazan (1 UAM); 54.8897, -133.0219, Dall Island, Gooseneck Harbor (8 UAM); 54.9164, -133.0567, Dall Island, Gold Harbor (4 UAM); 54.9167, -133.0833, Dall Island, Gold Harbor (1 UAM); 54.9208, -133.0278, Dall Island, Gold Harbor (3 UAM); 54.9500, -133.0000, Dall Island, Tlevak Pass (1 UAM); 55.2094, -133.1381, Dall Island, North Bay (26 UAM); 55.2156, -133.1414, Dall Island, North Bay (1 UAM); 55.2500, -133.1167, Dall Island, Tlevac Narrows, Turn Point (6 UAM); 54.5208, -133.5208, Forrester Island (6 UAM); 54.7050, -133.5206, Forrester Island, Eagle Harbor (10 UAM); 54.8000, -133.5167, Forrester Island, Eagle Harbor (3 UAM); 54.8167, -133.5167, Forrester Island, Eagle Harbor (6 UAM); 54.8167, -133.5319, Forrester Island (1 UAM); 54.8214, -133.5208, Forrester Island, Eagle Harbor (86 UAM); 54.8067, -132.6992, Long Island (4 UAM); 54.8167, -132.6833, Long Island, Nina Cove (17 UAM); 54.8172, -132.7064, Long Island, 3.3 km S, 2.3 E Bolles Inlet (14 UAM); 54.8361, -132.7353, Long Island, Bolles Inlet (8 UAM); 54.8500, -133.5333, Lowrie Island (32 UAM); 54.8583, -133.5375, Lowrie Island (9 UAM); 54.7667, -132.1833, Prince of Wales Island, Nichols Lake (1 UAM); 54.8167, -132.3667, Prince of Wales Island, SW end near Barrier Islands (15 UAM); 54.8719, -132.3142, Prince of Wales Island, Hunter Bay (11 UAM); 54.8744, -132.3594, Prince of Wales Island, south point of Hunter Bay (7 UAM); 54.9075, -132.4147, Prince of Wales Island, Ruth Cutoff (11 UAM); 55.6167, -132.9000, Prince of Wales Island (2 UAM). **JUNEAU QUAD:** 58.1000, -134.3167, Admiralty Island, head of Seymour Canal (17 UAM); 58.1500, -134.6833, Admiralty Island, Young Bay (2 UAM); 58.2833, -134.7500, Admiralty Island, Hawk Inlet (2 UAM); 58.4000, -134.9167, Admiralty Island, Mansfield Peninsula, Barlow Cove (2 UAM); 57.0792, -135.4778, Chichagof Island, Game Creek (1 UAM); 57.7167, -135.2167, Chichagof Island, Kadashan Bay, Tenakee Inlet (3 UAM); 57.9750, -135.6583, Chichagof Island, Salt Lake Bay (7 UAM);58.0000, -135.7333, Chichagof Island, Salt Lake Bay (7 UAM); 58.0500, -135.1500, Chichagof Island (4 UAM); 58.0500, -134.3000, Chichagof Island, Game Creek (4 UAM); 58.0667, -135.0667, Chichagof Island, Whitestone Harbor (2 UAM); 58.0667,

-135.2333, Chichagof Island (6 UAM); 58.0667, -135.4667, Chichagof Island, Game Creek (2 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (35 UAM); 58.1333, -135.4667, Chichagof Island, 1.5 mi NW Hoonah, Cannery (2 UAM); 58.1833, -135.5500, Chichagof Island, Gallagher Creek, mouth of (1 UAM); 58.2333, -135.8167, Chichagof Island, 4.3 mi SSW of Pt Adolphus (1 UAM); 58.2967, -134.5447, Douglas Island (1 UAM); 58.3169, -134.5533, Douglas Island, Fish Creek (5 UAM); 58.3333, -134.6000, Douglas Island, 10 mi N Douglas, Fish Creek (2 UAM); 58.5000, -135.0000, Lincoln Island (13 UAM); 58.3667, -134.8167, Shelter Island, Hand Troller Cove (6 UAM); 58.4167, -134.8500, Shelter Island (2 UAM); 58.1778, -133.9583, Turner Lake (15 UAM); 58.2833, -135.0500, Howard Bay (7 UAM); 58.3000, -134.4000, Aurora Boat Harbor (3 UAM); 58.3111, -133.9583, Turner Lake (13 UAM); 58.3333, -134.6000, Mendenhall area (1 UAM); 58.3833, -134.7000, John Muir Cabin, 20 km NW (2 UAM); 58.4000, -134.9500, Point Retreat (1 UAM); 58.4167, -134.5667, Mendenhall Glacier moraine, NE of Juneau (5 UAM); 58.4167, -135.4333, Excursion Inlet, W side (4 UAM); 58.4167, -134.5500, Mendenhall Lake (1 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (7 UAM); 58.7881, -134.9356, creek South of Antler River (13 UAM); 58.7889, -135.0278, mouth of Slate Creek (9 UAM); 58.9833, -134.7667, Peterson Creek, mile 25 N Glacier Hwy. (4 UAM); 59.5292, -134.9078, Echo Cove (90 UAM). **KETCHIKAN QUAD:** 55.104, -131.365, Annette Island, Crab Bay area (75 MSB); 55.1406, -131.4672, Annette Island (1 MVZ); 55.5167, -131.8000, Betton Island (58 UAM); 55.1783, -131.8058, Gravina Island, Phocena Bay (36 UAM); 55.3500, -131.7000, Gravina Island, mouth of Government Creek (3 UAM); 55.0833, -131.2333, Mary Island, Customhouse Cove (6 UAM); 55.2167, -131.4292, Pow Island (4 UAM); 55.3167, -131.6000, Revillagigedo Island, Forest Park Drive (1 UAM); 55.3333, -131.6333, Revillagigedo Island (17 UAM); 55.3333, -131.2167, Revillagigedo Island (5 UAM); 55.3439, -131.4983, Revillagigedo Island, South Tongass Highway (1 UAM); 55.4000, -131.7000, Revillagigedo Island (1 UAM); 55.4125, -131.7000, Revillagigedo Island, Tongass Hwy across from Ketchikan pulpmill (6 UAM); 55.4125, -131.7028, Revillagigedo Island, Ward Lake, Grassy Point (1 UAM); 55.4147, -131.6958, Revillagigedo Island, Ward Lake (1 UAM); 55.4492, -131.6372, Revillagigedo Island, Talbot Lake (4 UAM); 55.4894, -131.5986, Revillagigedo Island, Lake Harriet Hunt (7 UAM); 55.5000, -131.7167, Revillagigedo Island, mouth of Lunch Creek (1 UAM); 55.5000, -131.0000, Revillagigedo Island, Ella Bay (7 UAM); 55.5803, -130.9683, Revillagigedo Island, SW Manzanita Bay (14 UAM); 55.5833, -131.3333, Revillagigedo Island (1 UAM); 55.5856, -130.9714, Revillagigedo Island, Manzanita Bay (23 UAM); 55.5911, -130.9850, Revillagigedo Island, Manzanita Creek (3 UAM); 55.6333, -131.3667, Revillagigedo Island, head of Carroll Inlet (48 UAM); 55.6947, -131.6281, Revillagigedo Island, Margaret Cove (1 UAM); 55.7667, -131.0167, Revillagigedo Island, Portage Cove, Behm Canal (7 UAM); 55.7667, -131.0833, Revillagigedo Island, Portage Cove (2 UAM); 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (11 UAM); 55.8500, -131.7000, Revillagigedo Island, south of Gedney Pass (3 UAM); 56.5000, -131.7167, Revillagigedo Island, Ward Lake (1 UAM); Revillagigedo Island, T72S, R94E, Sec2, NE1/4 of NE1/4 (1 UAM); 55.2908, -130.8236, E Skull Creek, Smeaton Bay (5 UAM); 55.3025, -130.8439, mouth of Smeaton Bay (12 UAM); 55.5450, -130.8703, Point Louise, Rudyerd Bay (6 UAM); 55.5544, -130.8592, Rudyerd Bay (23 UAM); 55.5919, -130.8839, Behm Canal (5 UAM); 55.6811, -130.4894, Rudyerd Bay (1 UAM); 55.6872, -130.9722 (1 UAM); 55.6994, -130.52 Rudyerd Bay (2 UAM); 55.7056, -130.8928, Ledge Point, Walker Cove (3 UAM); 55.7133, -130.9011, Hut Point, Walker Cove (16 UAM); 55.7167, -131.8500, Cleveland Pen., 27 mi NNW of Port Stewart Bay (7 UAM); 55.7289, -131.8539, Port Stewart (10 UAM); 55.7444, -131.1103 (2 UAM); 55.7454, -130.6552, Walker Cove (1 UAM); 55.7458, -130.6123, Walker Cove (2 UAM); 55.7667, -130.8833, Chickamin River, Wolf cabin (7 UAM); 55.7893, -130.9559, Walker Cove (5 UAM); 55.8422, -130.8550, E side Leduc Lake (1 UAM); 55.8511, -130.9347 (1 UAM); 55.8833, -130.7667, Chickamin River near confluence with Leduc River (2 UAM); 55.8833, -132.0333, 500' elevation; Cleveland Peninsula, Emerald Bay (1 UAM); 55.9167, -130.0167, Hyder, Salmon River Valley, Titan Trail (1 UAM); 55.9322, -130.8372 (1 UAM); 55.9333, -130.0333 (3 UAM); 55.9667, -130.0667 (17 UAM); 55.9667, -130.3333, Hyder; mouth of Fish Creek, Salmon River Valley (7 UAM); 56.0269, -130.0706 (2 UAM). **MT. FAIRWEATHER QUAD:** 58.2583, -136.2986, "Big" Inian Island (2 UAM). **PETERSBURG QUAD:** 56.2625, -132.9811, Bushy Island (6 UAM); 56.2667, -132.9833, Bushy Island (11 UAM); 56.2625, -132.9694, Bushy Island (3 UAM); 56.0333, -132.0167, Deer Island, South side of Island (10 UAM); 56.0581, -132.0022, Deer Island, East side of Island (2 UAM); 56.0683, -132.0175, Deer Island (2 UAM); 56.0833, -132.3500, Etolin Island (13 UAM); 56.1667, -132.4500, Etolin Island, Anita Bay (14 UAM); 56.1833, -132.4500, Etolin Island, Anita Bay area (26 UAM); 56.1867, -132.6328, Etolin Island (1 UAM); 56.2000, -132.4667, Etolin Island (1 UAM); 56.2211, -132.5089, Etolin Island (24 UAM); 56.3167, -132.4500, Etolin Island, Anita Bay (1 UAM); 56.1667, -132.4500, Kadin Island (2 UAM); 56.1833, -132.4500, Kadin Island (3 UAM);56.0000, -133.4167, Kosciusko Island, Tokeen Bay, mouth Sockeye Creek (10 UAM); 56.0500, -133.5500, Kosciusko Island (2 UAM); 56.6667, -133.7333, Kuiu Island, Rocky Pass (across from NW end High Island) (5 UAM); 56.3667, -133.3167, Kupreanof Island, East Salt Chuck Cabin (7 UAM); 56.3667, -133.3000, Kupreanof Island (5 UAM); 56.3667, -133.3167, Kupreanof Island (5 UAM); 56.6931, -132.9556, Kupreanof Island (7 UAM); 56.7167, -133.6833, Kupreanof Island, Irish Creek (10 UAM); 56.7922, -133.7203, Kupreanof Island, Big John Bay (12 UAM); 56.8000, -133.7167, Kupreanof Island, Big John Bay (7 UAM); 56.8333, -133.3667, Kupreanof Island (1 UAM); 56.8333, -133.3333, Kupreanof Island, 1.75 miles SW of east Salt Chuck Cabin (2 UAM); 56.8500, -133.3667, Kupreanof Island, head of Towers Arm (9 UAM); 56.8667, -133.3167, Kupreanof Island, N of West Salt Chuck Cabin (4 UAM); 56.8667, -133.3333, Kupreanof Island, N of West Salt Chuck Cabin (5 UAM); 56.8667, -133.3000, Kupreanof Island (1 UAM); 56.9500, -133.9000, Kupreanof Island, Kake, near Kake Forest Service cabin (2 UAM); 54.7333, -132.8833, Mitkof Island, Twin Creek (2 UAM); 56.5061, -132.8589, Mitkof Island, Woodpecker Cove (12 UAM); 56.5167, -132.7000, Mitkof Island, S end of blind slough (5 UAM); 56.5300, -132.7500, Mitkof Island, Ohmer Cr, 22.5 mile Mitkof Highway (5 UAM); 56.5431, -132.7789, Mitkof Island, Woodpecker Cove (5 UAM); 56.5667, -132.7167, Mitkof Island, Ohmer Creek (3 UAM); 56.5806, -132.7431, Mitkof Island, Ohmer Creek (2 UAM); 56.5833, -132.8333, Mitkof Island, 3/4 mi S Blind Slough Picnic Area (10 UAM); 56.5833, -132.7667, Mitkof Island, 22.5 mi Mitkof Hwy (19 UAM); 56.5833, -132.8333, Mitkof Island, 3/4 mi S Blind Slough Picnic Area (15 UAM); 56.5833, -132.8000, Mitkof Island (30 UAM); 56.6000, -132.7000, Mitkof Island, upper Ohmer Creek (5 UAM); 56.6000, -132.7333, Mitkof Island, beaver pond 1.5 mi N Ohmer Campground (21 UAM); 56.6000, -133.4167, Mitkof Island, Ohmer Creek (8 UAM); 56.6667, -132.8333, Mitkof Island, Ohmar Creek (104 UAM); 56.7167, -132.9333, Mitkof Island, Twin Creeks (4 UAM); 56.7167, -132.9167, Mitkof Island, Twin Creeks Road, 5 mi S Petersburg (12 UAM); 56.7167, -132.8667, Mitkof Island, Twin Creek drainage (50 UAM); 56.7210, -132.9290, Mitkof Island, Twin Creek (2 UAM); 56.7333, -132.9667, Mitkof Island, Wrangell Narrows (6 UAM); 56.7333, -132.8833, Mitkof Island, Twin Creek (20 UAM); 56.8028, -132.9667, Mitkof Island, Twin Creeks Road, 5 mi S Petersburg (7 UAM); 58.6333, -132.9167, Mitkof Island, Blind Slough (3 UAM); Mitkof Island (16 UAM); 56.0667, -133.2833, Prince of Wales Island, El Capitan Passage (15 UAM); 56.1667, -133.3167, Prince of Wales Island, El Capitan (15 UAM); 56.1744, -133.3692, Prince of Wales Island, Turn Creek, El Capitan area (84 UAM); 56.2675, -133.4619, Prince of Wales Island, El Capitan area (8 UAM); Prince of Wales Island, Bear's Plunge Cave, upper passage (1 UAM); Prince of Wales Island, Salt Chuck Trail (7 UAM); 56.2167, -132.9667, Shrubby Island (1 UAM); 56.2333, -132.9667, Shrubby Island, Ossipee Channel (90 UAM); 56.2333, -132.9833, Shrubby Island, Ossipee Channel, Kashevarof Islands (24 UAM); 56.2333, -132.9667, Shrubby Island (11 UAM); 56.0833, -133.0333, Thorne Island (12 UAM); 56.4028, -132.6028, Vank Island, Mud Bay (30 UAM); Woewodski Island (4 AMNH); 56.2561, -132.3303, Woronkofski Island, Nemo (11 UAM); 56.3970, -132.4810, Woronkofski Island, N side of island (40 UAM); 56.4000, -132.5167, Woronkofski Island, Wedge Point (17 UAM); 56.4353, -132.4967, Woronkofski Island (79 UAM); 56.2333, -132.1333, Wrangell Island (17 UAM); 56.2697, -132.0706, Wrangell Island, Fools Creek (36 UAM); 56.2833, -132.1667, Wrangell Island, Nemo Rd. extension (8 UAM); 56.3183, -132.2861, Wrangell Island (9 UAM); 56.3333, -132.3333, Wrangell Island, Pat Creek (1 UAM); 56.3486, -132.1347,

Wrangell Island (18 UAM); 56.3500, -132.3333, Wrangell Island, Trout Lake, mouth of Pat Creek (3 UAM); 56.4692, -132.3456, Wrangell Island (14 UAM); 56.3333, -132.8333, Zarembo Island, Snow Passage (2 UAM); 56.3333, -132.8333, Zarembo Island, Saint John Harbor (8 UAM); 56.3333, -132.8500, Zarembo Island (1 UAM); 56.3567, -132.8100, Zarembo Island, 0.13 mi W Spur Rd. (8 UAM); 56.4167, -133.0000, Zarembo Island, Saint John Harbor (17 UAM); 56.4500, -132.9500, Zarembo Island, Saint John Bay, near USFS cabin (29 UAM); 56.2333, -132.2500, Stikine River near Andrews Slough (1 UAM); 56.2333, -132.2500, Stikine River near Andrews slough, south bank (1 UAM); 56.3636, -132.0081, Berg Bay (16 UAM); 56.4667, -132.3778, Stikine River (1 UAM); 56.5833, -132.4333, Stikine River, Sergief Island (1 UAM); 56.6167, -132.4333, Stikine River, Farm Island, Binkley Slough (1 UAM); 56.6250, -132.4000, Stikine River, Farm Island (1 UAM); 56.6333, -132.3167, Stikine River, Hooligan Point on Limb Island (6 UAM); 56.6333, -132.4167, Stikine River, Farm Island (19 UAM); 56.6750, -132.2833, Stikine River, Limb Island (4 UAM); 56.7000, -132.2500, Stikine River, Figure Eight Lake (25 UAM); 56.7728, -132.6075, Jap Creek (23 UAM); 56.9661, -132.8167 (1 UAM);57.0000, -132.9833, Thomas Bay (4 UAM); 58.6633, -134.9058, Mallard Slough, Stikine River (25 UAM). **PORT ALEXANDER QUAD:** 56.0667, -134.9000, Baranof Island, Plotnikof Lake (4 UAM); 56.5900, -134.9000, Baranof Island, Plotnikof Lake (2 UAM); 56.5903, -134.8603, Baranof Island, Plotnikof Lake (90 UAM); 56.8333, -134.7000, Baranof Island, Red Bluff Bay (7 UAM); 54.6833, -132.5167, Kuiu Island, tributary of Brown Creek (1 UAM); 56.3167, -134.0667, Kuiu Island, trail between Affleck Canal & Petrof Bay (1 UAM); 56.3214, -134.0708, Kuiu Island, trail between Affleck Canal & Petrof Bay (5 UAM); 56.3214, -134.0717, Kuiu Island, head of Affleck Bay (22 UAM); 56.4000, -134.1417, Kuiu Island, Thetis Bay meadow (11 UAM); 56.5000, -134.0333, Kuiu Island, Aleck's Creek (7 UAM); 56.5833, -134.5167, Kuiu Island, tributary of Brown Creek (19 UAM); 56.5833, -134.0000, Kuiu Island, Point Decision, next to lighthouse (13 UAM); 56.7100, -134.2317, Kuiu Island, Rowan Bay (8 UAM). **PRINCE RUPERT QUAD:** 54.9722, -131.3386, Dog Island (56 UAM); 55.9725, -131.3386, Dog Island (20 UAM); 54.8214, -131.5208, Duke Island (5 UAM); 54.9456, -131.4256, Duke Island, Ryus Bay (7 UAM); 54.9483, -131.4889, Duke Island (27 UAM); 54.9622, -131.4256, Duke Island, Ryus Bay (32 UAM); 54.9622, -133.4889, Duke Island (9 UAM); 54.9647, -131.4078, Duke Island, Ryus Bay (24 UAM); 54.9667, -131.3167, Duke Island, Pond Bay (27 UAM); 54.9750, -131.3333, Duke Island, Pond Bay (36 UAM); 54.8167, -130.6500, inlet, 2 km NW of Willard Inlet mouth (1 UAM); 54.9500, -130.7500, head of Nakat Inlet (1 UAM); 54.9833, -131.0000, Foggy Bay, Kirk Point (4 UAM); 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (7 UAM). **SITKA QUAD:** 57.4333, -134.5500, Admiralty Island (5 UAM); 57.6286, -134.4028, Admiralty Island, Distance Lake (1 UAM); 57.6314, -134.3808, Admiralty Island, Distin Lake (24 UAM); 57.6667, -134.3333, Admiralty Island, head of Seymour Canal (1 UAM); 57.8361, -134.3072, Admiralty Island, Windfall Harbor (26 UAM); 56.7500, -135.1667, Baranof Island (1 UAM); 57.0500, -135.2167, Baranof Island, Herring Cove, 0.5 mi S, 4.75 mi E of Sika (21 UAM); 57.0583, -135.3167, Baranof Island, base of Gavin Hill (1 UAM); 57.0625, -135.3333, Baranof Island, ca. 0.5 km up Gavin Hill Trail (14 UAM); 57.0667, -135.2667, Baranof Island, Indian River's east side in line with pumphouse (11 UAM); 57.0667, -135.3000, Baranof Island, next to road that leads to pumphouse on Indian River side (3 UAM); 57.0667, -135.3000, Baranof Island, next to road that leads to pumphouse on Indian River side (5 UAM); 57.0667, -135.3333, Baranof Island (5 UAM); 57.0667, -135.3083, Baranof Island, opposite road leading to pumphouse (18 UAM); 57.0750, -135.2833, Baranof Island, ca. 0.5 mi up Indian River Trail (3 UAM); 57.0833, -135.3500, Baranof Island, Harbor Mt Rd, 2.25 mi N, 1 mi W of Sitka (5 UAM); 57.1333, -135.3500, Baranof Island (68 UAM); 57.1333, -135.3667, Baranof Island, Starrigavan Bay, 5.75 mi N, 1.25 mi W of Sitka (21 UAM); 57.1333, -135.7333, Baranof Island, Starrigavan Bay (19 UAM); 57.2667, -134.8333, Baranof Island, Kelp Bay, middle arm (1 UAM); 57.3667, -134.8833, Baranof Island, "Catherine Island" (1 UAM); 57.4197, -135.7200, Chichagof Island, Suloia Lake (23 UAM); 57.7000, -135.0000, Chichagof Island (1 UAM); 57.7000, -135.5000, Chichagof Island, Kadashan River, Tenakee Inlet (4 UAM); 57.7000, -135.2167, Chichagof Island, Kadashan River, Tenakee Inlet (53 UAM); 57.7228, -136.1719, Chichagof Island (2 UAM); 57.7333, -135.0833, Chichagof Island, Trap Bay, Tanakee Inlet (6 UAM); 57.7333, -135.2167, Chichagof Island, Kadashan River, Tenakee Inlet (2 UAM); 57.7417, -135.3167, Chichagof Island, Crab Bay, Tenakee Inlet (2 UAM); 57.7500, -135.0167, Chichagof Island, Trap Bay, Tenakee Inlet (3 UAM); 57.7806, -135.2167, Chichagof Island, Tenakee Springs, Sunny Cove,Tenakee Inlet (4 UAM); 57.7833, -135.6333, Chichagof Island, Tenakee Inlet, Seal Bay drainage (5 UAM); 57.7833, -135.1167, Chichagof Island, Tenakee Springs, Tenakee Inlet (1 UAM); 57.7833, -134.9500, Chichagof Island, Tenakee Inlet (1 UAM); 57.7833, -135.1167, Chichagof Island, Tenakee Springs, Tenakee Inlet (1 UAM); 57.7833, -135.1500, Chichagof Island, 4.5 km E Tenakee Springs (2 UAM); 57.7833, -135.1167, Chichagof Island, Tenakee Springs, Tenakee Inlet (2 UAM); 57.7833, -134.9500, Chichagof Island, Tenakee Inlet (3 UAM); 57.8000, -135.9167, Chichagof Island, Lisianski River (2 UAM); 57.8167, -136.1500, Chichagof Island, Otter Lake (39 UAM); 57.8333, -135.0500, Chichagof Island, Pavlof River drainage (1 UAM); 57.8667, -135.7667, Chichagof Island (1 UAM); 57.8833, -135.0667, Chichagof Island, Freshwater Bay Rd. (27 UAM); 57.9094, -135.5489, Chichagof Island, upper Tenakee Inlet (2 UAM); 57.9097, -135.5489, Chichagof Island, upper Tenakee Inlet (15 UAM); 57.9333, -135.6000, Chichagof Island, Salt Lake Bay, Port Frederick (4 UAM); 57.9394, -135.6083, Chichagof Island, NE side of Island (3 UAM); 57.9397, -135.6072, Chichagof Island, NE side of Island (6 UAM); 57.9500, -135.6333, Chichagof Island, Salt Lake Bay, Port Frederick (129 UAM); 57.9575, -134.3072, Chichagof Island, Salt Lake Bay, Port Frederick (12 UAM); 57.9575, -135.4900, Chichagof Island, Salt Lake Bay, Port Frederick (39 UAM); 57.9667, -134.9333, Chichagof Island (2 UAM); 57.9750, -135.6583, Chichagof Island, Salt Lake Bay, Port Frederick (12 UAM); 57.9833, -135.4167, Chichagof Island, Game Creek, upper (1 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (1 UAM); 58.2167, -135.5000, Chichagof Island, upper Port Frederick (1 UAM); 57.0167, -135.6833, Kruzof Island, south coast (2 UAM); 57.1667, -135.7333, Kruzof Island, Shelikof Bay (10 UAM); 57.1667, -135.7333, Kruzof Island, born in captivity to female taken at Shelikof Bay (2 UAM); 57.3031, -135.8247, Kruzof Island, Sea Lion Cove (5 UAM); 57.3167, -135.7667, Kruzof Island, Kalinin Bay, old cannery site (4 UAM); 57.3333, -135.7833, Kruzof Island, head of Kalinin Bay (2 UAM); 57.7028, -135.7156, Moser Island (17 UAM); 57.2494, -135.6514, Partofshikof Island, southern tip of is., at narrows, across from Kruzof Isand (4 UAM); 57.9314, -134.2367, Swan Island, off Admiralty Island (1 MVZ). **SKAGWAY QUAD:** 59.0400, -136.2167, Muir Glacier morraine (1 CAS); Muir Inlet, Glacier Bay (3 USNM); 59.0992, -135.2103, mouth of Yeldagalga Creek (1 UAM); 59.1333, -135.3667, Chilkat Peninsula (5 UAM); 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (17 UAM); 59.2861, -136.1085, west end of Takhin Ridge (1 UAM); 59.3167, -135.5667, Haines, Chilkoot Lk Pk (2 UAM); 59.3661, -135.7994, 10 km E, 9 km S Klukwan (4 UAM); 59.3667, -135.8000, 18 mile Haines Highway (3 UAM); 59.3833, -135.8500, 23 mile Haines Highway (3 UAM); 59.4083, -135.9556, 24 mile Haines Highway (6 UAM); 59.4108, -136.0025, Klehini R, 5 km W Klukwan (1 UAM); 59.4147, -136.0972, Porcupine River (2 UAM); 59.4147, -136.0619, Porcupine River (3 UAM); 59.4522, -136.0272, Mosquito Lake (9 UAM); 59.5000, -135.2666667 (4 UAM); 59.5317, -135.3481, Dyea, mouth W branch Taiya R (11 UAM); 59.5333, -135.0833, Laughton Glacier (1 UAM); 59.5333, -135.3500, Taiya R, N of West Creek; 5 mi N, 1.5 mi W of Skagway (8 UAM); 59.5397, -136.1056 (1 UAM); 59.5500, -135.1 (2 UAM); 59.5667, -135.1167, Glacier, 15km NE Skagway (3 UAM); 59.5747, -136.1567 (3 UAM); 59.5926, -135.8921, Klukwah Mountain (4 UAM); 59.6142, -135.1669, White Pass; 1.6 km S USA/Canada border on Klondike Highway (3 UAM); 59.6158, -135.1683, White Pass (1 UAM). **SUMDUM QUAD:** 57.4294, -133.9389, Admiralty Island, W Gambier Bay (52 UAM); 57.5333, -133.9500, Admiralty Island, N arm of Gambier Bay (7 UAM); 57.8167, -133.9833, Admiralty Island, Glass Penninsula opposite Dorn Island (3 UAM); 57.2997, -133.8217, East Brother Island (6 UAM); 57.2903, -133.8447, West Brother Island (6 UAM); 57.1669, -133.2531, Farragut Bay North Arm (4 UAM); 57.2164, -133.5014, Cape Fanshaw (1 UAM); 57.3667, -133.4667, 8.5 mi SE Goldbelt logging camp, Hobart Bay (45 UAM); 57.5500, -133.4833, Windham Bay (3 UAM); 57.5833, -133.3667, Chuck River (3 UAM). **TAKU RIVER QUAD:** 57.0367, -133.9586, Limestone Inlet (12 UAM);

57.0367, -133.9583, Limestone Inlet (1 UAM); 58.0333, -133.9667, Stephens Passage, Limestone Inlet (1 UAM); 58.0367, -133.9583, Limestone Inlet (22 UAM); 58.1833, -133.3167, Crescent Lake (38 UAM); 58.2000, -133.4000, Whiting River drainage, Crescent Lake (1 UAM); 58.5333, -133.6833, Fish Creek (1 UAM); 58.5500, -133.6833, Canyon Island (10 UAM); 58.5444, -133.6805, Fish Creek (61 UAM).

Western Heather Vole
Phenacomys intermedius Merriam, 1889

OTHER COMMON NAMES. None.

TAXONOMY. The taxonomic relationship between eastern and western North America populations are unresolved, with some authors recognizing the specific distinctiveness of *P. intermedius* in the mountainous West from *P. ungava* across boreal Canada (e.g., Musser and Carleton, 2005). The affinity of heather voles from Southeast Alaska is unknown, but according to Hall (1981) *P. i. intermedius* is the subspecies in closest proximity to Alaska populations.

Phenacomys intermedius intermedius

Original Description. 1889. *Phenacomys intermedius* Merriam, N. Amer. Fauna, 2:32, October 30.

Type Locality. A basaltic plateau, 5500 ft., about 20 mi. NNW Kamloops, British Columbia.

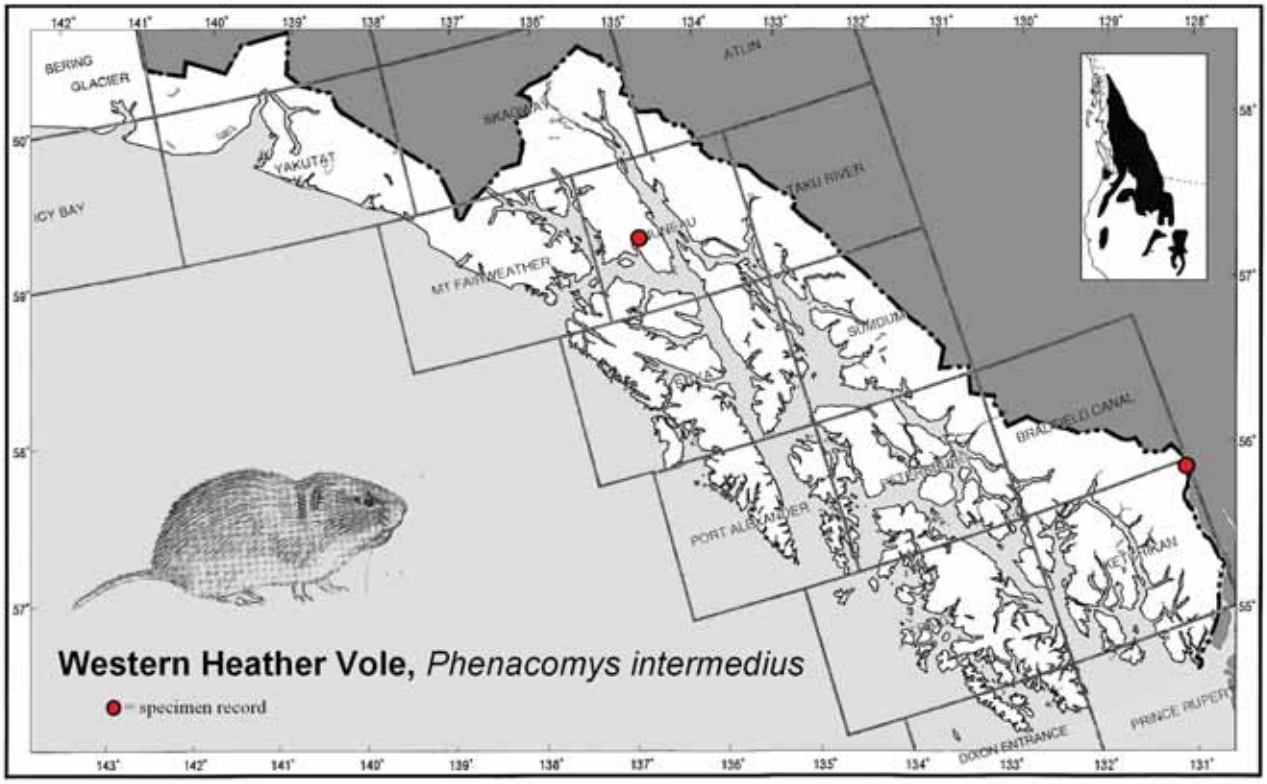
Type Specimen. NMC 780.

Range. Central British Columbia south to New Mexico.

REVISIONS AND REVIEWS. McAllister and Hoffmann (1988), Hallett (1999).

STATUS. IUCN-Least concern.

DISTRIBUTION. The heather vole occurs widely across boreal Canada and the mountainous regions of western U.S. and British Columbia (Hall, 1981; Nagorsen, 2005). Near Southeast Alaska, it has been taken on the east side of the Coast Mountains in Canada near Hazelton, Telegraph Creek, Atlin, Dezadeash Lake, Chilkat Pass, and Kluane Lake (Youngman, 1975; Hall, 1981; Nagorsen and Jones, 1981; Nagorsen, 2005). In 1995, we found this species in subalpine habitat 2 km inside British Columbia near Hyder, Alaska.



The occurrence of this vole from within Alaska has now been documented as follows (MacDonald et al., 2004): one from above treeline in the Chilkat Range east of Excursion Inlet on 11 August 1996; three captured along the Titan Trail between 1130-1220 m. near Hyder on 23 September 1999.

Fossil remains of heather voles have been found in abundance inside limestone caves on Prince of Wales Island. All dated material is older than the last glacial maximum (Heaton and Grady, 2003).

Further inventory of the Coastal Mountains should expand our understanding on the distribution, taxonomic relationships, and evolutionary history of this vole in Southeast Alaska.

SPECIMENS. **JUNEAU QUAD:** 58.41667, -135.4333, Excursion Inlet, E side in mountains (1 UAM). **KETCHIKAN QUAD**: 55.8300, -130.0500, Reverdy Mts., Titan Trail N of Hyder, T68S R100E, Sec6 NW1/4 of NW1/4 (3 UAM).

Northern Bog Lemming
Synaptomys borealis (Richardson, 1828)

OTHER COMMON NAMES. Lemming Mouse, Wrangell Lemming Mouse.

TAXONOMY. Jarrell and Fredga (1993), following Koenigswald and Martin (1984) and Repenning and Grady (1988), consider *Mictomys* the appropriate generic name for the northern bog lemming. Hall (1981) recognized 9 subspecies; 1 occurs in Southeast Alaska.

Synaptomys borealis truei

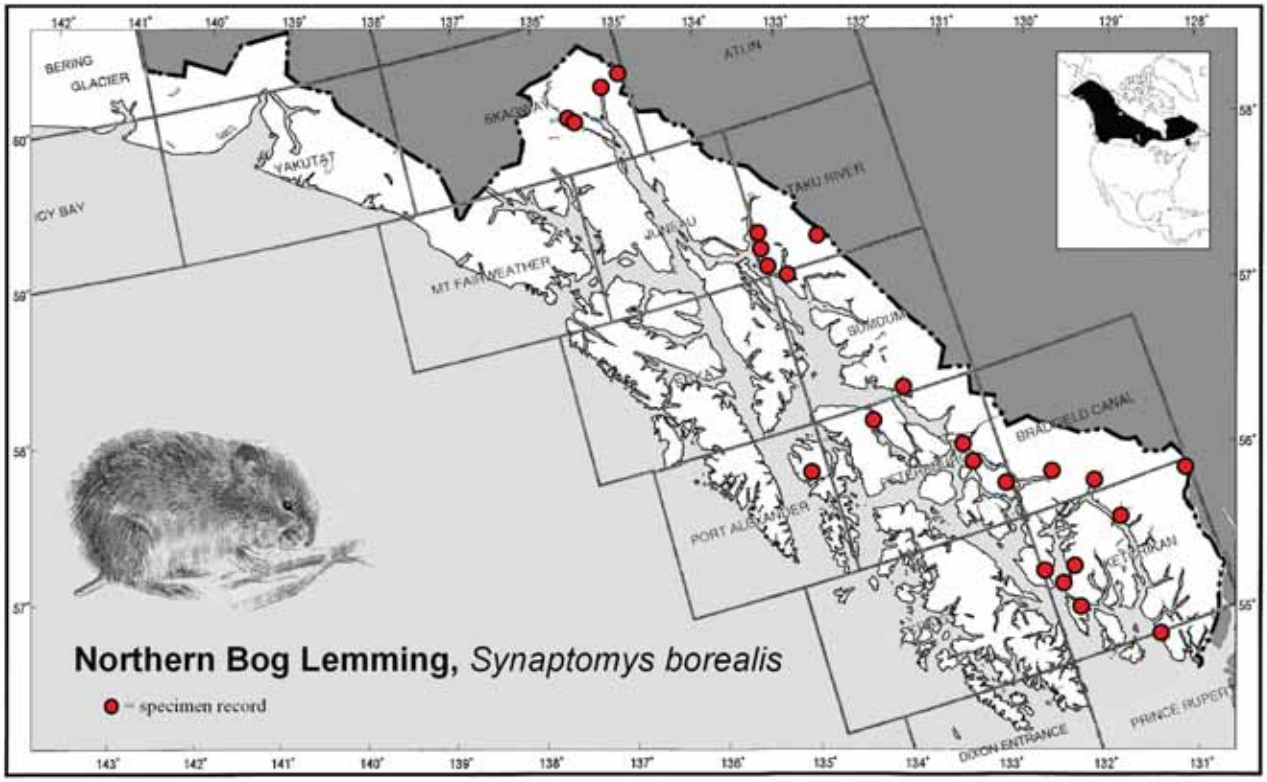
Original Description. 1896. *Synaptomys* (*Mictomys*) *truei* Merriam, Proc. Biol. Soc. Washington, 10:63, March 19.

Type Locality. Skagit Valley, Skagit Co., Washington.

Type Specimen. USNM 3798/12101.

Range. Southeast Alaska, coastal British Columbia, northwestern Washington.

Remarks. Includes *Synaptomys (Mictomys) wrangeli* Merriam, 1896, Proc. Biol. Soc. Washington, 10:63, March 19, type from Wrangell, Alexander Archipelago, Alaska (USNM 74720).



REVISIONS AND REVIEWS. Jarrell and Fredga (1993).

STATUS. IUCN-Least concern.

DISTRIBUTION. The distribution of the Northern Bog Lemming in Southeast Alaska remains poorly understood. The limited number of specimens are from a scattering of mainland localities ranging from the head of Portland Canal northward to White Pass and the upper Lynn Canal. Island records include Back, Betton, Gravina, Revillagigedo, Kuiu, Kupreanof, and Wrangell islands.

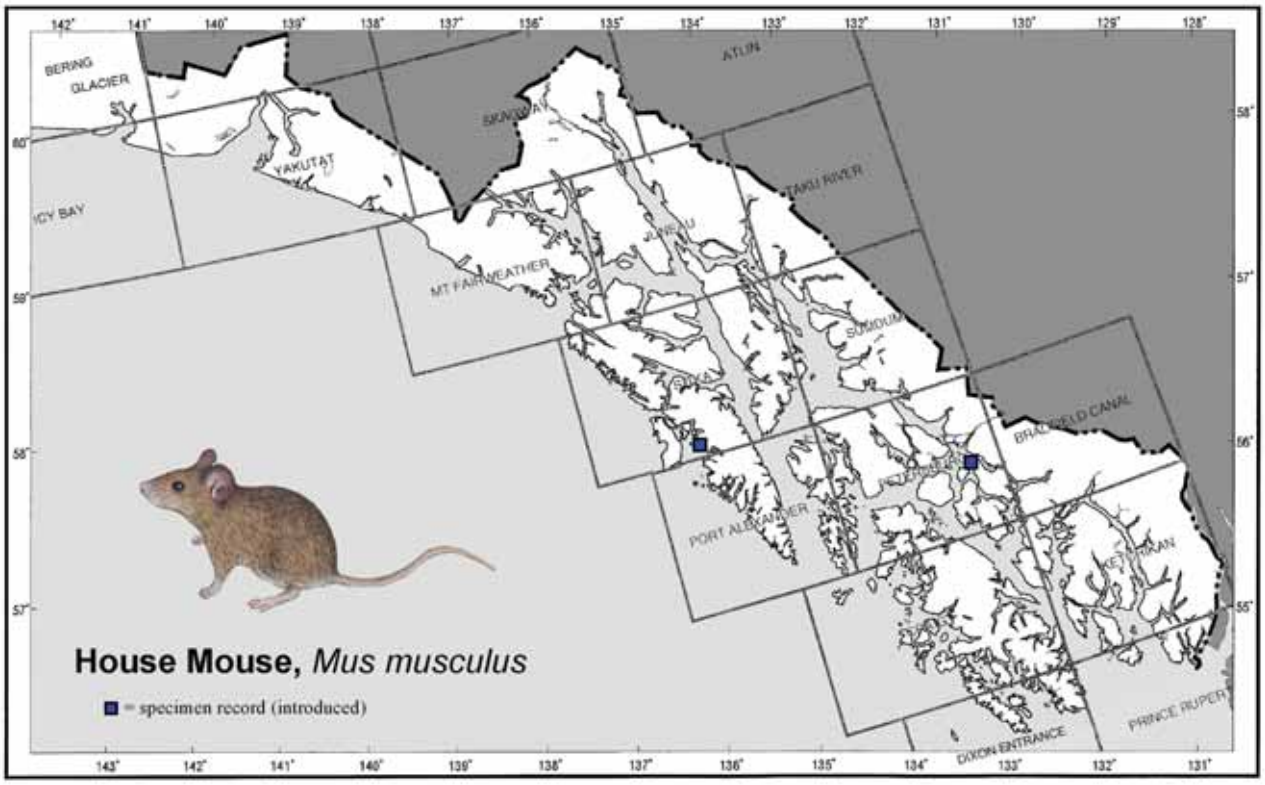
SPECIMENS. **BRADFIELD CANAL QUAD:** 56.0833, -131.1000, mouth of Unuk River (1 UAM); 56.2289, -131.4517, Tyee (1 UAM). **JUNEAU QUAD:** 59.5292, -134.9078, Echo Cove (1 UAM). **KETCHIKAN QUAD:** 55.5333, -131.7500, Back Island (2 UAM); 55.5333, -131.8000, Betton Island (13 UAM); 55.3500, -131.7000, Gravina Island, mouth of Government Creek (1 UAM); 55.6000, -131.6333, Revillagigedo Island, Loring (1 UAM); 55.6167, -131.9667, Helm Bay, Cleveland Peninsula (1 UAM); 55.7667, -130.8833, Chickamin River, Wolf Cabin (2 UAM); 55.8300, -130.0500, T68S R100E, Sec6 NW1/4 of NW1/4 N of Hyder (1 UAM); 55.8511, -130.9347, Chickamin River area (1 UAM). **PETERSBURG QUAD:** Kupreanof Island, Portage Bay area (1 MSB); 56.2697, -132.0706, Wrangell Island, Fools Creek (1 UAM); Wrangell Island, Wrangell (5 USNM); 56.6333, -132.3667, Stikine River, Farm Island (1 UAM). **PORT ALEXANDER QUAD:** 56.7067, -134.2421, Kuiu Island, Rowan Bay (1 MSB). **PRINCE RUPERT QUAD:** 54.9833, -131.0000, Foggy Bay, Kirk Point (1 UAM). **SKAGWAY QUAD:** 59.3456, -135.7697, 11 km E, 12 km S Klukwan River (2 UAM); 59.3661, -135.7994,10 km E, 9 km S Klukwan (1 UAM); 59.5333, -135.3500, Taiya R drainage, N of West Cr; 5 mi N, 2 mi W of Skagway (1 UAM). **SUMDUM QUAD:** Port Snettisham (1 MVZ); Thomas Bay (4 MVZ). **TAKU RIVER QUAD:** 58.0367, -133.9583, Limestone Inlet (1 UAM); 58.2000, -133.4000, Whiting River drainage, Crescent Lake (1 UAM); 58.3167, -133.9667, Turner Creek (1 UAM); 58.1778, -133.9583, Turner Creek (1 UAM).

Family **Muridae** Illiger, 1811

House Mouse
Mus musculus Linnaeus, 1758

OTHER COMMON NAMES. None.

TAXONOMY. The form inhabiting Alaska may be the introduced race *Mus musculus domesticus* (Schwarz and Schwarz, 1943). Variation among North American populations has not been studied. This subspecies is considered a distinct species by Marshall and Sage (1981).



DISTRIBUTION. Introduced from Europe, this mouse is commensal with man, inhabiting urban and agricultural areas primarily. In his archived notes, C. P. Streator (1895*) mentions catching three *Mus* in the forest near Juneau.

Only four specimens that date from 1891 to 1946 have been preserved from the region. The current status of this non-native species is unknown.

SPECIMENS. **PETERSBURG QUAD:** 56.4670, -132.3780, Wrangell Island, Wrangell (1 CAS). **SITKA QUAD**: 57.0500, -135.3330, Baranof Island, Sitka (1 CAS, 2 SDMNH).

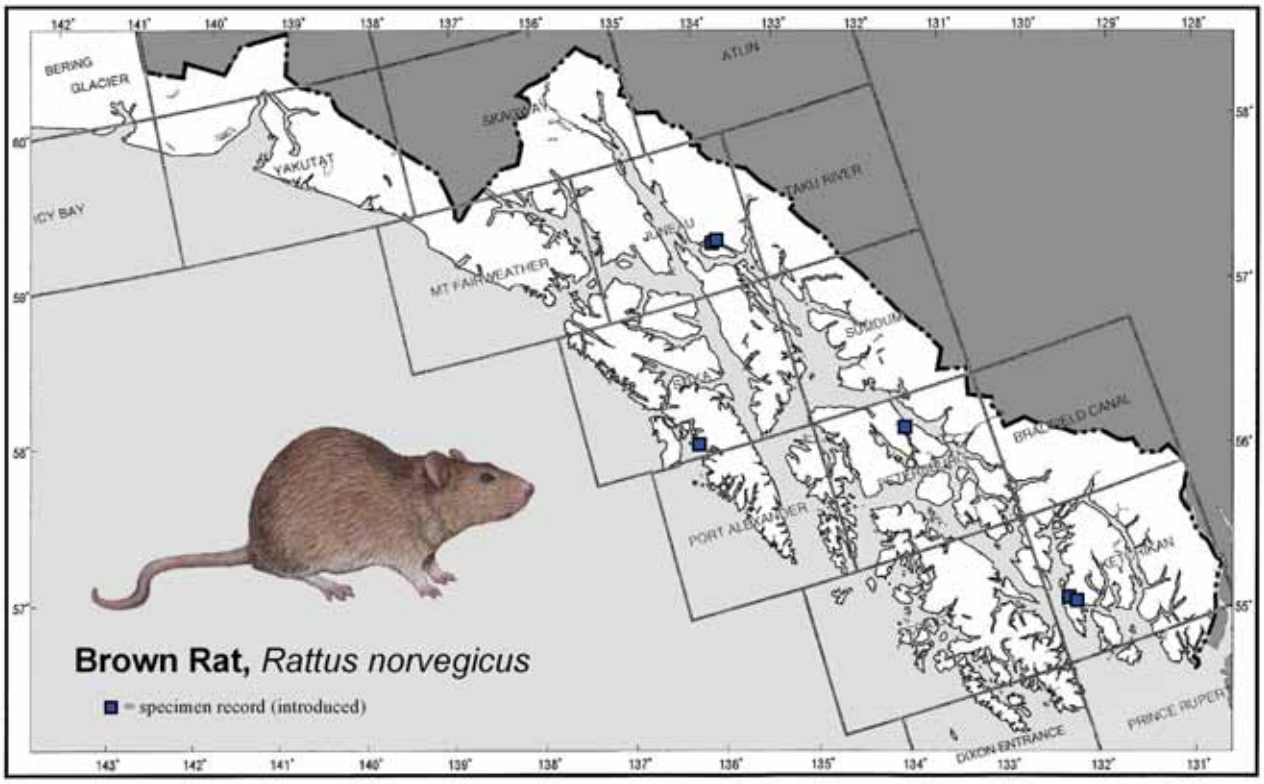
Brown Rat
Rattus norvegicus (Berkenhout, 1769)

OTHER COMMON NAMES. Norway Rat, Barn Rat.

TAXONOMY. Hall (1981) listed one subspecies for North America, *R. n. norvegicus*. Nagorsen (1990) indicates that the taxonomy of North American populations is obscured by multiple accidental introductions by humans.

DISTRIBUTION. *Rattus norvegicus* is a commensal, non-native rat. Specimens are from near human populations on Baranof, Mitkof, Revillagigedo, and Douglas islands, and on the mainland from Juneau. Brown rats have been seen at Sitka's landfill (MacDonald and Cook, 1996), and along the waterfront at Ketchikan (S. Brockmann, pers. comm.).

SPECIMENS. **JUNEAU QUAD:** 58.2778, -134.3931, Douglas Island, Douglas (1 UAM); 58.3083, -134.4083, Juneau (1 USNM). **KETCHIKAN QUAD:** 55.0000, -131.0000, Revillagigedo Island, Ketchikan, North Point Higgins Rd., near milepost 14 N Tongass Hwy (1 UAM); Revillagigedo Island, Ketchikan (2 USNM). **PETERSBURG QUAD:** 56.8029, -133.1750, Mitkof Island, Petersburg (2 USNM). **SITKA QUAD**: 57.0500, -135.3330, Baranof Island, Sitka (1 CMNH).



Family **Erethizontidae** Bonaparte, 1845

North American Porcupine
Erethizon dorsatum (Linnaeus, 1758)

OTHER COMMON NAMES. Porcupine.

TAXONOMY. Two subspecies have been recognized in Southeast Alaska (Hall, 1981).

Erethizon dorsatum myops

Original Description. 1900. *Erethizon epixanthus myops* Merriam, Proc. Washington Acad. Sci., 2:27, March 14.

Type Locality. Portage Bay, Alaska Peninsula, Alaska.

Type Specimen. USNM 59140.

Range. Southwestern and central Alaska eastward to Alberta.

Erethizon dorsatum nigrescens

Original Description. 1903. *Erethizon epizanthus* [*sic*] *nigrescens* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 19:558, October 10.

Type Locality. Shesley River, British Columbia.

Type Specimen. AMNH 20772.

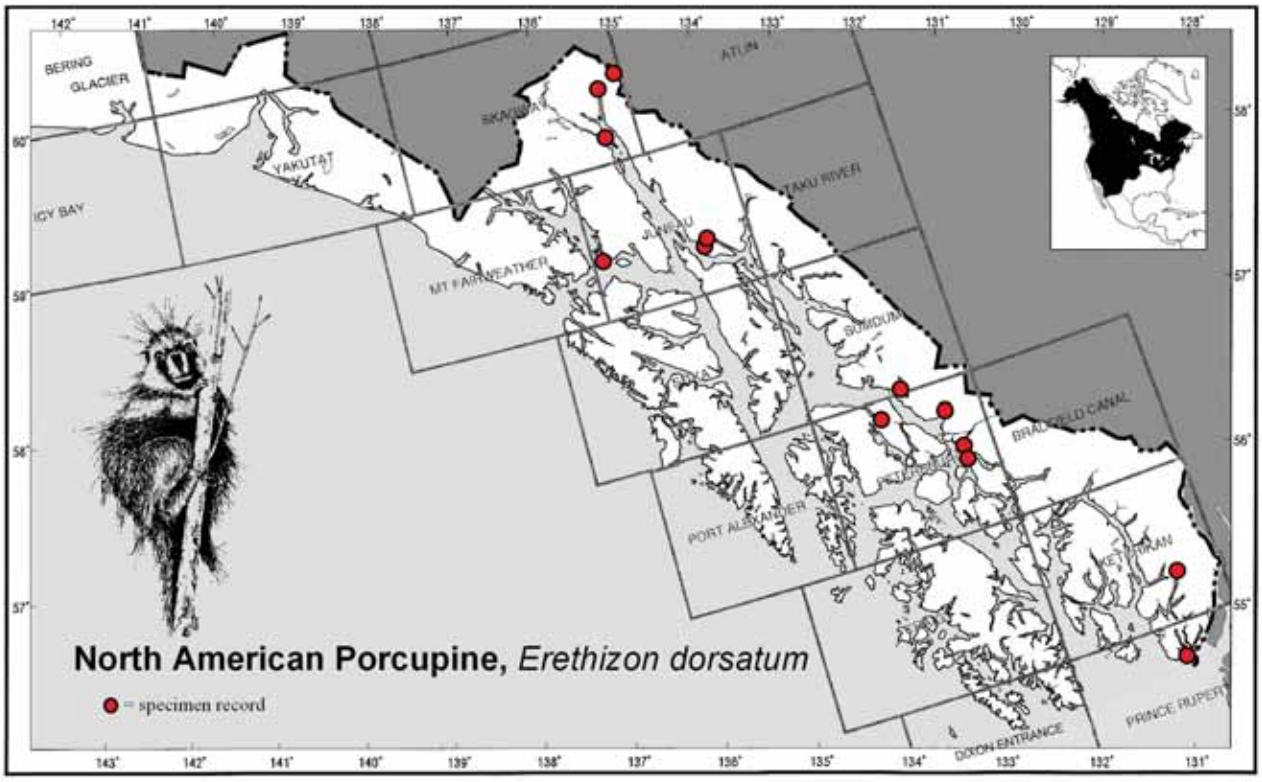
Range. Southeast Alaska, British Columbia, Washington.

REVISIONS AND REVIEWS. Woods (1973).

STATUS. IUCN-Least concern.

DISTRIBUTION. Porcupines are found along the mainland of Southeast Alaska, and on some of the islands in close proximity, including Douglas, Etolin, Hassler, Kupreanof, Mitkof, Revillagigedo, and Wrangell islands (MacDonald and Cook, 1996). Specimens are few, however, suggesting further effort is needed to clarify the distribution and status of this species in the region.

SPECIMENS. **JUNEAU QUAD:** 58.3403, -134.5442, Douglas Island (1 UAM); 58.3500, -134.6833, Auke Bay ferry terminal, Juneau (1 UAM); 58.7889, -135.0278, mouth of Slate Creek (1 UAM); 59.5292, -134.9078, Echo Cove (1 UAM); Glacier Bay, Pt. Gustavus (1 USNM). **KETCHIKAN QUAD**: 55.3167, -130.4833, Boca De Quadra (1 MVZ). **PETERSBURG QUAD**: 56.8917, -133.1917, Kupreanof Island, east Duncan Salt Chuck cabin (1 UAM); Wrangell Island (1 FMNH); 56.5167, -132.4000, mouth Stikine River (1 CAS); 57.0080, -132.9833, Thomas Bay (1 MVZ); LeConte Bay (2 CAS). **PRINCE RUPERT QUAD**: 54.7750, -130.7333, Fort Tongass (1 USNM). **SKAGWAY QUAD**: 59.1500, -135.3500, Chilkat Peninsula 7 mi. SSE Haines (2 KU); 59.1667, -135.3667, Chilkat Peninsula, 500m W Ansley Is, mouth of unnamed creek (1 UAM); 59.5510, -135.1222, Glacier, White Pass (1 USNM); Skagway (1 USNM).



Key to the Lagomorphs of Southeast Alaska

1. • Hind legs scarcely larger than front legs; no visible tail; skull lacking supraorbital process on frontal ..... **Collared Pika, *Ochotona collaris***
   • Hind legs notably larger than front legs; tail short but obvious; skull with supraorbital process on frontal ..... **Snowshoe Hare, *Lepus americanus***

Order **Lagomorpha** Brandt, 1855
Family **Ochotonidae** Thomas, 1897

Collared Pika
Ochotona collaris (Nelson, 1893)

OTHER COMMON NAMES. None.

TAXONOMY. The species is monotypic (Hall, 1981).

Ochotona collaris

Original Description. 1893. *Lagomys collaris* Nelson, Proc. Biol. Soc. Washington, 8:117, December 21.

Type Locality. Near head Tanana River, about 200 mi. S Fort Yukon, Alaska.

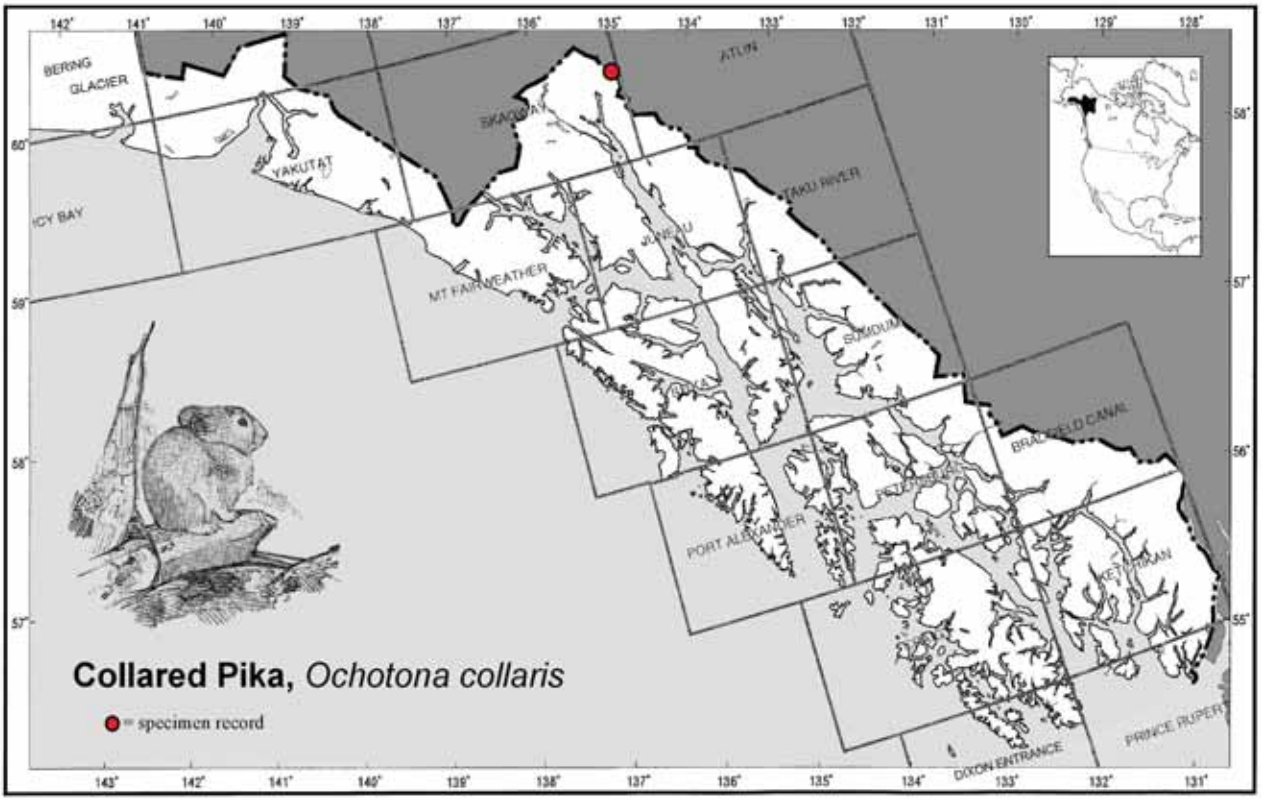
Type Specimen. USNM 14384/36297.

Range. Alaska and northwestern Canada.

STATUS. IUCN-Least concern.

DISTRIBUTION. The Collared Pika is only known in Southeast Alaska from White Pass, at the border of Alaska and British Columbia (MacDonald and Cook, 1996). This species may be present in other montane areas along the northern mainland.

SPECIMENS. **SKAGWAY QUAD:** 59.6000, -135.1667, White Pass, 500 mi S USA/Canada border along railroad (1 UAM); 59.6161, -135.1383, White Pass (1 UAM); White Pass (2 UCLA).



Family **Leporidae** Fischer, 1817

Snowshoe Hare
Lepus americanus Erxleben, 1777

OTHER COMMON NAMES. Varying Hare, Snowshoe Rabbit.

TAXONOMY. Considered *L. a. dalli* by Hall (1981); monotypic by Nagorsen (1985).

Lepus americanus dalli

Original Description. 1900. *Lepus americanus dalli* Merriam, Proc. Washington Acad. Sci., 2:29, March 14.
Type Locality. Nulato, Alaska.
Type Specimen. USNM 8996/7579.
Range. Alaska and northwestern Canada.
Remarks. Includes *L. a. macfarlani* Merriam as synonymized by Youngman (1975).

REVISIONS AND REVIEWS. Nagorsen (1985).

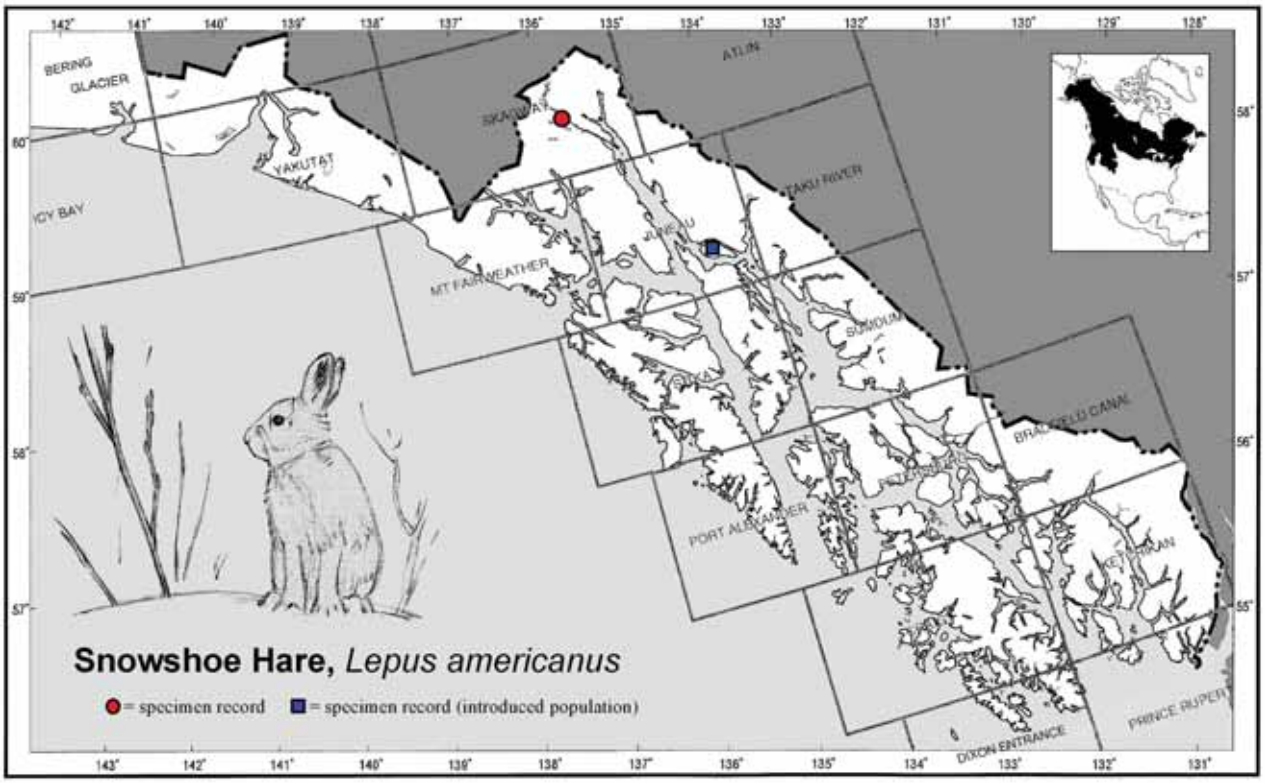
STATUS. IUCN-Least concern.

DISTRIBUTION. Snowshoe Hares are limited to the northern mainland of Southeast Alaska. They are known to regularly occur in the Chilkat Valley near Haines, and at Dyea in the vicinity of Skagway (MacDonald and Cook, 1996). Hares are occasionally found in the Taku River Valley near the Canada border (MacDonald and Cook, 1996). Home (1973) reported sightings of hares at Glacier Bay and on the Alsek River. R. Nelson (pers. comm., 1999) reported their regular occurrence in the Yakutat area. A report of hares at the mouth of the Stikine River (Manville and Young, 1965) has not been substantiated.

Snowshoe Hares now present on Douglas Island and nearby on the mainland were probably derived from the wild population near Haines sometime in the early 1900s (MacDonald and Cook, 1996).

A number of transplant attempts in Southeast Alaska were considered failures (Burris and McKnight, 1973; MacDonald and Cook, 1996).

SPECIMENS. **JUNEAU QUAD:** 58.2583, -134.275, Douglas Island (1 UAM). **SKAGWAY QUAD:** 59.7500, -135.9333, Wells, Chilkat Valley (5 MVZ, 6 UCLA).



Key to the Shrews of Southeast Alaska

1. • Third unicuspid tooth (U3) noticeably smaller than the fourth ….....… 2
   • Third unicuspid tooth (U3) equal to or larger than than the fourth …..... **Cinereus Shrew**, *Sorex cinereus*

2. • Skull relatively large (usually >19 mm); hind foot more than 18 mm greater than 65 mm; pelage grayish-black, never distinctly brown ..... **American Water Shrew, *Sorex palustris*** (includes *S. alaskanus*)
   • Skull, hind foot smaller; pelage distinctly brown ….....… **Dusky Shrew, *Sorex monticolus***

Order **Soricomorpha** Gregory, 1910
Family **Soricidae** Fischer von Waldheim, 1817

Glacier Bay Water Shrew
Sorex alaskanus Merriam 1900

OTHER COMMON NAMES. None.

TAXONOMY. For a discussion of the taxonomic and distributional status of this species, see the *Sorex palustris* account.

Sorex alaskanus

Original Description. 1900. *Sorex navigator alaskanus* Merriam, Proc. Washington Acad. Sci., 2:18, March 14.

Type Locality. Point Gustavus, Glacier Bay, Alaska.

Type Specimen. USNM 97713.

Range. Known only from the type locality.

STATUS. HERITAGE-GHQ (historical, possibly extinct?); IUCN-Least concern. Previously known only from two specimens collected in 1899 at Point Gustavus, the type locality (see *S. palustris* map). Since then, only one additional specimen has been preserved: a male taken at Bartlett Cove on 22 June 1970 (UAM 49979). Additional specimens would help clarify taxonomic and distributional status.

SPECIMENS. **JUNEAU QUAD:** Point Gustavus, Glacier Bay (2 USNM); 58.4500, -135.9167, Bartlett Cove (1 UAM)

Cinereus Shrew
Sorex cinereus Kerr, 1792

OTHER COMMON NAMES. Common Shrew, Masked Shrew, Streator Shrew.

TAXONOMY. Two subspecies have been recognized in this region. *Sorex c. streatori* is the widespread taxon while *S. c. cinereus* is known only from White Pass (MacDonald and Cook, 1996). Populations of *Sorex cinereus* from three mainland localities in Southeast Alaska exhibited minimal levels of variation in mitochondrial DNA sequences (Demboski, 1999; Demboski and Cook, 2003); however, geographic variation across the archipelago has not been examined.

Sorex cinereus cinereus

Original Description. 1792. *Sorex arcticus cinereus* Kerr, Animal Kingdom, p. 206.

Type Locality. Severn Settlement (= Fort Severn), Ontario.

Type Specimen. USNM 84556.

Range. Northern Alaska through most of Canada and western U.S.

Sorex cinereus streatori

Original Description. 1895. *Sorex personatus streatori* Merriam, N. Amer. Fauna, 10:62, December 31.

Type Locality. Yakutat, Alaska.

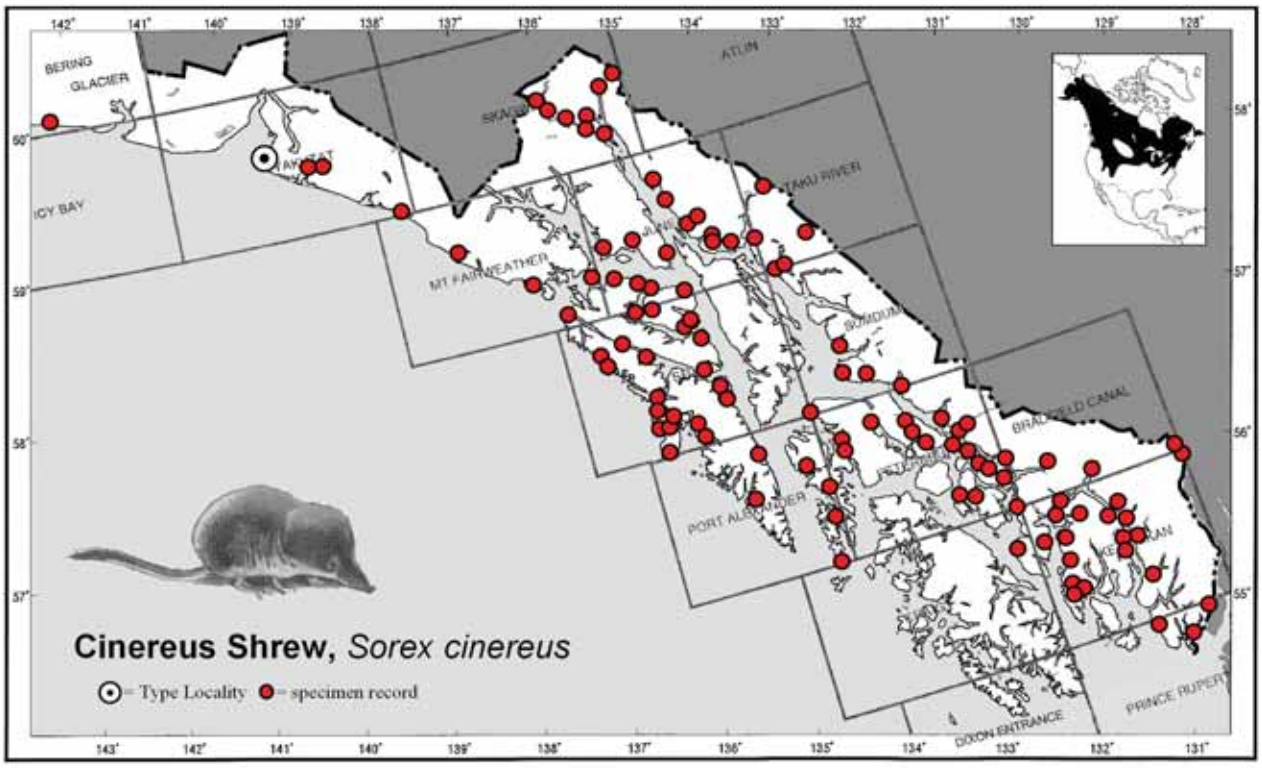
Type Specimen. USNM 73537.

Range. Pacific Coast from Prince William Sound, Alaska, to Washington.

REVISIONS AND REVIEWS. Van Zyll de Jong (1983, 1991), Whitaker (2004).

DISTRIBUTION. The Cinereus Shrew is found along the entire coastal mainland of Southeast Alaska, on islands of the Alexander Archipelago north of Sumner Strait, and on islands in close proximity to the mainland south of Sumner Strait (MacDonald and Cook, 1996). Island records include Baranof, Bell, Black, Chichagof, Deer, Douglas, Emmons (J. Whitman, pers. comm.), Etolin, Gedney, Grant, Gravina, Halleck, Hassler, Herbert Graves, Kadin, Krestof, Kruzof, Kuiu, Kupreanof, Lemesurier, Lester (Beardslee Is.), Mitkof, Moser, Partofshikof, Read, Revillagigedo, Wrangell, and Yakobi Islands. Specimen records (2 KU) indicating the co-occurrence of this shrew with *S. monticolus* on the Inian Islands in Icy Strait between Chichagof Island and the mainland are intriguing. Additional sampling on these islands should be completed.

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (4 CAS). **BRADFIELD CANAL QUAD:** 56.0031, -131.9847, Deer Island (7 UAM); 56.0083, -131.9925, Deer Island (2 UAM); 56.0108, -131.5672, E side Reflection Lake (26 UAM); 56.0269, -130.0706 (1 UAM); 56.0578, -131.9669, south side of Frosty Bay (1 UAM); 56.0833, -131.1000, mouth of Unuk River, (27 UAM); 56.2206, -131.4736, Tyee (3 UAM). **CRAIG QUAD:** 55.7500, -132.1833, Union Bay, N shore at mouth (4 UAM). **JUNEAU QUAD:** 57.7167, -135.2167, Chichagof Island, Kadashan Bay, Tenakee Inlet (1 UAM);58.0000, -135.7333, Chichagof Island, Salt Lake Bay (1 UAM); 58.0667, -135.4667, Chichagof Island, Game Creek (25 UAM); 58.0667, -135.0667, Chichagof Island, Whitestone Harbor (1 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (14 UAM); 58.1333, -135.4667, Chichagof Island, 1.5 mi NW Hoonah, Cannery (2 UAM); 58.1833, -135.5500, Chichagof Island, mouth of Gallagher Creek, 7 mi NW of Hoonah (2 UAM); 58.2333, -135.8167, Chichagof Island, 4.3 mi SSW of Pt. Adolphus (1 UAM); 58.2583, -134.2750, Douglas Island, Douglas Harbor (1 UAM); 58.2839, -134.5203, Douglas Island (1 UAM); 58.2967, -134.5447, Douglas Island (2 UAM); 58.3169, -134.5533, Douglas Island, Fish Creek (2 UAM); Lester Island, Beardslee Is., (1 KU); 58.2833, -135.0667, Howard Bay (4 UAM); 58.2833, -135.0500 (10 UAM); 58.3000, -134.4000 (2 UAM); 58.3000, -135.2000, W side Lynn Canal near jct with Icy Strait, No Use Cr (1 UAM); 58.3333, -134.6000, Auke Bay area, Mendenhall River (13 UAM); 58.4000, -134.5500, Mendenhall Glacier Road (1 UAM); 58.4000, -134.9500, Point Retreat (1 UAM); 58.4167, -135.4333, Excursion Inlet (25 UAM); 58.4500, -135.8833, Bartlett Cove, 10 km NW Gustavus Airport (24 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (18 UAM); 58.5222, -134.8000, Eagle River (1 UAM); 58.5333, -134.8000, Eagle River Beach, 15 1/2 mi N, 15 3/4 mi W of (1 UAM); 58.5333, -133.6833, Taku River, Fish Creek (3 UAM); 58.5750, -134.5750, Mendenhall Lake (1 UAM); 58.7881, -134.9356, creek South of Antler River (21 UAM); 58.7889, -135.0278, mouth of Slate Creek (8 UAM); 58.9833, -134.7667, Peterson Creek, mile 25 N Glacier Hwy. (2 UAM); 59.5292, -134.9078, Echo Cove (5 UAM); 59.5292, -134.3661, Echo Cove (38 UAM); Auke Bay; Dairy Farm Road (1 UAM). **KETCHIKAN QUAD:** 55.9175, -131.5589, Bell Island, SSW point of island (4 UAM); 55.8878, -131.6847, Black Island (8 UAM); 55.8561, -131.7061, Gedney Island (4 UAM); 55.5500, -131.7167, Grant Island (7 UAM); 55.3500, -131.7000, Gravina Island,



mouth of Government Creek (2 UAM); 55.9169, -131.6653, Hassler Island, 2.5 km N Fin Point (25 UAM); 55.3167, -131.6000, Revillagigedo Island, Forest Park Drive (1 UAM); 55.3333, -131.6333, Revillagigedo Island (13 UAM); 55.3417, -131.6458, Revillagigedo Island (17 UAM); 55.4000, -131.7000, Revillagigedo Island (3 UAM); 55.4125, -131.7000, Revillagigedo Island, Ward Lake, Grassy Point (1 UAM); 55.4167, -131.7000, Revillagigedo Island, frog pond near Ward Lk (2 UAM); 55.5000, -131.0000, Revillagigedo Island, Ella Bay (12 UAM); 55.5803, -130.9683, Revillagigedo Island, SW Manzanita Bay (3 UAM); 55.5856, -130.9881, Revillagigedo Island, Manzanita Bay (1 UAM); 55.6947, -131.6281, Revillagigedo Island, Margaret Cove (7 UAM); 55.7667, -131.0167, Revillagigedo Island, Behm Canal, Portage Cove (3 UAM); 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (1 UAM); 55.8375, -131.4667, Revillagigedo Island, Klu Bay tidal flat (3 UAM); 55.3717, -131.6861, Revillagigedo Island, Ketchikan, Carlanna Lake (1 UAM); 55.2908, -130.8236, E Skull Creek, Smeaton Bay (2 UAM); 55.5450, -130.8703, Point Louise, Rudyerd Bay (1 UAM); 55.5544, -130.8592, Rudyerd Bay (1 UAM); 55.7056, -130.8928, Ledge Point, Walker Cove (2 UAM); 55.7289, -131.8539, Port Stewart (1 UAM); 55.8167, -130.9000, mouth of Chickamin River (1 UAM); 55.9667, -131.6167, Cleveland Pen., 43.5 mi N of Bailey Bay (2 UAM); 55.9667, -130.0667 (1 UAM); 56.0269, -130.0706, Salmon River mouth of Texas Creek (2 UAM). **MT. FAIRWEATHER QUAD:** 58.3011, -136.0969, Lemesurier Island (4 UAM); 58.1000, -136.4667, Yakobi Island, Soapstone Cove (2 UAM); Torch Bay, Glacier Bay NP (13 KU); N. Lituya Bay, Glacier Bay NP (3 KU). **PETERSBURG QUAD:** 56.0581, -132.0022, Deer Island (1 UAM); 56.0333, -132.0167, Deer Island (7 UAM); 56.0581, -132.0022, Deer Island, East side of Island (4 UAM); 56.0683, -132.0175, Deer Island, (5 UAM); 56.0833, -132.3500, Etolin Island (1 UAM); 56.1667, -132.4500, Etolin Island, Anita Bay (4 UAM); 56.1833, -132.4500, Etolin Island, Anita Bay (4 UAM); 56.1833, -132.5333, Etolin Island, Anita Bay area (2 UAM); 56.1867, -132.6328, Etolin Island (1 UAM); 56.6167, -132.4333, Stikine River, Farm Island (3 UAM); 56.6333, -132.4167, Stikine River, Farm Island, Ellis Cabin (6 UAM); 56.5136, -132.4581, Kadin Island, N Kadin Island (5 UAM); 56.5167, -132.3000, Kadin Island, S end (1 UAM); 56.5333, -132.4500, Kadin Island, N Kadin Island (2 UAM); 56.6667, -133.7333, Kuiu Island (1 UAM); 56.7167, -133.6833, Kupreanof Island, Irish Creek (2 UAM); 56.8333, -133.3667, Kupreanof Island (7 UAM); 56.8500, -133.3667, Kupreanof Island, old growth forest behind Towers Arm cabin (3 UAM); 56.8667, -133.3167, Kupreanof Island (5 UAM); 56.8667, -133.3333, Kupreanof Island (1 UAM); 56.7333, -132.8833, Mitkof Island, Twin Creek (1 UAM);56.0000, -132.0000, Mitkof Island (1 UAM); 56.5061, -132.8589, Mitkof Island, Woodpecker Cove (2 UAM); 56.5300, -132.7500, Mitkof Island, Ohmer Cr, 22.5 mile Mitkof Highway (3 UAM); 56.5333, -132.7500, Mitkof Island, Ohmer Cr 22.5 mi Mitkof Hwy (9 UAM); 56.5431, -132.7789, Mitkof Island, Woodpecker Cove (1 UAM); 56.5833, -132.7667, Mitkof Island, 22.5 mi Mitkof Hwy (2 UAM); 56.5833, -132.8333, Mitkof Island, 3/4 mi S Blind Slough Picnic Area (2 UAM); 56.5833, -132.7667, Mitkof Island (9 UAM); 56.5833, -132.8333, Mitkof Island (1 UAM); 56.6000, -132.7333, Mitkof Island, beaver pond 1.5 mi N Ohmer Campground (3 UAM); 56.6000, -132.7000, Mitkof Island, upper Ohmer Creek (1 UAM); 56.6667, -132.8333, Mitkof Island (3 UAM); 56.7167, -132.9167, Mitkof Island, Twin Creeks Road, 5 mi S (1 UAM); 56.7333, -132.8833, Mitkof Island, Twin Creek (2 UAM); 56.7333, -132.8833, Mitkof Island, Twin Creek (1 UAM); 56.7333, -132.9667, Mitkof Island, Wrangell Narrows (4 UAM); 56.7500, -132.9500, Mitkof Island, 19.25 mi Mitkof Highway (1 UAM); Mitkof Island (5 UAM); 56.2333, -132.1333, Wrangell Island (30 UAM); 56.2561, -132.3303, Wrangell Island, Nemo Point (1 UAM); 56.2667, -132.1333, Wrangell Island, Earl West Marsh (9 UAM); 56.2667, -132.2500, Wrangell Island, McCormick Creek (5 UAM); 56.2833, -132.1667, Wrangell Island, Nemo Rd. extension (1 UAM); 56.3183, -132.3083, Wrangell Island, 2 mi S McCormick Creek, N side of Main Line Rd. (9 UAM); 56.3183, -132.2861, Wrangell Island, 4 mi S McCormick Creek, S side of Main Line Rd. (19 UAM); 56.3183, -132.3083, Wrangell Island (7 UAM); 56.3500, -132.3333, Wrangell Island, Trout Lake, mouth of Pat Creek (14 UAM); 56.4000, -132.2500, Wrangell Island (1 UAM); 56.4500, -132.2667, Wrangell Island (2 UAM); 56.4692, -132.3456, Wrangell Island (32 UAM); 56.5000, -132.2833, Wrangell Island (11 UAM); 56.3636, -132.0081, Berg Bay (2 UAM); 56.6750, -132.2833, Stikine River, Limb Island (2 UAM); 56.7000, -132.2500, Stikine River, Figure Eight Lake (2 UAM); 56.7728, -132.6075, Jap Creek (6 UAM); 56.9661, -132.8167 (4 UAM); 57.0083, -132.9833, Thomas Bay (1 UAM); 58.6633, -134.9058, Stikine River, Mallard Slough (31 UAM). **PORT ALEXANDER QUAD:** 56.5903, -134.8603, Baranof Island, Plotnikof Lake (24 UAM); 56.8333, -134.7000, Baranof Island, Red Bluff Bay (4 UAM); 56.0500, -134.1667, Kuiu Island, Howards Cove (1 UAM); 56.3167, -134.0667, Kuiu Island (3 UAM); 56.3214, -134.0717, Kuiu Island, Affleck Canal (4 UAM); 56.3214, -134.0708, Kuiu Island, trail between Affleck Canal & Petrof Bay (5 UAM); 56.5000, -134.0333, Kuiu Island, Aleck's Creek (4 UAM); Kuiu Island, Point Decision, next to lighthouse (2 UAM); Kuiu Island, Rowan Bay (2 UAM); 56.6672, -134.2428, Kuiu Island (1 UAM); Kuiu Island, tributary of Brown Creek (1 UAM). **PRINCE RUPERT QUAD:** 54.8167, -130.6500, inlet, 2 km NW of Willard Inlet mouth (3 UAM); 54.9833, -131.0000, Foggy Bay, Kirk Point (12 UAM); 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (8 UAM); 55.9500, -130.7500, head of Nakat Inlet (6 UAM). **SITKA QUAD:** 57.0500, -135.2167, Baranof Island (15 UAM); 57.0625, -135.3333, Baranof Island, ca. 0.5 km up Gavin Hill Trail (3 UAM); 57.0667, -135.2667, Baranof Island, Indian River's east side (11 UAM); 57.0667, -135.3333, Baranof Island (4 UAM); 57.1333, -135.3500, Baranof Island, creek to Starrigavan Bay, 5 1/2 mi N, 1 mi W (5 UAM); 57.1333, -135.7333, Baranof Island, Starrigavan Bay (3 UAM); 57.1333, -135.3667, Baranof Island (3 UAM); 57.1333, -135.3667, Baranof Island (3 UAM); 57.2667, -134.8333, Baranof Island, Kelp Bay, middle arm (13 UAM); 57.2667, -134.8333, Baranof Island (2 UAM); 57.7833, -135.1500, Baranof Island, 4.5 km E Tenakee Springs (8 UAM); 57.3667, -134.8833, Baranof Island, Catherine "Island" (3 UAM); 57.4197, -135.7200, Chichagof Island, Suloia Lake (26 UAM); 57.5000, -135.0500, Chichagof Island (1 UAM); 57.6390, -136.0814, Chichagof Island, Klag Bay (7 UAM); 57.6400, -136.0826, Chichagof Island, Klag Bay (5 UAM); 57.6404, -136.0823, Chichagof Island, Klag Bay (2 UAM); 57.7000, -135.2167, Chichagof Island, Kadashan River, Tenakee Inlet (87 UAM); 57.7000, -135.0000, Chichagof Island, mt near jct Chatham St & Tenakee Inlet; 9.7 mi SE Tenekee Sp (2 UAM); 57.7228, -136.1719, Chichagof Island (1 UAM); 57.7833, -135.6333, Chichagof Island, Tenakee Inlet, Seal Bay drainage (2 UAM); 57.8000, -135.9167, Chichagof Island, Lisianski River (2 UAM); 57.8011, -136.1375, Chichagof Island, Otter Lake (1 UAM); 57.8167, -136.1500, Chichagof Island, Otter Lake (21 UAM); 57.8333, -135.0500, Chichagof Island, Pavlof River drainage (33 UAM); 57.9333, -135.6000, Chichagof Island, Salt Lake Bay, Port Frederick (2 UAM); 57.9397, -135.6072, Chichagof Island, NE side of Island (1 UAM); 57.9500, -135.6333, Chichagof Island, Salt Lake Bay, Port Frederick (41 UAM); 57.9575, -135.4928, Chichagof Island, Salt Lake Bay, Port Frederick (1 UAM); 57.9750, -135.6583, Chichagof Island, Salt Lake Bay, Port Frederick (11 UAM); 57.9833, -135.4167, Chichagof Island, upper Game Creek (1 UAM); 58.0667, -135.4667, Chichagof Island, Game Creek (1 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (1 UAM); Chichagof Island, Salt Lake Bay (6 UAM); 57.2333, -135.4833, Halleck Island, NW Halleck Pt. (11 UAM); Herbert Graves Island (1 collected in 1996 by UAM but apparently lost); 57.2008, -135.5169, Krestof Island, DeGroff Bay (8 UAM); 57.0167, -135.6833, Kruzof Island, coast across from St. Lazaria I (3 UAM); 57.1667, -135.7333, Kruzof Island, Shelikof Bay (20 UAM); 57.1833, -135.6167, Kruzof Island, Mud Bay (8 UAM); 57.3031, -135.8247, Kruzof Island, Sea Lion Cove (14 UAM); 57.3167, -135.7667, Kruzof Island, Kalinin Bay, old cannery site (6 UAM); 57.3333, -135.7833, Kruzof Island, head of Kalinin Bay (19 UAM); 57.7000, -135.7000, Moser Island (3 UAM); 57.7028, -135.7156, Moser Island (13 UAM); 57.2494, -135.6514, Partofshikof Island (2 UAM); 57.2710, -135.6250, Partofshikof Island (6 UAM). **SKAGWAY QUAD:** 59.1500, -135.3500, Haines, Chilkat St Pk (1 UAM); 59.1625, -135.3578, Chilkat Peninsula; Mud Bay (18 UAM); 59.1667, -135.3667, Chilkat Peninsula, 500m W Ansley Island, mouth of creek (1 UAM); 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (39 UAM); 59.3167, -135.5667, Haines, Chilkat St Pk (1 UAM); 59.3333, -135.7500, 18 mi Haines Highway (9 UAM); 59.3456, -135.7697, 11 km E, 12 km S Klukwan (20 UAM); 59.3661, -135.7994, 10 km E, 9 km S Klukwan (19 UAM); 59.3666, -135.7982, 17 mile Haines Highway (1 UAM); 59.4108, -135.0025 (1 UAM); 59.4667, -135.3500, (8 UAM); 59.4950, -136.0717, 9 km W, 10 km N

Klukwan (1 UAM); 59.5000, -135.2667, mi 3.6 Klondike Hwy; 3.1 mi N, 1.6 mi E of (1 UAM); 59.5003, -135.3542, Taiya River tidal flats (3 UAM); 59.5031, -135.3456, 500 m S Taiya River bridge (3 UAM); 59.5317, -135.3481, Dyea, mouth W branch Taiya R (9 UAM); 59.5333, -135.3500, Taiya R drainage, N of West Cr; 5 mi N, 1.5 mi W of (6 UAM); 59.5500, -135.1000, Glacier (1 UAM); 59.5747, -136.1567 (34 UAM); 59.6142, -135.1669, White Pass; 1.6 km S USA/Canada border on Klondike Highway (2 UAM); Southwest end of Chilkat Peninsula (2 UAM). **SUMDUM QUAD:** 57.1167, -133.1833, Read Island (1 UAM); 57.1697, -133.2531, Farragut Bay North Arm (3 UAM); 57.2164, -133.5014, Cape Fanshaw (11 UAM); 57.3667, -133.4667, 4 mi SE Goldbelt logging camp, Hobart Bay (6 UAM). **TAKU RIVER QUAD:** 57.0367, -133.9586, Limestone Inlet (1 UAM); 58.0333, -133.9667, Stephens Passage, Limestone Inlet (1 UAM); 58.0367, -133.9583, Limestone Inlet (7 UAM); 58.0367, -133.7917, Limestone Inlet (1 UAM); 58.2000, -133.4000, Whiting River drainage, Crescent Lake (1 UAM). **YAKUTAT QUAD:** 59.0694, -138.3486, Doame River, beach side (2 UAM); 59.4139, -139.0086, Harlequin Lake (1 UAM); 59.4139, -139.0086, Lakeshore Harlequin Lake (2 UAM); 59.4153, -139.0086, Harlequin Lake (1 UAM); 59.4153, -139.0114, Horsetail Bog on Harlequin Lake Trail (1 UAM); 59.4158, -139.0222, Harlequin Lake Trail (1 UAM); 59.4500, -139.2000, Yakutat, Antlen Creek (1 UAM); 59.4936, -139.7289, 3 mi SE Yakutat, Cannon Beach (2 UAM); 59.5000, -139.6667, Yakutat, near Forest Service bunkhouse (6 UAM); 59.5131, -139.6794, Yakutat Forest Service bunkhouse (11 UAM); 59.5333, -139.9000, Yakutat (1 UAM); 59.5500, -139.7333, Yakutat (3 UAM).

Dusky Shrew
Sorex monticolus Merriam, 1890

OTHER COMMON NAMES. Montane Shrew, Vagrant Shrew, Warren Island Shrew.

TAXONOMY. Five subspecies have been recognized in Southeast Alaska (Hall, 1981; Alexander, 1996). Representatives of *S. monticolus* from Southeast Alaska were included in an assessment of mitochondrial DNA variation (cytochrome *b* and ND4 genes) (Demboski, 1999; Demboski and Cook, 2001). Two highly divergent clades (likely distinct species) occur in the region so the coast was probably colonized twice during the Holocene (Lessa et al., 2003). The mainland area between Juneau and Skagway may be a zone of contact between these lineages.

Sorex monticolus alascensis

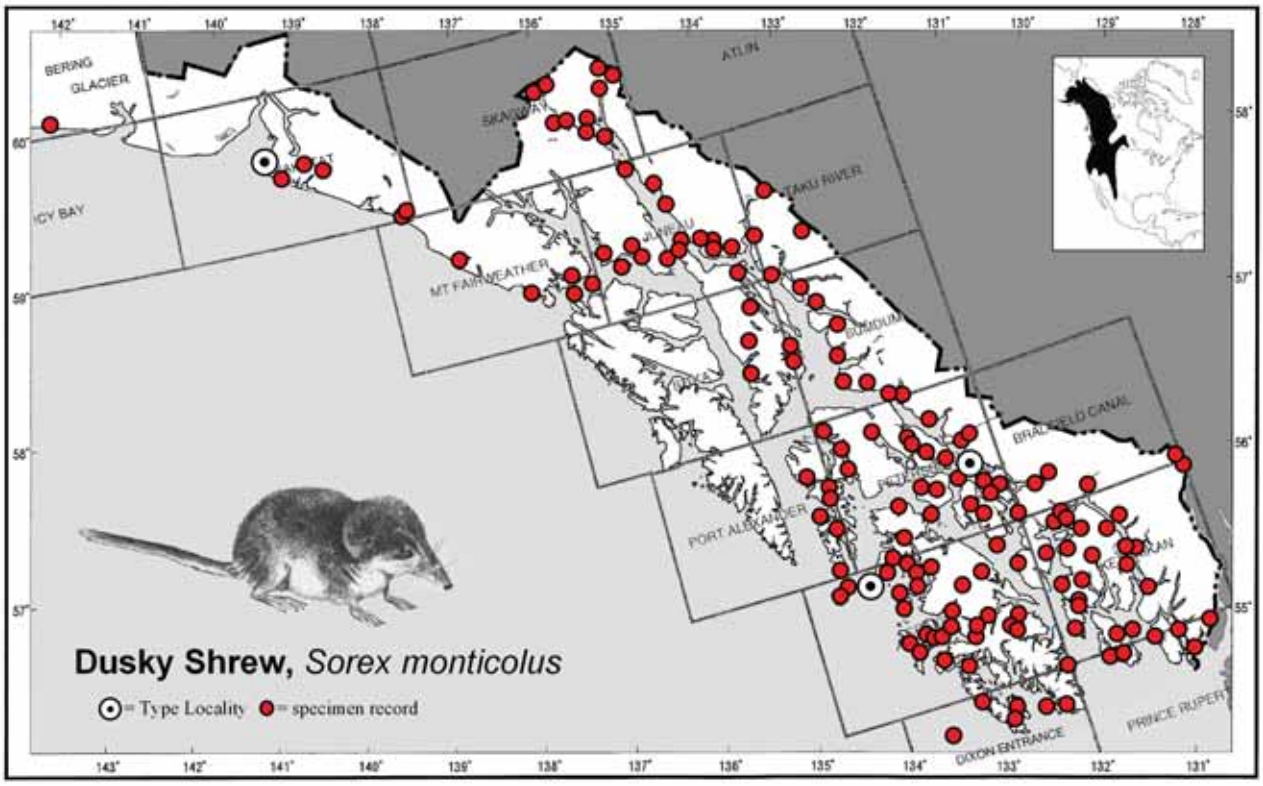
Original Description. 1895. *Sorex obscurus alascensis* Merriam, N. Amer. Fauna, 10:76, December 31.

Type Locality. Yakutat, Alaska.

Type Specimen. USNM 73539.

Range. Coastal Alaska from Prince William Sound to the Taku Inlet and Admiralty Island (Alexander 1996).

Remarks. Includes *Sorex glacialis* Merriam, 1900, Proc. Washington Acad. Sci., 2:16,



March 14, type from Point Gustavus, E side of entrance to Glacier Bay, Alaska (USNM 97709)

Sorex monticolus elassodon

Original Description. 1901. *Sorex longicauda elassodon* Osgood, N. Amer. Fauna, 21:35, September 26.

Type Locality. Cumshewa Inlet near old Indian village of Clew, Moresby Island, Queen Charlotte Islands, British Columbia.

Type Specimen. USNM 100597.

Range. Central and southern outer islands of the Alexander Archipelago of Southeast Alaska (excluding Coronation and Warren islands) to Haida Gwaii (Queen Charlotte Islands), British Columbia.

Sorex monticolus longicauda

Original Description. 1895. *Sorex obscurus longicauda* Merriam, N. Amer. Fauna, 10:74, December 31.

Type Locality. Wrangell, Alaska.

Type Specimen. USNM 74711.

Range. Taku River, Alaska to River Inlet, British Columbia.

Remarks. Alexander (1996:29) indicated that the correct spelling of this subspecies is "*longicaudus*" to agree in gender with the masculine *Sorex* and *monticolus*.

Sorex monticolus malitiosus

Original Description. 1919. *Sorex obscurus malitiosus* Jackson, Proc. Biol. Soc. Washington, 32:23, April 11.

Type Locality. E side Warren Island, Alaska.

Type Specimen. MVZ 8401.

Range. Warren and Coronation islands, Alexander Archipelago, Southeast Alaska.

Sorex monticolus obscurus

Original Description. 1891. *Sorex vagrans similis* Merriam, N. Amer. Fauna, 5:34, July 30.

Type Locality. Timber Creek, Lemhi Mountain (= Salmon River Mts.), 8200 ft. (2,440 m), Lemhi Co., Idaho.

Type Specimen. USNM 23525/30943.

Range. North- and east-central Alaska through the Rocky Mountain states.

Remarks. Shrews from the upper Lynn Canal area of Southeast Alaska were included in this taxon by Alexander (1996).

REVISIONS AND REVIEWS. Hennings and Hoffmann (1977), van Zyll de Jong (1983), Smith and Belk (1996).

STATUS. IUCN-Least concern.

DISTRIBUTION. The Dusky Shrew is found throughout the mainland, including a nunatak "island" in the Juneau Ice Fields (PSM), and on most of the islands of the Alexander Archipelago except Baranof and Chichagof and nearby islands (MacDonald and Cook, 1996).

This shrew has been collected from the following islands in the Alexander Archipelago: Admiralty, Anguilla, Annette, Baker, Barrier, Beardslee (including Lester and Young), Bell, Betton, Black, Cap, Coronation, Dall, Deer, Dog, Douglas, Duke, Eagle, Etolin, Forrester, Gedney, Gravina, Hassler, Heceta, Hoot, Hotspur, Inian, Kadin, Kosciusko, Kuiu, Kupreanof, Lemesurier, Long, Lowrie, Lulu, Marble, Mary, Mitkof, Noyes, Owl, Percy, Pleasant, Prince of Wales, Revillagigedo, San, San Fernando, San Juan Bautista, Sangao, Santa Rita, Shelikof, Shelter, Shrubby, Spanish, Stone, Suemez, Sullivan, Tuxekan, Warren, Woewodski, Woronkofski, Wrangell, and Zarembo.

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (10 CAS). **BRADFIELD CANAL QUAD:** 56.0031, -131.9847, Deer Island (4 UAM); 55.9997, -131.5664, SW side Reflection Lake (1 UAM); 56.0092, -131.5756, W side Reflection Lake (3 UAM); 56.0108, -131.5672, W side Reflection Lake (2 UAM); 56.0269, -130.0706 (2 UAM); 56.0578, -131.9669, S side of Frosty Bay (3 UAM); 56.0833, -131.1000, mouth of Unuk River (6 UAM); 56.1847, -131.6297, Eagle Bay (6 UAM); 56.1847, -131.6286, Eagle Bay (1 UAM); 56.1886, -131.5811, Duck Point (4 UAM); 56.1914, -131.6781, Hoya Creek (1 UAM); 56.2206, -131.4736, Tyee (9 UAM); 56.2289, -131.4517, Tyee (2 UAM). **CRAIG QUAD:** 55.6667, -133.5167, Anguilla Island (2 UAM); 55.3667, -133.6000, Baker Island, NW of section 17 of Port San Antiono (8 UAM); 55.8917, -133.3750, Cap Island (7 UAM); 55.8833, -134.2333, Coronation Island, NE side, across from Spanish Islands (2 UAM); 55.9167, -134.2500, Coronation Island, Aats Bay , beach fringe (2 UAM); 55.9250, -134.3208, Coronation Island, Egg Harbor (10 UAM); 55.1228, -133.1117, Dall Island, Hook Arm, Sea Otter Harbor (1 UAM); 55.2094, -133.1381, Dall Island, North Bay (1 UAM); 55.2600, -133.1239, Dall Island, Tlevak Narrows (1 UAM); 55.8833, -133.5000, Eagle Island (7 UAM); 55.7500, -133.5000, Heceta Island, Port Alice (5 UAM); 55.7667, -133.4500, Heceta Island, Chuck Lake (2 UAM); 55.7833, -133.6333, Heceta Island, lake near Cone Peak (1 UAM); 55.7986, -133.5336, Heceta Island (2 UAM); 55.7986, -133.5336, Heceta Island (1 UAM); 55.8000, -133.6667, Heceta Island, Dead Tree Point (9 UAM); 55.8000, -133.6500, Heceta Island, Port Alice (1 UAM); 55.8031, -133.5914, Heceta Island, Port Alice (1 UAM); 55.8833, -133.3833, Hoot Island (1 UAM); 55.9189, -133.6850, Kosciusko Island (5 UAM); 55.9828, -133.6050, Kosciusko Island, 2 mi NE Edna Bay (1 UAM); 55.4397, -133.4553, Lulu Island (1 UAM); 55.4500, -133.4500, Lulu Island (2 UAM); 55.9667, -133.4500, Marble Island (3 UAM); 56.0000, -133.4000, Marble Island (1 UAM); 55.4500, -133.6500, Noyes Island, Kelly Cove (2 UAM); 55.4611, -133.6389, Noyes Island, Kelly Cove (3 UAM); 55.8833, -133.4167, Owl Island (4 UAM); 54.6892, -132.5403, Prince of Wales Island, North Thorne Bay (1 UAM); 55.0000, -131.9667, Prince of Wales Island, Polk Inlet Road (3 UAM); 55.2667, -133.1167, Prince of Wales Island, Tlevac Narrows (1 UAM); 55.2794, -133.1858, Prince of Wales Island (1 UAM); 55.3342, -132.5311, Prince of Wales Island, Polk Inlet (4 UAM); 55.3467, -132.8356, Prince of Wales Island, Polk Inlet Road (4 UAM); 55.3500, -133.6000, Prince of Wales Island, Thorne Bay Ranger District (1 UAM); 55.3575, -132.5194, Prince of Wales Island, Polk Inlet (1 UAM); 55.3808, -132.4778, Prince of

Wales Island, Goose Bay, Polk Inlet (1 UAM); 55.3961, -132.4578, Prince of Wales Island, Old Tom Creek (11 UAM); 55.3992, -132.4094, Prince of Wales Island, Old Tom Creek (10 UAM); 55.4167, -132.4667, Prince of Wales Island, Polk Inlet (2 UAM); 55.4333, -132.8267, Prince of Wales Island (1 UAM); 55.4539, -132.3264, Prince of Wales Island, Smith Cove, Skowl Arm (18 UAM); 55.4611, -132.6917, Prince of Wales Island (1 UAM); 55.4667, -133.0667, Prince of Wales Island, head of Crab Bay (1 UAM); 55.5000, -132.6950, Prince of Wales Island, Maybeso Creek (1 UAM); 55.5500, -133.0742, Prince of Wales Island, Klawock Lake, along beach fringe, Fireweed Lodge (7 UAM); 55.5667, -133.0667, Prince of Wales Island (2 UAM); 55.6917, -132.8653, Prince of Wales Island, S shore, Control Lk, 16 mi W Thorne Bay (6 UAM); 55.6975, -132.7731, Prince of Wales Island, Rio Roberts (11 UAM); 55.7167, -132.8167, Prince of Wales Island, Ball's Lake, 15 mi W Thorne Bay (3 UAM); 55.7667, -132.6333, Prince of Wales Island, Thorne River Flats (1 UAM); 55.8333, -133.1500, Prince of Wales Island, Staney Cr Cabin, 25 mi WNW Thorne Bay (7 UAM); 55.4500, -133.3583, San Fernando Island, Pt. Amargura (53 UAM); 55.4500, -133.3667, San Fernando Island (1 UAM); 55.4733, -133.3894, San Fernando Island (6 UAM); 55.9500, -133.3667, San Island (1 UAM); 55.4258, -133.3186, San Juan Bautista Island, Point Cambon (1 UAM); 55.4433, -133.2947, San Juan Bautista Island, Point Eugenia (3 UAM); 55.9167, -133.3000, Sangao Island (5 UAM); 55.4072, -133.4667, Santa Rita Island (3 UAM); 55.2639, -133.0019, Shelikof Island (8 UAM); 55.9414, -134.1273, Spanish Islands, southern-most island (1 UAM); 55.9000, -132.3167, Stone Islands, S of Etolin Island (1 UAM); 55.2667, -133.3500, Suemez Island, SE, near Ridge Island (4 UAM); 55.2789, -133.3139, Suemez Island (3 UAM); 55.2789, -133.3161, Suemez Island, Port Refugio (4 UAM); 55.2833, -133.3000, Suemez Island, Port Refugio (6 UAM); 55.2847, -133.3344, Suemez Island, Port Refugio (3 UAM); 55.2928, -133.3231, Suemez Island, Port Refugio (1 UAM); 55.3000, -133.3000, Suemez Island, Port Refugio (1 UAM); 55.3031, -133.3000, Suemez Island, Port Refugio (1 UAM); 55.8833, -133.3667, Tuxekan Island, Northwest side (3 UAM); 55.9000, -133.3333, Tuxekan Island (1 UAM); 55.8750, -133.8417, Warren Island, Warren Cove (6 UAM); 55.7500, -132.1833, , Union Bay, N shore at mouth (17 UAM). **DIXON ENTRANCE QUAD:** 54.8000, -132.4333, Barrier Islands, E side Middle Island (3 UAM); 54.7442, -132.7711, Dall Island (4 UAM); 54.8000, -132.8500, Dall Island, Essowah Lakes (1 UAM); 54.8069, -132.7692, Dall Island, Pond Bay (1 UAM); 54.9167, -133.0833, Dall Island, Gold Harbor Lake, above harbor (1 UAM); 55.2094, -133.1381, Dall Island, North Bay (1 UAM); 55.2500, -133.1167, Dall Island, Tlevac Narrows, Turn Point (2 UAM); 54.8000, -133.5167, Forrester Island, Eagle Harbor (2 UAM); 54.8214, -133.5208, Forrester Island, Eagle Harbor (18 UAM); 54.8167, -132.6833, Long Island, Nina Cove (1 UAM); 54.8172, -132.7064, Long Island, SE of Bolles Inlet (4 UAM); 54.8500, -133.5333, Lowrie Island (17 UAM); 54.7667, -132.1833, Prince of Wales Island, Nichols Lake (9 UAM). **JUNEAU QUAD:** 58.1000, -134.3167, Admiralty Island, head of Seymour Canal (7 UAM); 58.4000, -134.9500, Admiralty Island, Point Retreat (1 UAM); 58.5211, -135.9183, Beardslee Is. (1 MVZ); 58.2967, -134.5447, Douglas Island (2 UAM); 58.3169, -134.5533, Douglas Island, Fish Creek (3 UAM); 58.3333, -134.6000, Douglas Island, 10 mi N Douglas, Fish Creek (1 UAM); Lester Island, Beardslee Is. (1 KU); 58.3286, -135.6194, Pleasant Island (6 UAM); 58.3617, -135.5731, Pleasant Island, N side at mouth of creek (7 UAM); 58.3667, -134.8167, Shelter Island, Hand Troller Cove (1 UAM); Sullivan Island, SE end (8 KU); Young Island, Beardslee Is. (3 KU); 58.2833, -135.05 (1 UAM); 58.2833, -135.0667, Howard Bay (4 UAM); 58.3000, -134.4 (1 UAM); 58.3000, -134.4166667 (7 UAM); 58.3111, -133.9083, Turner Lake (1 UAM); 58.3333, -134.6000, Auke Bay area, Mendenhall River (1 UAM); 58.3667, -134.6333, Mendenhall wetlands (1 UAM); 58.4000, -134.9500, Point Retreat (1 UAM); 58.4083, -134.5750, Mendenhall Lake (2 UAM); 58.4167, -134.5667, Mendenhall Glacier moraine, NE of (3 UAM); 58.4167, -135.4333, Excursion Inlet, W side (13 UAM); 58.4167, -135.4333, Howards Bay (1 UAM); 58.4167, -135.4333333 (1 UAM); 58.4500, -135.8833, Bartlett Cove, 10 km NW Gustavus Airport (24 UAM); 58.4667, -135.8500, Bartlett Cove 10km NW of Gustavus Airport (3 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (7 UAM); 58.5333, -134.8000, Eagle River Beach, 15 1/2 mi N, 15 3/4 mi W of (1 UAM); 58.5506, -135.4792, Chilkat Range, 6.5 km NNE Excursion Inlet (2 UAM); 58.7881, -134.9356, creek South of Antler River (15 UAM); 58.7889, -135.0278, mouth of Slate Creek (16 UAM); 58.9833, -134.7667, Peterson Creek, mile 25 N Glacier Hwy. (3 UAM); 59.5292, -134.9078, Echo Cove (6 UAM); 59.5292, -134.3661, Echo Cove (30 UAM); Auke Bay; Dairy Farm Road (1 UAM); Cowee Creek (2 UAM). **KETCHIKAN QUAD:** 55.1036, -131.3650, Annette Island, Crab Bay (16 MSB); 55.9194, -131.5131, Bell Island, 300 m W bench mark VOW2 (9 UAM); 55.5333, -131.8000, Betton Island (23 UAM); 55.8878, -131.6847, Black Island (3 UAM); 55.8561, -131.7061, Gedney Island (3 UAM); 55.1783, -131.8058, Gravina Island, Phocena Bay (6 UAM); 55.3500, -131.7000, Gravina Island, mouth of Government Creek (3 UAM); 55.9169, -131.6653, Hassler Island, 2.5 km N Fin Point (6 UAM); 55.0833, -131.2333, Mary Island, Customhouse Cove (1 UAM); 55.3167, -131.6000, Revillagigedo Island, Forest Park Drive (2 UAM); 55.3333, -131.6333, Revillagigedo Island (13 UAM); 55.3417, -131.6458, Revillagigedo Island (17 UAM); 55.4000, -131.7167, Revillagigedo Island, Tongass Ave (1 UAM); 55.4125, -131.7028, Revillagigedo Island, Ward Lake, Grassy Point (5 UAM); 55.4147, -131.6958, Revillagigedo Island, Ward Lake (4 UAM); 55.4167, -131.7000, Revillagigedo Island, frog pond near Ward Lk (1 UAM); 55.4894, -131.5986, Revillagigedo Island, Lake Harriet Hunt (1 UAM); 55.5000, -131.0000, Revillagigedo Island, Ella Bay (27 UAM); 55.5803, -130.9683, Revillagigedo Island, SW Manzanita Bay (3 UAM); 55.5825, -130.9669, Revillagigedo Island, SW Manzanita Bay (2 UAM); 55.5903, -130.9714, Revillagigedo Island, Manzanita Bay (1 UAM); 55.6333, -131.3667, Revillagigedo Island, head of Carroll Inlet (2 UAM); 55.6947, -131.6281, Revillagigedo Island, Margaret Cove (1 UAM); 55.7667, -131.0167, Revillagigedo Island, Behm Canal, Portage Cove (8 UAM); 55.7678, -131.0833, Revillagigedo Island, Portage Cove (1 UAM); 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (5 UAM); Revillagigedo Island (4 UAM); 55.2908, -130.8236, E Skull Creek, Smeaton Bay (3 UAM); 55.5450, -130.8703, Point Louise, Rudyerd Bay (1 UAM); 55.5544, -130.8592, Rudyerd Bay (2 UAM); 55.7289, -131.8539, Port Stewart (1 UAM); 55.7667, -130.8833, Chickamin River, Wolf cabin (4 UAM); 55.8833, -130.7667, Chickamin River, near Leduc Junction (1 UAM); 55.9167, -130.0333, Hyder (1 UAM); 55.9167, -130.0167, Hyder, Salmon River Valley, Titan Trail (1 UAM); 55.9333, -130.0333, Hyder area (2 UAM); 55.9667, -130.0667, Hyder area (4 UAM). **MT. FAIRWEATHER QUAD:** 58.2583, -136.2986, Inian Island (3 UAM); 58.2833, -136.0833, Lemesurier Island (2 UAM); 58.3011, -136.0958, Lemesurier Island (18 UAM); Dundas Bay, Glacier Bay NP (2 KU); Torch Bay, Glacier Bay NP (26 KU); N. Lituya Bay, Glacier Bay NP (16 KU). **PETERSBURG QUAD:** 56.0333, -132.0167, Deer Island (5 UAM); 56.0683, -132.0175, Deer Island (1 UAM); 56.0833, -132.3500, Etolin Island (1 UAM); 56.1667, -132.4500, Etolin Island, Anita Bay (14 UAM); 56.1833, -132.4833, Etolin Island, Anita Bay area (2 UAM); 56.1833, -132.4500, Etolin Island, Anita Bay area (17 UAM); 56.2000, -132.4667, Etolin Island (2 UAM); 56.2211, -132.5089, Etolin Island (2 UAM); 56.3333, -132.4500, Etolin Island (2 UAM); 56.5136, -132.4581, Kadin Island, N Kadin Island (1 UAM); 56.5167, -132.3000, Kadin Island, S end (3 UAM); 56.5333, -132.4500, Kadin Island, N Kadin Island (6 UAM);56.0000, -133.4167, Kosciusko Island, Tokeen Bay, mouth Sockeye Creek (1 UAM); 56.0500, -133.5500, Kosciusko Island (1 UAM); 56.6667, -133.7333, Kuiu Island, Rocky Pass (across from NW end High Island) (4 UAM); 56.3667, -133.3167, Kupreanof Island (1 UAM); 56.7922, -133.7203, Kupreanof Island, Big John Bay (2 UAM); 56.8000, -133.7167, Kupreanof Island, Big John Bay (8 UAM); 56.8500, -133.3667, Kupreanof Island, head of Towers Arm (2 UAM); 56.8667, -133.3167, Kupreanof Island (2 UAM); 56.8667, -133.3333, Kupreanof Island (1 UAM); 56.9500, -133.9000, Kupreanof Island, Kake, near Kake Forest Service cabin (6 UAM); 54.7333, -132.8833, Mitkof Island, Twin Creek (2 UAM); 56.5333, -132.7500, Mitkof Island, Ohmer Cr 22.5 mi Mitkof Hwy (1 UAM); 56.5833, -132.7667, Mitkof Island (1 UAM); 56.5833, -132.8333, Mitkof Island, 3/4 mi S Blind Slough Picnic Area (7 UAM); 56.5833, -132.7667, Mitkof Island (3 UAM); 56.5833, -132.8333, Mitkof Island (2 UAM); 56.5833, -132.7667, Mitkof Island, 19.25 mi Mitkof Highway (2 UAM); 56.5833, -132.8000, Mitkof Island, Petersburg Range District (1 UAM); 56.6000, -132.4167, Mitkof Island, Ohmer Creek (1 UAM); 56.6667, -132.8333, Mitkof Island, Ohmar Creek (8 UAM); 56.7167, -132.9167, Mitkof Island, Twin Creeks Road, 5 mi S

(1 UAM); 56.7167, -132.8667, Mitkof Island, Twin Creek drainage (3 UAM); 56.7333, -132.9667, Mitkof Island, Wrangell Narrows (18 UAM); Mitkof Island (1 UAM); Mitkof Island, Ohmer Creek (2 UAM); Mitkof Island, upper Ohmer Creek (1 UAM); Mitkof Island (1 UAM); Mitkof Island, Twin Creek Road, 5mi S of (1 UAM); 56.1667, -133.3167, Prince of Wales Island, near El Capitan trail head (2 UAM); 56.1744, -133.3692, Prince of Wales Island, Turn Creek, El Capitan area (1 UAM); Prince of Wales Island, Bear's Plunge Cave, upper passage (1 UAM); 56.2333, -132.9667, Shrubby Island, Ossipee Channel (36 UAM); Woewodski Island (4 AMNH); 56.4000, -132.5167, Woronkofski Island, Wedge Point (3 UAM); 56.4353, -132.4967, Woronkofski Island (1 UAM); 56.2333, -132.1333, Wrangell Island (44 UAM); 56.2358, -132.1456, Wrangell Island (1 UAM); 56.2561, -132.3303, Wrangell Island, Nemo Point (1 UAM); 56.2667, -132.1333, Wrangell Island, Earl West Marsh (3 UAM); 56.2667, -132.2500, Wrangell Island, McCormick Creek (1 UAM); 56.3183, -132.2861, Wrangell Island, 4 mi S McCormick Creek, S side of Main Line Rd. (78 UAM); 56.3183, -132.3083, Wrangell Island, 2 mi S McCormick Creek, N side of Main Line Rd. (13 UAM); 56.3333, -132.3333, Wrangell Island, Pat Creek (2 UAM); 56.3417, -132.3389, Wrangell Island, Trout Lake, Pat Creek (2 UAM); 56.3500, -132.3333, Wrangell Island, Trout Lake (19 UAM); 56.4000, -132.2500, Wrangell Island (22 UAM); 56.4500, -132.2667, Wrangell Island (12 UAM); 56.4692, -132.3456, Wrangell Island (44 UAM); 56.5000, -132.2833, Wrangell Island (24 UAM); 56.3333, -132.8333, Zarembo Island, Saint John Harbor (11 UAM); 56.3333, -132.8500, Zarembo Island (1 UAM); 56.3500, -132.8333, Zarembo Island, Saint John Harbor (1 UAM); 56.3567, -132.8100, Zarembo Island, 0.13 mi W Spur Rd. (2 UAM); 56.4167, -133.0000, Zarembo Island, Saint John Harbor (10 UAM); 56.4500, -132.9500, Zarembo Island, Saint John Bay, near USFS cabin (17 UAM); 56.2333, -132.2500, Stikine River, S bank, nr Andrew Slough (1 UAM); 56.3636, -132.0081, Berg Bay (8 UAM); 56.5833, -132.4333, Stikine River, Sergief Island (2 UAM); 56.6167, -132.4333, Stikine River, Farm Island, Binkley Slough Cabin (3 UAM); 56.6250, -132.4000, Stikine River, Farm Island, MacDonald cabin (1 UAM); 56.6333, -132.4167, , Stikine River, Livingston homestead (5 UAM); 56.6750, -132.2833, Stikine River, Limb Island (1 UAM); 56.7000, -132.2500, Stikine River, Limb Island (4 UAM); 56.7000, -132.2500, Stikine River, Figure Eight Lake (15 UAM); 56.7728, -132.6075, Jap Creek (3 UAM); 56.9661, -132.8167 (3 UAM); 57.0083, -132.9833, Thomas Bay (3 UAM); 58.6633, -134.9058, Stikine River, Mallard Slough (11 UAM). **PORT ALEXANDER QUAD:** 56.0500, -134.1667, Kuiu Island, Howards Cove (1 UAM); 56.3167, -134.0667, Kuiu Island (1 UAM); 56.3214, -134.0717, Kuiu Island, head of Affleck Canal (4 UAM); 56.4333, -134.2167, Kuiu Island, Explorer Basin (3 UAM); 56.5000, -134.0333, Kuiu Island, Alecks Creek (5 UAM); 56.5833, -134.0000, Kuiu Island, tributary of Brown Creek (3 UAM); Kuiu Island, Point Decision, next to lighthouse (1 UAM); 56.7100, -134.2317, Port Alexander, Kuiu Island, Rowan Bay (7 UAM). **PRINCE RUPERT QUAD:** 54.9694, -131.3383, Dog Island (3 UAM); 54.9722, -131.3386, Dog Island (5 UAM); 54.8214, -133.5208, Duke Island (1 UAM); 54.8256, -133.5208, Duke Island (4 UAM); 54.9483, -131.4889, Duke Island (12 UAM); 54.9622, -131.4256, Duke Island, Ryus Bay (11 UAM); 54.9750, -131.3333, Duke Island, Pond Bay (9 UAM); 54.9686, -131.5128, Hotspur Island (5 UAM); 54.9578, -131.5450, Percy Island (8 UAM); 54.8167, -130.6500, inlet, 2 km NW of Willard Inlet mouth (3 UAM); 54.9500, -130.7500, head of Nakat Inlet (1 UAM); 54.9833, -131.0000, Foggy Bay, Kirk Point (14 UAM); 54.9436, -130.3336, Gwent Cove, Hidden Inlet, Pearse Canal (6 UAM). **SITKA QUAD:** 57.4333, -134.5500, Admiralty Island (2 UAM); 57.6286, -134.4028, Admiralty Island, Distance Lake (3 UAM); 57.6314, -134.3808, Admiralty Island, Distin Lake (13 UAM); 57.8361, -134.3072, Admiralty Island, Windfall Harbor (15 UAM). **SKAGWAY QUAD:** 57.1697, -133.2531, Chilkat Peninsula 500m W Ansley Island mouth of creek (1 UAM); 59.1500, -135.3500, Haines, Chilkat St Pk (2 UAM); 59.1625, -135.3578, Chilkat Peninsula, Mud Bay (14 UAM); 59.2500, -135.4167, Haines area (2 UAM); 59.2617, -135.5597, 3.9 miles Haines Hwy/WNW of Haines City limits (3 UAM); 59.2654, -135.8769, Takhin Ridge (1 UAM); 59.3167, -135.5667, Haines, Chilkoot Lk (4 UAM); 59.3333, -135.7500, 18 mi Haines Highway (1 UAM); 59.3661, -135.7994, 10 km E, 9 km S Klukwan (2 UAM); 59.4147, -136.0972, Porcupine River (1 UAM); 59.4147, -136.0619, Porcupine River (5 UAM); 59.4333, -135.95 (1 UAM); 59.5031, -135.3456, 500 m S Taiya River bridge (1 UAM); 59.5317, -135.3481, Dyea, mouth W branch Taiya R (2 UAM); 59.5747, -136.1566667 (1 UAM); 59.5926, -135.8921, Klukwah Mountain (4 UAM); 59.6066, -135.8535, Klukwah Mountain (6 UAM); 59.6158, -135.1683, White Pass (2 UAM); 59.6164, -135.1397, White Pass (1 UAM); 59.6232, -136.0750, Tohitkah Mountain (2 UAM); 59.6253, -136.0893, Tohitkah Mountain (3 UAM); 59.6374, -136.1291, Mount Ashmun (1 UAM); Dyea (8 UAM). **SUMDUM QUAD:** 57.4294, -133.9389, Admiralty Island, W Gambier Bay (6 UAM); 57.5333, -133.9500, Admiralty Island, N arm of Gambier Bay (1 UAM); 57.8361, -134.3072, Admiralty Island, Windfall Harbor (1 UAM); 57.1697, -133.2531, Farragut Bay North Arm (3 UAM); 57.2164, -133.5014, Cape Fanshaw (8 UAM); 57.3667, -133.4667, Hobart Bay (12 UAM); 57.5833, -133.3667, Chuck River (2 UAM); 57.7667, -133.5167, Power's Creek, Endicott Arm (1 UAM); 57.8833, -133.6500, Williams Cove, Tracy Arm (1 UAM). **TAKU RIVER QUAD:** 58.0333, -133.9667, Stephens Passage, Limestone Inlet (4 UAM); 58.0367, -133.9586, Limestone Inlet (1 UAM); 58.0367, -133.9583, Limestone Inlet (3 UAM); 58.2000, -133.4000, Whiting River drainage, Crescent Lake (2 UAM); 58.5167, -133.7333, Taku River drainage, Wright River mouth (1 UAM); 58.5333, -133.6833, Taku River, Fish Creek (1 UAM). **YAKUTAT QUAD:** 59.1000, -138.2667, Doame River (4 UAM); 59.0694, -138.3486, Doame River, beach side (3 UAM); 59.4139, -139.0086, Lakeshore Harlequin Lake (3 UAM); 59.4153, -139.0086, Harlequin Lake (18 UAM); 59.4158, -139.0222, Harlequin Lake Trail (5 UAM); 59.4333, -139.5667, Yakutat, beach near Situk R (1 UAM); 59.4500, -139.2000, Yakutat, Antlen Creek (1 UAM); 59.4936, -139.7289, 3 mi SE Yakutat, Cannon Beach (2 UAM); 59.5000, -139.6667, Yakutat, near Forest Service Cabin (11 UAM); 59.5131, -139.6794, Yakutat, near Forest Service bunkhouse (19 UAM); 59.5500, -139.7333, Yakutat (9 UAM).

American Water Shrew
Sorex palustris Richardson, 1828

OTHER COMMON NAMES. Water Shrew, Mountain Water-shrew, Navigator Shrew.

TAXONOMY. Of the nine subspecies listed by Hall (1981), only one occurs in Alaska. *Sorex alaskanus* is restricted to Glacier Bay and may be a subspecies of *S. palustris* (see *S. alaskanus* account). Results of a recent molecular study (O'Neill et al., 2005) suggest that *S. palustris* may comprise two species: *S. palustris* (a boreal eastern form) and *S. navigator* (a western montane or Cordilleran form that includes all Alaska populations).

Sorex palustris navigator

Original Description. 1858. *Neosorex navigator* Baird, Mammals, *in* Rep. Expl. Surv. Railr. to Pacific, 8, pt. 1 (Washington, 1857), p. 11, July 14.

Type Locality. Near head of Yakima River, Cascade Mountains, Kittitas County, Wash.

Type Specimen. USNM 629/1780.

Range. Alaska, east to northwestern Northwest Territories, south to southcentral California, southern Utah, northern New Mexico, and isolated populations in the White Mountains of Arizona.

REVISIONS AND REVIEWS. Beneski and Stinson (1987), O"Neill et al. (2005).

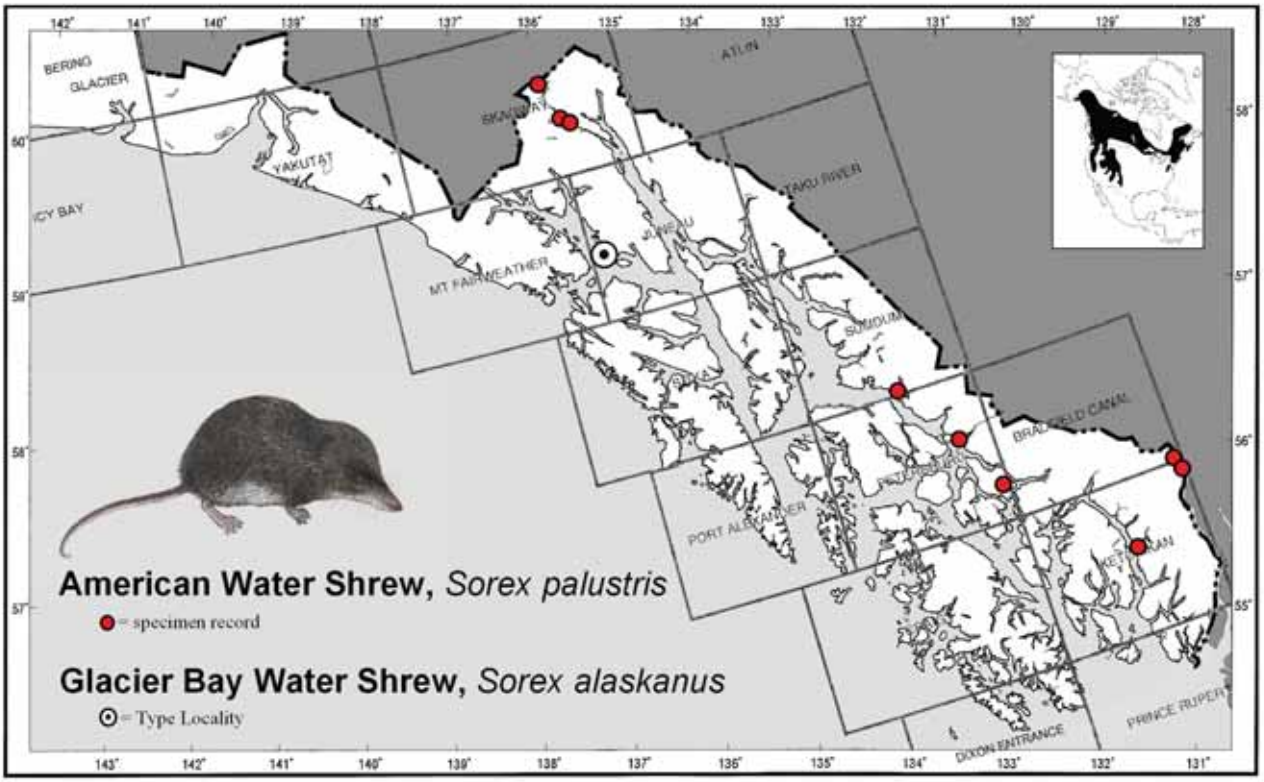
STATUS. IUCN-Least concern.

DISTRIBUTION. Until recently, the American Water Shrew, *S. palustris*, in Southeast Alaska was believed to occur only along the coastal mainland. The few specimen records of this semi-aquatic shrew range from Hyder to the Chilkat Valley near Haines (MacDonald and Cook, 1996).

In the 1998 field season a water shrew was captured by hand in Fool's Creek, Wrangell Island, the first record of this species in the Alexander Archipelago. Unsubstantiated but convincing reports elsewhere in the archipelago include one seen along Ward Creek, Revillagigedo Island, in 1999 (M. Brown, pers. comm.), and the capture (and eventual discard) by NOAA fish biologists of several very large and dark shrews (identified as *S. palustris*) in minnow traps set in the Big John Bay watershed on Kupreanof Island in the mid-1980s (M. Lorenz, pers comm., 2004).

Two male water shrews taken in 1899 by A. K. Fisher from Point Gustavus, Glacier Bay, were described as a new subspecies, *S. navigator alaskanus* by Merriam (1900). The subsequent elevation of these two specimens to full species status as *S. alaskanus* by Jackson (1926, 1928) has been questioned by Hall (1981) and Junge and Hoffmann (1981; but see Hutterer, 2005). Only one additional specimen of *S. alaskanus* from Bartlett Cove on 22 June 1970 has been preserved (UAM 49979).

SPECIMENS. **BRADFIELD CANAL QUAD:** 56.0269, -130.0706, Salmon River, Hyder region (1 UAM). **KETCHIKAN QUAD:** 55.9333, -130.0333, Hyder (1 UAM); 55.9069, -130.0253, Hyder, Salmon River valley (1 UAM); 55.5500, -130.8670, Rudyard Bay (1 UCLA). **PETERSBURG QUAD:** 56.2697, -132.0706, Wrangell Island, Fools Creek (1 UAM); 57.0083, -132.9833, along Muddy R, 2.5 mi S Thomas Bay (1 UAM); 56.6333, -132.4167, Stikine River, Farm Island (1 UAM). **SKAGWAY QUAD:** 59.3333, -135.7500, Haines, 13 mi Haines Hwy (3 UAM): 59.3667, -135.8000, Haines, 18 mi Haines Hwy (2 UAM); 59.6232, -136.0750, Tohitkah Mountain (1 UAM); 11 miles NW Kukwan (1 CAS); 4 mi. N, 9 mi. W of Haines, E side of Chilkat River (2 KU); Haines (1 USNM).



Key to the Bats of Southeast Alaska

1. • Pelage black-brownish with a frosting of white on back and usually on underside; skull with 36 teeth ……..... **Silver-haired Bat *Lasionycteris noctivagans***
   • Pelage brownish without white frosting; skull with 38 teeth …..... 2

2. • Calcar with well developed keel ……..... 3
   • Calcar without well developed keel …..... 4

3. • Underwing furred outward to a line from the elbow to the knee … **Long-legged Myotis, *Myotis volans***
   • Underwing not furred …..... **California Myotis, *Myotis californicus***

4. • Ears long (> 17 mm), when laid forward extends about 4 mm beyond tip of nose; fur dark brown without glossy sheen …..... **Keen's Myotis, *Myotis keenii***
   • Ears shorter (< 17 mm), when laid forward reaches only to nostril; fur reddish brown with glossy sheen …..... ..... **Little Brown Bat, *Myotis lucifugus***

Order **Chiroptera** Blumenbach, 1779
Family **Vespertilionidae** Gray, 1821

Silver-haired Bat
Lasionycteris noctivagans (Le Conte, 1831)

OTHER COMMON NAMES. None.

TAXONOMY. No subspecies are currently recognized (Hall, 1981).

Lasionycteris noctivagans

Original Description. 1891. *V*[*espertilio*] *noctivagans* Le Conte, *in* McMurtrie, Animal Kingdom, 1: [app.]431.

Type Locality. Eastern United States.

Type Specimen. Not known to exist.

Range. Southeast Alaska and southern Canada across the entire continental U.S.

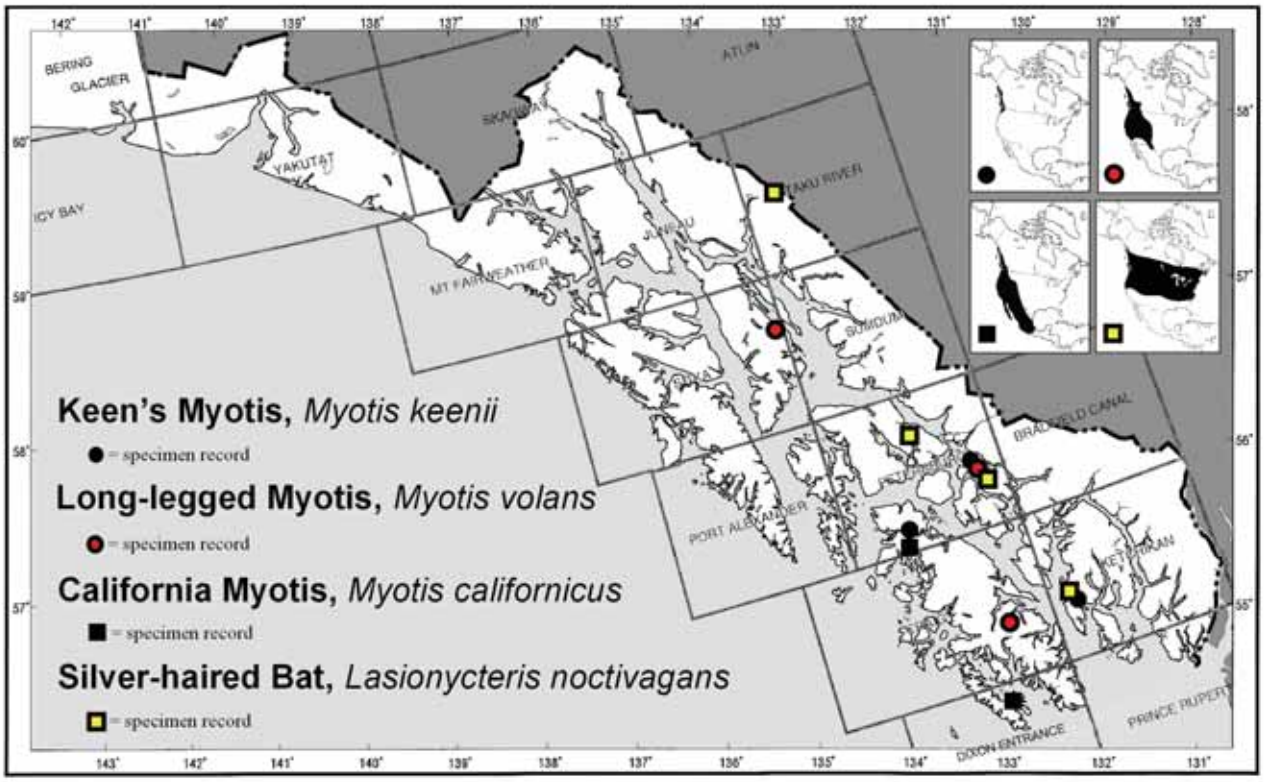
REVISIONS AND REVIEWS. Kunz (1982).

STATUS. IUCN-Least concern.

DISTRIBUTION. Until recently this species was known for Southeast Alaska from one specimen (AMNH 213141), a juvenile female found roosting on 4 November 1964 in an old gill net in a shed near the Alaska/British Columbia border on Canyon Island, Taku River (Barbour and Davis, 1969).

Three new specimens (Parker et al., 1997), all collected in January, include a specimen (UAM 20738) found in a woodpile 15 km south of Wrangell, a specimen (UAM 30100) found dead clinging to the side of a house in Petersburg, and a specimen (UAM 30099) found alive in a house entryway in Ketchikan.

SPECIMENS. **PETERSBURG QUAD:** 56.3667, -132.3667, Wrangell Island (1 UAM); 56.7500, -132.9333, Mitkof Island (1 UAM). **KETCHIKAN QUAD:** 55.3722, -131.0667, Revillagigedo Island, 4 miles North Tongass Highway (1 UAM). **TAKU RIVER QUAD:** 58.7167, -133.6750, Taku River, Canyon Island (1 AMNH).



California Myotis

Myotis californicus (Audubon & Bachman, 1842)

OTHER COMMON NAMES. Californian Myotis.

TAXONOMY. The Alaska specimens were included under the subspecies *M. c. caurinus* by Hall (1981).

Myotis californicus caurinus

Original Description. 1897. *Myotis californicus caurinus* Miller, N. Amer. Fauna, 13:72, October 16.

Type Locality. Massett, Graham Island, Queen Charlotte Islands, British Columbia.

Type Specimen. USNM 72219.

Range. Southeast Alaska to California.

REVISIONS AND REVIEWS. Simpson (1993).

STATUS. IUCN-Least concern.

DISTRIBUTION. Grinnell (1918) and Miller and Allen (1928) reported two specimens of *M. californicus* from Howkan, Long Island (MVZ) More recently, two *M. californicus* skulls were discovered in El Capitan Cave on Prince of Wales Island (UAM 22143, 22144; Parker et al., 1997). A third live animal was collected there in February 1992 (UAM 20498). Samples of skin, hair, and feces were sequenced from an additional eight California myotis netted and released at three localities in the El Capitan area, northern Prince of Wales Island in 1997-1998 (UAM 47035-37, 54529-31, 54533-34).

SPECIMENS. **DIXON ENTRANCE QUAD:** 54.8750, -132.8014, Long Island, Howkan (2 MVZ). **PETERSBURG QUAD:,** 56.1667, -133.3167, Prince of Wales Island, El Capitan Cave (3 UAM); 56.1833, -133.3167, Prince of Wales Island, El Capitan cave entrance (2 UAM); 56.1667, -133.2, Prince of Wales Island, Twin Island Lake outlet (1 UAM); 56.1744, -133.3692, Prince of Wales Island, Turn Creek, El Capitan area (5 UAM).

Keen's Myotis
Myotis keenii (Merriam, 1895)

OTHER COMMON NAMES. Keen Bat, Keen's Long-eared Bat, Keen's Long-eared Myotis.

TAXONOMY. At one time *Myotis keenii* included two subspecies: *M. k. keenii* from the west coast of North America, and *M. k. septentrionalis* of east-central North America (Hall, 1981). Studies by van Zyll de Jong (1979, 1985), however, concluded that the two were separate species distinguished by cranial and pelage characters. Keen's Myotis is morphologically and genetically very similar to Long-eared Myotis, *M. evotis,* and may be conspecific (COSEWIC, 2003; Burles et al., 2004). No subspecies are currently recognized (van Zyll de Jong, 1985).

Myotis keenii

Original Description. 1895. *Vespertilio subulatus keenii* Merriam, Am. Nat., 29:860, September.

Type Locality. Masset, Graham Island, Queen Charlotte Islands, British Columbia.

Type Specimen. USNM 729220.

Range. North Pacific Coast, from Washington to Southeast Alaska.

REVISIONS AND REVIEWS. Van Zyll de Jong (1979, 1985), Fitch and Shump (1979), van Zyll de Jong and Nagorsen (1994).

STATUS. IUCN-Least concern; BRITISH COLUMBIA-Red (endangered or threatened); COSEWIC-Data Deficient (COSEWIC, 2003). The biology of *M. keenii* is poorly known and only about 60 specimens of this coastal species have been preserved. Whether this is an indication that this species is actually rare, and thus a species of concern for conservation, is unknown. Nagorsen and Brigham (1993) suggest that so little information is currently available on this species that little can be said about its habitat affinities.

DISTRIBUTION. Until recently, the occurrence of *Myotis keenii* in Southeast Alaska was based on a single specimen collected in 1887 at Ft. Wrangell, Wrangell Island (USNM 187394). In 1993, a second specimen of Keen's Myotis was collected at Turn Creek, Prince of Wales Island (MacDonald and Cook, 1996). Based on DNA sequences of the mitochondrial cytochrome *b* gene (Cook, unpubl.), the specimen of *M. keeni* reported by MacDonald and Cook (1996) and Parker and Cook (1996) from Hoonah, Chichagof Island in 1994 (UAM 29831) may have been misidentified. Corroborative evidence is also needed for one collected in Ketchikan on Revillagigedo Island in August 1999 (UAM 55944), and another found rabid on northern Prince of Wales Island in mid-July 2006 (Castrodale, 2006; D. Parker McNeill, pers. comm.).

SPECIMENS. **JUNEAU QUAD:** 55.7500, -131.5000, Revillagigedo Island, Ketchikan (1 UAM). **PETERSBURG QUAD:** 56.1667, -133.2833, Prince of Wales Island, Turn Creek, upstream from Rd 15 bridge (1 UAM); 56.4667, -132.4333, Wrangell Island, Ft. Wrangell (1 USNM).

Little Brown Myotis
Myotis lucifugus (Le Conte, 1831)

OTHER COMMON NAMES. Little Brown Bat, Alaskan Little Brown Bat.

TAXONOMY. Six subspecies were recognized by Hall (1981) with perhaps two occurring in Southeast Alaska.

Myotis lucifugus alascensis

Original Description. 1897. *Myotis lucifugus alascensis* Miller, N. Amer. Fauna, 13:63, October 16.

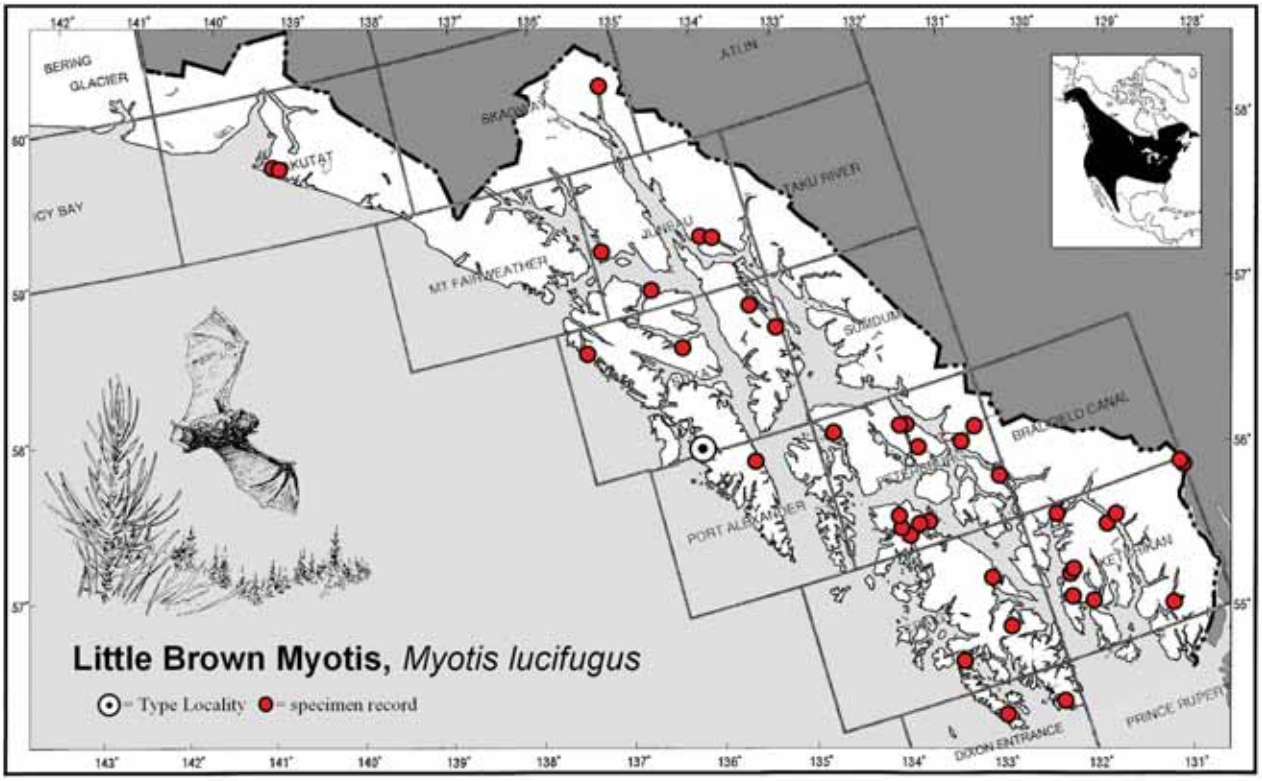
Type Locality. Sitka, Baranof Island, Alexander Archipelago, Alaska.

Type Specimen. USNM 77416.

Range. West coast of North America from southeast Alaska to California, most of British Columbia, and extreme western Alberta.

Myotis lucifugus pernox

Original Description. 1911. *Myotis pernox* Hollister, Smithson. Misc. Collect, 56(26):4, December 5.



Type Locality. Henry House, Alberta.
Type Specimen. USNM 174134.
Range. Central Alaska and northwestern Canada.

REVISIONS AND REVIEWS. Fenton and Barclay (1980).

STATUS. IUCN-Least concern. The extensive karst system in Southeast Alaska may be an important resource for *M. lucifugus* and probably *M. californicus* and *M. volans* (if not other species). Reconnaissance of several caves on Prince of Wales Island in January 1992 (by JAC) and since then by a number of cavers (Baichtal, 1993a; E. Lance, pers. comm., 2004) revealed periodic use of the caves for roost sites. Those data are preliminary and careful documentation of bat use (including seasonality) should be included in any karst management scheme. The American Society of Mammalogists has provided guidelines for the protection of roost sites (Sheffield et al., 1992).

DISTRIBUTION. *Myotis lucifugus* is the most numerous and widely distributed bat in Southeast Alaska, although relatively few specimens substantiate this assumption. The distribution and occurrence of all bat species are poorly documented in Southeast Alaska. Several species apparently reach their northern range limits in this region (Parker et al., 1997).

Specimens extend from Hyder to Yakutat along the mainland, and in the Alexander Archipelago from Admiralty, Baranof, Chichagof, Dall, Grant, Mitkof, Prince of Wales, Revillagigedo, Ring, and Wrangell islands.

SPECIMENS. **CRAIG QUAD:** 55.2094, -133.1381, Dall Island, North Bay (1 UAM); 55.3333, -132.5000, Prince of Wales Island, Polk Inlet Forest Service camp (2 UAM); 55.3486, -132.5014, Prince of Wales Island, Dog Salmon Creek (2 UAM); 55.6686, -132.5075, Prince of Wales Island, Thorne Bay (1 UAM). **DIXON ENTRANCE QUAD:** 54.8000, -132.8500, Dall Island, Essowah Lakes (1 UAM); 54.7542, -132.1917, Prince of Wales Island, Nichols Lake (1 UAM). **JUNEAU QUAD:** 58.1000, -135.4333, Chichagof Island, Hoonah, old cannery (19 UAM); 58.3833, -134.6667, Juneau (1 UAM); 58.4500, -135.8833, Bartlett Cove, 10 km NW of Gustavus Airport (21 UAM); 58.3333, -134.4500, Juneau, near Salmon Creek (1 UAM); Juneau area, Mendenhall Valley (1 UAM). **KETCHIKAN QUAD:** 55.5500, -131.7167, Grant Island (1 LACM); 55.3236, -131.5167, Revillagigedo Island, house at 243 Wood Rd., Herring Bay, Ketchikan (1 UAM); 55.4125, -131.7000, Revillagigedo Island, Frog Pond near Ward Lake (1 UAM); 55.4167, -131.7000, Revillagigedo Island, Ward Lake Frog Pond (2 UAM); 55.6000, -131.6500, Revillagigedo Island, 18.5 mi N Ketchikan, Loring Boardwalk (4 UAM); 55.7667, -131.0833, Revillagigedo Island, Portage Cove (1 UAM); 55.7667, -130.8833, Chickamin River, Wolf cabin (3 UAM); 55.9167, -130.0167, Hyder, house attic (30 UAM); 55.9333, -130.0333, Hyder area (2 UAM); 55.9667, -130.0667, Hyder area (3 UAM); 55.9667, -131.6167, Cleveland Peninsula, 43.5 mi N of Ketchikan, Bailey Bay (1 UAM). **PETERSBURG QUAD:** 56.6667, -132.8333, Mitkof Island (2 UAM); 56.8000, -132.9667, Mitkof Island (8 UAM); 56.8000, -132.8833, Mitkof Island (1 UAM); 56.9167, -133.7833, Mitkof Island, Petersburg Reservoir (1 UAM); 56.1000, -133.2500, Prince of Wales Island, Devil's Canopy Cave (1 UAM); 56.1333, -133.1333, Prince of Wales Island (4 UAM); 56.1333, -133.1167, Prince of Wales Island, 108 Creek at gauging station (1 UAM); 56.1500, -133.1667, Prince of Wales Island, inside Cavern Lake cave (1 UAM); 56.1667, -133.0000, Prince of Wales Island, Eagle Roost Cave (2 UAM); 56.1667, -133.3167, Prince of Wales

Island, El Capitan Cave (1 UAM); 56.1667, -133.3000, Prince of Wales Island, Turn Creek, upstream from Rd 15 bridge (1 UAM); 56.1744, -133.3692, Prince of Wales Island, Turn Creek, El Capitan area (1 UAM); 56.2000, -133.3000, Prince of Wales Island, Blowing in the Wind Cave (5 UAM); 56.2500, -133.3333, Prince of Wales Island, Red Creek (1 UAM); 56.2500, -133.2500, Prince of Wales Island, Red Creek between Red Bay Lk & Red Bay (2 UAM); 56.2833, -132.0994, Wrangell Island, over pond 50m SW of Fools Inlet Rd 2.2km S of Jct to Long Lake (1 UAM); 56.6167, -132.4000, Stikine River, Farm Island (1 UAM); 56.6667, -132.2167, Stikine River, N of Mt Rynda, over Andrew Cr jct with Andrew Slough (4 UAM). **SITKA QUAD:** 57.8361, -134.3072, Admiralty Island, Windfall Harbor (4 UAM); 57.0500, -135.3333, Baranof Island, Sitka (1 USNM); 57.7000, -135.2167, Chichagof Island (1 UAM); 57.8069, -136.3458, Chichagof Island, White Sulphur Hot Springs (4 UAM); 57.0389, -135.2889, Ring Island, Jamestown Bay (1 UAM); 57.0500, -135.3167, AK raptor center (2 UAM). **SKAGWAY QUAD:** 59.4586, -135.3143, Skagway, 7th and State Street (1 UAM). **YAKUTAT QUAD:** 59.5131, -139.6794, Yakutat, USFS compound (1 UAM); Situk River (2 ROM).

Long-legged Myotis
Myotis volans (H. Allen, 1866)

OTHER COMMON NAMES. Hairy-winged Myotis, Long-legged Bat.

TAXONOMY. The original Mole Harbor record was included under the subspecies *M. v. longicrus* (Hall, 1981).

Myotis volans longicrus

Original Description. 1886. *Vespertilio longicrus* True, Science, 8:588, December 24.

Type Locality. Vicinity of Puget Sound, Washington.

Type Specimen. USNM 15263/22480.

Range. Pacific coast from southeast Alaska to California and east to Alberta, Canada.

REVISIONS AND REVIEWS. Warner and Czaplewski (1984).

STATUS. IUCN-Least concern.

DISTRIBUTION. A single specimen of *M. volans* (MVZ 186) collected at Mole Harbor, Admiralty Island, in 1907 was until recently the only documented record of this species in Alaska. Three specimens from Wrangell Island and one from Prince of Wales Island are now recorded (West, 1994; MacDonald and Cook, 1996; Parker et al., 1997).

SPECIMENS. **CRAIG QUAD:** 55.3333, -132.5000, Prince of Wales Island, Polk Inlet Forest Service camp (1 UAM). **PETERSBURG QUAD:** 56.4781, -132.3872, Wrangell Island, Mt. Dewey trailhead (2 UAM; 1 ADFG-Anchorage). **SITKA QUAD:** 57.6667, -134.0500, Admiralty Island, Mole Harbor (1 MVZ).

Author (SOM) and son, Orien, setting a mist net for bats across a beaver dam near Portage Cove, Revillagigedo Island, July 1995. A Little Brown Myotis was taken here, along with five Meadow Jumping Mice from the dense vegetation close to water. (*Photograph courtesy of M. K. MacDonald.*)

Key to the Carnivores of Southeast Alaska

1. • Limbs modified as flippers ……..……..…… 2
   • Limbs not modified as flippers …..... 6

2. • Hind flippers short and permanently pointing backward; external ear pinnae absent …..... 3
   • Hind flippers long and capable of rotation forward under the body; external ear pinnae present 4

3. • Size very large; snout prominent and especially so in males; check teeth simple and peg-like, incisors 4/4 …..... **Northern Elephant Seal, *Mirounga angustirostris***
   • Size smaller; snout not pendulous or prominent; cheek teeth with two roots and not peg-like, incisors 6/6 …..... **Harbor Seal, *Phoca vitulina***

4. • Thick covering of soft fur and disproportionally long hind flippers; cheek teeth 6/6 ... **Northern Fur Seal, *Callorhinus ursinus***
   • Short coat of rather coarse hair and relatively short hind flippers; cheek teeth 5/5 …..... 5

5. • Large with robust head and broad snout; pelage tan to blond; adult males lacking a prominently raised forehead; cheek teeth in unbroken row …..... **Steller's Sea Lion, *Eumetopias jubatus***
   • Substantially smaller with relatively longer, narrower snout; pelage dark brown to black; adult males with prominently raised forehead; cheek teeth with gap between second last and last upper tooth …..... **California Sea Lion, *Zalophus californianus***

6. • Claws retractable; fewer than 30 teeth …..... 7
   • Claws always visible; more than 30 teeth …..... 8

7. • Tail long (> 700 mm); 30 teeth …..... **Cougar, *Puma concolor***
   • Tail short (< 200 mm); 28 teeth …..... **Canadian Lynx, *Lynx canadensis***

8. • Five clawed toes on feet …..... 9
   • Rudimentary clawed toe on front foot, four toes on hind foot …..... 20

9. • Tail extremely short; weight 80 kg or greater …..... 10
   • Tail usually relatively long; weight less than 80 kg …..... 11

10. • Front claws longer than hind claws; forehead profile "dished" or concave; upper M2 longer than 31 mm .....… **Brown Bear, *Ursus arctos***
    • Front and hind claws about the same length; forehead gently sloped; upper M2 shorter than 31 mm …..... **Black Bear, *Ursus americanus***

11. • Banded bushy tail; 40 teeth; molars 2/2 …..... **Raccoon, *Procyon lotor***
    • Tail not banded; less than 40 teeth; molars 1/2 …..... 12

12. • Tail cylindrical, tapering from thick base; toes webbed …..... 13
    • Tail not tapering from thick base; toes not webbed …..... 14

13. • Tail about ¼ of total length; 32 teeth …..... **Sea Otter, *Enhydra lutris***
    • Tail more than ¼ of total length; 36 teeth ..... **N.A. River Otter, *Lontra canadensis***

14. • Premolars 4/4 …..... 15
    • Premolars fewer than 4/4 …..... 17

15. • Tail more than 290 mm …..... **Fisher, *Martes pennanti***
• Tail less than 290 mm ….....… 16

16. • Skull foreshortened and rounded; rostrum short and broad; palate short; auditory bullae small; teeth large and crowded (see Figure 11, p. 90) .....… **Pacific Marten, *Martes caurina***
• Skull elongated; rostrum relatively long and narrow; palate long; bullae large; teeth small, less crowded …..... **American Marten, *Martes americana***

17. • Weight more than 6 kg; two pale stripes along flanks; premolars 4/3 ... **Wolverine, *Gulo gulo***
• Weight less than 2 kg; no stripes along flanks; premolars 3/3 ….....… 18

18. • Length of upper tooth row more than 20 mm .....… **American Mink, *Neovison vison***
• Length of upper tooth row less than 17 mm ….....… 19

19. • Weight more than 50 g; tail long with black tip ….... **Ermine, *Mustela erminea***
• Weight less than 50 g; tail short without black tip….....… **Least Weasel, *Mustela nivalis***

20. • Weight less than 7 kg; skull less than 150 mm long .....… **Red Fox, *Vulpes vulpes***
• Weight more than 7 kg; skull length greater than 160 mm ….....… 21

21. • Hind foot greater than 200 mm; nose pad greater than 25 mm wide; skull length greater than 210 mm; lower M1 greater than 25 mm …..... **Wolf, *Canis lupus***
• Hind foot less than 200 mm; nose pad less than 25 mm wide; skull length less than 190 mm; lower M1 less than 25 mm …..... **Coyote, *Canis latrans***

Order **Carnivora** Bowdich, 1821
Family **Felidae** G. Fischer, 1817

Canadian Lynx
Lynx canadensis Kerr, 1792

OTHER COMMON NAMES. Lynx.

TAXONOMY. Werdelin (1981) concluded that Eurasian and North American lynx are distinct species, whereas Kurtèn and Rausch (1959) and Tumlison (1987) considered them conspecific. Hall (1981) recognized one subspecies across mainland North America, while van Zyll de Jong (1975) and Werdelin (1981) considered the designation of subspecies unwarranted.

Lynx canadensis canadensis

Original Description. 1792. Lynx canadensis Kerr, The animal kingdom …, 1:157.

Type Locality. Eastern Canada [= Quebec].

Type Specimen. Not known to exist.

Range. Northern North America, excluding Newfoundland.

REVISIONS AND REVIEWS. McCord and Cardoza (1982), Tumlinson (1987, 1999).

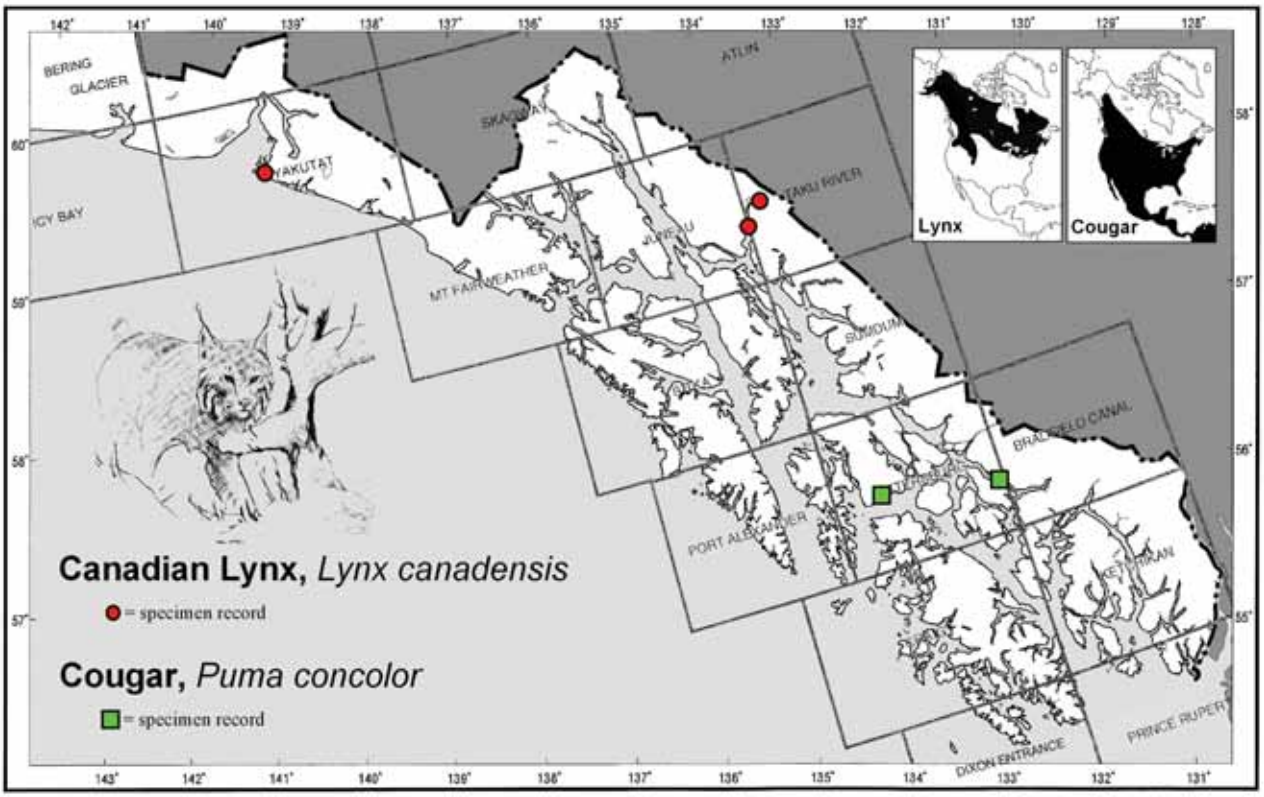
STATUS. CITES-Appendix II.

DISTRIBUTION. The Canadian Lynx is an uncommon resident on the northern mainland of Southeast Alaska and an occasional visitor to major river corridors elsewhere along the mainland. Bailey (1920) reported carcasses of two lynx killed on Douglas Island (near the mainland), apparently the only island record.

Preserved specimens from the region are limited to Yakutat and Taku Inlet. Home (1973) reported a number of lynx sightings at Glacier

Bay and a skeleton found on Casement Glacier in 1967. Furbearer harvest reports (ADFG, 2004) indicated two lynx trapped near Gustavus, four near Yakutat, and 18 in the Chilkat Valley between 2000-2003. Individuals have been observed on the mainland near Hyder (R. Thomas, pers. comm., 1990), Chickamin River (1 trapped and another seen by SOM in 1973-74), Grant Creek and the Unuk River (R. Bishop, pers. comm., 1993), and the Taku River (J. Owens, pers. comm., 1994).

SPECIMENS. **TAKU RIVER QUAD:** 58.5176, -133.8414, Taku River (1 MVZ); Taku Inlet (1 USNM). **YAKUTAT QUAD:** 59.5469, -139.7272, vicinity of Yakutat (1 MVZ).



Cougar
Puma concolor (Linnaeus, 1771)

OTHER COMMON NAMES. Puma, Mountain Lion.

TAXONOMY. Placed in *Puma* by Pocock (1917), Weigel (1961), and Kratochvil (1982). The subspecies of the Cougar in Southeast Alaska is unknown. The race, *P. c. missoulensis* (as *Felis c. missoulensis* in Hall, 1981), would be the most proximal.

Mitochondrial DNA analysis by Culver et al. (2000) revealed little genetic variation across all regions of North America; they suggest only one subspecies should be recognized.

REVISIONS AND REVIEWS. Currier (1983).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Not at risk. Cougar populations in many western states and Canada have been increasing in recent years (Woodford, 2004).

DISTRIBUTION. This large cat is widely distributed from Canada to South America. Cougars may be expanding their range into Alaska, a proposition supported by a growing number of sightings, a photograph, and two recent specimens. Most are confined to the southeast region of the state.

The occurrence of Cougars in Alaska was first substantiated by the collection of a male on the east side of Wrangell Island in 1989 (UAM 18551; MacDonald and Cook, 1996).

On 20 April 1998, a lone Cougar was observed and photographed at Myers Chuck,

Cleveland Peninsula (photo on file), and in December of 1998, a trapper captured a male lion in a wolf snare at Totem Bay, Kupreanof Island (UAM 50544).

In recent years there have been a number of unconfirmed reports of Cougars in the region (as well as several unsubstantiated sightings farther north in east-central Alaska). These include Skagway (in 2002); Haines (dates unknown); Gustavus (1958); Cleveland Peninsula (1998, 2003); Twelve-mile Arm, Prince of Wales Island (summer 1992); Mitkof Island (1999); Snettisham (2000); and Revillagigedo Island (2004) (MacDonald and Cook, 1996; Home, 1973; Woodford, 2004; L. Carson, pers. comm., 1992; M. Brown, pers. comm., 1992; J. Hunley, pers. comm., 2003; Ketchikan Daily News, 17 August 2004).

SPECIMENS. **PETERSBURG QUAD:** 56.4167, -132.2500, Wrangell Island, Blake Channel opposite Aaron Creek (1 UAM); 56.4689, -133.4308, Kupreanof Island, Little Totem Bay (1 UAM).

Family **Canidae** Fischer, 1817

Coyote
Canis latrans Say, 1823

OTHER COMMON NAMES. Brush wolf.

TAXONOMY. The subspecies of Coyote that occurs in Southeast Alaska is unknown. According to Hall (1981), *C. l. incolatus* is the logical candidate.

Canis latrans incolatus

Original Description. 1934. *Canis latrans incolatus* Hall, Univ. California Publ. Zool., 40:369, November 5.

Type Locality. Isaacs Lake, 3000 ft., Bowron Lake region, British Columbia.

Type Specimen. MVZ 43898.

Range. Alaska and northwestern Canada.

REVISIONS AND REVIEWS. Bekoff (1977).

DISTRIBUTION. The Coyote occurs infrequently in the river valleys and adjacent coastlines of the southern mainland of Southeast Alaska and is a resident of the mainland from the Taku River northward. Home (1973) reported Coyotes present throughout the year in the Glacier Bay area including a den in 1972. Barten (2004c) indicated that Coyotes were becoming common near Gustavus and in the foothills of the Chilkat Mountains. The only report of this species in the Alexander Archipelago is that of an adult female trapped on Mitkof Island near Dry Straits in the winter of 1983-84 (MacDonald and Cook, 1996).

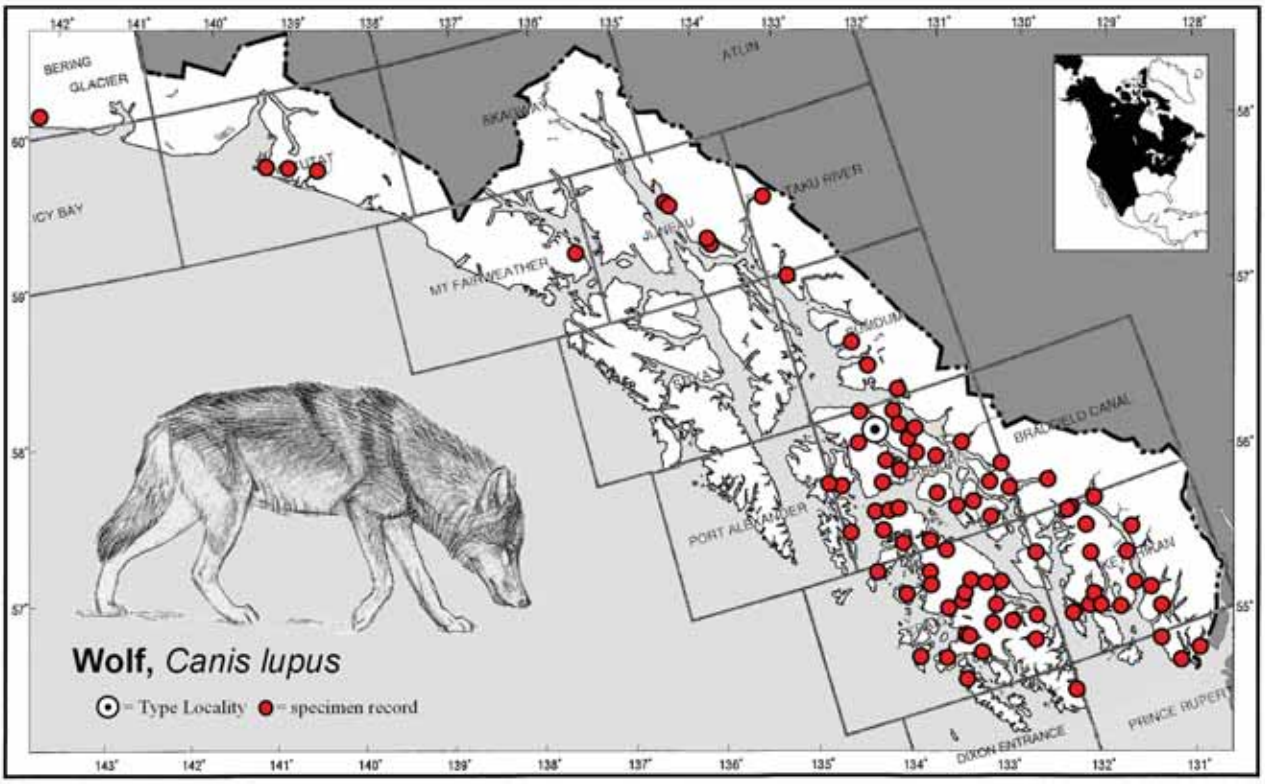
The Coyote is relatively new to the region, first arriving around 1900, and reaching peak numbers in the 1940s. Loyal Johnson (pers. comm., 1994) found them "very common" to "abundant" from the Yakutat area, northward during the mid-1960s. Coyotes have been reported in several areas near the Alaska border in British Columbia, including registered traplines on the Whiting River, lower Iskut River, and near Stewart at the head of Portland Canal (MacLeod, 1950).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (1 UAM, I LACM).

Wolf
Canis lupus Linnaeus, 1758

OTHER COMMON NAMES. Gray Wolf, Timber Wolf, Alexander Archipelago Wolf.

TAXONOMY. The subspecies *C. l. ligoni* is restricted to Southeast Alaska (Goldman, 1937; Hall, 1981; Pederson, 1982). Molecular studies based on nuclear microsatellites (Weckworth et al., 2005) and sequences of the mitochondrial control region (Weckworth et al., submitted) are consistent with this designation as they indicate little exchange between coastal populations of Wolves and those found east of the Coast



Range. The relationship of wolves along the British Columbia coast and those of south-coastal Alaska needs to be examined.

Canis lupus ligoni

Original Description. 1937. *Canis lupus ligoni* Goldman, Journal of Mammalogy, 18:39, February 11.

Type Locality. Head Duncan Canal, Kurpeanof Island, Alaska.

Type Specimen. USNM 243323.

Range. Southeast Alaska.

REVISIONS AND REVIEWS. Mech (1974), Suring et al. (1992), Person et al. (1996), Weckworth et al. (2005), Schoen (2007), Weckworth et al. (submitted).

STATUS. CITES-Appendix II. *C. l. ligoni* was considered a subspecies of concern by West (1991) and Suring et al. (1992). The Wolf is a Management Indicator Species for the Tongass National Forest (Sidle and Suring, 1986; Kiester and Eckhardt, 1994). Southeast Alaska populations harbor a substantial portion of the documented genetic variation in North American wolves (Weckworth et al., submitted). Like other insular species in the region, Wolf populations should be carefully monitored. Habitat fragmentation, increased access through road construction, trapping, introductions of pathogens (e. g., canine distemper) or exotic species may impact this species.

DISTRIBUTION. Wolves occur throughout the mainland of Southeast Alaska and on islands in the Alexander Archipelago south of Frederick Sound, excluding Coronation, Forrester, and the smaller, more isolated islands without an adequate prey base. There are no substantiated records from any of the islands north of Frederick Sound, although there have been several sightings of this animal on Admiralty Island in recent years. Specimens from the Alexander Archipelago include Annette, Baker, Conclusion, Dall, Duck, Etolin, Grief, Heceta, Keene, Kosciusko, Kuiu, Kupreanof, Mitkof, Prince of Wales, Revillagigedo, Suemez, Thorne, Woewodski, Wrangell, and Zarembo islands.

Wolves were introduced experimentally to Coronation Island in 1960 and 1963; none remained there by the early 1970s (Klein, 1996).

No remains of *C. lupus* have been recovered from cave deposits excavated in Southeast Alaska (Heaton and Grady, 2003).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (1 CAS). **BRADFIELD CANAL QUAD:** 56.1917, -131.6000, Duck Island, Bradfield Canal (1 UAM). **CRAIG QUAD:** 55.3667, -133.6000, Baker Island, Port San Antonio (1 UAM); Dall Island, Sea Otter Sound (1 LACM); 55.7500, -133.4833, Heceta Island, Warm Chuck Inlet (4 UAM); 55.9500, -133.7986, Kosciusko Island (1 UAM); 55.2519, -132.2525, Prince of Wales Island, Sunny Cove (1

UAM); 55.2519, -132.2553, Prince of Wales Island, Sunny Cove (1 UAM); 55.2833, -132.9000, Prince of Wales Island (1 UAM); 55.3500, -133.6000, Prince of Wales Island (17 UAM); 55.3956, -132.4956, Prince of Wales Island, Polk Inlet (1 UAM); 55.4000, -133.0333, Prince of Wales Island, Doyle Bay (1 UAM); 55.4000, -133.1333, Prince of Wales Island, Trocadero Bay (1 UAM); 55.4000, -132.1000, Prince of Wales Island, Kasaan Bay (3 UAM); 55.4167, -132.4667, Prince of Wales Island, Polk Inlet (7 UAM); 55.4611, -132.6917, Prince of Wales Island, Harris River (1 UAM); 55.5167, -132.9833, Prince of Wales Island, Klawock Lake (2 UAM); 55.5667, -132.6333, Prince of Wales Island, Karta Lake (4 UAM); 55.5719, -132.5414, Prince of Wales Island, Karta Bay (4 UAM); 55.5833, -133.1667, Prince of Wales Island, Shinaku Inlet (2 UAM); 55.6000, -133.1167, Prince of Wales Island, North Entrance (1 UAM); 55.6292, -133.0042, Prince of Wales Island, N entrance of Big Salt Lake (1 UAM); 55.6319, -132.9075, Prince of Wales Island (1 UAM); 55.6833, -132.4500, Prince of Wales Island, Thorne Bay estuary (1 UAM); 55.6917, -132.8653, Prince of Wales Island, Control Lake (2 UAM); 55.7000, -132.5833, Prince of Wales Island, Thorne River (1 UAM); 55.7500, -132.7500, Prince of Wales Island, Honker Divide (1 UAM); 55.8167, -133.1333, Prince of Wales Island, Staney Creek drainage (Twin Spurs) (1 UAM); 55.9411, -132.9736, Prince of Wales Island, Logjam Creek Rd (2 UAM); 55.9411, -132.9708, Prince of Wales Island, Hatchery Creek (3 UAM); 55.9500, -133.2167, Prince of Wales Island, Sarkar Lake, Prince of Wales Island (4 UAM); Prince of Wales Island, Karta Bay (3 UAM); Prince of Wales Island, Tokeen (2 UAM); Prince of Wales Island, Kasaan Bay (1 UAM); Prince of Wales Island, Lancaster Bay (Cove) (1 UAM); Prince of Wales Island, Kitkun Cove (Bay) (1 UAM); Prince of Wales Island, Twin Spur (4 UAM); Prince of Wales Island, Control Lake (1 UAM); Prince of Wales Island, Shinaku Inlet (2 UAM); Prince of Wales Island, northern Prince of Wales (1 UAM); Prince of Wales Island, south Prince of Wales Island (11 UAM); Prince of Wales Island, SE Prince of Wales Island (1 UAM); 55.3000, -133.3000, Suemez Island, Port Refugio (3 UAM); 55.7500, -132.0000, Cleveland Peninsula (1 UAM). **DIXON ENTRANCE QUAD:** 54.8542, -131.9667, Prince of Wales Island, Kendrick Bay (1 UAM); 54.8917, -132.0542, Prince of Wales Island, W arm of Kendrick Bay (1 UAM). **JUNEAU QUAD:** 58.2028, -134.1458, Point Bishop (2 UAM); 58.2500, -134.1667, Juneau (1 UAM); 58.6472, -134.9083, Cowee Creek (1 UAM); 58.6667, -134.9333, Echo Cove (1 UAM); 58.7167, -135.0000, Berners Bay (1 UAM). **KETCHIKAN QUAD:** Annette Island (1 UAM); 55.2167, -131.2667, Revillagigedo Island, Lucky Cove (1 UAM); 55.2333, -131.3500, Revillagigedo Island, Thorne Arm (4 UAM); 55.2833, -131.5000, Revillagigedo Island, Carroll Inlet (2 UAM); 55.3167, -131.0000, Revillagigedo Island, Princess Bay (2 UAM); 55.3333, -131.5000, Revillagigedo Island, George Inlet (9 UAM); 55.3833, -131.5083, Revillagigedo Island, Silvis Lake, George Inlet (1 UAM); 55.4161, -131.4814, Revillagigedo Island, George Inlet (1 UAM); 55.4208, -131.5208, Revillagigedo Island, Mahoney Lake (3 UAM); 55.5000, -130.9833, Revillagigedo Island, Ella Bay (2 UAM); 55.5833, -131.3333, Revillagigedo Islan (4 UAM); 55.6500, -131.3500, Revillagigedo Island, Carroll Creek (1 UAM); 55.8167, -131.3500, Revillagigedo Island, Orchard Lake (2 UAM); 55.9333, -131.3833, Revillagigedo Island, Cow Creek (1 UAM); 55.9500, -131.5000, Revillagigedo Island, Curlew Point (1 UAM); Revillagigedo Island, SE Revillagigedo Island (1 UAM); Revillagigedo Island, southern part of island (1 UAM); Revillagigedo Island (1 UAM); 55.0667, -131.0167, Boca de Quadro Passage (2 UAM); 55.1708, -130.8203, Badger Bay (2 UAM); 55.3167, -130.9000, Smeaton Bay (10 UAM); 55.3333, -131.6333333 (1 UAM); 55.7500, -132.0000, Bailey Bay; Cleveland Peninsula (2 UAM); 55.7833, -130.9667, Chickamin River (1 UAM); 55.9667, -131.1833, Fitzgibbon Cove (1 UAM); 55.9833, -131.4000, Anchor Pass (1 UAM); south Behm Canal (mainland) (1 UAM); Helm Bay (north Behm Canal); Cleveland Penninsula (1 UAM); Anchor Pass (north Behm Canal) (1 UAM); Winstanley Harbor (south Behm Canal) (2 UAM); N Behm Canal (1 UAM); Helm Bay (1 UAM); Rudyerd Bay (2 UAM); Anchor Pass (1 UAM); Behm Canal (2 UAM). **MT. FAIRWEATHER QUAD:** 58.5000, -136.1667, Berg Bay (1 UAM). **PETERSBURG QUAD:** Conclusion Island (1 USNM); 56.1000, -132.3500, Etolin Island (1 UAM); 56.1833, -132.7167, Etolin Island, Steamer Bay (4 UAM); 56.2333, -132.3833, Etolin Island, Anita Bay (1 UAM); Etolin Island (1 UAM); Etolin Island, King Geo Cove (1 UAM); 56.6167, -133.0667, Grief Island, southwest coast of Kupreanof Island (1 UAM); 56.6000, -132.9833, Keene Island (1 UAM); 56.0833, -133.4167, Kosciusko Island, Devil Fish Bay (1 UAM); 56.2667, -133.8833, Kuiu Island, Port Beauclerc (2 UAM); 56.5500, -133.8667, Kuiu Island, Seclusion Harbor (1 UAM); 55.7500, -133.5000, Kupreanof Island, Pete Creek (7 UAM); 56.4667, -133.2833, Kupreanof Island, Douglas Bay (1 UAM); 56.4667, -133.3833, Kupreanof Island, Totem Bay (1 UAM); 56.5000, -133.0500, Kupreanof Island, lower Duncan Canal (2 UAM); 56.5167, -133.1000, Kupreanof Island, Kah Sheets Bay (12 UAM); 56.5167, -132.9167, Kupreanof Island, Prolewy Point; Wrangell Narrows (1 UAM); 56.5833, -133.1000, Kupreanof Island, south Little Duncan Bay (1 UAM); 56.6000, -133.0167, Kupreanof Island (1 UAM); 56.6333, -133.2500, Kupreanof Island, Castle River (4 UAM); 56.6333, -132.9333, Kupreanof Island, Colorado Creek (1 UAM); 56.7250, -132.9583, Kupreanof Island, near Tonka (1 UAM); 56.7333, -132.9500, Kupreanof Island, Mountain Point (1 UAM); 56.7500, -133.5000, Kupreanof Island, Beecher Pass (8 UAM); 56.7500, -133.2500, Kupreanof Island, Indian Point (1 UAM); 56.7833, -133.4833, Kupreanof Island (2 UAM); 56.8000, -133.1000, Kupreanof Island, Lindenburg Penninsula (1 UAM); 56.8125, -132.9917, Kupreanof Island, Petersburg Creek (2 UAM); 56.8736, -133.0133, Kupreanof Island, Colp Lake (2 UAM);57.0000, -133.3333, Kupreanof Island, Portage Bay (1 UAM); 56.5167, -132.0833, Kupreanof Island, Kah Sheets (3 UAM); Kupreanof Island, across Papke's Landing (1 UAM); Kupreanof Island, Big Creek (1 UAM); Kupreanof Island (20 UAM); Kupreanof Island, Hogan's Hole (1 UAM); Kupreanof Island, across from Fur Farm (1 UAM); Kupreanof Island, Beecher Bay (1 UAM); Kupreanof Island, Portage Bay (2 UAM); Kupreanof Island, Ohmer Slough (2 UAM); Kupreanof Island, Petersburg Mountain (1 UAM); Kupreanof Island, Little Duncan (1 UAM); Kupreanof Island, Point Mitchell (1 UAM); Kupreanof Island, Duncan Canal (1 UAM); 56.5000, -132.9333, Mitkof Island, Alexander Bay (1 UAM); 56.5167, -132.7000, Mitkof Island, Blind Slough (3 UAM); 56.6139, -132.8208, Mitkof Island, Blind River (1 UAM); 56.6333, -132.9167, Mitkof Island, Anchor Point (9 UAM); 56.6667, -132.8333, Mitkof Island (8 UAM); 56.6750, -132.9319, Mitkof Island, Papkes Landing (1 UAM); 56.7500, -133.0000, Mitkof Island, Scow bay (1 UAM); 56.7833, -132.8167, Mitkof Island, Point Frederick (1 UAM); 56.8125, -132.9917, Mitkof Island, Petersburg Creek (1 UAM); Mitkof Island, Hood Point, Beecher Pass (1 UAM); Mitkof Island (3 UAM); Mitkof Island, Dry Straights (1 UAM); Mitkof Island (1 UAM); 55.3583, -133.6042, Prince of Wales Island, North POW Island (1 UAM); 55.5333, -132.5167, Prince of Wales Island, Twelvemile Arm (1 UAM);56.0000, -133.2167, Prince of Wales Island, N Prince of Wales Island (1 UAM); 56.0113, -132.9609, Prince of Wales Island, Barnes Lake (4 UAM); 56.0692, -133.0803, Prince of Wales Island, Whale Passage (1 UAM); 56.1833, -133.5167, Prince of Wales Island, Calder Bay (2 UAM); 56.2333, -133.5833, Prince of Wales Island, Calder Mountain (1 UAM); 56.3333, -133.3000, Prince of Wales Island, Red Bay (11 UAM); 56.3333, -133.5333, Prince of Wales Island, Alder Creek (1 UAM); 56.3333, -133.4333, Prince of Wales Island, Buster Creek (1 UAM); 56.3542, -133.6208, Prince of Wales Island, Point Baker (1 UAM); Prince of Wales Island, Whale Passage (4 UAM); Prince of Wales Island, Prince of Wales or Kosciusko Island (1 UAM); Prince of Wales Island, N Prince of Wales Island (2 UAM); Prince of Wales Island, Snakey Lakes [sic] (2 UAM); Prince of Wales Island (5 UAM); 56.0833, -133.0333, Thorne Island (1 UAM); 56.5500, -133.0000, Woewodski Island, Alexander Bay (1 UAM); 56.5667, -133.0000, Woewodski Island, Alex Bay (10 UAM); Woewodski Island (1 UAM); 56.1833, -132.5000, Wrangell Island (2 UAM); 56.1833, -132.1500, Wrangell Island, Thoms Creek (1 UAM); 56.1833, -132.0000, Wrangell Island, Fools Inlet (1 UAM); 56.2667, -132.2000, Wrangell Island, Zimovia Strait (2 UAM); 56.2833, -132.1667, Wrangell Island (2 UAM); Wrangell Island, north end (1 UAM); 56.3333, -132.8333, Zarembo Island (1 UAM); 55.9667, -132.8833, Point Agassiz (1 UAM); 56.0667, -133.0833, Whale Passage (2 UAM); 56.3833, -132.1500, Madan Bay (1 UAM); 56.5333, -132.6000, Sumner Strait (2 UAM); 56.6333, -133.1000, Duncan Canal (1 UAM); 56.9333, -133.0000, Beecher Pass (2 UAM); 56.9667, -132.8833, Point Agassiz (6 UAM);57.0000, -132.9833, Thomas Bay (1 UAM); 57.4167, -133.2500, Port Houghton (1 UAM); Stikine Flats (2 UAM); Stikine River (3 UAM). **PORT ALEXANDER QUAD:** 56.5833, -134.0000, Kuiu Island (3 UAM). **PRINCE RUPERT QUAD:** 54.7667, -130.7833, Nakat (3 UAM); 54.7833, -130.6167,

`Nakat Inlet' (=Fillmore Inlet) (1 UAM); 54.8000, -130.6333, Willard Inlet (2 UAM); 54.9836, -130.9144, Very Inlet (3 UAM); Kirk Point (2 UAM). **SUMDUM QUAD:** Kupreanof Island, vicinity of Turnabout Island (1 UAM); 57.2500, -133.1667, Farragut Bay (5 UAM); Thomas Bay (1 UAM); Windham Bay (1 UAM). **TAKU RIVER QUAD:** Taku River (3 UAM). **YAKUTAT QUAD:** 59.4167, -139.0833, area between Situk R and Ahrnklin River (1 UAM); 59.5000, -139.4167, between Situk River and Ahrnklin River (1 UAM); 59.5167, -139.6667, Yakutat (1 UAM); Yakutat, Situk River (3 UAM). **SE REGION:** southern SE Alaska (8 UAM).

Arctic Fox
Vulpes lagopus (Linnaeus, 1758)

OTHER COMMON NAMES. Blue fox.

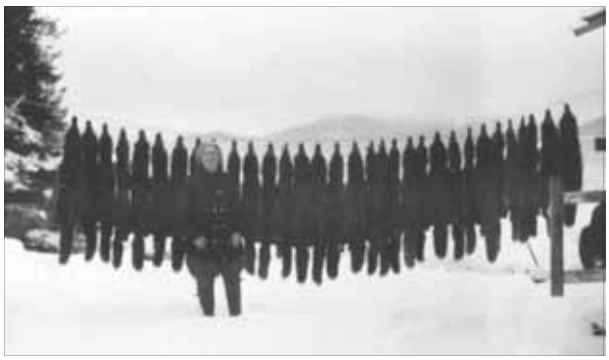
TAXONOMY. Youngman (1975), following Bobrinskii et al. (1965), considered *Alopex* a subgenus of *Vulpes*, a conclusion supported by the genetic studies of Geffen et al. (1992) and subsequently followed by Baker et al. (2003) and Wozencraft (2005). Perhaps all the farmed animals in Southeast Alaska were from *V. l. pribilofensis* stock.

REVISIONS AND REVIEWS. Youngman (1975), Nowak (1991), Geffen et al. (1992), Audet et al. (2002).

DISTRIBUTION. Arctic Foxes ("blue" phase from the Aleutians and Pribilof islands) were introduced to at least 182 islands in the Alexander Archipelago of Southeast Alaska between 1899 (starting at Sumdum Island) through 1929 (Bailey, 1993). The fur industry collapsed in the 1930s and no Arctic Foxes now remain in the region.

Fossil remains of Arctic Foxes that date from the last glacial maximum to earlier than 40,000 years ago have been recovered from a cave on Prince of Wales Island (Heaton and Grady, 2003).

SPECIMENS. **JUNEAU QUAD:** Sullivan Island (2 USNM). **PETERSBURG QUAD:** Mitkof Island, Petersburg Fur Farm (4 MVZ, 1 MSB).



Blue fox skins at Jim Yorkis' fox farm on Sumdum Island in 1935 (*courtesy of the Alaska State Library Trevor M. Davis Collection, PCA-97*).

Red Fox
Vulpes vulpes (Linnaeus, 1758)

OTHER COMMON NAMES. Cross Fox, Silver Fox.

TAXONOMY. The taxonomic relationship of Red Foxes in Southeast Alaska is not known. The subspecies, *V. v. abietorum*, is found in nearby British Columbia (Hall, 1981).

Vulpes vulpes abietorum

Original Description. 1900. *Vulpes alascensis abietorum* Merriam, Proc. Washington Acad. Sci., 2:669, December 28.

Type Locality. Stuart Lake, British Columbia.

Type Specimen. USNM 71197.

Range. Southern Yukon and Northwest Territories, Interior British Columbia (and probably adjacent coastal Southeast Alaska), and northern Alberta.

Remarks. Youngman (1975) found this race indistinguishable from *V. v. alascensis*.

REVISIONS AND REVIEWS. Larivière and Pasitschniak-Arts (1996).

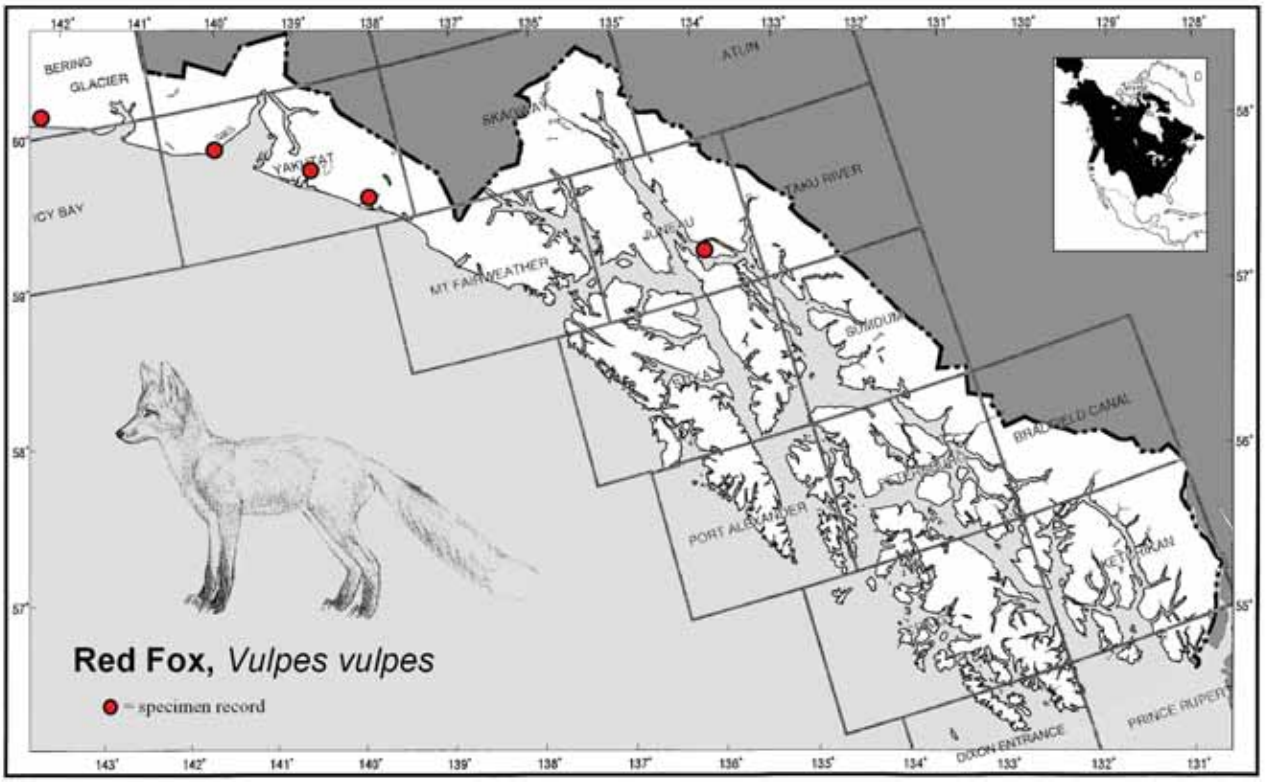
STATUS. IUCN-Least concern.

DISTRIBUTION. The Red Fox is an infrequent visitor to the major river valleys along the southern mainland of Southeast Alaska. Small numbers probably occur year-round farther north, particularly in the Haines area (ADFG, 1978), where they were once considered "fairly common" (MacDonald and Cook, 1996). The only record of a naturally occurring Red Fox on any island in the Alexander Archipelago is that of a male collected next to the mainland on Douglas Island on 12 December 1995 (UAM). There are no reports of Red Foxes being trapped anywhere in the region between 1997-2003 (ADFG, 2001, 2004).

Red Foxes introduced to the Alexander Archipelago for commercial harvest have been documented for Cleft, Dry, Kupreanof, Passage, and Sukoi Islands between 1894 and 1929 (Bailey, 1993). None are known to be successful; however, second-hand reports of single Red Fox sightings from the west coast of Chichagof Island and from northern Baranof Island "a number of years ago" (J. McClung, pers. comm., 1995) are intriguing. In addition, Allen Hasselborg, in his field notes (MVZ Archives) from Freshwater Bay, Chichagof Island, dated 1 December 1908, stated: "I had expected to get some marten but found there is none on Chichagof Island. There is a few foxes. They are said to be always black. About 20 have been caught at Freshwater Bay since the Indians remember more within the last 6 or 7 years." That native, or much more likely, introduced foxes may still persist on these islands cannot at this time be discounted.

The dentary and an upper canine of a Red Fox that dated to 10,050 yr B.P. was recovered from a cave on Prince of Wales Island (Heaton and Grady, 2003).

SPECIMENS. **BERING GLACIER QUAD:** Yakataga, Kaliakh (sic) River, Sunshine Point (1 CAS). **JUNEAU QUAD:** 58.2972, -134.4319, Douglas Island, Kowee Creek; near N end of Juneau road system (1 UAM). **YAKUTAT QUAD:** 59.1330, -138.4167, Dry Bay, Yakutat region (1 AMNH); 59.4241, -139.294, Anklin [=Ahmklin and Aantlen] River, Yakutat Bay region (1 MVZ); 59.6956, -140.3042, Point Manby, Yakutat Bay (1 MVZ).



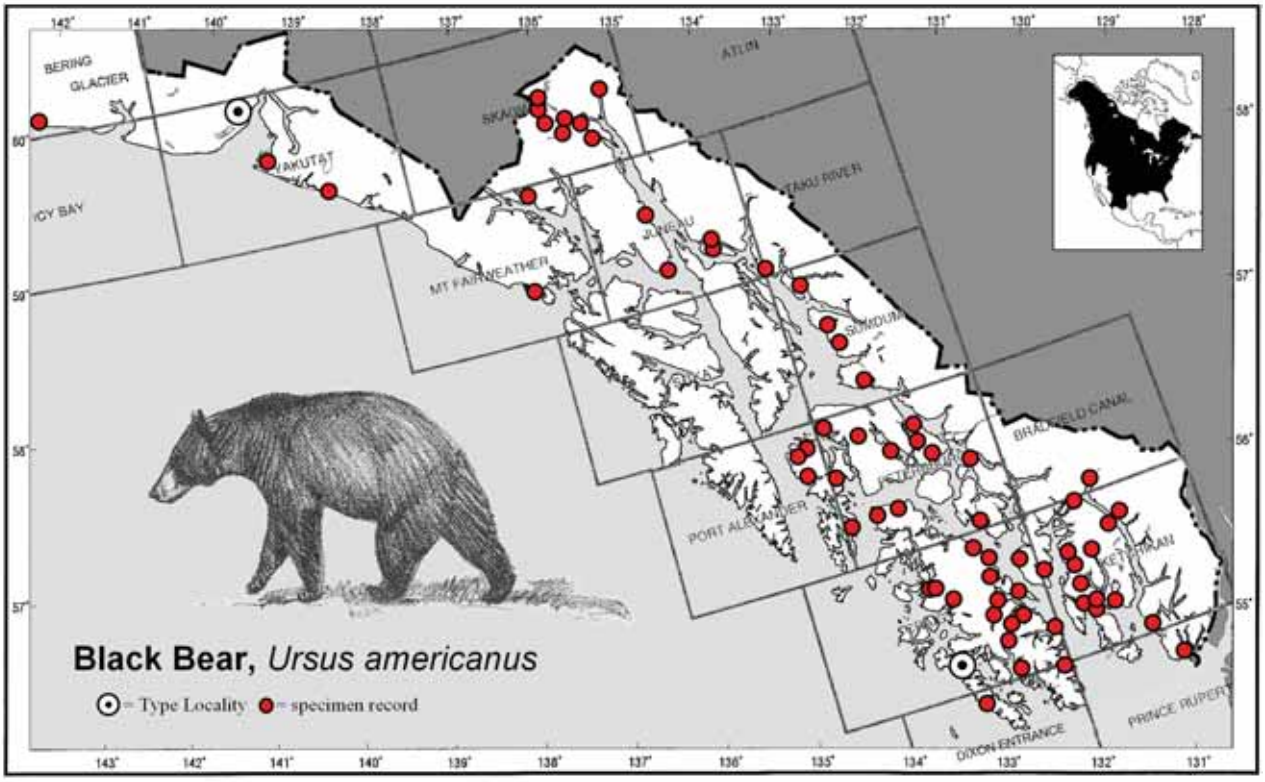
Family **Ursidae** Fischer, 1817

American Black Bear
Ursus americanus Pallas, 1780

OTHER COMMON NAMES. Black Bear, Cinnamon Bear, Dall Island Black Bear, Glacier Bear.

TAXONOMY. Hall (1981) recognized 16 subspecies of Black Bear, of which 2 occur in Southeast Alaska. The validity of some of these, particularly Pacific Coastal forms, is questionable (Nagorsen, 1990). In Hall's view, the subspecies *U. a. pugnax* occurs throughout the Alexander Archipelago and southern mainland, while *U. a. emmonsii*, the so called "Glacier Bear," inhabits the northern mainland from about Glacier Bay northward along the coast to Prince William Sound (*U. a. americanus*) and the Kenai Peninsula (*U. a. perniger*). Black Bears on the nearby Haida Gwaii (Queen Charlotte Islands) have long been included under the separate subspecies name, *U. a. charlotte.*

Two lineages (coastal and continental) exist based on examination of both mitochondrial sequences (Stone and Cook, 2000) and nuclear microsatellite variation (Peacock, 2004). The coastal lineage extends along the Pacific Coast from Kupreanof Island to northern California, while the continental lineage is more widespread occurring from central Alaska to the East Coast (Byun et al., 1997; Wooding and Ward, 1997; Stone and Cook, 2000). Each may have expanded into the region since the Holocene (Lessa et al., 2003), with contact between these lineages occurring along the mainland from the Stikine River north to Haines and on a few islands (Peacock, 2004). Recent discoveries of early postglacial black bear remains on nearby Haida Gwaii and Vancouver Island farther south (Nagorsen et al., 1995; Wigen, 2005) are supportive of a very early post-glacial pathway along the coast. That coastal bears may have a longer and more complex tenure in the region, however, is supported by discoveries in Southeast Alaska of pre- and post-glacial fossil remains of black bears from cave deposits on Prince of Wales, Coronation, and Dall islands (Heaton, 1995; Heaton and Grady, 1992, 1993, 2003).



Ursus americanus emmonsii

Original Description. 1895. [*Ursus americanus*] var. *emmonsii* Dall, Science, n.s., 2:87, July 26.

Type Locality. Based on specimens from Saint Elias Alps, near Yakutat Bay, Alaska.

Type Specimen. None designated.

Range. Glacier Bay region northward to Prince William Sound.

Ursus americanus pugnax

Original Description. 1911. *Ursus americanus pugnax* Swarth, Univ. California Publ. Zool., 7:141, January 12.

Type Locality. Rocky Bay, now Bobs Bay, Dall Island, Alaska.

Type Specimen. MVZ 8332.

Range. Southeast Alaska.

REVISIONS AND REVIEWS. Anderson (1945), Larivière (2001), Schoen and Peacock (2007).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Not at risk. The Black Bear is a Management Indicator Species for the Tongass National Forest (Kiester and Eckhardt, 1994; Sidle and Suring, 1986). Limited movement of Black Bears among islands suggests each insular population should be carefully managed, particularly given increased development, habitat conversion, and harvests by hunters in the region.

DISTRIBUTION. Black Bears can be found along the mainland coast of Southeast Alaska and on most of the islands in the Alexander Archipelago south of Frederick Sound. There are no reports of Black Bears on Annette, Duke, Mary, Warren, Coronation, or Forrester islands, or on any island north of Frederick Sound except Pleasant Island close to the mainland in Icy Strait (MacDonald and Cook, 1996; J. Moran, pers. comm., 2005). Kuiu Island supports the highest density of Black Bears documented in North America (Peacock, 2004).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (1 UAM). **BRADFIELD CANAL QUAD:** 56.0833, -131.0833, Unuk River (1 UAM). **CRAIG QUAD:** 55.2000, 133.2333, Dall Island, Rocky Bay, now Bobs Bay (1 MVZ); 55.7167, -133.1500, Prince of Wales Island, Staney Cove (1 UAM); 55.0333, -132.6000, Prince of Wales Island, Nutkwa (1 UAM); 55.0333, -132.0667, Prince of Wales Island, north arm Moira Sound (1 UAM); 55.2333, -132.5667, Prince of Wales Island, Josephine Lake (1 UAM); 55.2833, -132.0667, Prince of Wales Island, south arm Cholmondeley Sound (5 UAM); 55.3333, -132.5000, Prince of Wales Island, Dog Salmon Creek (1 UAM); 55.3956, -132.4956, Prince of Wales Island, Polk Inlet (1 UAM); 55.4167, -132.3667, Prince of Wales Island, McKenzie Inlet (1 UAM); 55.4333, -132.2667, Prince of Wales Island, Skowl Arm (1 UAM); 55.4333, -132.3500, Prince of Wales Island, Smith Cove (1 UAM); 55.4500, -132.6833, Prince of Wales Island, Harris River (1 UAM); 55.5056, -132.5500, Prince of Wales Island, 12 mile arm, Jarvis Island area (1 UAM); 55.5500, -132.2833, Prince of Wales Island, Lyman Anchorage (1 UAM); 55.5500, -132.5667, Prince of Wales Island, Karta River (1 UAM); 55.5625, -132.5750, Prince of Wales Island, Karta River (6 UAM); 55.6292, -133.0042, Prince of Wales Island, Big Salt Lake (2 UAM); 55.7089, -132.6131, Prince of Wales Island, Falls Creek (1 UAM); 55.7333, -133.2500, Prince of Wales Island, Shaheen Creek (1 UAM); 55.8000, -132.5000, Prince of Wales Island, Sal Creek (1 UAM); 55.8903, -132.6208, Prince of Wales Island, Ratz Creek (1 UAM); Prince of Wales Island (1 UAM); Prince of Wales Island, Harris River (1 UAM). **DIXON ENTRANCE QUAD:** 54.9333, -133.1500, Dall Island, Waterfall Bay, (1 UAM). **JUNEAU QUAD:** 58.2000, -135.0833, Couverdon Island (1 UAM); 58.0167, -133.9833, Stephens Passage, Limestone (1 UAM); 58.0500, -134.0333, Taku Harbor (1 UAM); 58.2917, -134.3767, Ebner Falls, Perserverance Trail (1 UAM); 58.3042, -134.4083, Juneau, Switzer Village (2 UAM); 58.3333, -134.6333, GMU 1C, UCU Minor Code 0701 (2 UAM); 58.5750, -135.1583, St. James Bay, Chilkat Peninsula (2 UAM); 58.8000, -134.9667, GMU 1C, UCU Minor Code 0901 (1 UAM); 58.9167, -136.5333, GMU 1C, UCU Minor Code 0202 (1 UAM); Juneau, milepost 16 Glacier Highway (1 UAM). **KETCHIKAN QUAD:** 55.2333, -131.3500, Revillagigedo Island, Thorne Arm (1 UAM); 55.2833, -131.5167, Revillagigedo Island, Carroll Inlet (4 UAM); 55.3333, -131.5000, Revillagigedo Island, George Inlet (1 UAM); 55.3333, -131.6333, Revillagigedo Island (11 UAM); 55.3833, -131.3278, Revillagigedo Island, Gnat Cove, Carroll Inlet (1 UAM); 55.4167, -131.6333, Revillagigedo Island, Brown Mountains (2 UAM); 55.4306, -131.2547, Revillagigedo Island, Shoal Cove (5 UAM); 55.4875, -131.5833, Revillagigedo Island, Lake Harriet Hunt (4 UAM); 55.5667, -131.6500, Revillagigedo Island, Long Arm (1 UAM); 55.5667, -131.6833, Revillagigedo Island, Moser Bay (1 UAM); 55.5825, -131.3517, Revillagigedo Island, head of Carroll Inlet (2 UAM); 55.5833, -131.3333, Revillagigedo Island, N tip of island (3 UAM); 55.5833, -131.5333, Revillagigedo Island, Heckman Lake (1 UAM); 55.6500, -131.3500, Revillagigedo Island, Carroll Creek (1 UAM); 55.7000, -131.6500, Revillagigedo Island, Traitors Cove (3 UAM); 55.7736, -131.0417, Revillagigedo Island, Portage Cove (1 UAM); Revillagigedo Island, mile 13 north Tongass (1 UAM); 55.0556, -130.9917, Bull Head Cove (1 UAM); 55.6000, -131.9167, Helm Bay (2 UAM); 55.6167, -131.9500, Helm Bay (1 UAM); 55.6167, -131.8833, Wadding Cove (1 UAM); 55.7456, -132.2647, Meyers Chuck (1 UAM); 55.7833, -130.9667, Chickamin River (1 UAM); 55.9833, -131.4000, Anchor Pass (2 UAM); Boca de Quadra, Kah Shakes (1 UAM). **MT. FAIRWEATHER QUAD:** 58.2833, -136.8667, GMU 01C, UCU Minor Code 0504 (2 UAM). **PETERSBURG QUAD:** 56.6667, -133.1667, Castle Island, Duncan Canal, east Castle Island (1 UAM); 56.0667, -132.4667, Etolin Island, Burnett Inlet (1 UAM); Kosciusko Island, Shakan (1 USNM); 56.2667, -133.8833, Kuiu Island, Port Beauclerc (1 UAM); Kuiu Island, Saginaw Bay (4 USNM); Kuiu Island, Three Mile Arm (1 USNM); 56.7625, -134.3831, Kupreanof Island, Big John Bay (1 UAM); 56.7930, -133.4970, Kupreanof Island (2 UAM); 56.9667, -133.9333, Kupreanof Island, Kake (5 UAM); 56.5167, -132.7000, Mitkof Island, Blind Slough (1 UAM); 56.5431, -132.7789, Mitkof Island, Woodpecker Cove (1 UAM); 56.6667, -132.8333, Mitkof Island, Olsen log dump (1 UAM); 56.7944, -132.8222, Mitkof Island, Frederick Point (1 UAM); Mitkof Island, Magill's trailer park in the Petersburg city limits (2 UAM); 56.1744, -133.3692, Prince of Wales Island, Turn Creek, El Capitan area (1 UAM); 56.1833, -133.3000, Prince of Wales Island, SE corner of El Captain Peak (1 UAM); 56.3000, -133.5667, Prince of Wales Island (1 UAM); 56.3333, -133.3000, Prince of Wales Island, Red Bay (2 UAM); 56.4667, -132.3778, Wrangell Island, Wrangell Dump (1 UAM). **PORT ALEXANDER QUAD:** Kuiu Island, head of Security Bay (1 UAM). **PRINCE RUPERT QUAD:** 54.8000, -130.7333, Nakat Inlet (1 UAM). **SKAGWAY QUAD:** 59.1000, -135.5417, GMU 1D, UCU Minor Code 0202 (1 UAM); 59.2250, -135.9000, GMU 1D, UCU Minor Code 0204 (2 UAM); 59.2667, -135.6833, 8 miles up Takhin Valley, Takhinsha (1 UAM); 59.2833, -136.1833, Tsirku, GMU 1D, UCU Minor Code 0207 (2 UAM); 59.3250, -135.9000, GMU 1D, UCU Minor Code 0206 (1 UAM); 59.3500, -136.7500, Chilkat River, Tukgahgo Mountain, GMU 1D, UCU Minor Code 0210 (8 UAM); 59.3500, -136.2667, 16.75 mile

Haines Hwy mountain side, GMU 1D, UCU Minor Code 0210 (1 UAM); 59.4000, -136.2667, GMU 1D, UCU Minor Code 0209 (3 UAM); 59.4500, -135.3000, Skagway (1 UAM); 59.4667, -136.1750, GMU 1D, UCU Minor Code 0301 (1 UAM); 59.4667, -136.7000, Chilkoot Lake, GMU 1D, UCU Minor Code 0501 (5 UAM); 59.5417, -136.1667, Kelsal River, bait station 21281, GMU 1D, UCU Minor Code 0302 (6 UAM). **SUMDUM QUAD:** Kupreanof Island, Big Creek (1 UAM); 57.8542, -133.6167, Holkam Bay, William's Cove (1 UAM); 57.1000, -133.2333, Farragut Bay (2 UAM); 57.4667, -133.4333, GMU 1C, UCU Minor Code 2608 (1 UAM); 57.5583, -133.5250, head of Windham Bay (2 UAM). **TAKU RIVER QUAD:** 58.0417, -133.9167, GMU 1C, UCU Minor Code 2303 (1 UAM). **YAKUTAT QUAD:** 59.2833, -139.0500, Yakutat, Akwe River (1 UAM); 59.5500, -139.7333, Yakutat, garbage dump (1 UAM).

Brown Bear
Ursus arctos Linnaeus, 1758

OTHER COMMON NAMES. Admiralty Island Crested Bear, Admiralty Island Grizzly, Alsek Grizzly, Dall Brown Bear, Glacier Bay Grizzly, Grizzly Bear, Island Grizzly, Lynn Canal Grizzly, Shiras Brown Bear, Sitka Brown Bear, Sitka Grizzly, Strange Bear, Townsend Bear, Yakutat Grizzly.

TAXONOMY. Rausch (1963) included all of the 13 species proposed for Southeast Alaska Brown Bears by Merriam (1918) under the trinomial, *U. a. horribilis.* Hall (1984) recognized three subspecies for the Southeast Alaska region.

Studies of mitochondrial DNA variation (Cronin et al., 1991; Talbot and Shields, 1996) and nuclear microsatellite variation (Paetkau et al., 1998) suggested limited exchange of female Brown Bears between islands (Admiralty, Baranof, and Chichagof) and the mainland; however, movement of male Brown Bears was detected (Paetkau et al., 1998). Leonard et al. (2000) examined ancient DNA recovered from permafrost preserved fossils and found the distinctive insular mitochondrial lineage now known only from the northern islands of the Alexander Archipelago was more extensively distributed during the late Pleistocene (interior Yukon Territory).

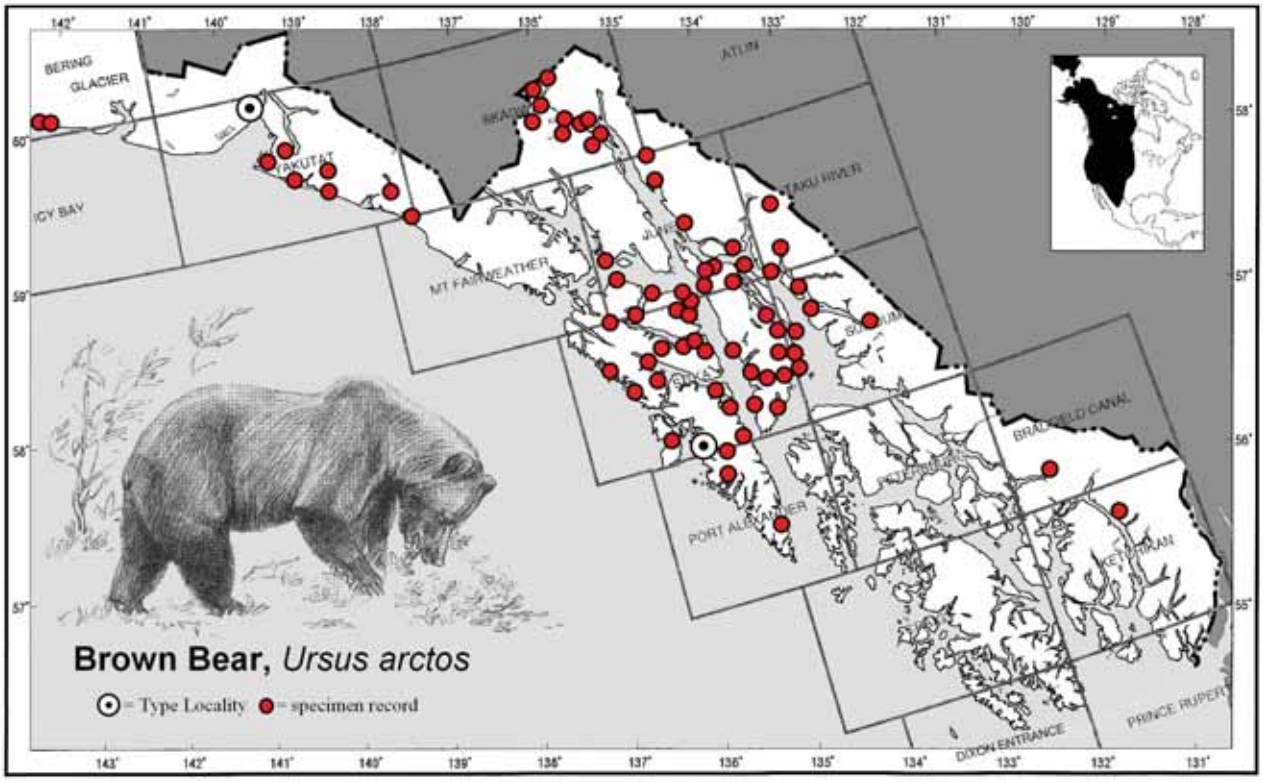
Ursus arctos dalli

Original Description. 1896. *Ursus dalli* Merriam, Proc. Biol. Soc. Washington, 10:71, April 13.

Type Locality. Yakutat Bay (NW side), Alaska.

Type Specimen. USNM 75048.

Range. Northern mainland of Southeast Alaska, from Yakutat area south to about Glacier Bay.



Remarks. Includes *nortoni, townsendi*, and *orgiloides*. Paetkau et al. (1998) found the Brown Bears of coastal Alaska genetically indistinct from interior populations, and suggested the designation *U. a. dalli* be dropped in favor of *U. a. horribilis*.

Ursus arctos sitkensis

Original Description. 1896. *Ursus sitkensis* Merriam, Proc. Biol. Soc. Washington, 10:73, April 13.

Type Locality. Near Sitka, Alaska.

Type Specimen. USNM 187891.

Range. Alexander Archipelago and northern mainland of Southeast Alaska.

Remarks. Includes *eulophus, eltonclarki, orgilos, caurinus, shirasi, insularis, neglectus*, and *mirabilis*.

Ursus arctos stikeenensis

Original Description. 1914. *Ursus stikeenensis* Merriam, Proc. Biol. Soc. Washington, 27:178, August 13.

Type Locality. Tatletuey Lake, near head Skeena River, northern British Columbia.

Type Specimen. USNM 202794.

Range. Northern and coastal British Columbia and adjacent southern mainland of Southeast Alaska.

Remarks. Includes *tahltanicus, pervagor, chelan, hoots, kwakiutl, warburtoni, chelidonias, atnarko*, and *crassodon*.

REVISIONS AND REVIEWS. Pasitschniak-Arts (1993), Schoen and Gende (2007).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Special concern. Suring et al. (1992) considered the Brown Bear a species of concern in Southeast Alaska. It is a Management Indicator Species for the Tongass National Forest (Kiester and Eckhardt, 1994; Sidle and Suring, 1986).

DISTRIBUTION. Brown Bears are found along the entire coastal mainland of Southeast Alaska (especially along the major river systems), and on most of the islands of the Alexander Archipelago north of Frederick Sound (MacDonald and Cook, 1996). Brown Bears are occasionally seen, but have not become established, on nearshore islands south of Frederick Sound, specifically Etolin, Mitkof, Revillagigedo, and Wrangell islands (MacDonald and Cook, 1996).

Fossil remains of *Ursus arctos* in limestone caves on Prince of Wales Island range in age from middle Wisconsin (35,365 ± 800 yr B.P.) to early Holocene (Heaton, 1995; Heaton and Grady, 2003). Brown Bear (and Black Bear) remains have also been found in cave deposits on Dall and Coronation islands (Heaton and Grady, 2003). These islands are south of Frederick Sound, where today only Black Bears occur. On nearby Haida Gwaii, Brown Bear remains have recently been recovered from glacial and postglacial deposits (Wigen, 2005).

SPECIMENS. **BERING GLACIER QUAD:** Yakataga area (5 UAM). **BRADFIELD CANAL QUAD:** 56.2250, -131.5125, Bradfield Canal, Bradfield River Flats (1 UAM); 56.2250, -131.5125, Bradfield River, Mt. Tyee, Cleveland Peninsula (2 UAM). **JUNEAU QUAD:** 58.0833, -134.7667, Admiralty Island, Hawk Inlet (5 UAM); 58.1167, -134.1667, Admiralty Island, Doty Cove (1 UAM); 58.1500, -134.6833, Admiralty Island, Fowler Creek (1 UAM); 58.1833, -134.5500, Admiralty Island, Point Young (1 UAM);58.0000, -135.0000, Chichagof Island, between Whitestone Harbor and Freshwater Bay (1 UAM); 58.0333, -135.6333, Chichagof Island, Neka Bay (1 UAM); 58.0569, -135.0958, Chichagof Island, Suntaheen Creek (1 UAM); 58.0667, -135.0667, Chichagof Island, Whitestone Harbor, Whitestone Log Camp (1 UAM); 58.1083, -135.4417, Chichagof Island, Hoonah (2 UAM); 58.0500, -134.4083, GMU 04Z, UCU Minor Code 4701 (1 UAM); 58.1250, -135.4000, GMU 04Z, UCU Minor Code 2405 (1 UAM); 58.1333, -134.5333, GMU 04Z, UCU Minor Code 3606 (1 UAM); 58.2750, -135.8167, GMU 04Z, UCU Minor Code 3503 (1 UAM); 58.3833, -135.9167, Gustavus (1 UAM); 58.5333, -134.7500, GMU 1C, UCU Minor Code 1501 (1 UAM); 58.8333, -134.9833, Berners River (1 UAM). **KETCHIKAN QUAD:** 55.8167, -130.9167, Chickamin River (1 UAM). **PORT ALEXANDER QUAD:** 56.3833, -134.6417, Baranof Island, Little Port Walter (2 UAM); 56.8500, -135.0750, GMU 04Z, UCU Minor Code 0701 (1 UAM). **SITKA QUAD:** 57, -134.0000, Admiralty Island, Pybus Bay (2 UAM); 57.1167, -134.3667, Admiralty Island, Herring Bay (1 UAM); 57.1333, -134.6333, Admiralty Island, Wilson Cove (1 UAM); 57.1500, -134.2833, Admiralty Island, Eliza Harbor (1 UAM); 57.2500, -134.6167, Admiralty Island, Whitewater Bay (1 UAM); 57.3086, -134.0700, Admiralty Island, Pybus Bay (3 UAM); 57.3167, -134.5833, Admiralty Island, Chaik Bay (5 UAM); 57.3333, -134.1500, Admiralty Island, Pybus Bay, Donkey Bay (1 UAM); 57.3595, -134.1452, Admiralty Island, N arm of Pybus Bay (1 UAM); 57.3833, -134.4000, Admiralty Island, Hood Bay (1 UAM); 57.4333, -134.5500, Admiralty Island, S arm of Hood Bay (1 UAM); 57.4333, -134.5500, Admiralty Island, N arm of Hood Bay (2 UAM); 57.4333, -134.5500, Admiralty Island, Hood Bay (1 UAM); 57.5000, -134.1000, Admiralty Island, N arm of Gambier Bay (3 UAM); 57.6000, -134.6667, Admiralty Island, Parker Point (2 UAM); Admiralty Island, west side Alexander Archipelago (1 UAM);57.0000, -135.0000, Baranof Island, Kelp Bay (1 UAM); 57.0833, -134.8500, Baranof Island, Baranof Lake/Salmon Lake (1 UAM); 57.5690, -135.9620, Baranof Island, Ford Arm (1 UAM); Baranof Island (1 UAM); 57.7333, -134.1000, Buck Island (1 UAM); 57.4000, -135.0583, Chichagof Island, Sitkon Bay, GMU 04Z, UCU Minor Code 0805 (1 UAM); 57.5333, -135.9667, Chichagof Island, Falcon Arm (1 UAM); 57.5667, -135.5833, Chichagof Island, Ushk Bay (1 UAM); 57.6667, -134.9833, Chichagof Island, NW side of Kook Lake (1 UAM); 57.7167, -135.2167, Chichagof Island, Kadashan Bay, Tenakee Inlet (2 UAM); 57.7389, -135.1250, Chichagof Island, Corner Bay, Tenakee Inlet (1 UAM); 57.7667, -135.4167, Chichagof Island, Saltery Bay, Tenakee Inlet (2 UAM); 57.7833, -134.9500, Chichagof Island, N Shore of Tenakee Inlet (2 UAM); 57.9250, -135.0083, Chichagof Island, GMU 04Z, UCU Minor Code 5103 (1 UAM); 57.9333, -135.1500, Chichagof Island, Freshwater Bay, Seal Creek (1 UAM); 57.9500, -135.2500, Chichagof Island, head of Freshwater Bay (1 UAM);58.0000, -136.0000, Chichagof Island, N arm of Hoonah Sound (2 UAM); Chichagof Island, Tenakee Bay (1 UAM); 57.6833, -136.2000, Herbert Graves Island, outside end of Island (1 UAM); Krestof Island (1 USNM); Kruzof Island (5 USNM); 57.1333, -134.4167, GMU 04Z, UCU Minor Code 4002 (1 UAM); 57.2833,

-134.8833, Pond Isle (3 UAM); 57.4750, -134.2000, GMU 04Z, UCU Minor Code 3802 (1 UAM); 57.6833, -135.6833, GMU 04Z, UCU Minor Code 4900 (2 UAM); 57.7250, -135.4833, GMU 04Z, UCU Minor Code 2903 (1 UAM); 57.7583, -135.5250, GMU 04Z, UCU Minor Code 2904 (1 UAM); 57.7917, -135.0750, GMU 04Z, UCU Minor Code 2601 (1 UAM); 57.8750, -135.8000, GMU 04Z, UCU Minor Code 3004 (1 UAM). **SKAGWAY QUAD:** 59, -135.0000, Chilkoot River (1 UAM); 59.1000, -135.5417, GMU 1D, UCU Minor Code 0202 (1 UAM); 59.1583, -135.3667, GMU 1D, UCU Minor Code 0401 (1 UAM); 59.1667, -135.4667, N of Pyramid Harbor (1 UAM); 59.1833, -135.6333, Murphy Flats, GMU 1D, UCU Minor Code 0203 (1 UAM); 59.2000, -135.4667, Chilkat River (2 UAM); 59.2250, -135.9000, Chilkat River, GMU 1D, UCU Minor Code 0204 (2 UAM); 59.2333, -135.4333, Takhin River, Haines (1 UAM); 59.2667, -135.6833, Takhiu River, 5 miles W of Chilkat River (1 UAM); 59.3250, -135.9000, Chilkat Lake, SE end on Beault, GMU 1D, UCU Minor Code 0206 (3 UAM); 59.3500, -136.7500, Chilkat River, GMU 1D, UCU Minor Code 0210 (2 UAM); 59.4000, -136.2667, Herman Creek, GMU 1D, UCU Minor Code 0209 (4 UAM); 59.4167, -136.0000, Herman Creek (2 UAM); 59.4667, -136.1750, GMU 1D, UCU Minor Code 0301 (2 UAM); 59.5417, -136.1667, Sheep Canyon, GMU 1D, UCU Minor Code 0302 (1 UAM); 59.6083, -136.1333, GMU 1D, UCU Minor Code 0304 (1 UAM); 59.6833, -135.9583, Chilkat, GMU 1D, UCU Minor Code 0303 (2 UAM). **SUMDUM QUAD:** 57.4667, -133.9167, Admiralty Island, Gambier Bay (1 UAM); 57.5833, -133.8333, Admiralty Island, Glass Peninsula, Doty Cove (1 UAM); 57.6333, -133.9833, Admiralty Island, Pleasant Bay (1 UAM); 57.3667, -133.9333, GMU 04Z, UCU Minor Code 3901 (1 UAM); 57.5000, -132.9250, GMU 1C, UCU Minor Code 2503 (1 UAM); 57.7500, -133.5833, 3 miles up Endicott Arm (1 UAM); 57.8917, -133.7167, GMU 1C, UCU Minor Code 2310 (2 UAM). **TAKU RIVER QUAD:** 58.0000, -132.0000, Whiting River (1 UAM); 58.0167, -133.9833, Limestone Inlet (1 UAM); 58.1417, -133.7167, GMU 1C, UCU Minor Code 2311 (1 UAM); 58.4333, -133.7167, Taku River, GMU 1C, UCU Minor Code 1805 (1 UAM). **YAKUTAT QUAD:** 59.0000, -139.0000, Situk Valley, 24 mile Forest Highway (1 UAM);59.0000, -138.0000, Alsek River, Yakutat (2 UAM); 59.1667, -138.2000, E Alsek cabin (1 UAM); 59.3167, -139.2333, mouth of Italio River (1 UAM); 59.4167, -139.5333, Ahrnklin River, mile 21 Situk Highway (2 UAM); 59.4333, -138.9333, Harlequin Lake, Yakutat (1 UAM); 59.4333, -139.5500, Situk River (2 UAM); 59.5500, -139.7333, Yakutat (1 UAM); 59.6167, -139.4000, Situk Lake (1 UAM); 60, -140, East River, Yakutat (3 UAM). **SOUTHEAST ALASKA**: (1 UAM).

Family **Otariidae** Gray, 1825

Northern Fur Seal
Callorhinus ursinus (Linnaeus, 1758)

OTHER COMMON NAMES. Alaska Fur Seal

TAXONOMY. Monotypic (Scheffer, 1958; Rice, 1998).

Callorhinus ursinus

Original Description. 1758. *Phoca ursina* Linnaeus, Syst. Nat. 10, 1:37.

Type Locality. Bering Island, Commander Islands.

Type Specimen. None designated.

Range. North Pacific Ocean.

REVISIONS AND REVIEWS. Gardner and Robbins (1998), Rice (1998), Brunner (2003).

STATUS. IUCN-Vulnerable; COSEWIC-Threatened. Approximately 74% of the world's population is found in the southern Bering Sea on the Pribilof Islands (Lander and Kajimura, 1982). After the killing of females at sea was terminated in 1968, the Alaska population rebounded to approximately 1.25 million in 1974. Annual pup production on the Pribilofs, which remained relatively stable between 1981 and 1995, has steadily been declining in subsequent years, with counts in both 2000 and 2002 now below the 1921 level on St. Paul Island and below the 1916 level on St. George Island (Angliss and Outlaw, 2005).

DISTRIBUTION. Northern Fur Seals occur from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan (Angliss and Outlaw, 2005).

Essentially an animal of the open sea while away from the breeding islands (Kenyon and Wilke, 1953), Northern Fur Seals from the Pribilof Islands migrate south and east offshore until March (Reeves et al., 1992). Females and young males begin to appear in late November along the continental slope and shelf from Sitka, in Southeast Alaska, as far south as California. Pups of both sexes arrive off the coast of Southeast Alaska in January (Fiscus, 1978). Fur seals can often be found hauled out on the Forrester Island complex (L. Johnson, pers. comm., 1994). A few thousand adult females habitually enter some of the deep outer straits and inlets of Southeast Alaska during the winter and spring herring runs (Kenyon and Wilke, 1953). Some years they are quite abundant in the Sitka area, but haven't been in recent years (L. Johnson, pers. comm., 1994).

SPECIMENS. **DIXON ENTRANCE QUAD:** 54.8500, -133.5333, Dixon Entrance, Lowrie Island (1 UAM). **SITKA QUAD:** Sitka, Baranof Island, Sitka area (109 USNM).

Steller's Sea Lion
Eumetopias jubatus (Schreber, 1776)

OTHER COMMON NAMES. Northern Sea Lion, Steller Sealion.

TAXONOMY. Monotypic (Scheffer, 1958; Rice, 1998).

Bickham et al. (1996) and Baker et al. (2005) assessed geographic variation in the mitochondrial control region and noted that the populations of Steller's Sea Lion in Southeast Alaska were distinctive from populations found farther west in the Gulf of Alaska and Aleutians. Such a separation was not supported by a study based on skull morphology, however (Brunner, 2002).

Eumetopias jubatus

Original Description. 1776. *Phoca jubata* Schreber, Die Saugthiere…theil 3, heft 17, Pl. 83b and p. 300.

Type Locality. North Pacific Ocean.

Type Specimen. Not known to exist.

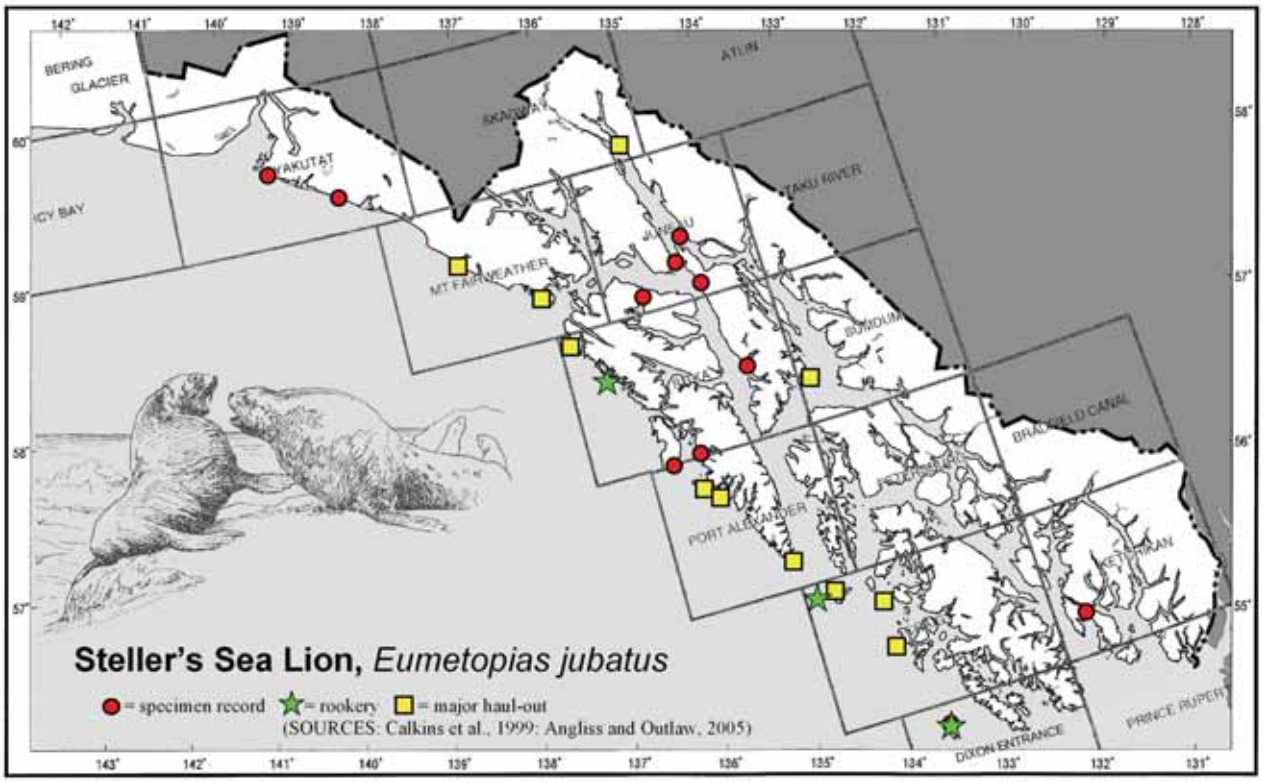
Range. North Pacific Ocean.

REVISIONS AND REVIEWS. Loughlin et al. (1987), Bickham et al. (1996), Brunner (2003).

STATUS. ESA-Threatened (east of 144º W), Endangered (west of 144º W); IUCN-Endangered; COSEWIC-Special Concern.

U.S. populations declined by about 75% recently (Calkins et al., 1999). Most dramatic have been the declines in central and western Gulf of Alaska and Aleutian Islands populations (averaging 4.3% per year for 1990-2002) (Angliss and Lodge, 2004). In contrast, Southeast Alaska and British Columbia stocks are stable or increasing (Angliss and Outlaw, 2005).

DISTRIBUTION. Steller's Sea Lions occur throughout the North Pacific Rim from central California to Japan. Most reproduction occurs at scattered rookeries along the central coast of the Gulf of Alaska and in the central Aleutian Islands (Reeves et al., 1992; Angliss and Outlaw, 2005). They are not known to migrate but disperse widely in the non-breeding season. Breeding rookeries in Southeast Alaska are located off Forrester Island (now the largest Steller's Sea Lion rookery in the world), White Sisters Islands, and Hazy Islands. Approximately 50 haulout sites are also found scattered along the Southeast Alaska coast (S. Zimmerman, NMFS, pers. comm., 1994).



SPECIMENS. **DIXON ENTRANCE QUAD:** 54.8750, -133.5630, Forrester Island, North Rocks, Forrester Island complex (1 UAM); 54.8500, -133.5333, Lowrie Island (4 UAM). **JUNEAU QUAD:** 58.4167, -134.8500, Shelter Island, SE tip of Island (1 UAM); Admiralty Island, Hawk Inlet (1 USNM); Chichagof Island, Port Frederick (1 USNM); near mouth of Lynn Canal (1 USNM). **KETCHIKAN QUAD:** 55.2833, -131.6000, Gravina Island, NE corner of Gravina Island (1 UAM). **SITKA QUAD:** 57.5000, -134.5500, Admiralty Island, Favorite Bay (1 UAM); Baranof Island, Sitka (1 USNM); Kruzof Island, Mt. Edgecumbe (1 USNM). **YAKUTAT QUAD:** 59.2503, -138.9339, Yakutat, Akwe River Beach (1 UAM); 59.4833, -139.7167, Cannon Beach, Yakutat (2 UAM).

California Sea Lion
Zalophus californianus (Lesson, 1828)

OTHER COMMON NAMES. California Sealion.

TAXONOMY. Three subspecies are generally recognized for three disjunct populations (Scheffer, 1958; Brunner et al., 2002; but see Rice, 1998). It is probably the nominate subspecies that occurs in Alaska waters.

Zalophus californianus californianus

Original Description. 1828. *Otaria californiana* Lesson, Dictionaire classique d'histoire naturalle, 13:420

Type Locality. vicinity San Francisco Bay, California.

Type Specimen. None designated.

Range. West coast of North America from the Mexico-Guatemala border to southern Alaska.

REVISIONS AND REVIEWS. Rice (1998), Brunner (2003).

STATUS. IUCN-Least concern; COSEWIC-Not at risk. Adult and subadult California Sea Lions have become relatively abundant in southern British Columbia waters since the 1970s (Bigg, 1988; Reeves et al., 1992). Reports of California sea lions of both sexes and during all seasons of the year have increased in Alaska in recent years (Maniscalco et al., 2004). These authors speculate that this may be due to increasing populations farther south, increasing competition for food, and changes in environmental conditions.

DISTRIBUTION. California Sea Lions are increasingly encountered in Alaska waters to as far north as the Bering Sea. In Southeast Alaska, Maniscalco et al. (2004) reported 23 sightings since 1982 that ranged from Forrester Island to Cape Yakutaga.

SPECIMENS. None.

Family **Phocidae** Gray, 1821

Northern Elephant Seal
Mirounga angustirostris (Gill, 1866)

OTHER COMMON NAMES. None.

TAXONOMY. Monotypic; no subspecies are currently recognized (Scheffer, 1958).

Mirounga angustirostris

Original Description. 1866. *Macrorhinus angustirostris* Gill, Proc. Chicago Acad. Sci., 1:33, April.

Type Locality: St. Bartholomew's Bay, Lower California, Mexico.

Type Specimen. USNM 4704 (lectotype).

Range. Eastern North Pacific Ocean.

REVISIONS AND REVIEWS. Stewart and Huber (1993), Le Boeuf and Laws (1994), Brunner (2002).

STATUS. IUCN-Least concern; COSEWIC-Not at risk. Reduced to near extinction by the late 1800s, there has been an almost exponential increase throughout the range of this species, with the population estimated to be 125,000 animals in 1992 (Stewart et al., 1994). In the mid-1990s, the California population was increasing and the Mexican population was apparently stable or decreasing (NMFS, Federal Register, 15 March 1996).

DISTRIBUTION. Northern Elephant Seals are restricted to the Northeast Pacific Ocean. They breed in rookeries from Baja California, Mexico, to Oregon (Hodder et al., 1998). During the nonbreeding season, Northern Elephant Seals range along the coast of Oregon, Washington, and British Columbia; adult males reach as far north as the Gulf of Alaska and the eastern Aleutian Islands (ADFG, 1973; Reeves et al., 1992, 2002). Elephant Seals are observed each year at various locations throughout Southeast Alaska (L. Carson, pers. comm., 1994; L. Johnson, pers. comm., 1994; S. Zimmerman, NMFS, pers. comm., 1994). Willett (1943) reported a dead Elephant Seal on a beach at Kasaan, Prince of Wales Island "shortly before February" 1940.

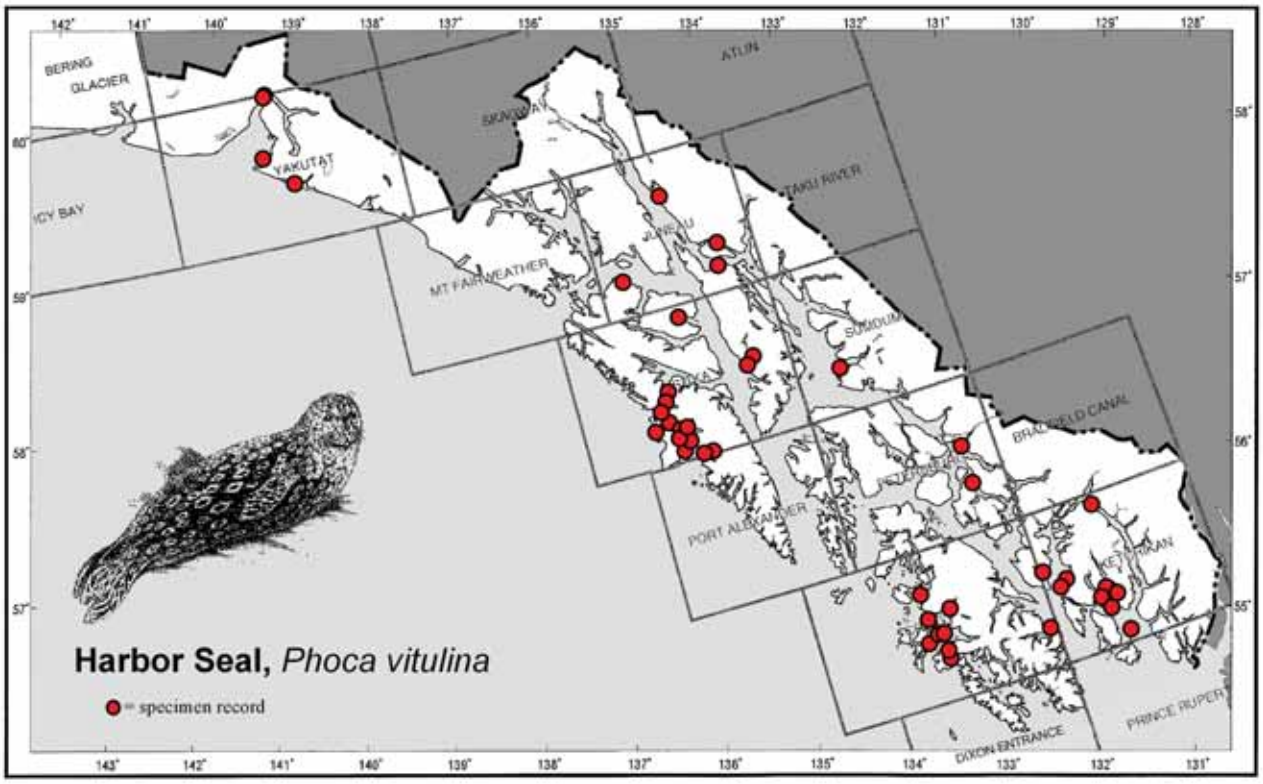
SPECIMENS. **CRAIG QUAD:** Prince of Wales Island, Kasaan (1 USNM).

Harbor Seal
Phoca vitulina Linnaeus, 1758

OTHER COMMON NAMES. Common Seal.

TAXONOMY. The taxonomy of Harbor Seals in the North Pacific and Bering Sea has been controversial. Four, sometimes five, subspecies of Harbor Seals are generally recognized across its broad range. The eastern Pacific form of harbor seal, *richardsi* (the valid spelling should be *richardii* according to Rice, 1998), and the western Pacific form, *stejnegeri*, generally are recognized as valid subspecies (Reeves et al., 1992; Reijnders et al., 1993; Rice, 1998), although samples corresponding to these two taxa did not appear to represent distinct mtDNA assemblages (O'Corry-Crowe and Westlake, 1998; Westlake and O'Corry-Crowe, 2002).

The combination of all DNA data collected by Burg et al. (1999) suggested that there are at least three populations of Harbor Seals in the Pacific composed of seals from 1) Japan, Russia, Alaska, and northern British Columbia, 2) southern British Columbia and Puget Sound, Washington, and 3) the outer coasts of Washington, Oregon, and California. Their analyses of five polymorphic microsatellite loci showed significant differences between the populations of



southern British Columbia and northern British Columbia-Southeast Alaska.

Phoca vitulina richardii

Original Description. 1864. *Halicyon richardii* Gray, 1864. Proc. Zool. Soc. London, p. 28.

Type Locality. Vancouver Island, British Columbia.

Type Specimen. BMNH 1864.2.19.1 (see Shaughnessy and Fay, 1977).

Range. Eastern Pacific from the Aleutian Islands to California.

Remarks. The name *richardsi* is an invalid spelling (Rice, 1998).

REVISIONS AND REVIEWS. Shaughnessy and Fay (1977), Burns et al. (1984), Burg et al. (1999).

STATUS. IUCN-Least concern; COSEWIC-Not at risk. West (1991) considered *Phoca vitulina* a species of ecological concern. While Harbor Seal numbers have declined dramatically in Prince William Sound over the past few decades (Westlake and O'Corry-Crowe, 2002), trend data from aerial counts in Southeast Alaska conducted during 1983-2001 indicated significant increase in the Ketchikan area, relative stability near Sitka, and a recent decline in Glacier Bay (R.J. Small et al., 2003).

DISTRIBUTION. Harbor Seals are widely distributed throughout coastal areas of the North Pacific, Arctic, and North Atlantic oceans (Nagorsen, 1990). They inhabit the entire Southeast Alaska coast and, during salmon migration, can be found considerable distances upstream along major rivers and in lakes. According to ADFG (1973), the greatest concentrations of Harbor Seals in Southeast Alaska occur in Glacier Bay National Park, in a few island areas along the outer coast of Chichagof Island, and in a few glacier-fed bays along the mainland coast.

SPECIMENS. **CRAIG QUAD:** 55.7200, -133.4167, Harmony Islands (2 UAM); 55.4397, -133.4553, Lulu Island (1 UAM); 55.5750, -133.3667, Palisade Island (1 UAM); 55.2833, -132.0667, Prince of Wales Island, `Chalmeley Island' (1 UAM); 55.3667, -133.2667, Prince of Wales Island, Port Estrella (2 UAM); 55.6050, -133.0850, Prince of Wales Island, Big Salt Lake (3 UAM); 55.4836, -133.3514, San Fernando Island (1 UAM); 55.2675, -133.3003, Suemez Island (1 UAM); 55.3000, -133.2500, Suemez Island, Port Refugio (2 UAM); 55.4333, -133.5000, Port Real Marina (2 UAM); 55.4836, -133.2511, Trocadera Bay (4 UAM). **JUNEAU QUAD:** 58.2341, -135.7154, Chichagof Island , Hoonah; Chicken Creek (1 UAM); 58.2000, -134.5000, Douglas Island, southern end of island (1 UAM); 58.3019, -134.4197, Juneau (1 UAM). **KETCHIKAN QUAD:** 55.5367, -131.7550, Back Island (1 UAM); 55.5367, -131.7622, Back Island (1 UAM); 55.5267, -131.7550, Betton Island, NE shore (1 UAM); 55.0733, -131.2350, Cat Island (3 UAM); 55.4833, -131.8000, Clover Island (13 UAM); 60.6383, -146.2917, Gravina Island (2 UAM); 60.6408, -146.2897, Gravina Island (9 UAM); 55.2467, -131.4133, Revillagigedo Island, Bold Island (1 UAM); 55.2967, -131.4917, Revillagigedo Island, Carrol Point (2 UAM); 55.3800, -131.3933, Revillagigedo Island, Carroll Inlet (1 UAM); 55.6250, -131.9611, Revillagigedo Island, Helm Bay (1 UAM); 55.9369, -131.1883, Revillagigedo Island (2 UAM); 55.4847, -131.8167, Tatoosh Island (1 UAM); 55.5250, -131.8500, Tatoosh Island (8 UAM); 55.5250, -131.8500, Tatoosh Island, Tatoosh Rocks (3 UAM); 55.5267, -131.7550, Tatoosh Island (11 UAM); 55.3514, -131.2500, Thorne Arm (2 UAM); 55.3572, -131.4506, George Inlet (1 UAM); 55.3689, -131.4514, George Inlet (2 UAM); 55.4567, -131.4833, Coon Cove (1 UAM); 55.4833, -131.8083, Clover Passage (11 UAM); 55.4847, -131.8167, Clover Pass (4 UAM); Behm Canal (1 UAM); north Behm Canal (1 UAM). **PETERSBURG QUAD:** 56.0581, -132.0022, Deer Island, East side of Island (1 UAM); 56.2920, -132.4750, Etolin Island, King George Creek (1 UAM);51.5294, -132.4568, Kadin Island, mouth of the Stikine River (3 UAM); Zarembo Island, Meter Bite Creek (1 UAM); 56.6333, -132.3333, Stikine R; Wrangell village (2 UAM). **SITKA QUAD:** 57.3333, -135.5000, Admiralty Island, Chaik Bay (6 UAM); 57.5033, -134.5839, Admiralty Island, Angoon (2 UAM); 57.5034, -134.5847, Admiralty Island, Angoon (3 UAM); 57.5036, -134.5006, Admiralty Island, Angoon (1 UAM); 57.5713, -134.3700, Admiralty Island, Kootznahoo Inlet, Salt Lake (1 UAM); 58.7200, -134.8683, Admiralty Island, Wilson Cove (5 UAM); Admiralty Island (1 UAM); 57.0333, -135.2417, Baranof Island, Silver Bay, near Sitka (3 UAM); 57.1500, -135.5833, Baranof Island, Point Kristof (1 UAM); 57.2506, -135.3836, Baranof Island, Nakwasina Sound; off Allan Point,(1 UAM); 57.2506, -135.3833, Baranof Island, Nakwasina Sound; off Allan Point (1 UAM); 57.2733, -135.5717, Baranof Island, St John Baptist Bay (2 UAM); 57.3517, -135.4667, Baranof Island, Fish Bay (4 UAM); 57.9833, -135.3167, Baranof Island, Sandy Cove (1 UAM); 57.1217, -135.4583, Big Gavanski Island (1 UAM); 57.1433, -135.4167, Big Gavanski Island (2 UAM); 57.4542, -135.5406, Big Rose Island, Big Rose Island (3 UAM); 57.4383, -135.6217, Chichagof Island, Deep Bay (2 UAM); 57.1011, -135.4678, Crow Island (1 UAM); 57.1022, -135.4681, Gaganin Island/Crow Island (1 UAM); 57.1022, -135.4681, Gagarin Island (1 UAM); 57.1217, -135.4583, Gagarin Island (6 UAM); 57.1117, -135.4017, Gavanski, Gavanski Rocks (1 UAM); 57.1433, -135.4167, Gavanski (1 UAM); 57.1417, -135.4167, Gavanski Island (3 UAM); 57.1667, -135.6250, Kruzof Island, Mud Bay (1 UAM); 57.1867, -135.5600, Kruzof Island, Port Krestof (2 UAM); 57.2750, -135.6833, Kruzof Island, Sukoi Inlet (3 UAM); 57.4192, -135.6025, Lesnoi Island (1 UAM); 57.1117, -135.4283, Little Gavanski Island (2 UAM); 57.1233, -135.4333, Little Gavanski Island (1 UAM); 57.1667, -135.5750, Magoun Island (1 UAM); 57.3333, -135.4350, Middle Island (1 UAM); 57.5167, -134.5250, Smith Island (1 UAM); 56.9750, -135.3167, Sandy Cove (1 UAM); 57.0178, -135.1672, Silver Bay/ Bear Cove (1 UAM); 57.0178, -135.1672, Silver Bay (1 UAM); 57.1217, -135.4583, Siginika (1 UAM); 57.1356, -135.5350, Hayward Strait (2 UAM); 57.1500, -135.5667, Hayward Strait (2 UAM); 57.1667, -135.4500, Eastern Bay (1 UAM); 57.1683, -135.5347, Degroff Bay (1 UAM); 57.1867, -135.5550, Hayward Strait (1 UAM); 57.1867, -135.5717, Hayward Strait (1 UAM); 57.1917, -135.8333 (1 UAM); 57.2344, -135.5189, Between Olga and Neva Straight (1 UAM); 57.2500, -135.4683, Nawkwasina Pass (2 UAM); 57.2500, -135.4750, Nawkwasina Pass (1 UAM); 57.2667, -135.5733, Marine Cove (1 UAM); 57.2733, -135.5717, Phillapino Cove [sic] (2 UAM); 57.2733, -135.5717, Kackel Narrows (1 UAM); 57.2917, -135.5833, Saint John Bay (1 UAM); 57.3167, -135.6917 (1 UAM); 57.3689, -135.5847, Fish Bay (1 UAM); 57.4000, -135.6317, Sergius Narrows (1 UAM). **SUMDUM QUAD:** 57.3167, -133.5000, Port Houghton (11 UAM). **YAKUTAT QUAD:** 59.4036, -139.4575, Situk (1 UAM); 59.5953, -139.6583, between Fitzgerald Island and Gregson Island (1 UAM); 59.9972, -139.5500, Disenchantment Bay (3 UAM); 60, -139.5500, Yakutat, Disenchantment Bay (13 UAM); 60, -139.5500, Yakutat, Disenchantment Bay (2 UAM); 60.0083, -139.5056, Hubbard Glacier, Disenchantment Bay (4 UAM); 60.0167, -139.5000, Hubbard Glacier (2 UAM).

Family **Mustelidae** Fischer, 1817

Sea Otter
Enhydra lutris (Linnaeus, 1758)

OTHER COMMON NAMES. Northern Sea Otter.

TAXONOMY. Wilson et al. (1991) conducted a reappraisal of Sea Otter taxonomy primarily based on skull morphology from throughout the species' range and recommended three subspecies be recognized, of which one occurs throughout Alaska.

Recent analyses of both mitochondrial and nuclear DNA sequence data (Cronin et al., 1996, 2002) found substantial differences between the three distinct Sea Otter stocks in Alaska (Gorbics and Bodkin 2001): Southeast, Southcentral, and Southwest. The range of the Southeast stock extends from Dixon Entrance to Cape Yakataga.

Enhydra lutris kenyoni

Original Description. 1991. *Enhydra lutris kenyoni* Wilson, J. Mammalogy, 72:33, February 13.

Type Locality. Amchitka Island, Alaska.

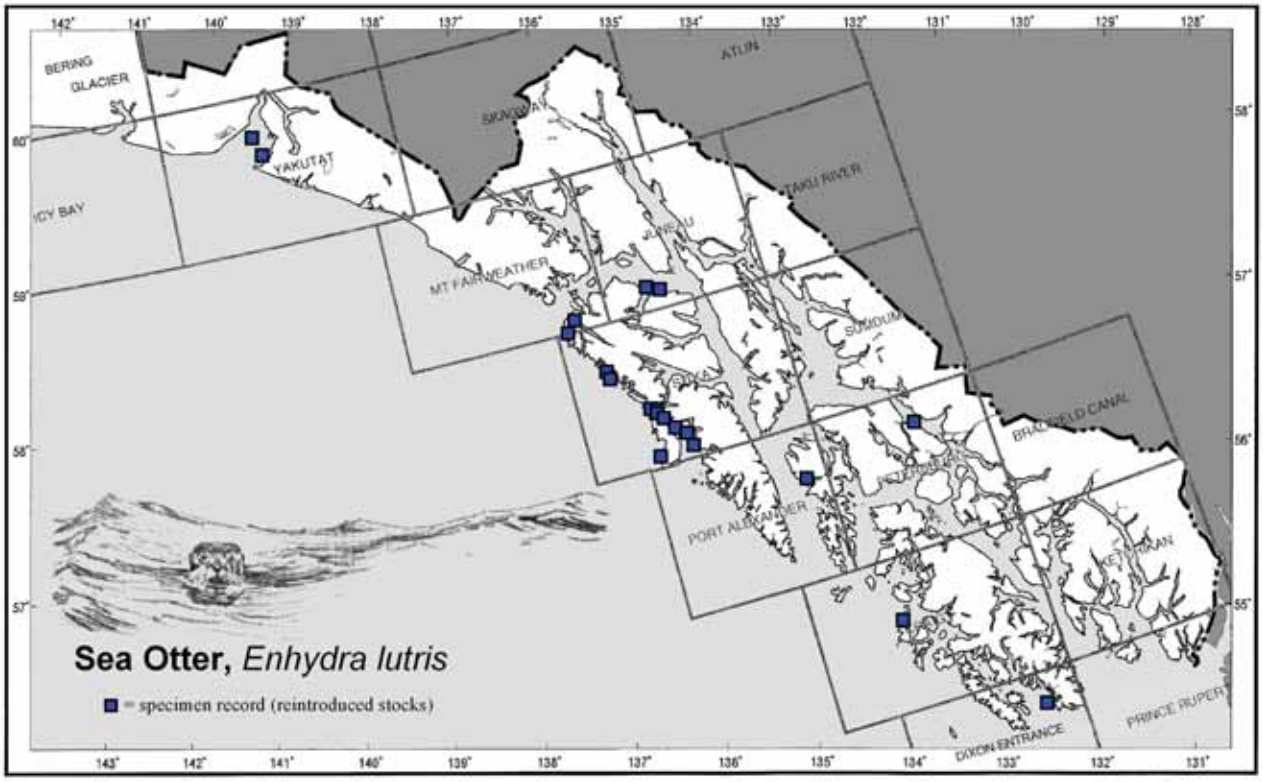
Type Specimen. USNM 527045.

Range. Throughout the Aleutian Islands and southward in the eastern Pacific to Washington.

REVISIONS AND REVIEWS. Kenyon (1969), Estes (1980), Wilson et al. (1991).

STATUS. CITES-Appendix II; IUCN-Endangered; COSEWIC-Threatened. The Southwest Alaska (Kodiak, Alaska Peninsula, Aleutians) stock of Sea Otters, which have experienced precipitous population declines in recent years, was petitioned for listing as threatened under ESA in 2004 (and sued on 1 June 2005 for delays in this effort). Sea Otters in the Southeast Alaska stock are not listed under the ESA (USFWS, 2002).

From the original 412 animals released into Southeast Alaska waters starting in 1965, the regional total had grown to more than 3500 animals in 1987 (Reeves et al., 1992) to 12,632 Sea Otters in 2000 (USFWS, 2002). The current population trend is uncertain (USFWS, 2002), although the Glacier Bay population increased



185% (to 1590 animals) between 2000 and 2001 (Bodkin et al., 2001).

DISTRIBUTION. Sea Otters were once found along most of the rim of the North Pacific from the northern Japanese Archipelago to central Baja California, including the Kuril, Commander, Aleutian, and Pribilof islands (Reeves et al., 1992). These animals almost were extirpated from most of their former range, including Southeast Alaska, by commercial hunting. In Alaska, they were protected in 1899. Hunting for Sea Otters by Natives has resumed in recent years in Southeast Alaska (Reeves et al., 1992). Gray (1915) reports five otters shot at Forrester Island in the spring of 1899, three in 1903, and one near Cape Pole, Kosciusko Island, in 1904. He also reported three observed in Blake Channel, between Wrangell Island and mainland, in about 1910, and one observed at Forrester Island in 1912.

Sea otters were translocated to seven sites in Southeast Alaska in the late 1960s (Burris and McKnight, 1973) from Amchitka and Prince William Sound stocks (Pitcher, 1989; Reidman and Estes, 1991).

SPECIMENS. **CRAIG QUAD:** 55.5980, -133.6090, San Lorenzo Islands, Hole in the Wall (3 UAM); 55.8880, -133.2430, Tuxekan Island (2 UAM). **DIXON ENTRANCE QUAD:** 54.6417, -132.4000, Barrier Islands, intertidal beach of northeasternmost island (1 UAM). **JUNEAU QUAD:** 58.1760, -135.4720, Scraggy Island (8 UAM); 58.1333, -135.2710, Spasski Island (1 UAM). **PETERSBURG QUAD:** 56.7944, -132.8222, Mitkof Island, Frederick Sound (1 UAM). **PORT ALEXANDER QUAD:** 56.6667, -134.2433, Kuiu Island, Rowan Bay (10 UAM). **PRINCE RUPERT QUAD:** Tongass (2 USNM, burial site, no date); **SITKA QUAD:** 57.0690, -135.4100, Apple Island (1 UAM); Baranof Island, Sitka (1 MVZ; collected 1906); Baranof Island, Sitka, N coast of (6 KU, skins only, July 1896); Baranof Island, Sitka (1 MCZ, no date); 57.1080, -135.4730, Crow Island (6 UAM); 57.0980, -135.4870, Gagarin Island, Sitka Sound (7 UAM); 57.3230, -135.6630, Kane Islands (6 UAM); 57.0140, -135.6360, Kruzof Island, Sitka Sound (1 UAM); 57.0430, -135.3667, Smith Island (1 UAM); 57.0900, -135.4967, Bieli Rocks, Sitka Sound (2 UAM); 57.1580, -135.5510, Rob Point (1 UAM); 57.1790, -135.6080, Mud Bay (1 UAM); 57.1840, -135.5100, Krestoff Point near Sitka (1 UAM); 57.2367, -135.5500, Neva Point, near Sitka (3 UAM); 57.2930, -135.5760, Saint John Baptist Bay, N of Sitka (9 UAM); 57.3043, -135.6901, Sukoi Inlet (1 UAM); 57.3610, -135.7810, Salisbury Sound, N of Sitka (7 UAM); 57.5890, -136.1333, between Ogden Passage and Khaz Bay (2 UAM); 57.6333, -136.1610, Ogden Passage (4 UAM); 57.9190, -136.3760, Lisianski Strait (2 UAM); 57.9680, -136.2860, Lisianski Inlet (2 UAM). **YAKUTAT QUAD:** 59.5980, -139.7610, Khantaak Island (6 UAM); 59.7320, -139.8390, Yakutat Bay (1 UAM). **SE ALASKA:** (1 MVZ; collected 1893).

Wolverine
Gulo gulo (Linnaeus, 1758)

OTHER COMMON NAMES. Carcajou.

TAXONOMY. Kurtén and Rausch (1959) demonstrated that New and Old World wolverines are conspecific and recognized only two subspecies of wolverines. All North American populations were included in a single race, *G. g. luscus*. Hall (1981), however, recognized four North American races, of which one occurs in Southeast Alaska.

Tomasik and Cook (2005) found the wolverines of Southeast Alaska genetically distinctive, suggesting the possibility of limited exchange between coastal and inland populations.

Gulo gulo luscus

Original Description. 1776. [*Ursus*] *luscus* Linnaeus, Syst. Nat., ed. 10, 1:47.
Type Locality. Hudson Bay.
Type Specimen. Not known to exist.
Range. Broadly distributed across Alaska, Canada and the northwestern contiguous United States.

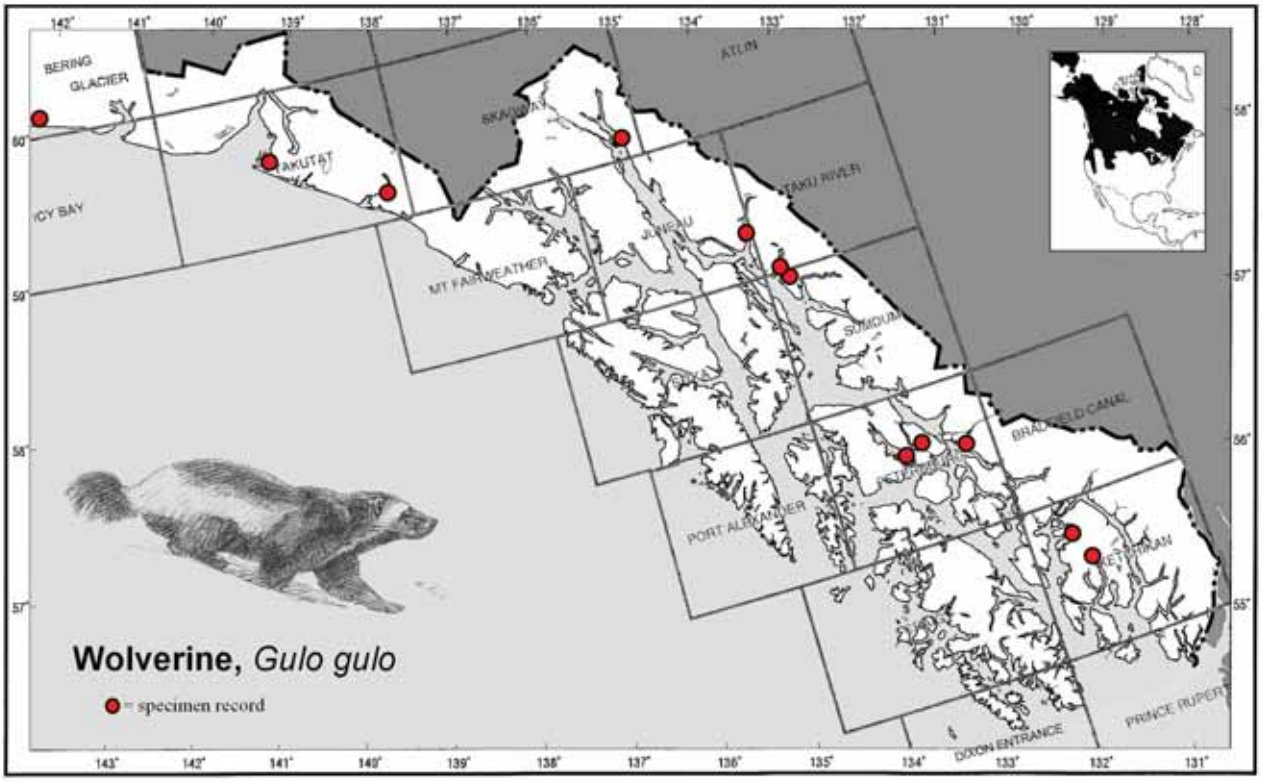
REVISIONS AND REVIEWS. Pasitschniak-Arts and Larivière (1995).

STATUS. IUCN-Vulnerable; COSEWIC-Special concern.

DISTRIBUTION. Wolverines occur on the mainland and are reported on several near-shore islands in the Alexander Archipelago, specifically Etolin, Fair, Kuiu, Kupreanof, Mitkof, Revillagigedo, and Wrangell islands (ADFG, 1973; MacDonald and Cook, 1996).

Heaton and Grady (2003) reported finding a single molar fragment, dated late Pleistocene or early Holocene, from a cave on Prince of Wales Island that appeared to match only *Gulo gulo*.

SPECIMENS. **BERING GLACIER:** Yakataga, Sunshine Point, Keliekh River (1 CAS). **JUNEAU QUAD:** Taku Inlet (2 USNM). **KETCHIKAN QUAD:** 55.7500, -131.5000, Revillagigedo Island, Ketchikan area (1 UAM); Revillagigedo Island, Carroll Inlet (1 USNM). **PETERSBURG QUAD:** 56.7500, -133.0000, Fair Island, Duncan Canal (1 UAM); Mitkof Island (1 KU, 2 MSUM); 56.6167, -132.3167, Stikine River, Pt Rothsay area, Government Slough (2 UAM). **SKAGWAY QUAD:** 59.2000, -135.2833, 8-10 miles up Katzehin River (1 UAM); 59.2000, -135.2833, Katzehin River, 1 mile from glacier (1 UAM). **SUMDUM QUAD:** 57.9167, -133.2167,



Gilbert Bay, Port Snettisham (1 UAM). **TAKU RIVER QUAD:** 58.08333333, -133.31667, Prospect Creek, Port Snettisham (1 UAM). **YAKUTAT QUAD:** bank of Alsek River, 8 mi. from Dry Bay Bar (1 AMNH); Yakutat (1 FMNH); Yakutat area (1 UCLA).

North American River Otter
Lontra canadensis (Schreber, 1777)

OTHER COMMON NAMES. Northern River Otter, Canadian River Otter, Land Otter, Prince of Wales Island Otter.

TAXONOMY. The genus of New World river otters was revised from *Lutra* to *Lontra* by van Zyll de Jong (1972). Hall (1981) recognized 7 subspecies of river otter in North America; one occurs in Southeast Alaska. Patterns of genetic variation in eastern North America otters did not concur with Hall's subspecific designations (Serfass et al., 1998). Reviews of the taxonomic status of *L. canadensis* indicated that river otters from Southeast Alaska are morphologically distinct from interior river otters (van Zyll de Jong, 1972; Fagen, 1986), but specimens have not been included in molecular genetic analyses.

Lontra canadensis mira

Original Description. 1935. *Lutra canadensis mira* Goldman, Proc. Biol. Soc. Washington, 48:185, November 15.

Type Locality. Kasaan Bay, Prince of Wales Island, Alaska.

Type Specimen. USNM 127888.

Range. Southeast Alaska and coastal British Columbia.

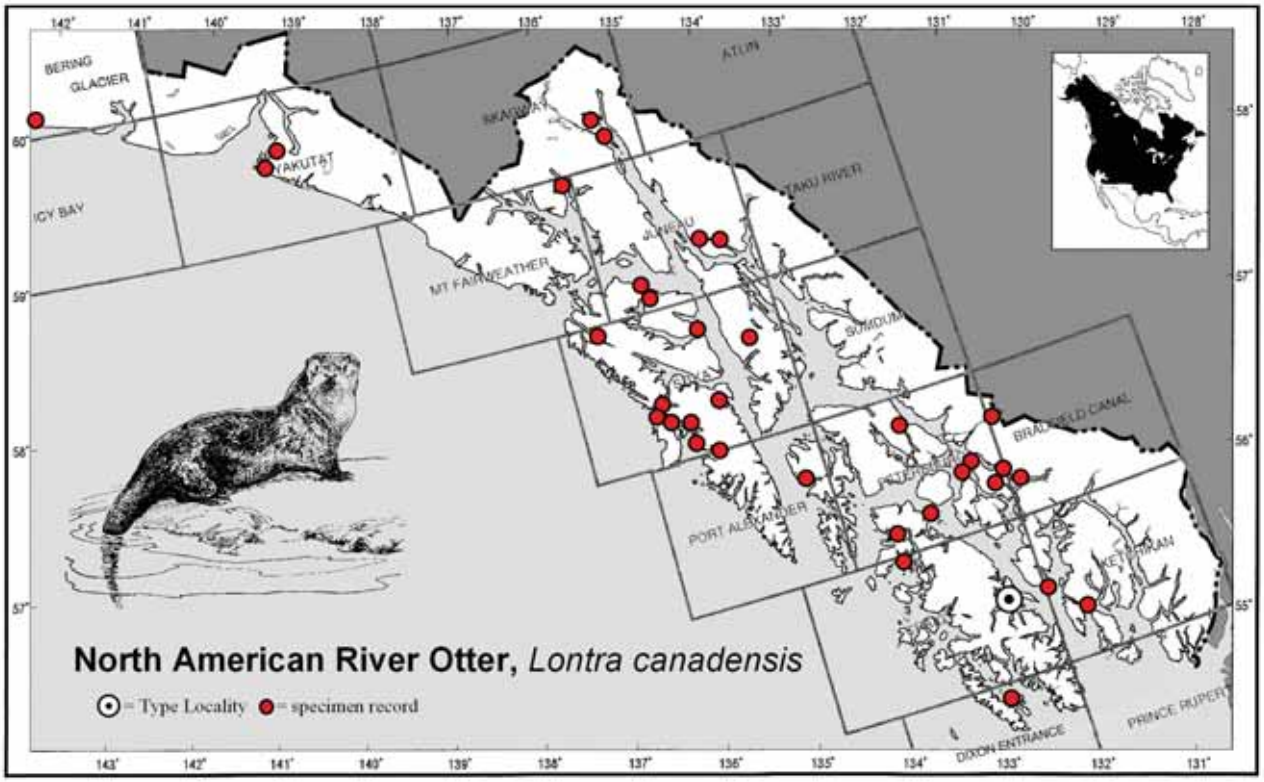
REVISIONS AND REVIEWS. Larivière and Walton (1998).

STATUS. CITES-Appendix II; IUCN-Least concern. The North American River Otter is a Management Indicator Species of the Tongass National Forest (Sidle and Suring, 1986; Kiester and Eckhardt, 1994).

DISTRIBUTION. River otters are found along the coastal and inland waters throughout Southeast Alaska. Specimen are from a number of mainland localities and the Alexander Archipelago from Admiralty, Baranof, Chichagof, Gavanski, Halleck, Krestof, Kruzof, Kuiu, Kupreanof, Long, Marble, Prince of Wales,

Rapids, Revillagigedo, Shrubby, Warren, Woronkofski, and Wrangell islands.

SPECIMENS. **BERING GLACIER QUAD:** Yakataga, Kaliakh (sic) River, Sunshine Point (1 CAS). **BRADFIELD CANAL QUAD:** 56.2333, -131.8833, Bradfield Canal, Marten Creek (1 UAM); 56.3500, -131.9833, Aaron Creek (3 UAM); 56.7000, -131.9333, Stikine River, Ketili Creek (1 UAM); Bradfield Canal (4 UAM). **CRAIG QUAD:** Marble Island, Tokeen (1 USNM); 55.8928, -133.8928, Warren Island (1 MVZ). **DIXON ENTRANCE QUAD:** 54.8711, -132.8033, Long Island, Howkan (7 MVZ). **JUNEAU QUAD:** 58.1083, -135.4417, Chichagof Island, Hoonah (1 UAM); Chichagof Island, Northern part of island (15 UAM); 58.3000, -134.4000, Juneau, Aurora Boat Basin (1 UAM); 58.3000, -134.4167, Egan Expressway (2 UAM); 58.3042, -134.4083, Juneau area (1 UAM); 58.3042, -134.4083, Juneau, 3 miles N on Eagan Highway (1 UAM); 58.3500, -134.6833, Auke Bay ferry terminal, Juneau (1 UAM); Lynn Canal, Berners Bay (3 UAM). **KETCHIKAN QUAD:** 55.3333, -131.6333, Revillagigedo Island, Ketchikan (1 UAM); 55.5294, -131.9533, Cleveland Peninsula, Bond Bay (2 UAM). **MT. FAIRWEATHER QUAD:** 58.9417, -136.1333, Gull Lake at Wachusetts Inlet (1 UAM). **PETERSBURG QUAD:** Kuiu Island (1 PSM); Kupreanof Island, Petersburg Creek (1 CMNH); 56.1500, -133.4000, Prince of Wales Island, Dry Pass (6 UAM); Prince of Wales Island, between Shakan Bay and Dry Pass (7 UAM); Shrubby Island (2 USNM); Woronkofski Island (2 UAM); 56.2833, -132.1667, Wrangell Island (2 UAM); 56.5000, -132.3333, Wrangell Island, near Wrangell (1 UAM); Wrangell Island, Wrangell (1 CMNH). **PORT ALEXANDER QUAD:** 56.7211, -134.3658, Kuiu Island, Washington Bay (1 PSM); 56.5406, -134.0511, Kuiu Island (1 PSM); Kuiu Island, Rowan Bay (1 CMNH). **SITKA QUAD:** 57.5333, -134.25, Admiralty Island (1 MVZ); Admiralty Island (4 CMNH); 57.0333, -135.2000, Baranof Island, Silver Bay (5 UAM); 57.2167, -134.8667, Baranof Island, Hidden Falls (1 UAM); 57.3875, -135.6083, Baranof Island, Schulze Head (1 UAM); Baranof Island, Sitka area (1 UAM); Baranof Island, Aleutkina Bay, 4 mi SE Sitka (1 UAM); Baranof Island, No Thorofare Bay, 4.5 mi SE Sitka (1 UAM); Baranof Island, Deep Inlet, 5 mi S of Sitka (3 UAM); Baranof Island, Samsing Cove, 5 mi S of Sitka (1 UAM); Baranof Island, Indian River (1 UAM); Baranof Island, Three Entrance Bay, 5.5 mi SW Sitka (1 UAM); Baranof Island, Starrigavan Bay, 5.5 mi N Sitka (2 UAM); Baranof Island, Katlian Bay, 8 mi N Sitka (1 UAM); Baranof Island, Nakwasina (7 UAM); Baranof Island, Lisa Creek, Nakwasina Bay (1 UAM); Baranof Island, Olga Strait (1 UAM); Baranof Island, Kakul Narrows, 25 mi NW Sitka (1 UAM); Baranof Island, Fish Bay, 22 mi NW Sitka (1 UAM); Baranof Island, Peril Strait (1 UAM); 57.7833, -134.9500, Chichagof Island, Tenakee Inlet (16 UAM); 57.8500, -134.9833, Chichagof Island, Freshwater Bay (1 UAM); 57.9583, -136.2250, Chichagof Island, Pelican (2 UAM); 58.2167, -135.5000, Chichagof Island, Port Frederick (1 UAM); Chichagof Island, Lisianski Inlet, Pelican (2 UAM); Chichagof Island, Lisianski Bay (2 UAM); Chichagof Island, N side of island (1 UAM); 57.1333, -135.4167, Gavanski Island, 6.5 mi NW Sitka (1 UAM); 57.2333, -135.3833, Halleck Island, Allan Point (1 UAM); Halleck or Krestof Island, Olga Strait (5 UAM); Krestof Island, DeGroff Bay (1 UAM); Kruzof Island, Crab Bay, 10.5 mi NW Sitka (1 UAM); Kruzof Island, Dry Pass (2 UAM); Kruzof Island, Kalinin Bay (3 UAM); Kruzof Island, Salisbury Sound (1 UAM); Kruzof Island, Sukoi Inlet (1 UAM); 57.4042, -135.6278, Rapids Island, in Peril Strait between Baranof and Chichagof islands (3 UAM). **SKAGWAY QUAD:** Haines, 7 mi. SSE of, Chilkat Peninsula (1 KU); Chilkat Lake (1 UCLA). **YAKUTAT QUAD:** 59.5000, -139.7500, Yakutat foreland (1 UAM); 59.5833, -139.5167, Yakutat foreland (1 UAM).



American Marten
Martes americana (Turton, 1806)

OTHER COMMON NAMES. Marten, Pine Marten.

TAXONOMY. Cytochrome *b* data from Stone and Cook (2002) suggested the genus *Martes* is paraphyletic with respect to *Gulo*. If supported with additional markers, this finding would indicate the need for taxonomic revision of some mustelid genera.

Two species of martens were recognized in North America based on skull (Figure 11) and other morphological differences up until the middle of the 20th century when Wright (1953) reduced *M. caurina* to a subspecies of *M. americana* based on possible intergradation between two populations in Montana (see the following account of *M. caurina* for further discussion). Clark et al. (1987) followed Wright's revision and tentatively recognized eight subspecies of American Marten that they divided into two groups: "americana" (a continental group comprising five subspecies) and "caurina" (a western group comprising three subspecies). Both Anderson (1970) and Hagmeier (1958), however, had earlier pointed out that subspecies designations were arbitrary because morphological variation was clinal in some cases, discordant in others (but see Dillon, 1961), and overall based on too few samples. Hall (1981) continued to recognize seven subspecies in the "americana" group; one of these occurs in Southeast Alaska.

Martes americana actuosa

Original Description. 1900. *Mustela americana actuosa* Osgood, N. Amer. Fauna, 19:43, October 6.

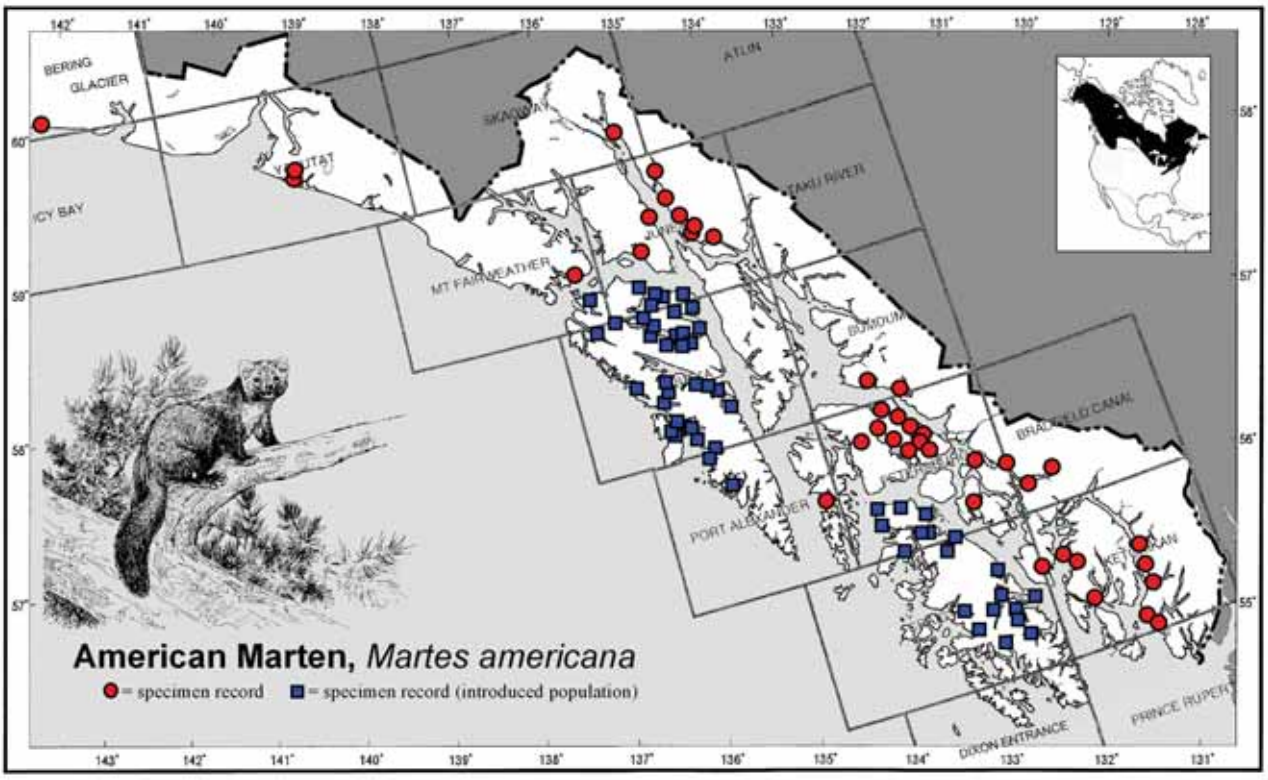
Type Locality. Fort Yukon, Alaska.

Type Specimen. USNM 6043.

Range. Interior and Southeast Alaska, northwestern Canada.

Remarks. Hall (1981) suggested the occurrence of the subspecies *kenaiensis* (Elliot, 1903) along the northern mainland of Southeast Alaska, but admitted that the limits of this taxon's range beyond the Kenai Peninsula was unknown.

REVISIONS AND REVIEWS. Clark et al. (1987), Giannico and Nagorsen (1989), Hicks and Carr (1995), Carr and Hicks (1997), Small et al. (2003), Schoen et al. (2007).



STATUS. IUCN-Least concern. Before game laws early in the 20th century, marten numbers in the region were greatly reduced by over harvest (MacDonald and Cook, 1996). *M. americana* is a Management Indicator Species of the USDA Forest Service.

DISTRIBUTION. Natural populations of American Marten have been documented on the coastal mainland of Southeast Alaska and in the Alexander Archipelago on Etolin, Kuiu, Kupreanof, Mitkof, Revillagigedo, Woewodski, and Wrangell islands. Marten of unknown status and affinity have also been reported from Gravina Island (L. Carson, Ketchikan, pers. comm.), Annette Island (J. Moran, Metlakatla, pers. comm.), and Zarembo Island (trapper reports in 2003-2005; R. Lowell, ADFG, Petersburg, pers. comm.; N. Dawson, pers. comm.).

In 1934, American Marten from Behm Canal and Thomas Bay on the mainland were successfully introduced on Prince of Wales Island and Baranof Island. A recent record and several reports of marten on Kosciusko (UAM specimen), Marble, Orr, Tuxekan, Heceta, Dall, Suemez, Long, and Sukkwan islands (various credible reports between 1996-2005) may have been derived from introduced stocks.

Between 1949 and 1952, American Marten were successfully introduced on Chichagof Island with stock taken from Baranof Island, Revillagigedo Island, the Stikine River drainage, Wrangell Island, Mitkof Island, and near Anchorage (Elkins and Nelson, 1954; Burris and McKnight, 1973). Marten are documented on Kruzof, Otstoia, Catherine, Partofschikof, and Yakobi islands; all of these may be from unreported transplants (MacDonald and Cook, 1996).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga area (7 CAS). **BRADFIELD CANAL QUAD:** 56.1806, -131.8847, Anan Creek (Anan Bay) (1 UAM); 56.2250, -131.5125, Bradfield Canal (38 UAM); 56.2333, -131.4667, Bradfield Canal (13 UAM); 56.3500, -131.9833, Aaron Creek (26 UAM). **CRAIG QUAD:** 55.6892, -132.5403, Prince of Wales Island, North Thorne Bay (3 UAM);55.0000, -133.0000, Prince of Wales Island, Salmon Bay (1 UAM); 55.2333, -132.6667, Prince of Wales Island, Deer Bay (25 UAM); 55.2361, -132.6750, Prince of Wales Island, Deer Bay (2 UAM); 55.2478, -132.3236, Prince of Wales Island, Cholmondeley Sound, west arm (5 UAM); 55.3167, -132.4500, Prince of Wales Island, Polk Cr (1 UAM); 55.3167, -132.4833, Prince of Wales Island, Polk Cr (3 UAM); 55.3167, -132.4500, Prince of Wales Island, Polk Cr (37 UAM); 55.4000, -132.6333, Prince of Wales Island, Twelvemile Arm (1 UAM); 55.4000, -132.9000, Prince of Wales Island, Trocadero Cr (1 UAM); 55.4167, -132.4667, Prince of Wales Island, Polk Inlet (89 UAM); 55.4167, -132.1333, Prince of Wales Island, Polk Inlet (3 UAM); 55.4500, -132.0106, Prince of Wales Island, Twelvemile Arm (25 UAM); 55.4611, -132.6917, Prince of Wales Island, Harris Creek (2 UAM); 55.5167, -132.9833, Prince of Wales Island, Klawock Lake (2 UAM); 55.7500, -132.4833, Prince of Wales Island, Slide Cr (18 UAM); 55.7556, -132.4917, Prince of Wales Island, Boy Scout Slide Cr (7 UAM); 55.9411, -132.9736, Prince of Wales Island, Logjam Creek (1 UAM); Prince of Wales Island, Stanley Creek (28 UAM); Prince of Wales Island, Thorne River (8 UAM); Prince of Wales Island, Halfway House Road (1 UAM); Prince of Wales Island, Stancy Cabin Road (1 UAM); Prince of Wales Island, Boy Scout Lake, Salt Cr (2 UAM). **JUNEAU QUAD:** 57.7333, -135.3167, Chichagof Island, Crab Bay (1 UAM); 57.9561, -135.7378, Chichagof Island (1 UAM); 57.9889, -135.6417, Chichagof Island, Neka Bay to 8-fathom (6 UAM);58.0000, -136.0000, Chichagof Island, north end of island (53 UAM);58.0000, -135.7333, Chichagof Island, upper Port Frederick (10 UAM); 58.0153, -135.5611, Chichagof Island, Seagull Creek (1 UAM); 58.0236, -135.6083, Chichagof Island, Chimney Rock (2 UAM); 58.0417, -135.6333, Chichagof Island, Neka Point (5 UAM); 58.0583, -135.4019, Chichagof Island, Gartina Creek, NE side of Island (2 UAM); 58.0600, -135.2719, Chichagof Island, upper Spasski Creek, NE part of Island (20 UAM); 58.0667, -135.0667, Chichagof Island, Whitestone Harbor, (10 UAM); 58.0792, -135.4778, Chichagof Island, Game Creek (33 UAM); 58.0792, -135.2875, Chichagof Island, Game Creek (1 UAM); 58.0833, -135.2833, Chichagof Island, Spasski Creek, NE part of Island (4 UAM); 58.0861, -135.4208, Chichagof Island, Gartina Creek (19 UAM); 58.0875, -135.2875, Chichagof Island, Spasski Creek, NE part of Island (49 UAM); 58.0944, -135.5750, Chichagof Island, Humpback Creek, W. Port Frederick (1 UAM); 58.1083, -135.4417, Chichagof Island, Hoonah (24 UAM); 58.1833, -135.5500, Chichagof Island, Gallaghar Creek (1 UAM); 58.1847, -135.5500, Chichagof Island, Halibut Creek; across from Halibut Island, Icy Straits (20 UAM); 58.2000, -135.5833, Chichagof Island, Flynn Cove (3 UAM); 58.3306, -134.4722, Salmon Creek (4 UAM); 58.3500, -134.5000, Lemon Creek Trail (1 UAM); 58.3819, -134.6000, Montana Creek; Juneau mainland (1 UAM); 58.4167, -135.4333, Excursion Inlet (4 UAM); 58.4369, -134.7500, 20 mile Glacier Hwy, Juneau mainland (4 UAM); 58.4917, -134.7889, Amalga Harbor (2 UAM); 58.5000, -134.6667, Eagle River (1 UAM); 58.5750, -135.1583, St James Bay; Chilkat Range (14 UAM); 58.5833, -134.8167, Yankee Basin Trail; Juneau mainland (3 UAM); 58.5833, -134.8667, Bessie Mine Trail (1 UAM); 58.5917, -134.9000, Bessie Mine Trail at Bessie Creek; Juneau mainland (5 UAM); 58.6069, -134.8531, Bessie Creek, Juneau Mainland (4 UAM); 58.7167, -135.0000, Berners Bay (8 UAM); 58.9167, -134.9167, Berners and Lace Rivers (9 UAM). **KETCHIKAN QUAD:** 55.3333, -131.6333, Revillagigedo Island (1 UAM); 55.3417, -131.6458, Revillagigedo Island, Ketchikan area (1 UAM); 55.5833, -131.6667, Revillagigedo Island, Naha Bay (2 UAM); 55.6033, -131.6333, Revillagigedo Island, Loring (40 UAM); 55.6667, -131.7500, Revillagigedo Island, Naha Bay (1 UAM); Revillagigedo Island, lower George Inlet (1 UAM); 55.0033, -131.0167, House Rock area near Very Inlet (2 UAM); 55.0333, -130.9667, Kah Shakes (1 UAM); 55.1000, -131.1500, southern tip Cleveland Peninsula (1 UAM); 55.3167, -130.9000, Smeaton Bay (3 UAM); 55.4078, -130.8819, Rudyerd Bay (32 UAM); 55.4875, -130.8833, Checats Point (6 UAM); 55.6167, -131.9667, Helm Bay, Cleveland Peninsula (50 UAM); 55.6208, -131.9667 (13 UAM); 55.6667, -131.7500, Naha, (2 UAM). **MT. FAIRWEATHER QUAD:** 58.1917, -136.2167, Chichagof Island, Idaho Inlet (8 UAM). **PETERSBURG QUAD:** Etolin Island (1 UCLA, 1 USNM); 56, -133.4167, Kosciusko Island, Tokeen Bay, Tenass Pass (12 UAM); 56.5167, -132.9167, Kupreanof Island, Wrangell Narrows (1 UAM); 56.6833, -132.9333, Kupreanof Island, South of Tonka Mt. (1 UAM); 56.6833, -132.9500, Kupreanof Island, Tonka Float (1 UAM); 56.7167, -133.1333, Kupreanof Island, Mitchell Creek (1 UAM); 56.7250, -132.9583, Kupreanof Island, Tonka, W. Wrangell Narrows (1 UAM); 56.7250, -132.9583, Kupreanof Island, near Tonka along Narrows (1 UAM); 56.7333, -132.9667, Kupreanof Island, Tonka (9 UAM); 56.7369, -132.9333, Kupreanof Island, Wrangell Narrows (2 UAM); 56.7500, -133.5000, Kupreanof Island (1 UAM); 56.8000, -133.2833, Kupreanof Island, Portage Bay (1 UAM); 56.8125, -132.9917, Kupreanof Island, Petersburg Creek (11 UAM); 56.8833, -132.9625, Kupreanof Island, Fivemile Creek (4 UAM); 56.9333, -133.1667, Kupreanof Island, Portage Bay road (5 UAM); 56.5000, -132.7667, Mitkof Island, 4.8 miles from Woodpecker Cove Rd. (1 UAM); 56.5167, -132.7000, Mitkof Island, Blind Slough (5 UAM); 56.5583, -132.7972, Mitkof Island, Summer Creek (1 UAM); 56.5589, -132.7806, Mitkof Island, Greens Creek (1 UAM); 56.5833, -132.8333, Mitkof Island, Blind Slough (17 UAM); 56.6167, -132.8167, Mitkof Island, Hatchery, Crystal fish (1 UAM); 56.6375,

-132.9167, Mitkof Island, Blind Slough (7 UAM); 56.6667, -132.8333, Mitkof Island, Cabin Creek drainage (35 UAM); 56.6917, -132.7611, Mitkof Island, big Bear Creek (1 UAM); 56.7210, -132.9290, Mitkof Island, Twin Creek (2 UAM); 56.7500, -132.8333, Mitkof Island (1 UAM); 56.7833, -132.8167, Mitkof Island, Frederick Road (2 UAM); 56.7944, -132.8222, Mitkof Island, Cabin Creek Rd. (14 UAM); 56.8028, -132.9667, Mitkof Island (11 UAM); Mitkof Island, Dry Straits Road (2 UAM); 55.5333, -132.5167, Prince of Wales Island, Twelvemile Arm (4 UAM); 56.0167, -132.8333, Prince of Wales Island, Coffman Cove (1 UAM); 56.0667, -133.0833, Prince of Wales Island, Whale Passage (1 UAM); 56.1000, -133.1833, Prince of Wales Island, Naukiti main Rd, Neck Lake (47 UAM); 56.1000, -133.1167, Prince of Wales Island, Whale Pass (1 UAM); 56.2000, -133.0667, Prince of Wales Island, Exchange Cove (11 UAM); 56.2333, -133.1000, Prince of Wales Island, Lava Cr (2 UAM); 56.3056, -133.3458, Prince of Wales Island, Goose Creek (1 UAM); 56.3333, -133.3000, Prince of Wales Island, Red Bay (8 UAM); 56.3542, -133.6208, Prince of Wales Island, Point Baker (38 UAM); Prince of Wales Island, Nahamia Creek (1 UAM); 56.5667, -133.0000, Woewodski Island (5 UAM); 56.4667, -132.3333, Wrangell Island, Two miles East of Wrangell (5 UAM); 56.0667, -133.0833, Whale Passage (19 UAM); 57.0083, -132.9833, Thomas Bay (20 UAM). **PORT ALEXANDER QUAD:** 56.2500, -133.6333, Baranof Island, Port Alexander (4 UAM); 56.7500, -135.1667, Baranof Island (31 UAM); 56.9833, -135.2917, Baranof Island, Deep Inlet (3 UAM); 57.0000, -135.2833, Baranof Island, Aleutkina Bay (1 UAM). **SITKA QUAD:** 57.0000, -135.2833, Baranof Island, Aleutkina Bay (1 UAM); 57.0417, -135.2000, Baranof Island, Herring Cove (1 UAM); 57.1333, -135.3750, Baranof Island, Starrigavan Bay (2 UAM); 57.1500, -135.3833, Baranof Island, Katlian Bay (8 UAM); 57.2500, -135.3417, Baranof Island, Nakwasina (10 UAM); 57.2500, -135.5667, Baranof Island (1 UAM); 57.2500, -135.5000, Baranof Island, Nakwasina Pass (2 UAM); 57.2500, -135.6167, Baranof Island, Fish Bay (2 UAM); 57.2500, -135.3333, Baranof Island, Nakwasina Bay (6 UAM); 57.2667, -134.8333, Baranof Island, Kelp Bay (2 UAM); 57.3833, -135.6167, Baranof Island, Fish Bay (37 UAM); 57.4333, -135.5583, Baranof Island (1 UAM); 57.9667, -135.0000, Baranof Island (2 UAM); Baranof Island, between Nakwasina & St John Bay (8 UAM); 57.3667, -134.8833, Baranof Island, Catherine "Island" (10 UAM); 57.4167, -135.0333, Baranof Island, Catherine "Island, Hanus Bay (1 UAM); 57.4000, -135.6500, Chichagof Island, Suloia Bay (2 UAM); 57.4583, -135.5500, Chichagof Island, Rose Channel (1 UAM); 57.5000, -135.5000, Chichagof Island (2 UAM); 57.5208, -135.5833, Chichagof Island, 2 miles S Poison Cove, along Rose Channel (1 UAM); 57.5333, -135.9667, Chichagof Island, Falcon Arm (2 UAM); 57.5667, -135.5833, Chichagof Island, Ushk Bay (3 UAM); 57.7167, -135.2167, Chichagof Island, Kadashan Bay, Tenakee Inlet (4 UAM); 57.7389, -135.1250, Chichagof Island, Corner Bay, Tenakee Inlet (7 UAM); 57.7417, -135.3167, Chichagof Island, Crab Bay, Tenakee Inlet (13 UAM); 57.7667, -135.4167, Chichagof Island, Saltery Bay, Tenakee Inlet (23 UAM); 57.7792, -135.1833, Chichagof Island, Indian River (64 UAM); 57.7806, -135.2167, Chichagof Island, near Tenakee Springs (10 UAM); 57.7833, -134.9500, Chichagof Island, Tenakee Inlet; Ten Mile Creek (2 UAM); 57.8261, -135.3739, Chichagof Island, Garden Point (1 UAM); 57.8417, -135.5167, Chichagof Island, Seal Bay, Tenakee Inlet (4 UAM); 57.9000, -135.5011, Chichagof Island, 10 mile Creek, N Tenakee Inlet (5 UAM); 57.9333, -135.1500, Chichagof Island, Seal Creek (1 UAM); 57.9500, -136.2167, Chichagof Island (1 UAM); 57.9583, -136.2250, Chichagof Island, Pelican (10 UAM); 57.9750, -135.6583, Chichagof Island, Salt Lake Bay, Port Frederick (7 UAM); 57.9889, -135.6417, Chichagof Island, north side of The Narrows (1 UAM); 57.9889, -135.6417, Chichagof Island, west side of The Narrows (2 UAM); 57.1333, -135.5500, Kruzof Island, Crab Bay (4 UAM); 57.1500, -135.5833, Kruzof Island, Port Krestof (1 UAM); 57.1667, -135.6667, Kruzof Island (8 UAM); 57.1667, -135.6000, Kruzof Island, Mud Bay (5 UAM); 57.1833, -135.4500, Kruzof Island, Ogla Strait (1 UAM); Kruzof Island (2 UAM); 57.5625, -135.4458, Otstoia Island (1 UAM); 57.2500, -135.6000, Partofshikof Island (2 UAM); 57.1500, -135.5500, Hayward Strait (Hayward Sound?) (7 UAM); 57.2500, -135.5667 (3 UAM); 57.4583, -135.5500, Rose Channel (2 UAM); 57.5000, -135.2167, Peril Strait (27 UAM). **SKAGWAY QUAD:** 59.2000, -135.2833, Katzehin River (8 UAM). **SUMDUM QUAD:** 57.1000, -133.2333, Farragut Bay, mainland SE (18 UAM). **YAKUTAT QUAD:** 59.4417, -139.5500, old Situk Creek (1 UAM); 59.5000, -139.5000, Yakutat area road system (21 UAM). **ADFG MANAGEMENT UNITS:** Unit 1, mainland (2 UAM); Unit 1C, mainland (3 UAM); Unit 1A, mainland (2 UAM); Unit 4 (4 UAM).

Figure 11. Skulls of **A**) *Martes caurina* (UAM 48838 ♂, Admiralty Island) and **B**) *Martes americana* (UAM 34912 ♂, Upper Lynn Canal, Katzehin River) show marked differences.

Pacific Marten
Martes caurina (Merriam, 1890)

OTHER COMMON NAMES. Named subspecies include Queen Charlotte Marten, Vancouver Island Marten, and Pacific Coast Marten.

TAXONOMY. Since 1890, when Merriam described *Martes caurina* from coastal Washington, the marten of North America have been considered to belong to two species: *Martes americana* and *M. caurina*. A latter revision by Rhoads (1902) supported Merriam's contention. Subsequently, these two polytypic forms were synonymized under *Martes americana* by Wright (1953). Recent mitochondrial DNA studies by Carr and Hicks (1997), Demboski et al. (1999), Stone (2000), Cook et al. (2001), and Stone et al. (2002), and nuclear DNA studies by McGowan et al. (1999) and Small et al. (2003) strongly suggest that the "caurina" and "americana" groups represent two distinct species, a view we follow in these accounts, contrary to Wilson and Reeder (2005).

Martes caurina

Original Description. 1890. *Mustela caurina* Merriam, N. Amer. Fauna, 4:27, October 8.

Type Locality. Near Grays Harbor, Grays Harbor Co., Washington.

Type Specimen. USNM 186450.

Range. Southeast Alaska southward along the coast (including Haida Gwaii and Vancouver islands) to California and eastward to Wyoming, Montana and Idaho (Hall, 1981; Stone et al., 2002).

The taxonomic status of named subspecies of *caurina* remains unresolved. Clark et al. (1987) included three subspecies of western marten within the "caurina" group: *caurina* (Merriam, 1890), *humboldtensis* Grinnell and Dixon, 1926:411, and *nesophila* (Osgood, 1901). The subspecies *origens* (Rhoads, 1902), *sierrae* Grinnell and Storer, 1916, *vancouverensis* Grinnell and Dixon, 1926, and *vulpina* (Rafinesque, 1819) were considered synonyms of *caurina* by Clark et al. (1987). Their submergence of *vulpina*, the oldest named taxon, was made without comment in regard to date priority.

The subspecies *nesophila* was restricted by Swarth (1911) and Hall (1981) to insular populations on the Queen Charlotte Islands and Kuiu Island in Southeast Alaska. Giannico and Nagorsen (1989) demonstrated that this race is strongly differentiated from other coastal populations, but suggested that *nesophila* should be applied only to the Queen Charlotte Islands populations. Their analysis of skull morphology of Southeast Alaska martens unfortunately included only material from the mainland or from island populations that were the result of introductions of marten from mainland stocks. They did not include material from Kuiu Island or Admiralty Island, the only two island localities of *M. caurina* in Southeast Alaska that were later identified from mitochondrial and nuclear molecular data by Stone and Cook (2002), Stone et al. (2002), and Small et al. (2003).

Preliminary findings from an expanded genetic study comparing mitochondrial and nuclear markers of martens from throughout North America, suggest that each North Pacific island population is distinctive and that Kuiu, Admiralty, Queen Charlotte, and Vancouver islands harbor a significant portion of the genetic diversity reported for populations of *M. caurina* throughout the species' range (N. Dawson, pers. com.). Admiralty and the Queen Charlottes have unique genetic signatures found nowhere else.

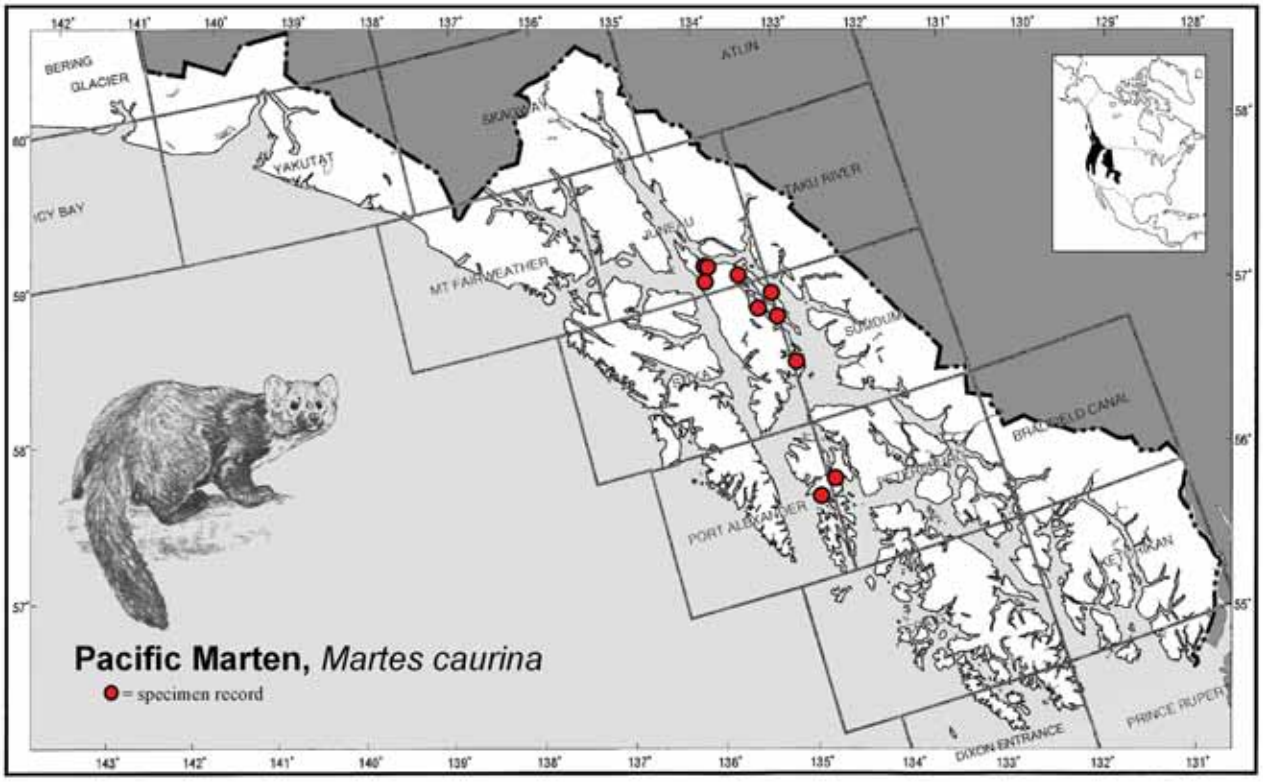
REVISIONS AND REVIEWS. Hicks and Carr (1995), Carr and Hicks (1997), Small et al. (2003).

STATUS. Marten are closely tied to old-growth forests and may be heavily impacted by logging activities (Buskirk, 1992; Buskirk and Ruggiero, 1994). Today, *M. caurina*, is extant on only two islands in the Alexander Archipelago, although several key islands have not been inventoried. The Kuiu Island population of *M. caurina* is of particular concern given past and projected timber harvests. Excessive logging on this island may contribute to the eventual extirpation of this species from Southeast Alaska. *M. caurina* is suspected to have had a much wider distribution throughout the islands of the Alexander Archipelago in the past. Koehler's (2006) assessment of molecular variation across the distribution of the nematode, *Soboliphyme baturini*, a parasite of mustelids, provides indirect evidence that the range of *M. caurina* has declined. Koehler (2006) recovered a unique genetic signature for populations of this parasite from Chichagof Island and that signature likely reflects the extirpation of *M. caurina* from this

island. Extant populations of marten on Chichagof Island are the result of repeated human introductions of *M. americana;* events also reflected in the genetic signatures of these Chichagof nematodes.

DISTRIBUTION. Natural populations of Pacific Marten in Southeast Alaska have been documented on Kuiu and Admiralty islands. Credible but as yet undocumented reports of martens on a number of outer islands (e.g., Dall, Heceta, Long) may have been derived from introduced *M. americana* stocks on Prince of Wales or could possibly be remnants of insular *M. caurina* lineages.

SPECIMENS. **JUNEAU QUAD:** 58.0917, -134.7750, Admiralty Island, Hawk Inlet (7 UAM); 58.1667, -134.6667, Admiralty Island, Youngs Bay (10 UAM); 58.1833, -134.5667, Admiralty Island, Admiralty Cove Cabin (2 UAM); 58.1875, -134.5750, Admiralty Island, Admiralty Cove (3 UAM); 58.1958, -134.5583, Admiralty Island, Young Point (1 UAM); 58.2333, -134.7333, Admiralty Island (4 UAM). **PETERSBURG QUAD:** Kuiu Island, Three Mile Arm (1 MVZ). **PORT ALEXANDER QUAD**: ; 56.5000, -134.2000, Kuiu Island, Tebenkof Bay (62 UAM). **SITKA QUAD:** 57.8333, -134.1667, Admiralty Island, upper Glass Peninsula (16 UAM); 57.9833, -134.3167, Admiralty Island, Swan Cove (9 UAM). **SUMDUM QUAD:** 57.4667, -133.9167, Admiralty Island, Gambier Bay (4 UAM); 57.7833, -134.0500, Admiralty Island (1 UAM); 57.7861, -134.0500, Admiralty Island (1 UAM); 57.9125, -133.9917, Admiralty Island, Twin Point area; Glass Peninsula (5 UAM); 58.0139, -134.2611, Admiralty Island, W side Seymour Canal (1 UAM).



Fisher
Martes pennanti (Erxleben, 1777)

OTHER COMMON NAMES. Pekan, Pennant's Marten.

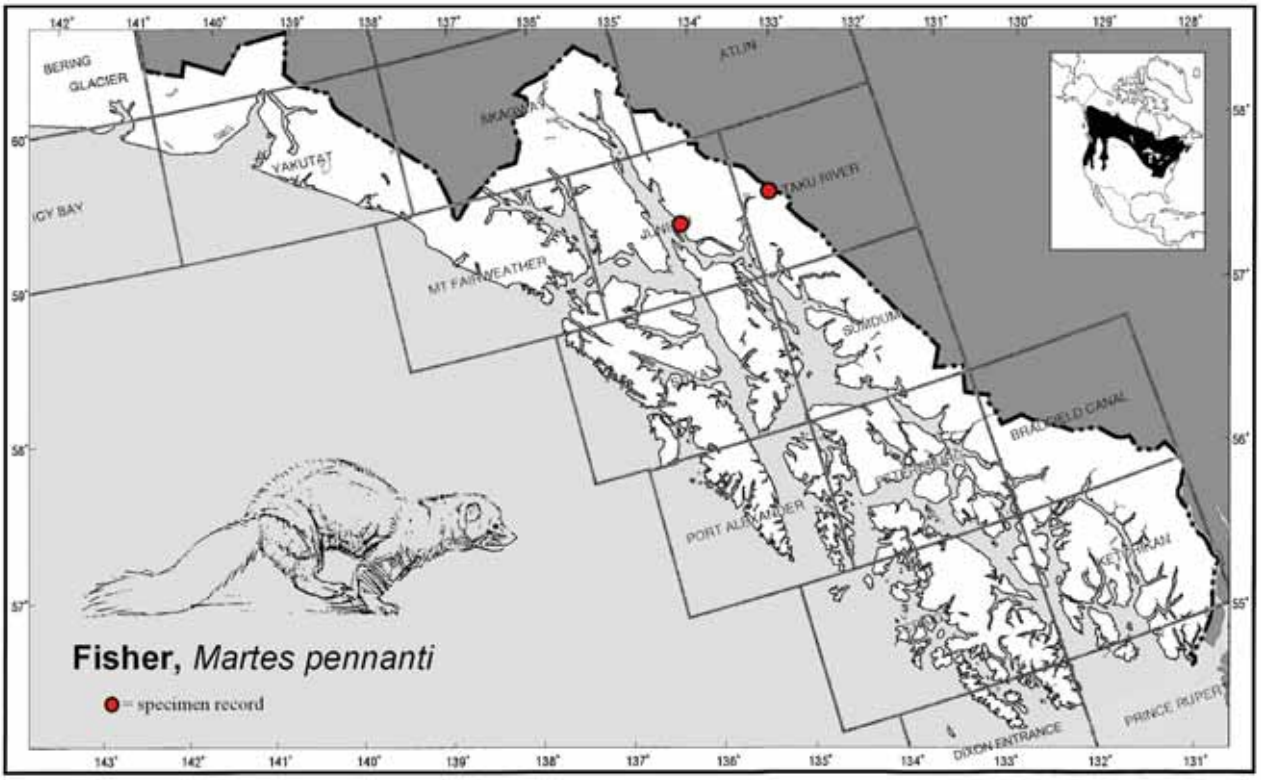
TAXONOMY. A range-wide revision that includes the new Alaska material is needed. Hall (1981) recognized three subspecies in North America and indicated that one, *M. p. pacifica*, occurs in southern Southeast Alaska. The possibility that the Fishers recently discovered in Southeast Alaska likely entered the region from inland British Columbia along river corridors would imply a closer affinity to the interior (rather than coastal) subspecies, *M. p. columbiana* (considered synonymous with *M. p. pennanti* by Youngman, 1975). In a genetic assessment based on mitochondrial DNA data of Fishers from throughout its range, Drew et al. (2003) found 12 haplotypes showing minimal sequence divergence with limited correspondence to subspecies designations.

REVISIONS AND REVIEWS. Powell (1981, 1993).

STATUS. IUCN-Least concern; BC-Blue (vulnerable).

DISTRIBUTION. The occurrence of Fishers in Southeast Alaska was confirmed by voucher specimens collected from the Taku River in 1994, a young male in 1996 near Juneau, and a mature female in 1997 from the Besi Creek area about 40 km north of Juneau. From these and other reports and sight records (MacDonald and Cook, 1996; Barten, 2004c), it appears that this species is a rare to uncommon visitor or resident on the mainland of Southeast Alaska. This species has been found as far north as southeastern Yukon, Canada (Youngman, 1975) and may be expanding its range. Genetic and paleontological evidence suggest that Fishers evolved in eastern North America and have expanded westward to the Pacific coast since the last glaciation (Graham and Graham, 1994; Wisely et al., 2004).

SPECIMENS. **JUNEAU QUAD:** 58.5833, -134.8333, Juneau (1 UAM); 58.6167, -134.9167, E of Sunshine Cove (1 UAM). **TAKU RIVER QUAD:** 58.5500, -133.6833, Taku River, Canyon Island (1 UAM).



Ermine
Mustela erminea Linnaeus, 1758

OTHER COMMON NAMES. Juneau Weasel, Short-tailed Weasel, Stoat, Tundra Weasel.

TAXONOMY. Hall (1944, 1951) recognized seven subspecies in Alaska, five are endemic to the Southeast region. Eger (1990) also recognized seven subspecies in the state and five in the Southeast region, but in her assessment of geographic variation in 13 craniometric characters, she 1) identified the Queen Charlotte endemic, *M. e. haidarum*, as also occurring in the Alexander Archipelago on neighboring Prince of Wales and Suemez islands, and 2) neither examined specimens nor included in her map the Beringian form, *M. e. arctica*, from the northern portion of Southeast Alaska.

Substantial geographic variation in the mitochondrial cytochrome *b* gene has been uncovered in Southeast Alaska with three distinctive lineages detected (Fleming and Cook, 2002). Southeast Alaska is the only region in the world where all three of these distinctive Ermine converge. One lineage is restricted to the Prince of Wales Archipelago and the Queen Charlotte Islands and may provide a signal for the hypothesized North Pacific Coastal refugium during the Pleistocene. Another lineage has a Holarctic distribution. In Southeast Alaska, it occurs only on Admiralty Island and near Yakutat, then into Yukon Territory, westward across Alaska, Siberia and into Europe. The third lineage is endemic to North America and occurs from the Pacific Ocean eastward across North America to the East Coast (Fleming and Cook, 2002). In Southeast Alaska this lineage has been found on Baranof and Chichagof islands and along the mainland and nearshore islands.

Whether these three lineages represent three distinct species needs to be critically evaluated.

Mustela erminea alascensis

Original Description. 1896. *Putorius richardsoni alascensis* Merriam, N. Amer. Fauna, 11:12, June 30.

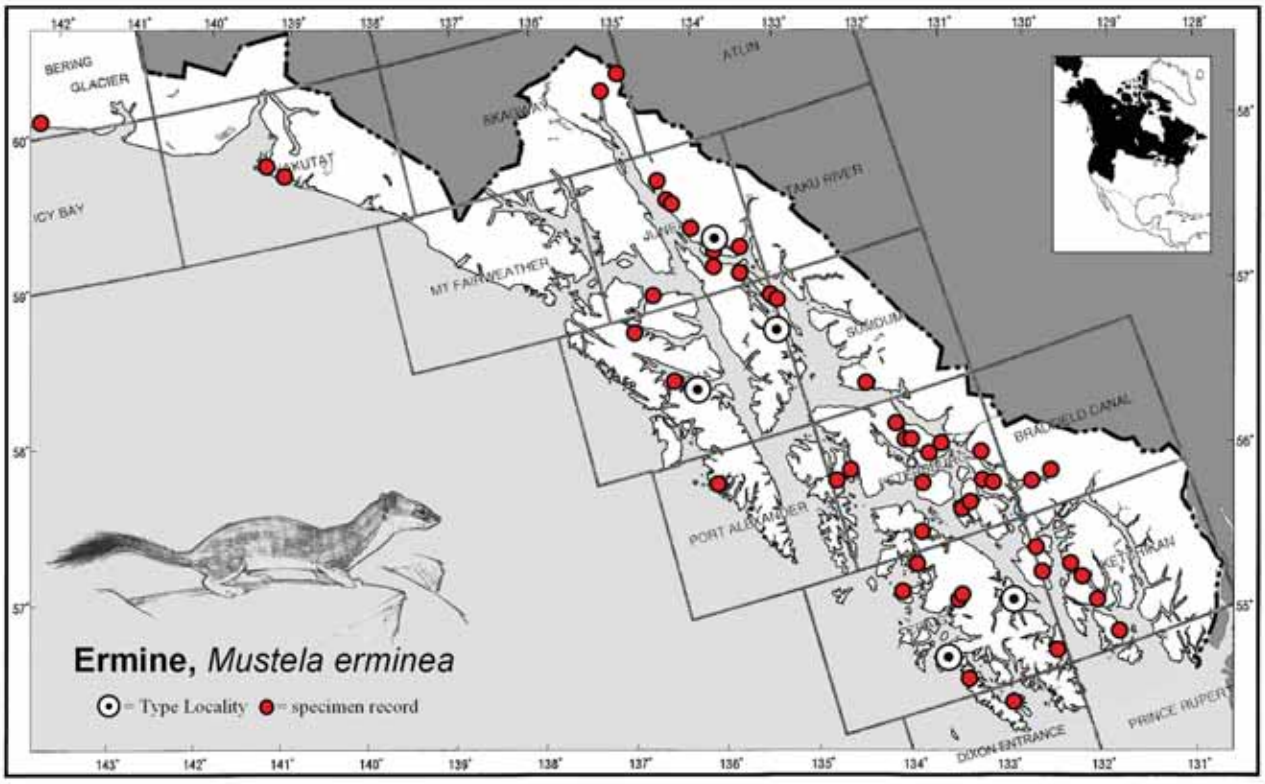
Type Locality. Juneau, Alaska.

Type Specimen. USNM 74423.

Range. Mainland Southeast Alaska between from Lynn Canal south to Portland Canal.

Mustela erminea arctica

Original Description. 1896. *Putorius arcticus* Merriam, N. Amer. Fauna, 11:15, June 30.



Type Locality. Point Barrow, Alaska.
Type Specimen. USNM 14062/23010.
Range. Nearly all of Alaska south along the Gulf Coast to Glacier Bay (Hall, 1951).

Mustela erminea celenda
Original Description. 1944. *Mustela erminea celenda* Hall, Proc. Biol. Soc. Washington, 57:38, June 28.
Type Locality. Kasaan Bay, Prince of Wales Island, Alaska.
Type Specimen. USNM 130987.
Range. Prince of Wales, Long, and Dall islands, Alexander Archipelago.

Mustela erminea initis
Original Description. 1944. *Mustela erminea initis* Hall, Proc. Biol. Soc. Washington, 57:37, June 28.
Type Locality. Saook Bay, Baranof Island.
Type Specimen. MVZ 289.
Range. Baranof and Chichagof islands, Alexander Archipelago.

Mustela erminea salva
Original Description. 1944. *Mustela erminea salva* Hall, Proc. Biol. Soc. Washington, 57:39, June 28.
Type Locality. Mole Harbor, Admiralty Island, Alaska.
Type Specimen. MVZ 74641.
Range. Admiralty Island.

Mustela erminea seclusa
Original Description. 1944. *Mustela erminea seclusa* Hall, Proc. Biol. Soc. Washington, 57:39, June 28.
Type Locality. Port Santa Cruz, Suemez Island, Alaska.
Type Specimen. MVZ 31232.
Range. Known only from type locality.

REVISIONS AND REVIEWS. King (1983), Eger (1990).

STATUS. ESA-Candidate as *M. e. seclusa*; COSEWIC-Threatened and BC-Red (endangered or threatened) as *M. e. haidarum*.

DISTRIBUTION. *Mustela erminea*, a Holarctic species, is widely distributed throughout Southeast Alaska, occurring along the entire mainland coast and probably on most of the islands in the Alexander Archipelago. Islands where Ermine are documented are as follows: Admiralty, Annette, Baranof, Chichagof, Dall, Douglas, El Capitan, Etolin, Heceta, Kuiu, Kupreanof , Long, Mitkof, Prince of Wales, Revillagigedo, Suemez, Wrangell, and Zarembo. Fay and Sease (1985) mention ermine taken on smaller islands adjacent to Prince of Wales.

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga area (6 CAS). **BRADFIELD CANAL QUAD:** 56.2067, -131.7234, Bradfield Canal,(2 UAM); 56.2206, -131.4736, Tyee (1 UAM). **CRAIG QUAD:** Dall Island, Sea Otter Harbor (1 LACM); 55.9339, -133.3181, El Capitan Island, Turner Creek (1 UAM); 55.7167, -133.4167, Heceta Island, Crooked Hook Lake (1 UAM); 55.7681, -133.5897, Heceta Island, 2 mi S Port Alice (1 UAM); 55.8031, -133.5914, Heceta Island, Port Alice (1 UAM); 55.1000, -132.1500, Prince of Wales Island, center of island (3 UAM); 55.1000, -132.1500, Prince of Wales Island, Duke Creek (1 UAM); 55.1000, -132.1500, Prince of Wales Island, Lower Steelhead Creek (1 UAM); 55.1000, -132.1500, Prince of Wales Island, Bennett Creek, Big Salt Rd. (1 UAM); 55.1000, -132.1500, Prince of Wales Island, Lower Steelhead Creek (3 UAM); 55.6167, -132.5500, Prince of Wales Island, Lake Ellen (1 UAM); 55.6167, -133.0000, Prince of Wales Island, Big Salt Creek (3 UAM); 55.6319, -132.9075, Prince of Wales Island (3 UAM); 55.6686, -132.5075, Prince of Wales Island, Thorne Bay (4 UAM); 55.6833, -132.4500, Prince of Wales Island, Boy Scout Lake (1 UAM); 55.7667, -132.0000, Prince of Wales Island, North Thorn Falls (1 UAM); Prince of Wales Island, Sandy Beach Road, 28 m from Slide Creek (1 UAM); 55.2753, -133.2775, Suemez Island, Port Refugio (1 UAM); Suemez Island, Port Santa Cruz (1 MVZ). **DIXON ENTRANCE QUAD:** 54.8708, 132.8014, Long Island, Howkan (1 FMNH). **JUNEAU QUAD:** 58.1000, -134.3167, Admiralty Island, head of Seymour Canal (1 UAM); 58.1833, -134.5667, Admiralty Island, Admiralty Cove Cabin (2 UAM); 58.1875, -134.5750, Admiralty Island, Admiralty Cove (1 UAM); 57.8667, -135.7667, Chichagof Island (1 UAM); 58.0667, -135.4667, Chichagof Island, Game & Sparske Creek (1 UAM); 58.0833, -135.4167, Chichagof Island, Gartina Creek (1 UAM); 58.0861, -135.4208, Chichagof Island, Gartina Creek (1 UAM); 58.1000, -135.4333, Chichagof Island, W side port Frederick near Hoonah (1 UAM); Chichagof Island, Neka River (2 UAM); Chichagof Island (1 UAM); 58.2583, -134.2750, Douglas Island, 5 mi N Douglas Highway (1 UAM); 58.2839, -134.5203, Douglas Island (1 UAM); 58.2740, -134.6457, Peterson Creek (2 UAM); 58.3000, -134.4000, Sunshine Cove Creek, Juneau mainland (1 UAM); 58.3000, -134.4000, Bridget Creek, Juneau mainland (1 UAM); 58.3042, -134.4083 (1 UAM); 58.3306, -134.4722, Salmon Creek (7 UAM); 58.3333, -134.4667, Salmon Creek trail, 3 miles north of Juneau (2 UAM); 58.3500, -134.5000, Lemon Creek Trail (1 UAM); 58.3819, -134.6000, Montana Creek, Juneau mainland (2 UAM); 58.3839, -134.6561, Spaulding Meadows (8 UAM); 58.4000, -134.6000, Montana Creek (1 UAM); 58.4000, -134.6167, Juneau Mainland (1 UAM); 58.4167, -134.7472 (1 UAM); 58.4369, -134.7500, 20 mile Glacier Hwy, Juneau mainland (1 UAM); 58.4833, -134.7833, Peterson Creek, mile 25 N Glacier Hwy. (1 UAM); 58.4917, -134.7889, Amalga Harbor, Juneau mainland (1 UAM); 58.5833, -134.8167, Yankee Basin Trail, Juneau mainland (1 UAM); 58.5833, -134.9000, Bessie Creek (8 UAM); 58.5833, -134.8833, Bessie Mine Trail (1 UAM); 58.5983, -134.8717, Bessie Creek (2 UAM); 58.6167, -134.9167, Bessie Creek, above Yankee Creek (1 UAM); 58.6167, -135.9333, Juneau Mainland, above Yankee Cove (2 UAM); 58.6333, -134.9000, Davies Creek Drainage (1 UAM); 58.6500, -134.9000, south of Cowee Creek, Juneau mainland (2 UAM); 58.6656, -134.8592 (2 UAM); 58.6667, -134.9333, Echo Cove, Juneau mainland (1 UAM); 58.7881, -134.9356 (1 UAM). **KETCHIKAN QUAD:** 55.3333, -131.5000, Revillagigedo Island, lower George Inlet (1 UAM); 55.4894, -131.5986, Revillagigedo Island, Lake Harriet Hunt (1 UAM); 55.6000, -131.6333, Revillagigedo Island, Loring Beach fringe (1 UAM); 55.6025, -131.6361, Revillagigedo Island, Loring Beech Fringe (1 UAM); 55.6167, -131.9667, Helm Bay, Cleveland Peninsula (5 UAM). **PETERSBURG QUAD:** 56.1867, -132.6328, Etolin Island (1 UAM); 56.2211, -132.5089, Etolin Island (2 UAM); 56.6445, -133.7210, Kuiu Island, Rocky Pass, Devil's Elbow (1 MSB); 56.3777, -133.4410, Kuiu Island, 1 mi.le S. of Devil's Elbow cabin (1 MSB); 56.7167, -132.9500, Kupreanof

Island, Tonka road system (1 UAM); 56.5333, -132.7333, Mitkof Island, Blind Slough (2 UAM); 56.6182, -132.8498, Mitkof Island, Blind Slough (2 UAM); 56.6183, -132.6197, Mitkof Island (4 UAM); 56.6667, -132.8333, Mitkof Island, Cabin Creek Rd. (22 UAM); 56.7394, -132.7664, Mitkof Island, Cabin Creek Road (19 UAM); 56.8028, -132.9667, Mitkof Island (8 UAM); Mitkof Island, near Sandy Beach Park (1 UAM); 56.0167, -132.8333, Prince of Wales Island, Coffman Cove (1 UAM); 56.1153, -133.1208, Prince of Wales Island, 0.5 mi upstream from lower 108 bridge, Whale Pass (1 UAM); 56.2667, -132.2000, Wrangell Island, McCormick Creek (2 UAM); 56.2833, -132.1667, Wrangell Island (1 UAM); 56.3167, -132.2833, Wrangell Island, Wrangell (1 UAM); 56.3183, -132.3083, Wrangell Island, 2 mi S McCormick Creek, N side of Main Line Rd. (1 UAM); 56.4799, -132.1645 (3 UAM); 56.3558, -132.8358, Zarembo Island, St. Johns Harbor (1 MVZ). **PRINCE RUPERT QUAD:** 55.1041, -131.3587, Annette Island, Crab Bay (1 MSB). **PORT ALEXANDER QUAD:** 56.9008, -135.3242, Baranof Island (1 UAM). **SITKA QUAD:** 57.9667, -134.0833, Admiralty Island, Glass Peninsula opposite South Island (1 UAM); 57.5000, -135.5000, Chichagof Island (1 UAM). **SKAGWAY QUAD:** 59.4566, -135.3291, Dyea Road, 1 mile W of Skagway (1 UAM); 59.6161, -135.1383, White Pass (1 UAM). **SUMDUM QUAD:** 57.9122, -133.9917, Admiralty Island, Twin Point, Glass Peninsula (4 UAM); 57.1000, -133.2333, Farragut Bay, mainland SE (1 UAM); 57.1697, -133.2531, Farragut Bay North Arm (1 UAM). **YAKUTAT QUAD:** 59.4333, -139.5667, Yakutat, Lower Situk Road (1 UAM); 59.4667, -139.6167, Tawah Creek (1 UAM); 59.4667, -139.6000, Tawah Creek (2 UAM); 59.5139, -139.7722, Summit Lake (1 UAM); 59.5500, -139.7333, Yakutat, Lower Situk Road (4 UAM).

Least Weasel
Mustela nivalis Linnaeus, 1766

OTHER COMMON NAMES. Alaskan Least Weasel.

TAXONOMY. Hall (1981) recognized *M. n. eskimo* as the only one of four Nearctic subspecies occurring in Alaska. However, the widely distributed race, *M. n. rixosa*, has been reported close to Southeast Alaska from Atlin, British Columbia (Hall, 1981).

REVISIONS AND REVIEWS. Reichstein (1957), Sheffield and King (1994), van Zyll de Jong (1992).

STATUS. IUCN-Least concern.

DISTRIBUTION. Sightings (but no specimens) of Least Weasel have been reported in the Glacier Bay area (MacDonald and Cook, 1996). We are not aware of any substantiated records of this species in Southeast Alaska.

SPECIMENS. None.

American Mink
Neovison vison (Schreber, 1777)

OTHER COMMON NAMES. Mink, Island Mink.

TAXONOMY. Placement of *vison* in the genus *Neovison* follows Wozencraft (2005), Abramov (1999) and others. Of the 15 subspecies listed by Hall (1981), 2 occur in Southeast Alaska.

Neovison vison energumenos

Original Description. 1896. *Putorius vison energumenos* Bangs, Proc. Boston Soc. Nat. Hist., 27:5, March.

Type Locality. Sumas, British Columbia.

Type Specimen. MCZ B3555.

Range. Western Canada, mainland Southeast Alaska to California and New Mexico.

Neovison vison nesolestes

Original Description. 1909. *Lutreola vison nesolestes* Heller, Univ. California Publ. Zool., 5:259, February 18.

Type Locality. Windfall Harbor, Admiralty Island, Alaska.

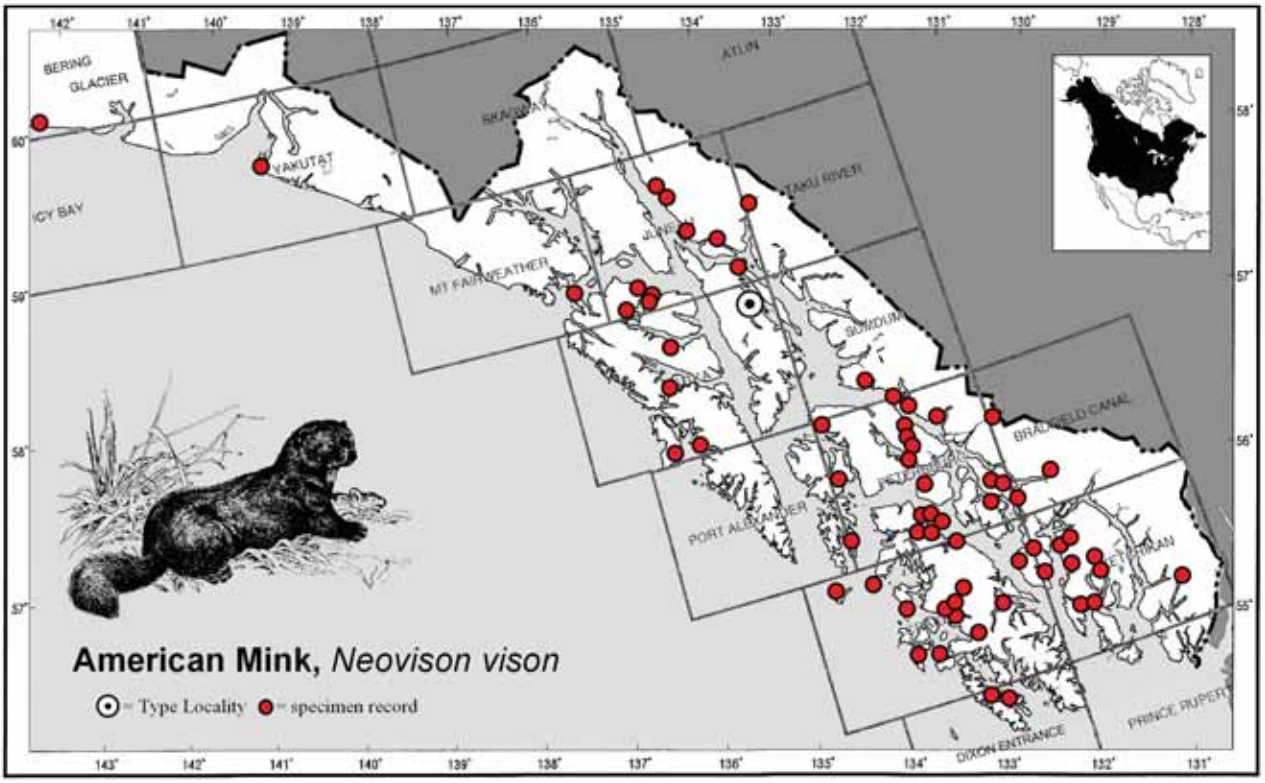
Type Specimen. MVZ 201.

Range. Alexander Archipelago of Southeast Alaska.

REVISIONS AND REVIEWS. Youngman (1982), Abramov (1999), Larivière (1999), Kurose et al. (2000).

STATUS. IUCN-Least concern.

DISTRIBUTION. Mink occur on the mainland and probably on most of the islands in the



Alexander Archipelago. Mink have been documented on the following islands: Admiralty, Anguilla, Baranof, Bluff, Butterworth, Castle, Chichagof, Coronation, Echo, Etolin, Gravina, Inian, Kruzof, Kuiu, Kupreanof, Long, Mitkof, Peratrovich, Prince of Wales, Revillagigedo, Shrubby, Suemez, Thorne, Woewodski, Wrangell, and Zarembo.

Ranch mink were introduced to Strait Island in 1956 from stock raised at the once-active Petersburg Fur Farm. Their status is unknown (Burris and McKnight, 1973).

SPECIMENS. **BERING GLACIER:** Cape Yakataga (1 CAS). **BRADFIELD CANAL QUAD:** 56.0667, -131.9667, Mainland Frosty Bay (4 UAM); 56.1667, -132.0000, Bradfield Canal (mainland) (3 UAM); 56.2333, -131.4667, Bradfield Canal (1 UAM); Stikine River, Hot Springs (1 USNM). **CRAIG QUAD:** 55.6667, -133.5833, Anguilla Island (1 UAM); 55.9178, -134.32, Coronation Island, Egg Harbor (3 MVZ); 55.5818, -133.1083, Peratrovich Island (7 UAM); 55.3500, -133.6000, Prince of Wales Island (6 UAM); 55.4000, -132.9000, Prince of Wales Island, Trocadero Cr. (1 UAM); 55.5333, -132.5167, Prince of Wales Island, Twelvemile arm on saltwater (1 UAM); 55.5333, -133.0167, Prince of Wales Island, Halfmile Creek (1 UAM); 55.5500, -133.1000, Prince of Wales Island, Bennett Creek, 1 mile outside of Klawock (2 UAM); 55.5500, -133.0833, Prince of Wales Island, Klawok; Big Salt Rd (1 UAM); 55.6167, -133.0000, Prince of Wales Island, Big Salt (3 UAM); 55.6833, -132.8500, Prince of Wales Island, Control Creek (1 UAM); Prince of Wales Island, Lower Steelhead Cr (2 UAM); 55.5000, -133.0000 (1 UAM); 55.5500, -133.0833, Prince of Wales Island, Klawock Hatchery (1 UAM); 55.2786, -133.4314, Suemez Island, Port Santa Cruz (1 MVZ); 55.7333, -132.2000, mouth of Union Bay (1 UAM); 55.7333, -132.2500, Bear Creek, Meyers Chuck (1 UAM); 55.7500, -132.0000, Union Bay, Cleveland Peninsula (1 UAM). **DIXON ENTRANCE QUAD:** 54.8711, -132.8033, Long Island, Howkan (5 MVZ). **JUNEAU QUAD:** 58.1833, -134.5667, Admiralty Island, Admiralty Cove Cabin (1 UAM); Admiralty Island, Oliver Inlet (2 MVZ); 58.0583, -135.7875, Chichagof Island, Port Frederick, Neka R (12 UAM); 58.1083, -135.4417, Chichagof Island, south of Hoonah (1 UAM); 58.1847, -135.5500, Chichagof Island, Halibut Creek across from Halibut Island, Icy Straits (1 UAM); 58.0792, -135.4778, lower Game Creek (1 UAM); 58.2740, -134.6457, Peterson Creek (2 UAM); 58.3000, -134.4000, Gastineau Channel (1 UAM); 58.3042, -134.4083 (2 UAM); 58.4369, -134.7500, 20 mile Glacier Hwy, Juneau mainland (2 UAM); 58.5833, -134.8833, (Bessie) or (Beggie) Creek (4 UAM); 58.6167, -134.9167, Bessie Creek, above Yankee Cove (1 UAM); 58.6500, -134.8167, Sunshine Cove Creek (1 UAM); 58.6500, -134.8167, Bridget Creek (1 UAM); 58.6708, -134.9333, Echo Cove (7 UAM); 58.8667, -134.8833, Eagle River (1 UAM); Auke Bay (1 UAM); Cowee Creek (1 UAM). **KETCHIKAN QUAD:** 55.3250, -131.6583, Gravina Island, Clam Cove (6 UAM); 55.2994, -131.4778, Revillagigedo Island (1 UAM); 55.3250, -131.5222, Revillagigedo Island, Herring Cove (1 UAM); 55.3333, -131.6333, Revillagigedo Island (1 UAM); 55.3417, -131.6458, Revillagigedo Island, Ketchikan area (36 UAM); 55.3783, -131.3219, Revillagigedo Island, Gnat Cove, Carroll Inlet (1 UAM); 55.4306, -131.2547, Revillagigedo Island, Shoal Cove (6 UAM); 55.4558, -131.3150, Revillagigedo Island, Island Point, Carroll Inlet (2 UAM); 55.4728, -131.3114, Revillagigedo Island, Carroll Inlet, near Marble Creek (9 UAM); 55.5825, -131.3517, Revillagigedo Island, head of Carroll Inlet (1 UAM); 55.5833, -131.3333, Revillagigedo Island (1 UAM); 55.6000, -131.6333, Revillagigedo Island, Loring Beach fringe (14 UAM); 55.7500, -131.5000, Revillagigedo Island (2 UAM); 55.7667, -131.7000, Revillagigedo Island, Neets Bay (4 UAM); 55.6167, -131.9667, Helm Bay, Cleveland Peninsula (14 UAM); Boca de Quadra (2 MVZ). **MT. FAIRWEATHER QUAD:** 58.2500, -136.3167, Inian Island (9 UAM). **PETERSBURG QUAD:** Bluff Island, Snow Passage (2 USNM); Echo Island, Kashevarof Passage (3 USNM); 56.1667, -132.2500, Etolin Island, Whaletail Cove (1 UAM); Kuiu Island, Three Mile Arm (19 MVZ); 56.2333, -133.9000, Kuiu Island, Louise Cove (37 UAM); 56.7167, -132.9500, Kupreanof Island, Tonka road system (1 UAM); 56.7500, -133.5000, Kupreanof Island (2 UAM); 56.8125, -132.9917, Kupreanof Island, Petersburg Creek (2 UAM); 56.6333, -132.9167, Mitkof Island, Blind Slough (1 UAM); 56.6667, -132.8333, Mitkof Island, Cabin Creek Rd. (21 UAM); 56.7500, -132.8333, Mitkof Island (48 UAM); 56.8028, -132.9667,

Mitkof Island (1 UAM); 56.9167, -132.8333, Mitkof Island (26 UAM);55.0000, -133.0000, Prince of Wales Island, Lake Bay (8 UAM);55.0000, -133.0000, Prince of Wales Island, Salmon Bay (10 UAM);55.0000, -133.0000, Prince of Wales Island, Whale Pass (69 UAM); 55.5333, -132.5167, Prince of Wales Island, Twelvemile Arm (5 UAM); 56.0167, -132.8333, Prince of Wales Island, Coffman Cove (2 UAM); 56.1000, -133.1167, Prince of Wales Island, 0.5 mi above 108 bridge at Whale Pass (1 UAM); 56.1000, -133.1667, Prince of Wales Island, Neck Lake (1 UAM); 56.1500, -133.2000, Prince of Wales Island, Twin Island Lake (1 UAM); 56.2000, -133.0667, Prince of Wales Island, Exchange Cove (1 UAM); 56.2333, -133.1000, Prince of Wales Island, mouth of Lava Creek (1 UAM); 55.0000, -133.0000, Prince of Wales Island, Point Baker (2 UAM); Shrubby Island (4 USNM); Thorne Island (2 USNM); 56.6667, -133.0000, Woewodski & Butterworth Islands (27 UAM); 56.2667, -132.2000, Wrangell Island, Wrangell Island vicinity (17 UAM); 56.2833, -132.1667, Wrangell Island, main island, Wrangell Island (30 UAM); 56.5000, -132.3333, Wrangell Island, lower Zimovia Straits (2 UAM); 56.5000, -132.3333, Wrangell Island, Wrangell Narrow (Forks) (3 UAM); 56.7500, -132.5833, Wrangell Island, Wrangell Narrows (1 UAM); 56.9167, -132.8333, Wrangell Island, Skogges Creek to Mt Point Beacon, Wrangell Narrows (5 UAM); 56.9167, -132.8333, Wrangell Island, Wrangell Narrows (7 UAM); 56.7500, -132.9167, Wrangell Narrows (1 UAM); Zarembo Island (1 USNM). **SITKA QUAD:** Baranof Island, Sitka area (1 UAM); 57.1500, -135.3833, Baranof Island, Katlian Bay (1 UAM); Baranof Island, Kelp Bay (6 UAM); Baranof Island (36 UAM); 57.5000, -135.5000, Chichagof Island, W side of Island (11 UAM); 57.7417, -135.3167, Chichagof Island, Crab Bay, Tenakee Inlet (1 UAM); 57.1667, -135.6667, Kruzof Island (4 UAM). **SUMDUM QUAD:** 57, -133.0000, Castle Island, Duncan Canal (13 UAM);57.0000, -133.0000, Kupreanof Island, Keku Strait (below Eagle Island), Lower Rocky Pass (3 UAM); 57.1000, -133.2333, Farragut Bay, mainland SE (6 UAM). **TAKU RIVER QUAD:** Taku River (1 MVZ). **YAKUTAT QUAD:** 59.5139, -139.7722, Yakutat area, Summit Lake (1 UAM); 59.5500, -139.7333, Yakutat, Lower Situk Road (1 UAM).

Family **Procyonidae** Gray, 1825

Raccoon
Procyon lotor (Linnaeus, 1758)

OTHER COMMON NAMES. Northern Raccoon.

TAXONOMY. Raccoons were introduced to Southeast Alaska from an Indiana population (Scheffer, 1947) representing the subspecies *P. l. lotor* (Hall, 1981).

REVISIONS AND REVIEWS. Lotze and Anderson (1979).

STATUS. IUCN-Least concern. The Raccoon is an island exotic in Southeast Alaska.

DISTRIBUTION. Raccoons are native to the southern coast of British Columbia, including Vancouver Island (Nagorsen, 1990). Raccoons from Vancouver Island were introduced to Haida Gwaii (Queen Charlotte Islands) in the early 1940s and have subsequently spread the full length of the two major islands of the archipelago and to at least 35 smaller associated islands (Hartman and Eastman, 1999).

In Southeast Alaska, eight melanistic Raccoons from Indiana were released on Singa Island, Sea Otter Sound, in October 1941, spreading to nearby El Capitan and other nearby islands (Scheffer, 1947; Burris and McKnight, 1973). Raccoons (all melanistic) still occurred on El Capitan Island as of June 1999, with recent reports of a black Raccoon near Staney Creek, Prince of Wales Island, and another, also melanistic, in the Shakan Strait area, Kosciusko Island (S. Geraghty, pers. comm.).

Raccoons of unknown origin were released or escaped on Japonski Island near Sitka in 1950, with a few eventually spreading to nearby Baranof Island (Elkins and Nelson, 1954; Burris and McKnight, 1973). Individuals were occasionally observed around the dump at the Sitka airport on Japonski Island up until the early 1970s (MacDonald and Cook, 1996).

SPECIMENS. None.

Key to the Hoofed Mammals of Southeast Alaska

1. • Permanent horns (not antlers) present in both sexes ……..... ……..…… 2
   • Males with deciduous, branched antlers, females antlered or antlerless …..... 3

2. • Horns shiny black, round in cross section, smooth and sharply pointed …….....… **Mountain Goat, *Oreamnos americanus***
   • Horns pale, yellowish-brown and either oval in cross-section, short and curved slightly back with blunt tips, or triangular in cross-section, massive, ridged, and curled into a tapered spiral …..... ..... **Dall's Sheep, *Ovis dalli***

3. • Upper canines absent ….....……. 4
   • Upper canines present …..... 5

4. • Antlers strongly palmate and extending sideways; length of skull more than 500 mm; nasal bones relatively short …….....…… **Moose, *Alces americanus***
   • Antlers not palmate and extending upwards from head; skull less than 500 m; nasal bones relatively long …..... **Mule Deer, *Odocoileus hemionus***

5. • Antlers semipalmate; vomer divides the posterior nares; canines small, pointed and usually do not project below the premaxilla …….....…..…… **Caribou, *Rangifer tarandus***
   • Antlers massive, round in cross-section; vomer does not divide the posterior nares; canines squat, rounded and project well below the premaxilla …..... **Wapiti, *Cervus canadensis***

Order **Artiodactyla** Owen, 1848
Family **Cervidae** Goldfuss, 1820

Moose
Alces americanus (Clinton, 1822)

OTHER COMMON NAMES. American Moose.

TAXONOMY. Differences in karyotype and anatomical features (Boyeskorov, 1999) suggested that moose found from the Yenisei River in central Siberia eastward into North America are specifically distinct from *Alces alces* of western Eurasia, a view followed and elaborated on by Grubb (2005). Recent genetic data suggest that moose did not appear in North America until about 15,000 years ago (Hundertmark et al., 2002). In Southeast Alaska, the British Columbia subspecies *A. a. andersoni* makes contact with the Alaska subspecies, *A. a. gigas*, on the mainland in the vicinity of the Taku River (Klein, 1965; Hundertmark et al., 2006).

Alces americanus andersoni

Original Description. 1950. *Alces americana andersoni* Peterson, Royal Ontario Mus. Zool., Life Sci. Occas. Pap., 9:1, May 25.

Type Locality. Sec/ 27, T. 10. R. 16, Sprucewood Forest Reserve, 15 mi. E. Brandon, Manitoba.

Type Specimen. ROM 20068.

Range. Eastern Yukon Territory, central British Columbia and Southeast Alaska, eastward to Michigan.

Alces americanus gigas

Original Description. 1899. *Alces gigas* Miller, Proc. Biol. Soc. Washington, 13:57, May 29.

Type Locality. N side Tustumena Lake, Kenai Peninsula, Alaska.

Type Specimen. USNM 86166.

Range. Alaska, Yukon Territory, and northwestern British Columbia.

REVISIONS AND REVIEWS. Peterson (1952), Franzmann (1981), Geist (1998), Boyeskorov (1999).

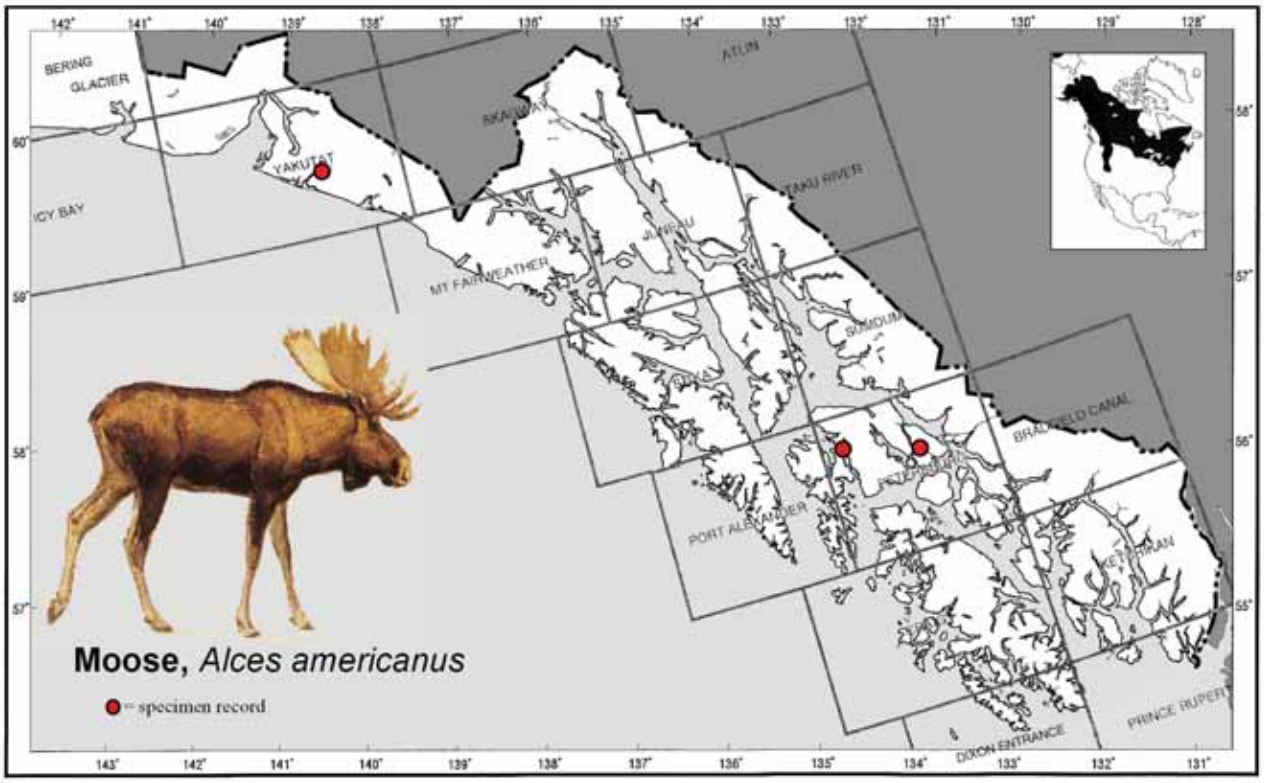
STATUS. IUCN-Least concern.

DISTRIBUTION. Moose began moving into Southeast Alaska from interior British Columbia via trans-coastal river corridors around the turn of the 20th century (Klein, 1965), with many of the populations becoming established in the early to mid 1900s. Moose continue to expand their range in Southeast Alaska and coastal British Columbia (Darimont et al., 2005; Hundertmark et al., 2006).

The Moose population in southern Southeast Alaska is localized in the Unuk River drainage. Moose were introduced to the Chickamin River drainage in 1963-64 but none has been seen there in recent years (Porter, 2004a). Moose are occasionally reported from Revillagigedo Island, Cleveland Peninsula, along the south end of the mainland near Portland Canal, and Hyder (MacDonald and Cook, 1996; Porter 2004a). A Moose population of unknown size and composition now inhabits the central portion of Prince of Wales Island (Porter, 2004a).

Moose populations found along the central mainland are concentrated near Thomas Bay and along the Stikine River. Small numbers also occur around Virginia Lake, Mill Creek, and Aaron Creek (Lowell, 2004a).

Farther up the coast, Moose occur along the Taku, Whiting, and Speel rivers. In recent years Moose and their sign have been seen regularly in the Port Houghton area (Barten, 2004a). Moose in the Berners Bay area are the result of transplants there in 1958 and 1960 (Burris and McKnight, 1973). Moose were first documented east of Lynn Canal in 1962 on the Barlett River, in the Chilkat Mountain range in 1963, the Endicott River and St. James Bay in 1965, and in the Gustavus Forelands in 1968 (Barten, 2004a). These animals probably originated from the Chilkat Valley population nears Haines, where Moose were first seen around 1930 (Barten, 2004a). Moose were first documented along the lower Alsek River in the late 1920s or early 1930s, and slowly expanded their range westward into the Yakutat and Malaspina forelands including Icy Bay (Barten, 2004b). Moose in the Cape Yakataga area arrived there in the mid-1970s from the eastward expansion of the Prince William Sound population, which originated from translocations during 1949-1958 of calves from the Kenai Peninsula, Anchorage, and Matanuska-Susitna area (Crowley, 2004).



Moose also have expanded their range into the Alexander Archipelago and now appear to be well distributed on Wrangell, Mitkof, and Kupreanof islands. Their numbers also appear to be increasing on Etolin, Zarembo, and Kuiu islands (Lowell, 2004b). There are occasional reports of moose on Chichagof Island (MacDonald and Cook, 1996).

SPECIMENS. **PETERSBURG QUAD:** 56.6667, -133.7333, Horseshoe Island, Rocky Pass (1 UAM); 56.6667, -132.8333, Mitkof Island, milepost 11.5 Mitkof highway (1 UAM). **YAKUTAT QUAD:** 59.41667, -139.0833, Yakutat Forelands, Ahrnklin River (1 UAM); 59.5399, -139.3691, Yakutat area (1 PSM).

Wapiti
Cervus canadensis Erxleben, 1777

OTHER COMMON NAMES. Elk, Red Deer.

TAXONOMY. Many authors now consider all New and Old World Wapiti and Red Deer to be a single species, *Cervus elaphus* (Bryant and Maser, 1982). Morphologic (Geist 1998) and molecular (Randi et al. 2001) analyses indicate that the Wapiti from North America and eastern Asia be recognized as specifically distinct (*C. canadensis*) from the Red Deer of western Eurasia (*C. elaphus*). Baker et al. (2003) agreed with this conclusion. Further analyses of mtDNA (cytochrome b) sequence data by Ludt et al. (2003) of Red Deer from across their range were consistent with the existence of two different species with three subspecies in Asia and North America (Wapiti or Eastern Red Deer), and at least four subspecies in Eurasia (Red Deer or Western Red Deer)

Up to six subspecies have been described in North America (Bryant and Maser, 1982). The Wapiti translocated to Etolin Island in Southeast Alaska from Oregon were from *C. c. roosevelti* and *C. c. nelsoni* stocks (Lowell, 2004c).

REVISIONS AND REVIEWS. Bryant and Maser (1982), Schonewald-Cox et al. (1985), Dolan (1988), Geist (1998).

STATUS. The Elk or Wapiti is an exotic species in Southeast Alaska.

DISTRIBUTION. Wapiti was a member of Alaska's large mammal fauna into the early Holocene (Guthrie, 1966). There is no evidence, however, that this species ever occurred in Southeast Alaska.

There have been a number of attempts to introduce Wapiti to Southeast Alaska (Burris and McKnight, 1973), beginning in 1926 and 1927 with the release of seven animals (from the state of Washington) on Kruzof Island.

Three attempts were made to introduce Wapiti to Revillagigedo Island, the first in 1937 (Washington stock), then again in 1963 and 1964 (from the Afognak Island herd which was originally from Washington). Animals were also released on Gravina Island in 1962, and on Annette Island in 1963, both from Afognak or Raspberry Island stocks. Like all of the previous attempts, these failed.

Fifty Wapiti from two areas in Oregon were released on Etolin Island in 1987 (Burris and McKnight, 1973). Since then, the Etolin population has continued to increase and extend its range by establishing a breeding population on nearby Zarembo Island. By June 2003, the number of Wapiti on both of these islands was estimated at 350-450 animals (Lowell, 2004c). Wapiti sightings have been reported from Bushy, Deer, Kupreanof, Mitkof, Prince of Wales, and Wrangell islands and the Cleveland Peninsula, raising concerns about potential negative effects that the increasing Wapiti population may have on the native Sitka Black-tailed Deer (Kirchhoff and Larsen, 1998; Lowell, 2004c).

SPECIMENS. **PETERSBURG QUAD:** 56.0583, -132.5833, Etolin Island (1 UAM).

Mule Deer
Odocoileus hemionus (Rafinesque, 1817)

OTHER COMMON NAMES. Black-tailed Deer, Sitka Deer, Sitka Black-tailed Deer.

TAXONOMY. Mule and black-tailed deer are considered a single species (Anderson and Wallmo 1984); however, Cronin (1991, 1992) surveyed mitochondrial variation in this species and reported a distinctive coastal form. From 8 to 11 subspecies have been proposed (Cowan, 1936, 1956; Hall, 1981; Wallmo, 1981); one occurs in Southeast Alaska.

Odocoileus hemionus sitkensis

Original Description. 1898. *Odocoileus columbianus sitkensis* Merriam, Proc. Biol. Soc. Washington, 12:100, April 30.

Type Locality. Sitka, Alaska.

Type Specimen. USNM 74383.

Range. Southeast Alaska and northern coastal British Columbia.

REVISIONS AND REVIEWS. Cowan (1936, 1956), Wallmo (1981), Anderson and Wallmo (1984), Schoen and Kirchhof (2007).

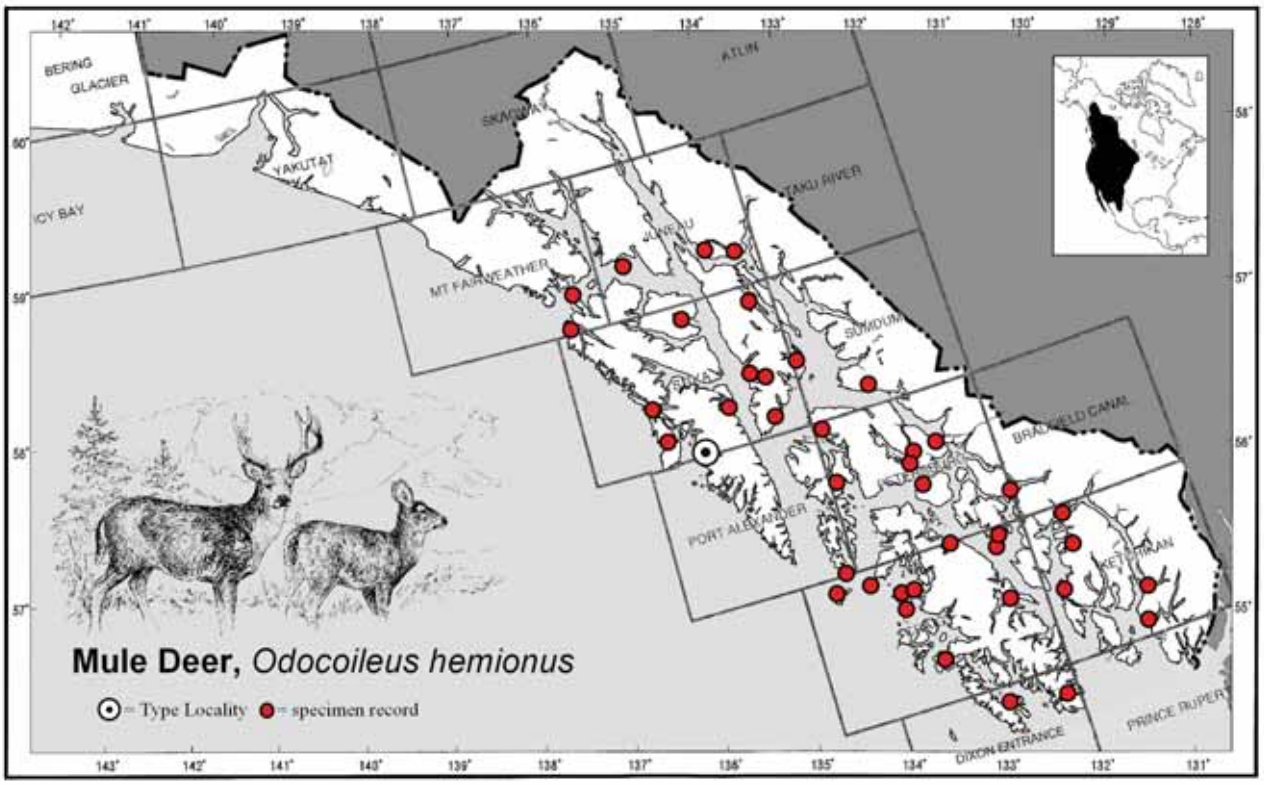
STATUS. IUCN-Least concern. The Sitka Black-tailed Deer is an exotic species north of Icy Strait and a Management Indicator Species of the Tongass National Forest (Sidle and Suring, 1986).

DISTRIBUTION. Sitka Black-tailed Deer are found throughout most of Southeast Alaska and are most numerous on islands in the Alexander Archipelago. Deer seem to have little trouble crossing wide expanses of coastal waters. As a result, they occur on nearly every island in the archipelago except remote Forrester Island (MacDonald and Cook, 1996).

ADFG (1973) reported a record of the larger interior subspecies, *O. h. hemionus*, taken from the Stikine River, and J. Baichtal (pers. comm.) reported one sighted near Hyder in 1991.

Deer were unknown on the mainland north of Cape Spencer until 1934 when 12 deer from Rocky Pass were translocated to islands in Yakutat Bay (Burris and McKnight, 1973). A small population of deer still persists on islands and along the eastern mainland of Yakutat Bay (Barten, 2005).

Attempts during the 1950s to establish deer populations near Skagway eventually failed, but proved successful on Sullivan Island in upper Lynn Canal.



SPECIMENS. **CRAIG QUAD:** 55.8794, -134.2461, Coronation Island (1 MVZ); 55.7167, -133.5500, Heceta Island, Bald Mountain (2 UAM); 55.7833, -133.6333, Heceta Island, Cone Peak (1 UAM); 55.7892, -133.4722, Heceta Island (1 UAM); 55.7981, -133.5881, Heceta Island, Port Alice (2 UAM); 55.8156, -133.5789, Heceta Island, Mint Lake (1 UAM); 55.8203, -133.5769, Heceta Island, Port Alice area (1 UAM); 55.8244, -133.5775, Heceta Island, Port Alice area (1 UAM); Heceta Island, Warm Creek Inlet, Chuck Lake area (2 UAM); Heceta Island, Butterball Lake (1 UAM); Heceta Island, Cone Peak (1 UAM); 55.8667, -132.3667, Onslow Island (1 UAM); Prince of Wales Island (4 USNM, 1 CAS, 2 MVZ); 55.2667, -133.3000, Suemez Island, Port Refugio (1 UAM); 55.9830, -134.1060, unnamed island, northern-most (1 UAM); Warren Island (2 MVZ). **DIXON ENTRANCE QUAD:** Long Island, Howkan (1 CAS). **JUNEAU QUAD:** 58.2500, -134.2667, Douglas Island, N side of Island (1 UAM); Pleasant Island (4 CMNH). **KETCHIKAN QUAD:** Bell Island (1 CMNH); 55.4667, -131.7833, Revillagigedo Island, Clover Pass (1 UAM); 55.7500, -131.5000, Revillagigedo Island, Ketchikan (2 UAM); 55.3167, -130.9000, Smeaton Bay (1 UAM). **MT. FAIRWEATHER QUAD:** Inian Is. (3 UCLA). **PETERSBURG QUAD:** Etolin Island (1 MVZ); Kuiu Island (3 MVZ); 56.7500, -133.5000, Kupreanof Island (2 UAM); 56.6333, -132.9167, Mitkof Island, Blind Slough (1 UAM); 56.6667, -132.6333, Mitkof Island, Ideal Cove (1 UAM). 56.1833, -132.0000, Wrangell Island, Fools Inlet (1 UAM); 56.9089, -132.6344, Zarembo Island (1 UAM). **PRINCE RUPERT QUAD:** 54.9833, -130.9333, Very Inlet (1 UAM). **SITKA QUAD:** 57.3833, -134.4000, Admiralty Island, Hood Bay (4 UAM); 57.4333, -134.5500, Admiralty Island, Hood Bay (6 UAM); Admiralty Island, Eliza Harbor (1 MVZ); Admiralty Island, Windfall Harbor (2 MVZ); 57.0167, -135.2333, Baranof Island, Birdsnest Bay (1 UAM); 57.0500, -135.3333, Baranof Island, 2.5 mi Halibut Point Road (2 UAM); 57.2500, -135.5000, Baranof Island, Nakwasina Bay (2 UAM); 57.2667, -134.8333, Baranof Island, Kelp Bay (1 UAM); Baranof Island (1 UAM); Baranof Island (16 USNM); Chichagof Island (1 USNM, 2 AMNH, 8 MVZ, 1 CMNH); Chichagof Island, Freshwater Bay (8 MVZ); Kruzof Island (1 USNM, 1 UWBM);58.0000, 136.5000, Yakobi Island (3 AMNH). **SUMDUM QUAD:** 57.4667, -133.9167, Admiralty Island, Gambier Bay (2 UAM); Farragut Bay (1 CMNH). **SE ALASKA:** (2 UAM).

David Klein, in addition to his pioneering work on wolves and deer on Coronation Island (Klein, 1996), further clarified patterns of mammalian diversity across the region (Klein, 1965) that were first outlined by Harry Swarth (1936) (*1987 photograph courtesy of T. Hanley*).

Caribou
Rangifer tarandus (Linnaeus, 1758)

OTHER COMMON NAMES. Reindeer.

TAXONOMY. Banfield (1961) recognized one Holarctic species for both Caribou and Reindeer, *Rangifer tarandus*. Populations in adjacent British Columbia are considered the woodland form, *R. t. caribou*, by Hall (1981), Shackleton (1999), and others.

Rangifer tarandus caribou

Original Description. 1788. [*Cervus tarandus*] *caribou* Gmelin, Syst. nat., ed. 13, 1:177.

Type Locality. Quebec City, Quebec.

Type Specimen. None designated.

Range. Extreme east-central Alaska (upper Chisana and White rivers; Zittlua et. al., 2000; Gardner, 2003) and adjacent southern Yukon Territory and northwestern British Columbia to Newfoundland.

REVISIONS AND REVIEWS. Banfield (1961), Geist (1998), Shackleton (1999).

STATUS. IUCN-Least concern; COSEWIC-Special concern (northern mountain population of *R. t. caribou*).

DISTRIBUTION. Caribou rarely occur on the northern mainland of Southeast Alaska, with reports of single animals observed near Haines (in about 1990) and Glacier Bay (in the late 1950s and in 1967) (MacDonald and Cook, 1996). Caribou may have occurred more regularly in the Haines area in the early 20th Century (Murie, 1935).

Caribou bones have been reported from pre- and post-glacial cave deposits in the Alexander Archipelago (Heaton and Grady, 2003). Like several other mammals that have been examined (e.g., Ermine), Caribou populations in the Alexander Archipelago may have had close affinities with populations in the Haida Gwaii (Queen Charlotte Islands). The Dawson Caribou (*R. t. dawsoni*) went extinct on Haida Gwaii by the early 1900s (Nagorsen, 1990; Byun et al., 2002).

SPECIMENS. None.

Family **Bovidae** Gray, 1821

Mountain Goat
Oreamnos americanus (de Blainville, 1816)

OTHER COMMON NAMES. None.

TAXONOMY. Hall (1981) recognized *O. a. columbiae* as the subspecies occurring in Southeast Alaska; however, Cowan and McCrory (1970) concluded that the small amount of geographic variation in cranial characters of this species did not warrant subspecific designation.

Oreamnos americanus columbiae

Original Description. 1904. *Oreamnos montanus columbianus* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 20:20, February 10.

Type Locality. Shesley Mountains, British Columbia.

Type Specimen. AMNH 19838.

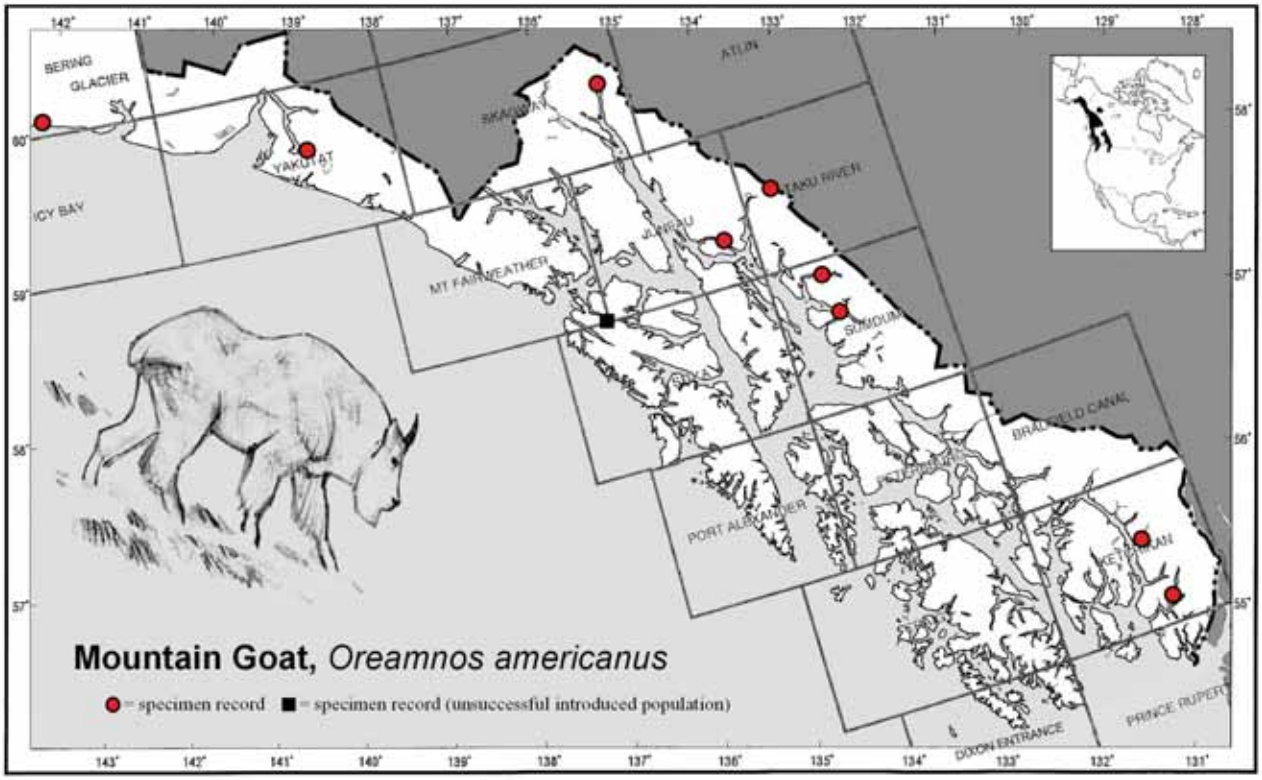
Range. Northwestern Canada and Southeast Alaska.

REVISIONS AND REVIEWS. Rideout and Hoffmann (1975).

STATUS. IUCN-Least concern. The Mountain Goat is an exotic species in the Alexander Archipelago and a Management Indicator Species of the Tongass National Forest (Sidle and Suring, 1986; Kiester and Eckhardt, 1994*).

DISTRIBUTION. Mountain Goats are found in suitable habitat along the entire mainland coast of Southeast Alaska. The only island record of natural occurrence is a single individual observed on Wrangell Island for several years (Klein, 1965). The highest counts of Mountain Goats have been made in the vicinities of Tracy Arm and the Peabody Mountains, southeast of Ketchikan (ADFG, 1973).

Mountain Goats were successfully introduced on Baranof Island in 1923 (Burris and McKnight, 1973), where they continue to thrive and expand their range across the island (Mooney, 2004). Transplant attempts on Chichagof Island in 1954 and 1955 were failures (Burris and McKnight, 1973; L. Johnson, pers. comm., 1994). A successful transplant of Mountain Goats to Revillagigedo Island occurred



in 1983 at Swan Lake (Smith and Nichols, 1984) and in 1991 at upper Mahoney Lake (Porter, 2004b). The Swan Lake population now numbers about 120-160 animals, and the upper Mahoney Lake population is estimated at 100-140 animals and is expanding (Porter, 2004b).

Mountains goats from the Whiting River were reintroduced to Mount Juneau in 1989 to enhance numbers near Juneau. By 1992, none of these individually marked goats remained in the area (Barten, 2004d).

SPECIMENS. **BERING GLACIER QUAD:** Cape Yakataga (1 CAS). **JUNEAU QUAD:** 58.2500, -134.2500, Juneau, ridge b/w headwaters Sheep Cr, Gastineau Channel (1 UAM); 50 miles S. Juneau (2 CAS). **KETCHIKAN QUAD:** 55.1667, -130.6667, Boca de Quadra, mainland southeast of Ketchikan (1 UAM); Rudyerd Bay (3 UCLA); Boca de Quadra (1 MVZ). **MT. FAIRWEATHER QUAD:** 58.0000, -136.0000, Chichagof Island (1 UAM). **SKAGWAY QUAD:** 20 miles from Skagway (1 USNM); near Skagway (1 FM-NH). **SUMDUM QUAD:** Tracy Arm, (1 AMNH); Endicott Arm (1 USNM). **TAKU RIVER QUAD:** Taku River near Canada Border (1 USNM).

Dall's Sheep
Ovis dalli Nelson, 1884

OTHER COMMON NAMES. Dall Sheep, Stone Sheep, Thinhorn Sheep.

TAXONOMY. Three subspecies of *O. dalli* are generally recognized (Cowan, 1940; Hall, 1981), with one, *O. d. dalli*, occurring throughout Alaska and extreme northwestern British Columbia. The British Columbia form, *O. d. stonei*, may, however, be the subspecies that occurs marginally in the Haines area (Shackleton, 1999). Worley et al. (2004) provided some support in nuclear DNA for the classification of Dall's sheep into the subspecies *stonei* and *dalli*. However, according to Loehr et al. (2006), mtDNA and the clinal nature of color morphology did not support this grouping.

REVISIONS AND REVIEW. Cowan (1940), Bowyer and Leslie (1992).

STATUS. IUCN-Least concern.

DISTRIBUTION. Dall's Sheep are found adjacent to Southeast Alaska in British Columbia on the drier western slopes of the Saint Elias Mountains and the Coast Mountains north of Haines and Skagway (Klein, 1965; Nichols, 1978).

The occurrence of Dall's Sheep in Southeast Alaska is based on a lone female collected from the Kelsall River Valley, northwest of Haines, by Alaska Department of Fish and Game biologists (R. Flynn, pers. comm., 1994; specimen not located). Sheep are seen occasionally near the Kelsall River in the vicinity of Mount Raymond (MacDonald and Cook, 1996).

Three *O. dalli* skulls collected by Allen E. Hasselborg for the MVZ are reported to be from Southeast Alaska, but the exact locality is not documented.

SPECIMENS. **SE ALASKA** (3 MVZ).

The White Pass and Yukon Railway at Tunnel Mountain crosses the Coast Range into British Columbia near White Pass (courtesy of the Anchorage Museum at Rasmuson Center, John Urban Collection, b64-1-75).

Key to the Whales of Southeast Alaska

1. • Baleen plates in mouth (no adult teeth); paired blow-holes ……..…… 2
   • Teeth present in adults (sometimes buried in gums); single blow-hole …..... 8

2. • Throat grooves present; baleen plates narrow and short, mouth straight…….....… 3
   • Throat grooves absent; long, wide baleen plates in huge arched mouth …..... **North Pacific Right Whale, *Eubalaena japonica***

3. • Throat grooves numerous, small dorsal fin …….....…… 4
   • Two to four short throat grooves, no dorsal fin …..... **Gray Whale, *Eschrichtius robustus***

4. • Flippers very long (to nearly one-third of body length)…….....… **Humpback Whale, *Megaptera novaeangliae***
   • Flippers relatively short …..... 5

5. • Total length less than 11 m; white band across flipper …….....…… **Common Minke Whale, *Balaenoptera acutorostrata***
   • Total length greater than 12 m; flipper lacking white band …..... 6

6. • Body huge (up to 30 m long), mottled blue-gray above, paler below; dorsal fin small, set far back on body; head broad, U-shaped…….....…… **Blue Whale, *Balaenoptera musculus***
   • Body smaller; dorsal fin more prominent and forward on body; head acutely pointed ….....… 7

7. • Jaw black on left side, white on right; 55-100 long ventral throat grooves …… **Fin Whale, *Balaenoptera physalus***
   • Dark gray on both sides of body, often with oval-shaped scars; 32-60 short ventral throat grooves ….....….. **Sei Whale, *Balaenoptera borealis***

8. • Tip of lower jaw well behind foremost limit of the head …….....…… 9
   • Tip of lower jaw in front of the limit of the head and at about the same limit as the tip of the snout …..... 10

9. • Length of animal greater than 7 m …….....…… **Sperm Whale, *Physeter catadon***
   • Length of animal less than 5 m ….....….. **Pygmy Sperm Whale, *Kogia breviceps***

10. • Top fin absent, adults all white in color …….....…… **Beluga, *Delphinapterus leucas***
    • Top fin present, color not as above …..... 11

11. • Teeth confined to lower jaw or apparently absent …….....…… 12
    • Teeth in upper and lower jaws…..... 15

.

12. • Top fin large, near the middle of the body. Teeth 2-7 pairs, at the front of the lower jaw …..... ….....… **Risso's Dolphin, *Grampus griseus***
    • Top fin considerably behind the middle of the body. Front end of jaws narrow. Two grooves on the throat. 1-2 pairs of teeth in the lower jaw of the males, usually concealed in females …..... 13

13. • Animal up to 8 m in length. Distance from tip of snout to blowhole 1/10 to 1/8 of the total length. "Forehead" not especially prominent. One pair of teeth at the tip of the lower jaw (concealed in females) ….....…… **Cuvier's Beaked Whale, *Ziphius cavirostris***
    • Animal smaller, not exceeding 6 m in length. Beak long …..... 14

14. • One pair of large, flattened, triangular teeth located far back on the lower jaw that protrude above the gumline in adult males. Average adult 10-11 m in length. Bulbous forehead ….....…… .....**Stejneger's Beaked Whale, *Mesoplodon stejnegeri***
    • Two pairs of teeth located at the tip of the lower jaw in both sexes. Average adult 5 m in length. Forehead not bulbous …..…..... **Baird's Beaked Whale, *Berardius bairdii***

15. • Animal between 4.6 and 10 m in length ….....…… 16
    • Animal seldom exceeding 3.7 m in length, more usually less than 2.74 m …..... 18

16. • "Forehead" not prominent. 20-26 pairs of teeth in upper and lower jaws. Prominent top fin, pointed and sometimes leaning anteriorly. Color conspicuously black and white ..... **Killer Whale, *Orcinus orca***
    • "Forehead" swollen and overhanging the tip of a very short beak. 7 to 12 pairs of teeth in both the upper and lower jaws. Color basically black or dark brown. …….....…… 17

17. • Head blunt with high forehead; front margins of flippers without distinctive hump; falcate dorsal fin broad-based, low-profiled and positioned far forward on body; teeth in upper jaw, if present, confined to anterior half of rostrum …….....… **Short-finned Pilot Whale, *Globicephala macrorhynchus***
    • Head rounded, not blunt; front margins of flippers with distinctive hump; falcate dorsal fin tall, erect and positioned midway on body; teeth in upper jaw not confined to anterior half of rostrum ….... **False Killer Whale, *Pseudorca crassidens***

18. • Dorsal fin tall and hooked. Flippers relatively large. Teeth curved and sharply pointed ..... **Pacific White-sided Dolphin, *Lagenorhynchus obliquidens***
    • Doral fin smaller and triangular. Flippers small. Teeth spade-like …..... 19

19. • Black body with white belly and flanks, often with white on trailing edge of dorsal fin and flukes …..... **Dall's Porpoise, *Phocoenoides dalli***
    • Body dark gray or black on back with lighter sides and near white belly …..... **Harbor Porpoise, *Phocoena phocoena***

Order **Cetacea** Brisson, 1762
Family **Balaenidae** Gray, 1821

North Pacific Right Whale
Eubalaena japonica (Lacépède, 1818)

OTHER COMMON NAMES. Black Right Whale, Right Whale, Black Whale, Pacific Right Whale.

TAXONOMY. Rice (1998) and others consider the right whale congeneric with the Bowhead Whale (*Balaena mysticetus*) and that all the world's right whale populations are conspecific as *Balaena glacialis*. Northern and Southern Hemisphere populations would be separated into two subspecies, *B. g. glacialis* and *B. g. australis*, respectively.

Eubalaena japonica
Original Description. 1818. *Balaena japonica* Lacépède, Mém. Mus. Hist. Nat., Paris, 4:469.
Type Locality. Japan.
Type Specimen. None designated.

REVISIONS AND REVIEWS. Rice (1998), Angliss and Outlaw (2005), Mead and Brownell (2005).

STATUS. CITES-Appendix I; U.S. ESA-Endangered; IUCN-Endangered; COSEWIC-Endangered. Right whales were given worldwide protection in 1935. Global numbers have been estimated at 500-900 (Martin, 1990); however, Angliss and Outlaw (2005) concluded that a reliable estimate is currently not available.

There have been several recent sightings, beginning in 1996, of right whales in the Bering Sea and one (in 1998) in the Gulf of Alaska south of Kodiak. One sighting from Bristol Bay in 2002 included a calf, the first confirmed sighting of a young animal since 1900 (Angliss and Outlaw, 2005).

The National Marine Fisheries Service was petitioned on 4 October 2000 to designate critical habitat in the southeast portion of the Bering Sea near Bristol Bay. On 14 June 2005, the NMFS was ordered to designate critical habitat for the North Pacific populations.

DISTRIBUTION. North Pacific Right Whales were once widely distributed and common from north temperate to tropical waters of the North Pacific. By the early 1900s, their numbers had been greatly reduced by commercial whaling. The Gulf of Alaska (including the outside waters off Southeast Alaska) and the Bering Sea were historic summer feeding areas for this migratory species, and these were the last areas to suffer overexploitation (Gilmore, 1978).

SPECIMENS. None.

Family **Balaenopteridae** Gray, 1864

Common Minke Whale
Balaenoptera acutorostrata Lacépède, 1804

OTHER COMMON NAMES. Northern Minke Whale, Davidson's Whale, Lesser Rorqual, Little Piked Whale, Piked Whale, Pikehead, Sharpheaded Finner Whale.

TAXONOMY. The taxonomy of the Minke Whale has long been problematic, with recent studies suggesting the existence of multiple species (Wada and Numachi, 1991). Two subspecies are generally recognized in the Northern Hemisphere. The subspecies of the North Pacific is *B. a. scammoni* (Rice, 1998). The long-used name *B. a. davidsoni* for this North Pacific race was found preoccupied by Deméré (1986).

Balaenoptera acutorostrata scammoni

Original Description. 1986. *Balaenoptera acutorostrata scammoni* Deméré, Marine Mammal Science 2:277-298.

Type Locality. Admiralty Inlet, Puget Sound, Washington.

Type Specimen. USNM 12177.

Range. North Pacific Ocean.

REVISIONS AND REVIEWS. Stewart and Leatherwood (1985).

STATUS. CITES-Appendix I; IUCN-Near threatened; COSEWIC-Not at risk. The Northern Hemisphere population was estimated to total about 125,000 animals (Martin, 1990). The North Pacific stock was estimated by Wada (1976) at 9000 individuals. Small numbers of Minke Whales were harvested by commercial whalers near British Columbia in the early 1900s (Stewart, 1999). All commercial hunting was stopped in 1986 (but see Baker et al., 2000).

DISTRIBUTION. The Common Minke Whale is found from the polar ice-edge to the tropics in all the world's oceans. Minke whales are relatively common in the Bering and Chukchi Seas and in the inshore waters of the Gulf of Alaska, but are less abundant in other parts of the eastern Pacific (Leatherwood et al., 1988; Mizroch, 1992). Two stocks of Minke Whales are recognized in U.S. waters: 1) Alaska (migratory), and 2) California/Washington/Oregon (non-migratory) (Dorsey et al., 1990).

SPECIMENS. **PETERSBURG QUAD:** Pearl Island (1 USNM).

Sei Whale
Balaenoptera borealis Lesson, 1828

OTHER COMMON NAMES. Pollack Whale, Rudolphi's Rorqual, Sardine Whale, Japan Finner.

TAXONOMY. Tomilin (1946) distinguished two subspecies for Northern Hemisphere and Southern Hemisphere populations. *B. b. borealis* is the northern race.

Balaenoptera borealis borealis

Original Description. 1828. *Balaenoptera borealis* Lesson, Histoire naturelle … des mammiferes et des oiseaux découverts depuis 1788, cétacés, p. 342.

Type Locality. Gromitz, Lubeck Bay, Schleswig-Holstein, Germany.

Type Specimen. None designated.

Range. Northern Hemisphere.

REVISIONS AND REVIEWS. Gambell (1985a).

STATUS. CITES-Appendix I; ESA-Endangered; IUCN-Endangered; COSEWIC-Endangered. The North Pacific population is roughly estimated at 13,000 whales in 1974, down from about 63,000 in 1963. They were given full protection in 1978-79 (Martin, 1990).

DISTRIBUTION. Sei Whales are found in most oceans and seas of the world, but generally avoid polar waters (Martin, 1990). A pelagic species, Sei Whales migrate seasonally between northern latitudes to feed and southern latitudes to breed. During the summer months, sei whales occur from California to the Gulf of Alaska, including the deeper waters off Southeast Alaska (Wynne, 1993).

SPECIMENS. None.

Blue Whale
Balaenoptera musculus (Linnaeus, 1758)

OTHER COMMON NAMES. Blue Rorqual, Sulphur-bottom Whale.

TAXONOMY. Three subspecies of *B. musculus* are currently recognized (Rice, 1998); one, *B. m. musculus,* occurs in the waters of the North Pacific, including Southeast Alaska.

Balaenoptera musculus musculus

Original Description. 1758. [*Balaena*] *musculus* Linnaeus, Syst. Nat., ed. 10, 1:76.

Type Locality. Firth of Forth, Scotland

Type Specimen: Not known to exist.

Range. Northern Hemisphere.

REVISIONS AND REVIEWS. Yochem and Leatherwood (1985).

STATUS. CITES-Appendix I; ESA-Endangered; IUCN-Endangered; COSEWIC-Endangered. Roughly 15,000 remain worldwide and about 3500 inhabit the North Pacific (Mate et al., 1999). Although Blue Whales have been protected since 1966, they are seldom observed in Alaska waters. The sighting and non-lethal skin and blubber sampling of several Blue Whales by researchers on board a NOAA vessel about 100 nautical miles southeast of Prince William Sound in July 2004 is the first confirmed report of this species in Alaska waters in three decades (AP writer D. Joling in Fairbanks Daily News-Miner on 28 July 2004).

DISTRIBUTION. Blue Whales have been found throughout every ocean, from the equator to the polar regions (Martin, 1990). In the eastern North Pacific, Blue Whales move in the summer months into the immediate offshore waters from central California to the Gulf of Alaska, including Southeast Alaska and Haida Gwaii (Queen Charlotte Islands), and the Aleutian Chain. They rarely enter the Bering Sea, but have occasionally been observed as far north as the Chukchi Sea (Rice, 1978).

SPECIMENS. **SE ALASKA:** possibly Wrangell or Shaken (2 UWBM).

Fin Whale
Balaenoptera physalus (Linnaeus, 1758)

OTHER COMMON NAMES. Common Finback Whale, Common Rorqual, Finback Whale, Herring Whale, Razorback Whale.

TAXONOMY. Two poorly-defined subspecies are recognized, with the name *Balaenoptera physalus physalus* applied to all Northern Hemisphere stocks (Rice, 1998).

Balaenoptera physalus physalus

Original Description. 1758. [*Balaena*] *physalus* Linnaeus, Syst. Nat., ed. 10, 1:75.
Type Locality. Spitzbergen seas.
Type Specimen. Not known to exist.
Range. North Pacific and North Atlantic oceans.

REVISIONS AND REVIEWS. Gambell (1985b), Rice (1998).

STATUS. CITES-Appendix I; ESA-Endangered; IUCN-Endangered; COSEWIC-Threatened. According to Martin (1990), Northern Hemisphere Fin Whales today number about 20,000 animals, down from about 58,000 animals prior to their overexploitation between the late 1950s and the early 1960s. Angliss and Outlaw (2005) concluded that reliable information on trends in abundance for the Northeast Pacific stock of Fin Whales is currently not available, and that there is no indication whether recovery of this stock is taking place.

DISTRIBUTION. The Fin Whale occurs in every ocean. Unlike the Gray Whale, the Fin Whale is highly pelagic and is rarely observed in inshore coastal waters. It migrates between low latitudes in winter and high latitudes in summer. Its summer range in the eastern North Pacific extends from the Aleutian Islands, through the Gulf of Alaska (including offshore Southeast Alaska), south to California (Martin, 1990; Nagorsen, 1990). Some individuals remain in North Pacific waters as far north as the Aleutians throughout the year (Rearden, 1981).

SPECIMENS. **SITKA QUAD:** Admiralty Island, Tyee (2 AM-NH).

Humpback Whale
Megaptera novaeangliae (Borowski, 1781)

OTHER COMMON NAMES. None.

TAXONOMY. Monotypic, with no subspecies currently recognized (Clapham and Mead, 1999).

Megaptera novaeangliae

Original Description. 1781. *Balaena novae angliae* Borowski, Gemeinnüzztige Naturgeschichte des Thierreichs … 2(1):21.
Type Locality. Coast of New England.
Type Specimen. Not known to exist.

REVISIONS AND REVIEWS. Winn and Reichley (1985), Clapham and Mead (1999).

STATUS. CITES-Appendix I; ESA-Endangered; IUCN-Vulnerable; COSEWIC-Threatened. Due to extensive overexploitation of this species, the North Pacific Humpback Whales have gone from an estimated 15,000 to about 2000 animals (Martin, 1990). North Pacific whales were given full protection in 1966 and appear to be making a strong recovery (Clapham, 1999). Calambokidis et al. (1997) estimated the current North Pacific population at 6,000-8,000 animals. Straley et al. (2002) estimated that the annual abundance of Humpback Whales in Southeast Alaska was minimally 961 animals. There are indications that Humpback Whale populations in Southeast Alaska may be approaching carrying capacity (Angliss and Lodge, 2004).

NMFS is considering whether the Southeast Alaska feeding area of Humpback Whales, and possibly other feeding areas in the North Pacific, should be formally designated as separate stocks under the Marine Mammal Protection Act (Angliss and Outlaw, 2005).

DISTRIBUTION. Humpback Whales are worldwide in distribution, with discrete Northern Hemisphere and Southern Hemisphere populations. In the North Pacific from spring through autumn, the largest concentrations are found in the Bering Sea and the eastern Aleutians, Prince William Sound, and in Southeast Alaska (Rearden, 1981; Nagorsen, 1990). Home (1973) considered the Humpback Whale the most commonly observed whale in Glacier Bay between May and September, with occasional sightings at other times of the year.

Winter and spring populations of the Hawaiian Islands migrate to northern British Columbia, Southeast Alaska, and Prince William Sound west to Kodiak and are referred to as the Central North Pacific stock. This is one of three populations currently recognized within the U.S. Exclusive Economic Zone (Angliss and Outlaw, 2005). There appears to be very little interchange between Humpback Whale feeding areas in Southeast Alaska and the Prince William Sound, Kodiak, and Shumagin Islands feeding areas to the north (Angliss and Outlaw, 2005).

SPECIMENS. **CRAIG QUAD:** 55.2833, -133.2667, Suemez Island, Ulloa Channel (1 UAM). **PORT ALEXANDER QUAD:** 56.3833, -134.6417, Baranof Island, Little Port Walter (1 UAM). **SITKA QUAD:** 57.4097, -134.5161, Admiralty Island, Hood Bay, 2 mi south of Distant Point (1 UAM); Chichagof Island (1 USNM); 57.0411, -135.3275, Kutkan Island, Sitka Sound (1 CAS); Sitka Bay (3 USNM).

Family **Eschrichtiidae** Ellerman and Morrison-Scott, 1951

Gray Whale
Eschrichtius robustus (Lilljeborg, 1861)

OTHER COMMON NAMES. California Gray Whale.

TAXONOMY. Hall (1981) considered the name *gibbosus* had priority over *robustus* (also see Barnes and McLeod, 1984). No subspecies are currently recognized (Rice, 1998).

Eschrichtius robustus

Original Description. 1861. *Balaenoptera robusta* Lilljeborg, Förh. Skand. Naturf. Ottende Møde, Kjöbenhavn, for 1860, 8:602.

Type Locality. Sweden.

Type Specimen. None designated.

REVISIONS AND REVIEWS. Jones et al. (1984), Rice (1998, 1999).

STATUS. CITES-Appendix I; ESA-North Pacific population delisted in 1994 (Federal Register, 59:31094); IUCN-Conservation dependent (NE Pacific stock); COSEWIC- Special concern. Since their protection, the eastern North Pacific population of Gray Whales has recovered to pre-exploitation abundance. The most recent count (1998) estimated 26,600 animals (Rugh et al., 1999; Angliss and Outlaw, 2005).

DISTRIBUTION. The Gray Whale is now restricted to the North Pacific Ocean. Two populations are recognized, one in the western Pacific, from Korea to the Sea of Okhotsk, and one in the eastern Pacific, from Mexico to the Bering, Chukchi, and Beaufort seas in the north (Martin, 1990). North Atlantic populations were hunted to extinction by the 1700s (Nagorsen, 1990).

Gray Whales migrate annually along the eastern Pacific coast between their summer feeding grounds in the northern Bering and Chukchi Seas and their wintering grounds in Mexico. Gray Whales are occassionally reported feeding in the summer in offshore waters from Southeast Alaska southward to California (Angliss and Outlaw, 2005).

SPECIMENS. None.

Family **Delphinidae** Gray, 1821

Short-finned Pilot Whale
Globicephala macrorhynchus Gray, 1846

OTHER COMMON NAMES. Blackfish, Pacific Pilot Whale, Short-finned Blackfish.

TAXONOMY. *Globicephala macrorhynchus* sometimes is included with *G. melaena* (now *G. melas*), the long-finned pilot whale (see Van Bree, 1971). No subspecies are recognized (Rice, 1998), but see Gaskin (1982), Mitchell (1975), and Stacey and Baird (1993).

Globicephala macrorhynchus

Original Description. 1846. *Globicephalus macrorhynchus* Gray, *in* The zoology of the voyage of H.M.S. Erebus and Terror … , 1(Mamm.):33.

Type Locality. South Seas.

Type Specimen. Not known to exist.

REVISIONS AND REVIEWS. Stacey and Baird (1993), Rice (1998).

STATUS. CITES-Appendix II; IUCN-Conservation dependent; COSEWIC-Not at risk. This species virtually disappeared from the west coast of the U.S. between 1984 and 1992 following a strong El Niño event in 1982-83. Since then sightings (or mortalities) have remained rare (Carretta et al., 2005).

DISTRIBUTION. Short-finned Pilot Whales occur worldwide, generally in tropical and warm-temperate waters (Martin, 1990); however, some occur as far north as the Alaska Peninsula and the Gulf of Alaska (Orr, 1951; Leatherwood and Dahlheim, 1978; Reilly, 1978; Rearden, 1981). Home (1980) reported this species spending long periods in shallow inshore areas in Southeast Alaska. Leatherwood et al. (1987) suggested that movements of this whale into the more northern waters of the eastern North Pacific appear to be related to periodic incursions of warm water.

SPECIMENS. None.

Risso's Dolphin
Grampus griseus (G. Cuvier, 1812)

OTHER COMMON NAMES. Gray Grampus, White-headed Grampus.

TAXONOMY. No subspecies are recognized (Rice, 1998).

Grampus griseus

Original Description. 1812. *Delphinus griseus* G. Cuvier, Ann. Mus. Nat. Hist., Paris 19:14.

Type Locality. Brest, France.

Type Specimen. Stuffed skin and skull at MNHN.

REVISIONS AND REVIEWS. Rice (1998), Reeves et al. (2002).

STATUS. CITES-Appendix II; IUCN-Data deficient; COSEWIC-Not at risk.

DISTRIBUTION. Risso's Dolphins are found in tropical and temperate waters throughout the world (Martin, 1990). Their northern limit in the eastern North Pacific Ocean probably does not exceed the southern portion of the Gulf of Alaska, including offshore Southeast Alaska (Leatherwood and Reeves, 1983), where it is a rare visitor (Braham, 1983). Shults et al. (1992) reported on the helminths from a Risso's Dolphin beached on Middleton Island in the central Gulf of Alaska, just west of the Southeast region.

SPECIMENS. None.

Pacific White-sided Dolphin
Lagenorhynchus obliquidens Gill, 1865

OTHER COMMON NAMES. Pacific Striped Dolphin, Hookfin Dolphin.

TAXONOMY. Using cytochrome *b* gene sequences, LeDuc et al. (1999) placed *obliquidens* and three other closely related species in the genus *Sagmatias*. Some authors (e.g., Honacki et al., 1982) considered *L. obliquidens* a junior synonym of the dusky dolphin, *L. obscurus*, from the Southern Hemisphere, a premise not supported by recent analyses of molecular data (Cipriano, 1997; May-Collado and Agnarsson, 2006).

A preliminary genetic analysis of 116 Pacific White-sided Dolphins collected in four areas (Baja California, the U.S. west coast, British Columbia/Southeast Alaska, and offshore) did not reveal significant phylogeographic partitioning, although animals from the different regions were sufficiently isolated to be treated as separate management units (Lux et al., 1997).

No subspecies are recognized (Rice, 1998), but distinguishable populations have been reported from the northeast Pacific and in Japanese waters (Walker et al. 1986; Waerebeek and Würsig, 2002).

Lagenorhynchus obliquidens

Original Description. 1865. *Lagenorhynchus obliquidens* Gill, Aproc. Acad. Nat. Sci. Phil. 17:177.

Type Locality. Near San Francisco, California, United States.

Type and Co-Type Specimens. USNM 1961, 1962, 1963.

REVISIONS AND REVIEWS. Rice (1998), Reeves et al. (2002).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Not at risk. Since the 1990s, a number of Ketchikan residents have noted an influx of Pacific White-sided Dolphins into the area. Large pods have been seen, especially during the winter months, in Behm Canal, Cholmondeley Sound, Clarence Strait, Clover Passage, Ernest Sound, George Inlet, Nichols Passage, and Snow Passage (L. Carson, J. Cousins, D. Harbor, T. Wills, pers. comm., 1994). Cetacean aerial surveys in 1997 in the Gulf of Alaska found one group of 164 Pacific White-sided Dolphins off Dixon Entrance (Angliss and Outlaw, 2005).

DISTRIBUTION. Pacific White-sided Dolphin are found in the North Pacific Ocean north of 20°N. In Alaska, they occur as far north as the southern Bering Sea, the Gulf of Alaska, and the Aleutian Islands (Angliss and Outlaw, 2005). This dolphin is common on the high seas, along the continental margins, and occasionally enters inshore coastal areas in Southeast Alaska and elsewhere (Dahlheim and Towell, 1994; Angliss and Outlaw, 2005).

SPECIMENS. None.

Killer Whale
Orcinus orca (Linnaeus, 1758)

OTHER COMMON NAMES. Blackfish, Orca.

TAXONOMY. Currently no subspecies are recognized (Rice, 1998).

Orcinus orca

Original Description. 1758. [*Delphinus*] *orca* Linnaeus, Syst. Nat. ed. 10, 1:77.

Type Locality. European seas.

Type Specimen. None designated.

REVISIONS AND REVIEWS. Heyning and Dahlheim (1988), Ford et al. (1994).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Threatened ("resident" type), Threatened ("transient" group), Special concern ("offshore" group).

Less is known about Killer Whales in Alaska in comparison to those in British Columbia and Washington State, but the same three groups (resident, transient, and offshore) also occur in Alaska waters (Dahlheim et al., 1997). The

resident and transient groups differ in aspects of morphology, ecology, and behavior, with studies on mtDNA variation indicating resident and transient groups are distinct (Stevens et al., 1989; Hoelzel, 1991; Hoelzel and Dover, 1991; Hoelzel et al., 1998). Less is known about the offshore Killer Whales. Those are encountered primarily off the coasts of California, Oregon, British Columbia and, rarely, in Southeast Alaska (Ford et al., 1994; Dahlheim et al., 1997).

DISTRIBUTION. Killer Whales are found in all the oceans and most of the seas of the world (Leatherwood and Dahlheim, 1978; Martin, 1990). They occur throughout the coastal waters of Southeast Alaska (Braham and Dahlheim, 1982). Seasonal and year-round occurrence has been noted for Killer Whales throughout Alaska (Braham and Dahlheim, 1982). Killer Whales identified in Southeast Alaska have been observed in Prince William Sound, British Columbia, and Puget Sound (Leatherwood et al., 1990; Dahlheim and Heyning, 1999).

SPECIMENS. **SITKA QUAD:** Admiralty Island, Killisnoo (1 USNM).

False Killer Whale
Pseudorca crassidens (Owen, 1846)

OTHER COMMON NAMES. None.

TAXONOMY. Placement of this genus in the subfamily Orcininae along with *Orcinus* has been contentious (Stacey et al., 1994). Currently no subspecies are recognized (Rice, 1998).

Pseudorca crassidens

Original Description. 1862. *Phocaena crassidens* Owen, Hist. Brit. Foss. Mamm. Birds, p. 516, fig. 213.

Type Locality. Subfossil skull in the "Lincolnshire Fens, near Stanford, England"

Type Specimen. Originally in the Museum of Stanford, England, but later said to be lost (Corbet and Hill, 1992).

REVISIONS AND REVIEWS. Stacey et al. (1994).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Not at risk.

DISTRIBUTION. The False Killer Whale is a rare visitor to Alaska waters (Leatherwood and Reeves, 1983; Leatherwood et al., 1988). The only confirmed report in Southeast Alaska waters is a single animal sighted (and positively identified from photographs) between Grand Island and Juneau harbor in May 2003 (NOAA-Alaska Region News Release, 2 July).

SPECIMENS. None.

Family **Monodontidae** Gray, 1821

Beluga
Delphinapterus leucas (Pallas, 1776)

OTHER COMMON NAMES. White Whale, Belukha.

TAXONOMY. No subspecies are currently recognized (R. Stewart, 1999).

O'Corry-Crowe et al. (1997) examined DNA sequences from the mitochondrial control region of 324 Belugas. They suggested a rapid radiation of these whales following the Pleistocene into several genetically distinctive groups that can be identified by their summering concentrations.

Delphinapterus leucas

Original Description. 1776. *Delphinus leucas* Pallas, … Reise durch verschiedene Provinzen des Russischen Reichs, 3(book 1):85, footnote.

Type Locality. Mouth Obi [Ob] River, northeastern Siberia, U.S.S.R. [Russia].

Type Specimen. None designated.

REVISIONS AND REVIEWS. Kleinberg et al. (1969), Brodie (1989), Stewart and Stewart (1989).

STATUS. CITES-Appendix II; ESA-Species of Concern, Cook Inlet population; IUCN-Critically endangered, Cook Inlet population. The total number of Belugas worldwide has been estimated at 49,000-69,000 animals (Martin, 1990). The isolated Cook Inlet stock, one of five recognized within Alaska waters (O'Corry-Crone et al., 1997, 2002), experienced a sharp decline between 1994 and 1998 and then remained stable through 2004 at about 360 whales (NMFS, 2005). The latest estimate, in 2005, suggested further decline to 278 whales (NMFS, 2006). A small number of Belugas (under 20 animals and considered part of the Cook Inlet stock) occur at least seasonally in Yakutat Bay, Southeast Alaska. A study of the Yakutat Bay population in 2005 by O'Corry-Crowe et al. (2006) found a maximum number of 12 whales (with no newborn calves observed since 2002) mostly in Disenchantment Bay during spring and summer. A combination of sighting, behavioral, and genetic data from this study suggests that a small reproductive group of Beluga whales with unique ecology may be resident in the Yakutat Bay region year-round.

The Cook Inlet population, identified as "small and vulnerable to hunting or habitat deterioration" by IWC in 1992, was reviewed by the U.S. Fish and Wildlife Service for possible listing under the U.S. ESA. On 22 June 2000, NMFS determined that the Cook Inlet stock should not be listed under the ESA (65 FR 38778) primarily because the subsistence harvest, which appears to have been responsible for the majority of the decline in this stock, was prohibited in 1999 through an act of Congress. In April 2006, however, the World Conservation Union added the Cook Inlet Beluga to its Red List as Critically Endangered.

DISTRIBUTION. Belugas inhabit the shallow waters of arctic and sub-arctic seas around the world, occurring seasonally in most ice-free areas (Martin, 1990).

They are found in Cook Inlet during all seasons and, infrequently, from as far east in the Gulf of Alaska as Yakutat to as far west as Shelikof Strait near Kodiak Island (Hazard, 1988). During spring and summer months, these whales are typically concentrated near river mouths in northern Cook Inlet (Rugh et al., 2000). This population appears to be isolated from all others, perhaps since the last glacial period (Murray and Fay, 1979; O'Corry-Crowe et al., 1997, 2002).

SPECIMENS. None.

Family **Phocoenidae** Gray, 1825

Harbor Porpoise
Phocoena phocoena (Linnaeus, 1758)

OTHER COMMON NAMES. None.

TAXONOMY. Miyazaki et al. (1987) and Amano and Miyazaki (1992) recognized two subspecies, one in the Atlantic and one in the Pacific, but noted that western Pacific animals differ sufficiently from those in the eastern Pacific to warrant subspecific separation (as yet unnamed according to Rice, 1998). Unless further studies validate the naming of a separate subspecies for the western North Pacific population (sensu Rice, 1998), only one subspecies, *P. p. vomerina*, occurs in Alaska waters.

Two distinct mitochondrial DNA groupings or clades exist along the west coast of North America (Rosel, 1992). One clade is present in California, Washington, British Columbia and Alaska (no samples were available from Oregon), while the other is found only in California and Washington (Angliss and Outlaw, 2005).

Phocoena phocoena vomerina

Original Description. 1865. *Phocaena vomerina* Gill, 1865. Proc. Acad. Nat. Sci. Philadelphia, 17:178.
Type Locality. Puget Sound, Washington.
Type Specimen. USNM 4149.
Range. North Pacific Ocean.

REVISIONS AND REVIEWS. Gaskin et al. (1974), Angliss and Outlaw (2005).

STATUS. CITES-Appendix II; IUCN-Vulnerable; COSEWIC-Special concern. The world population is unknown, but there are strong indications that Harbor Porpoise numbers are declining and their ranges are constricting (Reeves and Leatherwood, 1994; Rosel, 1997). Areas of high density occur in Glacier Bay and Yakutat Bay (Angliss and Outlaw, 2005).

DISTRIBUTION. Harbor Porpoises are found in temperate and subarctic waters in the Northern Hemisphere (Martin, 1990). In the North Pacific, *P. phocoena* occurs from Japan and the Bering Sea, and to a lesser extent, the Chukchi Sea south across Southeast Alaska to California. The Harbor Porpoise primarily frequents coastal waters. In Southeast Alaska, Harbor Porpoises occur most frequently in waters less than 100 m in depth (Angliss and Outlaw, 2005).

SPECIMENS. **JUNEAU QUAD:** Sullivan Island, Lynn Canal (1 USNM); Lynn Canal (2 USNM). **MT. FAIRWEATHER QUAD:** Glacier Bay (1 USNM). **PETERSBURG QUAD:** near Petersburg (1 USNM). **SITKA QUAD:** SE corner of Sitka Sound (1 UWBM). **SKAGWAY QUAD:** Haines (1 USNM). **YAKUTAT QUAD:** De Monti [Monti] Bay (1 ROM).

Dall's Porpoise
Phocoenoides dalli (True, 1885)

OTHER COMMON NAMES. White Flank Porpoise, Spray Porpoise.

TAXONOMY. No subspecies are recognized, although two distinct morphological forms, the oceanic (*dalli*) and coastal (*truei*) occur (see Rice, 1998; Escorza-Treviño et al., 2004).

Phocoenoides dalli

Original Description. 1885. *Phocaena dalli* True, Proc. U.S. Nat. Mus., 8:95, June 19.
Type Locality. Strait west of Adakh [= Adak], Aleutian Islands, Alaska.
Type Specimen. USNM 21762.

REVISIONS AND REVIEWS. Jefferson (1988), Rice (1998).

STATUS. CITES-Appendix II; IUCN-Conservation dependent; COSEWIC-Not at risk. Dall's Porpoise is one of the most common species of whales in the North Pacific Ocean (Martin, 1990), although some populations may be increasingly threatened (McMillan and Bermingham, 1996). The Alaska population is estimated at 83,400 animals; no reliable information is available on population trends (Angliss and Outlaw, 2005)

DISTRIBUTION. Dall's Porpoises are found only in the North Pacific Ocean, usually near the continental shelf and slope and near the coastal shores in deeper waters (Martin, 1990). They range from Japan and the Bering Sea (seasonally) south throughout Southeast Alaska to California (Nagorsen, 1990).

SPECIMENS. **JUNEAU QUAD:** Sullivan Island, Lynn Canal (5 USNM); Cross Sound, Hoonah (1 USNM); Lynn Canal (1 USNM); Icy Strait, 3 mi. NW Spasski Island (1 USNM). **PETERSBURG QUAD:** Wrangell Island, near Wrangell (3 USNM); Zarembo Island, Meter Bight (1 USNM); Frederick Sound (1 USNM). **SITKA QUAD:** Chatham Str. off Danger Pt. at entrance of Kootznahoo Inlet, W. side Admiralty Island (1 MCZ).

Family **Physeteridae** Gray, 1821

Pygmy Sperm Whale
Kogia breviceps (Blainville, 1838)

OTHER COMMON NAMES. None.

TAXONOMY. The Pygmy Sperm Whale, *Kogia breviceps*, is a monotypic species, and until recently considered conspecific with the broadly sympatric Dwarf Sperm Whale, *K. sima* (Rice, 1998). The genus *Kogia* is placed in the family Kogiidae by some authors (e.g., Rice, 1998).

Kogia breviceps

Original Description. 1883. *Physeter breviceps* Blainville, Ann. Franc.Etr. Anat. Phys., 2:337.

Type Locality. South Africa, Western Cape Prov., Cape of Good Hope.

Type Specimen. Skull at MNHN.

REVISIONS AND REVIEWS. Handley (1966), Caldwell and Caldwell (1989).

STATUS. CITES-Appendix II; IUCN-Least concern; COSEWIC-Not at risk. Never the targets of large-scale commercial whaling, neither species is considered abundant, although the frequency of strandings suggested that occasionally they are common in local waters (Caldwell and Caldwell, 1989; Reeves et al., 2002).

DISTRIBUTION. The discovery of a moderately decomposed Pygmy Sperm Whale at Boilers Beach near Yakutat in July of 2003 is the first and so far only record of this species in Alaska waters.

Kogia breviceps is hypothesized as an oceanic species that lives beyond the edge of the continental shelf in tropical and temperate waters around the world (Rice, 1998). This species has been previously documented in the eastern Pacific as far north as Washington State (Rice, 1998). Sightings of *K. breviceps* in British Columbia waters lack positive confirmation due to the difficulty of distinguishing Pygmy from Dwarf Sperm Whales (Leatherwood and Reeves, 1983; Baird et al., 1996). Available data are insufficient to identify any seasonality in the distribution of *K. breviceps*, or to delineate possible stock boundaries (Carretta et al., 2005).

SPECIMENS. **YAKUTAT QUAD:** 59.5117, -139.8496, Boilers Beach, Ocean Cape area, near Yakutat (1 UAM).

Sperm Whale
Physeter catodon Linnaeus, 1758

OTHER COMMON NAMES. None.

TAXONOMY. *Physeter catodon* has priority over *P. macrocephalus*. Husson and Holthuis (1974:212) designated the neotype, and no subspecies are recognized (Rice, 1998).

Physeter catodon

Original Description. 1758. [*Physeter*] *catodon* Linnaeus, Syst. Nat. ed. 10, 1:76.

Type Locality. "Oceano Europaeo", restricted by Husson and Holthius (1974) to Berkhey, province of Zuid-Holland, The Netherlands.

Type Specimen. Neotype of the Berkhey specimen was selected by Husson and Holthius (1974).

REVISIONS AND REVIEWS. Rice (1989).

STATUS. CITES-Appendix I; ESA-Endangered; IUCN-Vulnerable; COSEWIC-Not at risk. The number of Sperm Whales in the North Pacific was reported to be 1,260,000 prior to exploitation, which was reduced to 930,000 whales by the late 1970s (Rice, 1989). There is no recent or reliable estimate of abundance for the North Pacific stock, and the number of Sperm Whales occurring within Alaska waters is unknown (Angliss and Outlaw, 2005). However, on the basis of total abundance, current distribution, and current regulatory measures, Braham (1992) postulated that the North Pacific stock is not now threatened with extinction.

DISTRIBUTION. Sperm Whales are found in all the oceans and are one of the most widely distributed marine mammals (Rice, 1989). During summer in the eastern North Pacific, male Sperm Whales move north to feed in the Gulf of Alaska, Bering Sea, and waters around the Aleutian Islands, while females and young remain in tropical and temperate waters year-round (Angliss and Outlaw, 2005).

SPECIMENS. None.

Family **Ziphiidae** Gray, 1865

Baird's Beaked Whale
Berardius bairdii Stejneger, 1883

OTHER COMMON NAMES. North Pacific Bottlenosed Whale, Northern Giant Bottlenose Whale, North Pacific Giant Bottlenosed Whale.

TAXONOMY. Two species of *Berardius* are currently recognized (Rice, 1998). The North Pacific population may be a northern form of Arnoux's Beaked Whale, *B. arnuxii*, of the Southern Hemisphere (Davies, 1963; Balcomb, 1989). No subspecies are recognized.

Berardius bairdii

Original Description. 1883. *Berardius bairdii* Stejneger, Proc. U.S. Nat. Mus. 6:75, June 30.
Type Locality. Eastern shore of Bering Island, Bering Sea, North Pacific Ocean.
Type Specimen. USNM 20992.

REVISIONS AND REVIEWS. Reeves and Mitchell (1993), Dalebout et al. (2004).

STATUS. CITES-Appendix I; IUCN-Conservation dependent; COSEWIC-Not at risk. Virtually nothing is known of the historical or current abundance of this species (Reeves and Mitchell, 1993; Mead, 1999), including reliable estimates for the Alaska population (Hill and DeMaster, 1999).

DISTRIBUTION. Baird's Beaked Whale occurs in Alaska waters from the southern Bering Sea to the Aleutian Islands and the Gulf of Alaska (Balcomb, 1989). Balcomb (1989) suggested a hiatus in distribution occurs in the eastern Gulf of Alaska. Strandings in Alaska waters were reported by Reeves and Mitchell (1993: Figure 4, Table 3).

SPECIMENS. None.

Stejneger's Beaked Whale
Mesoplodon stejnegeri True, 1885

OTHER COMMON NAMES. Bering Sea Beaked Whale, Sabre-toothed Beaked Whale.

TAXONOMY. No subspecies or distinct stocks are recognized (Nagorson, 1990; Hill and DeMaster, 1999).

Mesoplodon stejnegeri

Original Description. 1885. *Mesoplodon Stejnegeri* True, Proc. Nat. Mus. 8:585, November 21.
Type Locality. Bering Island, Bering Sea, North Pacific Ocean.
Type Specimen. USNM 21112.

REVISIONS AND REVIEWS. Loughlin and Perez (1985), Mead (1989).

STATUS. CITES-Appendix II; IUCN-Data deficient; COSEWIC-Not at risk. Reliable estimates of size and trends for Alaska populations are currently unavailable (Hill and DeMaster, 1999).

DISTRIBUTION. This little known species is confined to the cold-temperate waters of the North Pacific Ocean (Mead and Brownell, 1993). Reports from strandings and sightings suggest that Stejneger's Beaked Whales range from Japan, through the Bering Sea, and south off Southeast Alaska waters to California (Nagorsen, 1990). The species is not known to enter the Arctic Ocean (Hill and DeMaster, 1999).

SPECIMENS. None.

Goose-beaked Whale
Ziphius cavirostris G. Cuvier, 1823

OTHER COMMON NAMES. Cuvier's Beaked Whale.

TAXONOMY. No study of geographic variation throughout this species' range has been conducted and no subspecies are recognized (Rice, 1998).

Ziphius cavirostris

Original Description. 1823. *Ziphius cavirostris* Cuvier, Recherches sur les ossemens fossiles, ed. 2, 5(1):350.

Type Locality. Near Fos, Bouches-du-Rhone, France.

Type Specimen. Skull at MNHN.

REVISIONS AND REVIEWS. Heyning (1989).

STATUS. CITES-Appendix II; IUCN-Data deficient; COSEWIC-Not at risk. Reliable estimates of the number of goose-beaked whales in Alaska are currently unavailable (Hill and DeMaster, 1999), but the population is assumed stable (Wynne, 1993).

DISTRIBUTION. Goose-beaked Whales occur in all the world's oceans except the polar seas. In the Pacific, they range north into the Gulf of Alaska and the Aleutian Islands (Mitchell, 1968; Foster and Hare, 1990; Rice, 1998). No migrations are known (Martin, 1990).

SPECIMENS. **BERING GLACIER:** Yakataga (1 USNM). **YAKUTAT QUAD:** 54.7322, -139.7266, Yakutat (1 UAM); 59.6833, -140.3000, Malaspina forelands (Manby Point) (1 UAM); Yakutat (1 USNM).

The butchering of a large Sperm Whale (*Physeter catodon*) at the U.S. Whaling Company's base station at Port Armstrong, Baranof Island, in 1914. In the 1920s over 300 whales were taken from the surrounding waters. The carcasses were used for oil and fertilizer (*courtesy of the Alaska State Library Place File Collection, PortArmstrong-3*).

The Amphibian Fauna

Specimen Representation

The MVZ currently houses the largest single collection of amphibian specimens from Southeast Alaska (N=266; Figure 12; Appendix 3). There are an additional 589 specimens at UAM (N=140) and 13 other institutions, with the two most widespread species, Western Toad (*Bufo boreas)* and Roughskin Newt (*Taricha granulosa*), comprising the vast majority (83%) (Figure 13). Specimen representation on individual islands can be found in Appendix 7.

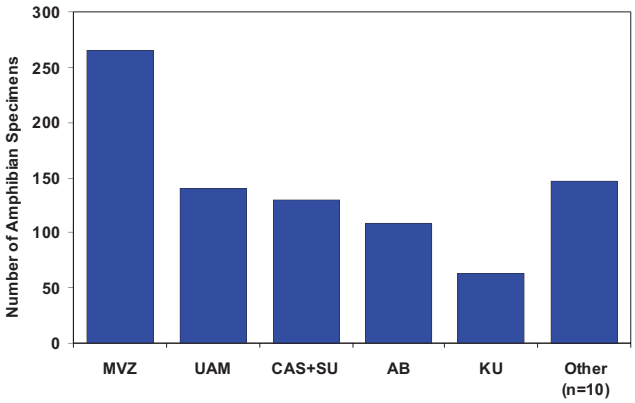


Figure 12. Specimen representation of amphibians by institution.

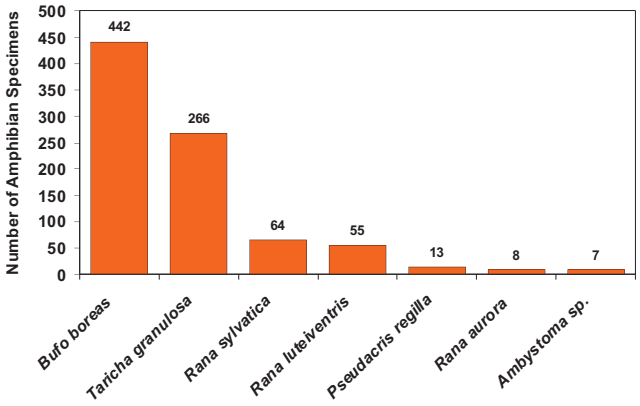


Figure 13. Specimen representation of amphibians by species.

Faunal Composition

Alaska supports eight species of amphibian that comprise five genera, five families, and two orders. All eight species are found in Southeast Alaska (MacDonald, 2003). The occurrence of the Alaska Worm Salamander (*Batrachoseps caudatus* Cope, 1889) from Annette Island (Hodge, 1976), is a long-standing enigma of Alaska herpetology and probably invalid (Wake et al., 1998; MacDonald, 2003).

Only two of Alaska's amphibian species occur beyond the Southeast region. The hardy Wood Frog (*Rana sylvatica*) ranges across much of the state south of the Brooks Range, and the Western Toad (*Bufo boreas*) occurs along the Gulf Coast as far north as Prince William Sound and several of its islands.

Two frog species are not native to the region and are the result of unauthorized translocations from populations outside the state. The Pacific Chorus Frog (*Pseudacris regilla*) and Red-legged Frog (*Rana aurora*) currently have restricted but viable populations on two separate islands in the Alexander Archipelago (MacDonald, 2003).

Amphibian Checklist

Scientific names follow Crother et al. (2000). Species introduced to the region by human agency are followed by an asterisk (*).

CAUDATA - newts and salamanders
- Ambystomatidae
  - *Ambystoma gracile*, Northwestern Salamander
  - *Ambystoma macrodactylum*, Long-toed Salamander
- Salamandridae
  - *Taricha granulosa*, Roughskin Newt

ANURA - frogs and toads
- Bufonidae
  - *Bufo boreas*, Western Toad
- Hylidae
  - *Pseudacris regilla*, Pacific Chorus Frog*
- Ranidae
  - *Rana aurora*, Red-legged Frog*
  - *Rana luteiventris*, Columbia Spotted Frog
  - *Rana sylvatica*, Wood Frog

Key to the Salamanders of Southeast Alaska

1. • Skin rough (except in breeding male) and bright yellow/orange on ventral surfaces …..... ..... **Roughskin Newt, *Taricha granulosa***
   • Skin smooth and color various …….....……..……..… 2

2. • Uniform gray-brown coloration and costal grooves pronounced … **Northwestern Salamander, *Ambystoma gracile***
   • Bright yellow, tan or light green dorsal stripe, and only faint costal grooves .....… **Long-toed Salamander, *Ambystoma macrodactylum***

Order **Caudata** Scopoli, 1777
Family **Ambystomatidae** Hallowell, 1856

Northwestern Salamander
Ambystoma gracile (Baird 1859 “1857”)

OTHER COMMON NAMES. British Columbia Salamander.

TAXONOMY. Two subspecies are generally recognized; one occurs in Southeast Alaska (Petranka, 1998; Crother et al., 2000). Nussbaum et al. (1983) indicated that geographic variation has not been studied well enough to determine the relationships of the various northern and southern populations and suspected that these populations may represent separate species. Titus (1990) found that

available genetic and morphological information does not correlate well with recognized subspecies and that their recognition may not be warranted.

Ambystoma gracile decorticatum

Original Description. 1886. *Ambystoma decorticatum* Cope, Proc. Am. Philos. Soc., 23:514-526.

Type Locality. Port Simpson, British Columbia.

Type Specimen. USNM 14493.

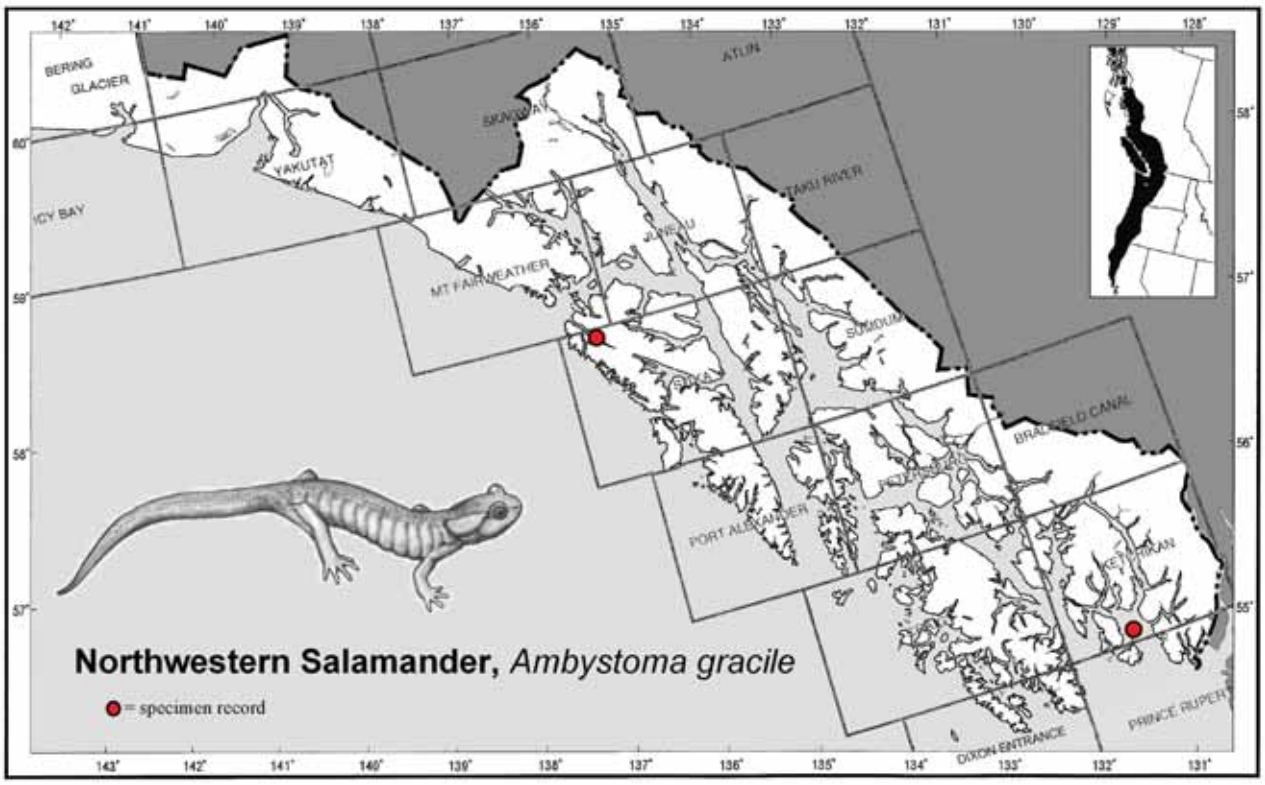
Range. Central coastal British Columbia north to Southeast Alaska.

REVISIONS AND REVIEWS. Snyder (1963), Shaffer et al. (1991), Weller and Green (1997), Petranka (1998), Green (1999), Matsuda et al. (2006).

STATUS. IUCN-Least concern; COSEWIC-Not at risk. The distribution and status of the Northwestern Salamander in Alaska is unknown and in need of study. Stable populations are believed to exist throughout its historical range (NatureServe Explorer, 2002). There is conflicting information on the affinity of this species for old-growth forests (Petranka, 1998).

DISTRIBUTION. This species has been collected at only two localities in Southeast Alaska: southeast of Ketchikan on Mary Island, and NW Chichagof Island near Pelican (Hodge, 1986). Two additional but unverified records are a globular egg mass, presumably of this species, found in Figure Eight Lake, Stikine River, on 12 June 1991 (Waters, 1992), and an adult reportedly observed near Graves Harbor on the outer coast of Glacier Bay National Park in 2000 (B. Anderson, pers. comm., 2004).

SPECIMENS. **KETCHIKAN QUAD:** 55.0800, -131.2200, Mary Island (1 USNM). **SITKA QUAD:** 57.9600, -136.2200, Chichagof Island, Pelican (2 AB).



Long-toed Salamander
Ambystoma macrodactylum Baird, 1849

OTHER COMMON NAMES. Eastern Long-toed Salamander.

TAXONOMY. Five subspecies are currently recognized; one occurs in Alaska (Petranka, 1998; Crother et al., 2000). Mainland populations and an island population in the vicinity of the Stikine River are phenotypically and taxonomically distinct from those elsewhere in the region (Norman and Hassler, 1996).

Amystoma macrodactylum columbianum

Original Description. 1961. *Ambystoma macrodactylum croceum* Ferguson, Am. Midl. Nat. 65:313.

Type Locality. 0.5 miles N. Anthony Lakes (SW 1/4, Sec. 7, R37E, T7S), Union Co., Oregon, (Elev. 7100 feet).

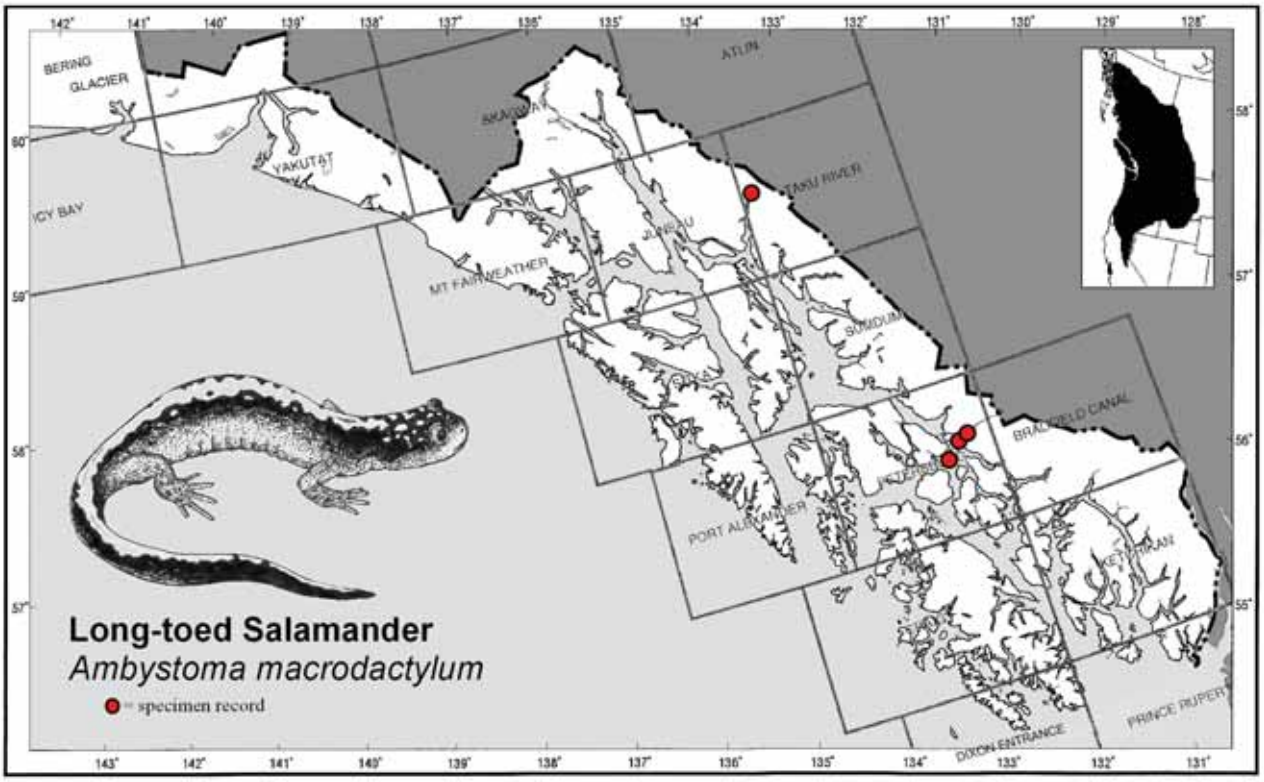
Type Specimen. USNM 142228.

Range. Central and western British Columbia north along the Pacific mainland coast from Knight Inlet to Southeast Alaska (Green, 1999).

REVISIONS AND REVIEWS. Ferguson (1963), Petranka (1998), Green (1999), Crother et al. (2000), Matsuda et al. (2006).

STATUS. IUCN-Least concern. The Long-toed Salamander is relatively common throughout its range (Petranka, 1998). In Southeast Alaska, the restricted distribution, unknown status, and possiblity of island endemics are factors of concern. Mortality and incidence of deformities have been linked to ultraviolet radiation and parasite (trematode) infection elsewhere (Blaustein et al., 1995). In developed areas, the destruction of wetland habitats may be the greatest threat (Petranka, 1998).

DISTRIBUTION. The extent of this species' distribution in northern British Columbia is not known, but Long-toed Salamanders have been found in the Stikine and Taku watersheds in British Columbia and Southeast Alaska, where it has been reported near the mouth of the Stikine River at Figure Eight Lake, Mallard Slough, Cheliped Bay, Andrew Slough, Farm Island, and farther out from the river delta on Sokolof Island (Hodge, 1973; Norman, 1999, 2004). Long-toed Salamanders have also been collected on the Alaska side of the Coast Range in the Taku River Valley (Miller, 1976).



SPECIMENS. **PETERSBURG QUAD:** 56.5000, -132.6000, Sokolof Island, S. side of small cove on W. side of island; NW 1/4 OF SEC. 15, T62S, R82E (1 sub-adult, 11 larvae supposedly sent to UAM; Norman, 2004); 56.7000, -132.2700, Stikine River, Figure Eight Lake (3 AB); 56.6200, -132.4300, Stikine River, Farm Island, Binkley Slough area (3 collected by authors and given to Brad Norman, 26 July 1992). **TAKU RIVER QUAD:** 58.5200, -133.9700, Taku River, between Hole-In-The-Wall and Twin Glaciers (1 AB).

Family **Salamandridae** Gray, 1825

Roughskin Newt
Taricha granulosa (Skilton, 1849)

OTHER COMMON NAMES. Rough-skinned Newt, Pacific Coast Newt, Western Newt, Northern Roughskin Newt.

TAXONOMY. Two subspecies are currently recognized; one occurs in Alaska (Crother et al., 2000). A high frequency of breeding adults on Gravina Island near Ketchikan displayed a dark mottling or blotching on their venter, similar only to individuals from Crater Lake, California, the type locality of *T. g. mazamae* (Myers, 1942). Genetic studies suggest that newts from Wrangell Island differ little from those in Washington state (Tan, 1994).

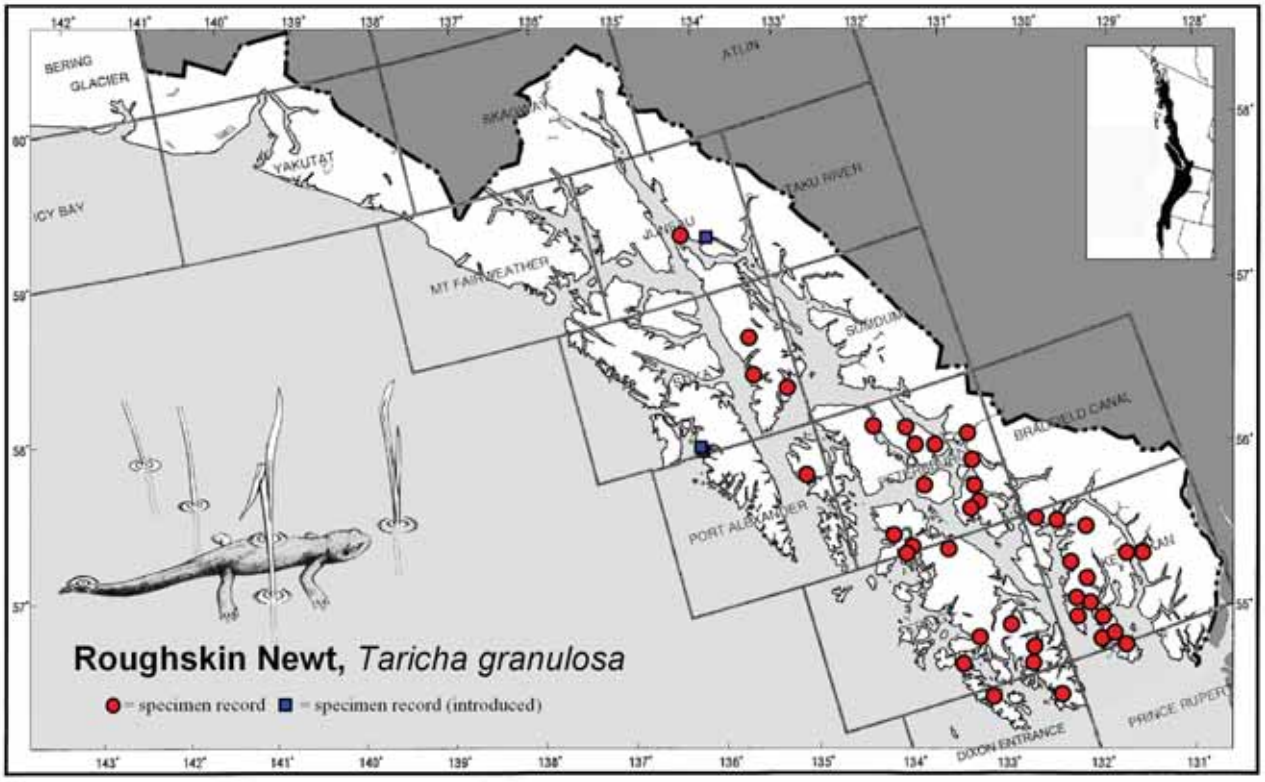
Taricha granulosa granulosa

Original Description. 1849. *Salamandra granulosa* Skilton, Am. J. Sci. Arts, (2)7:202.

Type Locality. Oregon; restricted to near Oregon City, Claskamas County, Oregon, USA, by Fitch, 1938, Copeia 1938:149.

Type Specimen. Unknown.

Range. Pacific coast from Southeast Alaska through British Columbia, including Vancouver Island but not the Haida Gwaii (Queen Charlotte Islands), to central California (Green, 1999).



REVISIONS AND REVIEWS. Nussbaum and Brodie (1981), Petranka (1998), Green (1999), Matsuda et al. (2006).

STATUS. IUCN-Least concern. The Roughskin Newt is the most common tailed amphibian in Southeast Alaska. This species is considered abundant and secure throughout its range (NatureServe Explorer, 2002). Studies elsewhere suggest that newt populations reach their highest densities in mature and old-growth forests (Aubry and Hall, 1991; Corn and Bury, 1991), and that clearcut logging has a negative impact on the terrestrial habitat and migration corridors of this species (Petranka, 1998).

DISTRIBUTION. Roughskin Newts have been documented from the mainland of Southeast Alaska as far north as the Stikine River. The presence of this species farther north along the Gulf Coast to perhaps as far west as Cook Inlet (Hodge, 1976) has not been adequately documented and appears to be in error. A discrete population of newts on the mainland north of the Stikine near Juneau are the result of a translocation from Shelter Island stocks in the 1960s (B. Wing, pers. comm., 2003). Roughskin Newts have been found widely distributed in the Alexander Archipelago south of Frederick Sound on Annette, Dall, Dog, Etolin, Gedney, Gravina, Hassler, Kosciusko, Kuiu, Kupreanof, Mitkof, Prince of Wales, Revillagigedo, Wrangell, and Zarembo islands. North of Frederick Sound, they have been found only on Admiralty Island and nearby Shelter Island. This species is unknown west of Chatham Strait except for two populations in the Galankin Islands group in Sitka Sound. Those are thought to be transplants from Ketchikan-area stock in about 1980 (J. Whitman, pers. comm., 2003). About 50 newts from Kuiu Island were accidentally introduced to wetlands on Baranof Island near Sitka by high school students in 2005 (Miller, 2005).

SPECIMENS. **CRAIG QUAD:** 55.1872, -133.1711, Dall Island, Bobs Bay (1 UAM); 55.3428, -132.5172, Prince of Wales Island, Polk Inlet (1 UAM); 55.3467, -132.8356, Prince of Wales Island, Polk Inlet Road (7 UAM); 55.9554, -132.8821, Prince of Wales Island, no specific locality recorded (8 UAM); 55.1700, -132.3300, Prince of Wales Island, Cholmondeley Sound, south arm, mouth of Disappearance Creek (10 LACM). **DIXON ENTRANCE QUAD:** 54.9561, -133.0592, Dall Island (2 MVZ); 54.9500, -132.9300, Dall Island, Rose Inlet (2 CAS); 54.8000, -132.2500, Prince of Wales Island, Hessa Inlet (1 CAS-SU). **JUNEAU QUAD:** 58.4200, -134.8700, Shelter Island, Shelter Lake (24 AB). **KETCHIKAN QUAD:** 55.0680, -131.4545, Annette Island, 1 1/4 mile from southernmost point of Long Lake above Tamgas Lake (10 UAM); 55.14056, -131.467, Annette Island, Peninsula N Annette Bay vicinity of landing (8 MVZ); 55.10666, -131.398, Annette Island, ca. 1.5 mi inland (by air) from upper end Crab Bay, E side island (3 MVZ); 55.2200, -131.4300, Annette Island, Hassler Harbor (1 USNM); 55.2800, -131.5800, Annette Island, Annette Bay (3 AB); 55.0000, -131.6000, Annette Island, vicinity of Point Davidson (5 CAS); 55.1300, -131.5700, Annette Island, Port Chester (2 USNM); 55.8561, -131.7061, Gedney Island (1 UAM); 55.2800, -131.7800, Gravina Island, Boucher's garden in Bostwich Pass, 2 mi. from beach (26 CAS-SU); 55.8944, -131.6542, Hassler Island, Blind Pass (1 UAM); 55.5000, -131.0000, Revillagigedo Island, Ella Bay (1 UAM); 55.8167, -131.3667, Revillagigedo Island, Orchard Lake (4 UAM); 55.4075, -131.7033, Revillagigedo Island, Ward Cove (8 UAM); 55.0400, -131.6700, Revillagigedo Island, Perseverance Trail, Ward Lake (1 CUMV); 55.3300, -131.6500, Revillagigedo Island, Ketchikan (12 CAS); 55.4100, -131.7000, Revillagigedo Island, Ward Lake (1 AB); 55.4131, -131.6983, Revillagigedo Island, Ward Lake (1 MVZ); 55.4490, -131.6362, Revillagigedo Island, White River Trail (6 MVZ); 55.4746, -131.4520, Revillagigedo Island, lake at head of Coon Cove, Georges Inlet (6 MVZ); 55.4938, -131.5564, Revillagigedo Island, 7.9 mi NE Ward Lake (6 MVZ); 55.9700, -131.8300, Cleveland Peninsula, McDonald Lake (1 USNM); 55.4678, -130.8320, Checats Lake (29 MVZ). **PETERSBURG QUAD:** 56.0978, -132.3603, Etolin Island, Site D of Brad Norman (4 MVZ); 56.1167, -132.4733, Etolin Island, Beaver Pond near Burnett Inlet (4 MVZ); 56.1800, 132.32, Etolin Island, Olive Cove (4 CAS-SU); 56.2800, -132.4200, Etolin Island, Kunk Lake (4 AB); 56.0300, -133.3800, Kosciusko Island, N head of Tokeen Bay (1 CAS-SU); 56.0700, -133.3300, Kosciusko Island, E side, near creek running into El Capitan Passage, W side (1 CAS-SU); 56.1300, -133.4500, Kosciusko Island, NE end of island near Prince of Wales Island (1 UMMZ); 56.8333, -133.3333, Kupreanof Island, 1.75 miles SW of east Salt Chuck Cabin (1 UAM); 56.6119, -132.7033, Mitkof Island, Ohmer Creek (4 UAM); 56.6839, -132.8465, Mitkof Island, Falls Creek, Mitkof Island, Alexander Archipelago (5 MVZ); 56.8000, -132.9700, Mitkof Island, Petersburg (2 UMMZ); Mitkof Island, Lake near Petersburg (1 AB); Mitkof Island (2 PSM); Wrangell Island, Highbush Lake (3 MVZ); 56.4700, -132.3800, Wrangell, Island, Wrangell reservoir (2 AB); 56.3667, -132.8333, Zarembo Island (1 UAM); 56.6997, -132.2703, Stikine River area, Figure Eight Lake (3 MVZ). **PORT ALEXANDER**: 56.6938, -134.2492, Kuiu Island, Rowan Bay (6 MSB); 56.7067, -134.2421, Kuiu Island, Rowan Bay area (4 MSB); 56.6117, -134.2167, Kuiu Island, Rowan Bay area (1 MSB); 56.2267, -134.2500, Kuiu Island, Rowan Bay area (5 MSB). **PRINCE RUPERT QUAD:** 54.9844, -131.3220, Dog Island (1 UAM). **SITKA QUAD:** 57.2861, -134.0419, Admiralty Island, near Pybus Bay (1 MVZ); 57.5333, -134.2500, Admiralty Island, interior of island (5 MVZ); Admiralty Island, West side of island, Chatham Strait (1 LACM).

A Roughskin Newt from a translocated population near Sitka, Baranof Island, in 2005 (p*hotograph by P. Mooney, ADFG*).

Key to the Frogs and Toad of Southeast Alaska

1. • Skin dry and warty. Parotoid glands present …….....… **Western Toad, *Bufo boreas***
   • Skin wet and smooth. Parotoid glands absent …….....…….……..……..… 2

2. • Toes long and straight, with round pads at tips. No dorsolateral folds …. **Pacific Chorus Frog, *Pseudacris regilla***
   • Toes tapered without pads. Dorsolateral folds present …….…….…..… 3

3. • Prominent dark eye mask. Underside cream white …….....… **Wood Frog, *Rana sylvatica***
   • Lack dark eye mask. Underside brightly colored …….…….…..… 4

4. • Sides usually with coarse black, red, and yellow mottling. Eyes turned outward. Hind legs long. Webbing on hind foot not full …...…….…….....… **Red-legged Frog, *Rana aurora***
   • Sides usually unmottled. Eyes turned slightly upward. Hind legs shorter. Webbing on hind foot full ……...…....…….....… **Columbia Spotted Frog, *Rana luteiventris***

Order **Anura** (Rafinesque, 1815) Hogg, 1839:152
Family **Bufonidae** Gray, 1825

Western Toad
Bufo boreas Baird and Girard, 1852

OTHER COMMON NAMES. Boreal Toad.

TAXONOMY. Frost et al. (2006) recommended this species be placed in the genus *Anaxyrus*. Three nominal subspecies are generally recognized, one of which occurs in Alaska. Geographic variation within this species is poorly studied and may mask a number of cryptic species (Crother et al., 2000).

Bufo boreas boreas

Original Description. 1852. *Bufo boreas* Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia 6:174.

Type Locality. Vicinity of Puget Sound.

Type Specimen. USNM 15467-70 (Syntypes).

Range. Western North America from southcoastal Alaska through western Canada (including Haida Gwaii and Vancouver Island) and western USA to northern California and Nevada (Stebbins, 1985).

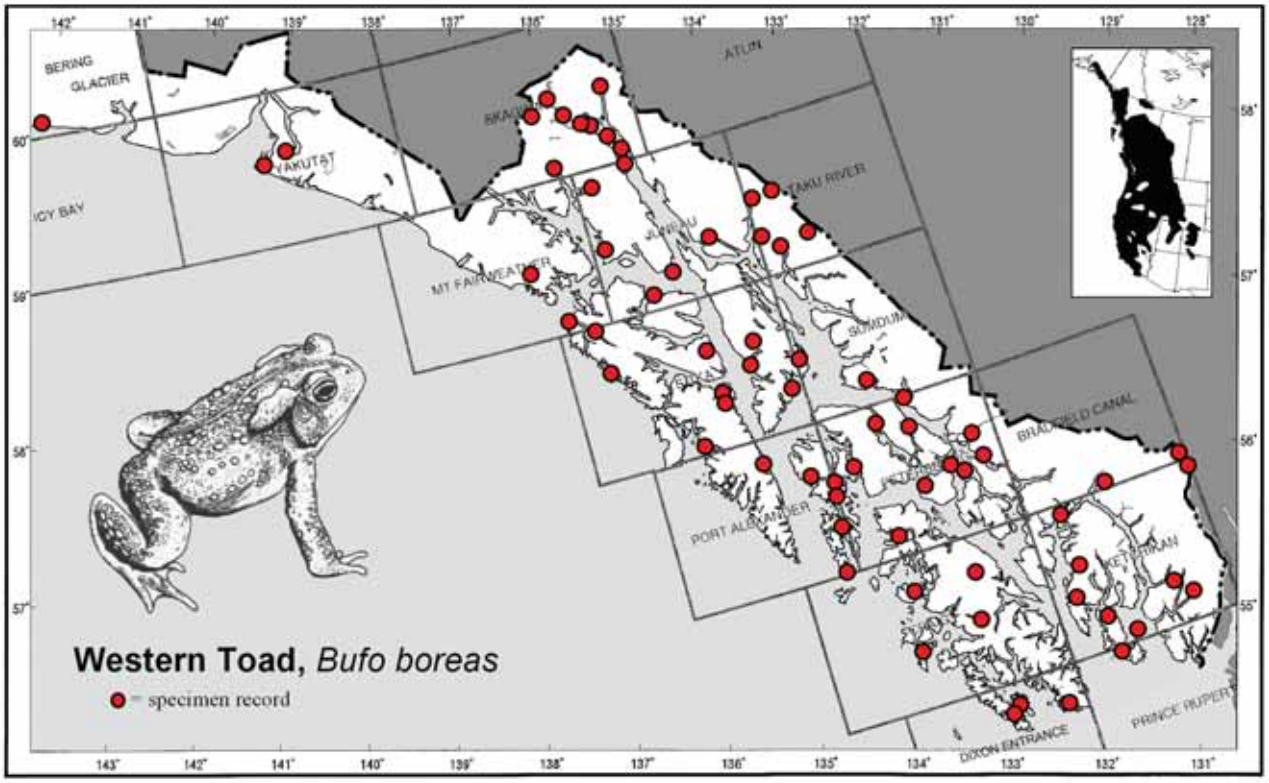
REVISIONS AND REVIEWS. Nussbaum et al. (1983), Green (1999), Frost et al. (2006), Matsuda et al. (2006).

STATUS. IUCN-Near threatened; COSEWIC-Special concern. Western Toad populations appear to be rapidly declining in many parts of their range for unknown reasons, even in relatively pristine environments (NatureServe Explorer, 2002). There is a growing concern that Alaska populations are experiencing a similar fate. Long-time residents from Haines to Ketchikan have noted sharp declines, prompting efforts to monitor toad populations. Alarmingly, five out of nine toads sampled from the Dyea area in 2005 tested positively for the lethal chytrid fungus, a disease implicated in major die-offs and extinctions of amphibians worldwide (Hahr, 2006).

DISTRIBUTION. Toads are widely distributed throughout the Alexander Archipelago and on the coast as far north as Prince William Sound (Swarth, 1936; Wiedmer and Hodge, 1996). Islands documented with specimens are Admiralty, Annette, Baker, Baranof (including Catherine "island"), Bushy, Chichagof, Chilkat (N.), Dall, Etolin,, Hassler, Heceta, Herbert Graves, Hotspur, Kosciusko, Kuiu, Kupreanof, Long, Mary, Mitkof, Noyes (UAM specimen not located), Prince of Wales, Revillagigedo, Sergief,

Suemez, Sullivan, Vank, Woronkofski, Wrangell, Yakobi, and Zarembo islands.

SPECIMENS. **BERING GLACIER QUAD:** 60.0700, -142.4300, Cape Yakataga (9 CAS, 7 UMMZ, 1 CMNH). **BRADFIELD CANAL QUAD:** 56.0269, -130.9844, Hyder area, Salmon River mouth of Texas River (1 UAM). **CRAIG QUAD:** 55.3667, -133.6000, Baker Island, Port San Antonio (1 UAM); 55.7786, -133.4539, Heceta Island, Chuck Lake edge (1 UAM); 55.7833, -133.5333, Heceta Island (1 UAM); 55.7644, -133.5319, Heceta Island (1 MVZ); 55.4500, -132.8500, Prince of Wales Island, 19km East of Craig, East side of Harris River (1 UAM); Prince of Wales Island, Cholmondeley Sound, W. Arm (1 LACM); Prince of Wales Island, N. Thorne River drainage (1 CUMV); 55.2667, -133.3500, Suemez Island, Port Refugio (3 UAM); 55.2789, -133.3161, Suemez Island (2 UAM). **DIXON ENTRANCE QUAD:** 54.7428, -132.8433, Dall Island, Security Cove (1 UAM); 54.7442, -132.7711, Dall Island, no specific locality recorded (1 UAM); 54.7833, -132.8667, Dall Island, Essowah Lakes (1 UAM); 54.8000, -132.8500, Dall Island, Essowah Lakes (1 UAM); 54.8117, -132.7708, Dall Island, Pond Bay (1 UAM); Dall Island, Rose Inlet (1 CAS); 54.8000, -132.6833, Long Island, 2 miles S Bolles Inlet (1 UAM); 54.8361, -132.7353, Long Island, Bolles Inlet (3 UAM); 54.7667, -132.1833, Prince of Wales Island, Nichols Lake (1 UAM). **JUNEAU QUAD:** 58.1200, -135.4600, Chichagof Island, Hoonah (1 USNM); 58.90, -135.70, Glacier Bay, tributary glacial stream entering Adams Inlet from NE, 3 mile S. Berg Mountain (3 CAS); Glacier Bay, Bartlett Cove (4 CUMV); Juneau area, Mendenhall Glacier (3 AB); 58.3019, -134.3099, 3 hrs out on Lemon Creek Trail, Juneau (2 MVZ); 58.3019, -134.4197, Juneau (43 MVZ); 58.3384, -134.4216, Salmon Creek Trail, Juneau (3 MVZ); 58.3417, -134.4014, Juneau, 0.25 mi E Salmon Reservoir, near Salmon Creek (1 MVZ); 58.3547, -134.5761, Juneau, marshes W of Juneau Airport (11 MVZ); 58.3800, -134.4531, 2 hrs out on Lemon Creek Trail, Juneau (1 MVZ); 58.4139, -134.5611, Juneau, Mendenhall Campground (2 MVZ); 58.4576, -134.5059, Juneau, E Trail along Mendenhall Glacier (4 MVZ). **KETCHIKAN QUAD:** 55.0422, -131.5722, Annette Island, Metlakatla Peninsula vicinity of Annette Island Airport, between Tent Point and Salt Chuck (7 MVZ); Annette Island (2 AB, 2 USNM); 55.9169, -131.6653, Hassler Island, 2.5 km N Fin Point (2 UAM); 55.0833, -131.2333, Mary Island, Customhouse Cove (1 UAM); Mary Island (1 AB, 1 USNM); Revillagigedo Island, Lake #2, Ward Cove Recreational Area, Ketchikan Lake (2 KU); 55.4100, -131.7000, Revillagigedo Island, Ward Lake (1 AB); 55.4490, -131.6362, Revillagigedo Island, White River Trail (2 MVZ); 55.4887, -131.5654, Revillagigedo Island, 7.4 mi NE Ward Lake (1 MVZ); 56.5897, -132.4256, Sergief Island, mouth of Stikine River (11 MVZ); Cleveland Peninsula, McDonald Lake (5 USNM); 55.2000, -130.4700, Boca de Quadra (3 USNM); 55.2800, -130.6300, head of Bakewell Arm, Smeaton Bay (1 UMMZ); 55.9200, -130.0200, Hyder (1 AB). **MT. FAIRWEATHER QUAD:** 58.1000, -136.4667, Yakobi Island, Soapstone Cove (2 UAM); 58.4183, -136.8097, Dixon River (5 UAM); 58.7608, -136.3486, Glacier Bay (12 MVZ). **PETERSBURG QUAD:** 56.6672, -134.2483, Bushy Island (1 UAM); Etolin Island, Olive Cove (10 CAS-SU); 56.1300, -133.4500, Kosciusko Island, off NW coast of Prince of Wales Island (2 UMMZ); 56.6442, -133.7204, Kuiu Island, Rocky Pass, Devil's Elbow area (1 MSB); 56.6445, -133.7210, Kuiu Island, Rocky Pass, Devil's Elbow area (3 MSB); 56.6596, -133.7243, Kuiu Island, Rocky Pass, 1.5 km S Summit Island (3 MSB); 56.8786, -133.3143, Kupreanof Island, near Salt Chuck cabin, North Arm Duncan Canal (1 UAM); 56.6420, -133.7007, Kupreanof Island, Rocky Pass, Devil's Elbow (1 MSB); 56.6644, -132.9633, Kupreanof Island, Green Rocks Lake, Lindenberg Peninsula (4 MVZ); 56.7873, -133.1590, Kupreanof Island, Duncan Creek, Lindenberg Peninsula (1 MVZ); Kupreanof island, near Petersburg (1 LACM); 56.8000, -132.9700, Mitkof Island, Petersburg (1 USNM, 1 PSM, 2 UMMZ); 56.4667, -132.6000, Vank Island (2 UAM); 56.3800, -132.5000, Woronkofski Island (1 CAS-SU); Wrangell Island, Wrangell (3 TCWC); 56.3500, -132.8333, Zarembo Island, Saint John Harbor (1 UAM); 56.7000, -132.2700, Stikine River, Figure Eight Lake (3 AB); 56.4500, -132.2000, Virginia Lake (1 AB, 3 TCWC). **PORT ALEXANDER QUAD:** 56.8333, -134.7000, Baranof Island, Red Bluff Bay (3 UAM); Baranof Island, Port Armstrong (1 AB); 56.0000, -134.1333, Kuiu Island, Cape Decision Lighthouse (1 UAM); 56.3214, -134.0717, Kuiu Island, Affleck Canal (1 UAM); 56.5000, -134.0333, Kuiu Island, Alecks Creek (1 UAM); 56.5833, -134.0000, Kuiu Island, Cape Decision Lighthouse (3 UAM); 56.7067, -134.2421, Kuiu Island, Rowan Bay area (2 MSB); 56.6993, -134.2429, Kuiu Island, Rowan Bay area (3 MSB); 56.6676, -134.2655, Kuiu Island, Rowan Bay area (1 MSB); 56.6938, -134.2492, Kuiu Island, Rowan Bay area (2 MSB); Kuiu Island, Washington Bay (1 CAS-SU). **PRINCE RUPERT QUAD:** 54.9686, -131.5128, Hotspur



Island (2 UAM). **SITKA QUAD:** 57.2814, -134.0961, Admiralty Island, Pybus Bay, S Cannery Cove (1 UAM); 57.6314, -134.3808, Admiralty Island, Distin Lake (1 UAM); Admiralty Island, S.E. District, Chatham St., W. Side Admirality Is. (2 LACM); Admiralty Island, Killisnoo (1 USNM); 57.3000, -134.8667, Baranof Island, Kelp Bay, middle arm (3 UAM); 57.3667, -134.8833, Baranof Island, Catherine "Island" (2 UAM); Baranof Island, Sitka (4 USNM); 57.9600, -136.2200, Chichagof Island, Pelican (1 AB); Chichagof Island, Kook Creek (1 CAS); Chichagof Island (1 USNM); 57.6667, -136.1833, Herbert Graves Island (1 UAM). **SKAGWAY QUAD:** N. Chilkat Island, 15 mi SSE Haines (1 KU); 59.0200, -135.3300, Sullivan Island, NE end of island, 16 miles S and 4 miles E of Haines (2 KU); 57.1697, -133.2531, Chilkat Peninsula 500m W Ansley Island (1 UAM); 59.2617, -135.5597, Haines Hwy: 3.9 mi WNW Haines city limit (1 UAM); 59.4950, -136.0717, 9 km W, 10 km N Klukwan (1 UAM); 59.3666, -135.7982, 17 mile Haines Highway (1 UAM); 59.2970, -135.6992, Mile 11 on Haines Hwy. (2 MVZ); 59.4633, -136.0228, Haines, Mosquito Lake (8 MVZ, 39 CAS); 2 mi N Mosquito Lake (2 MVZ); 59.4800, -135.3478, mouth of Taiya River (1 UAM); 9 mi W & 4 mi N Haines, E side Chikat River (24 KU); Chilkat Peninsula, 7 mi SSE Haines (13 KU); 67 km NW Haines, (1 KU); 59.5041, -135.3508, Dyea, near Taiya River (2 UAM); 59.4600, -135.3100, Skagway (1 AB). **SUMDUM QUAD:** 57.4294, -133.9389, Admiralty Island, W Gambier Bay (1 UAM); 57.0314, -132.8536, Thomas Bay (2 MVZ); 57.0100, -132.9800, Thomas Bay (2 SDNHM). **TAKU RIVER QUAD:** 58.1900, -133.6100, Port Snettisham, Speel River, Indian Lake (2 AB); 58.2800, -133.8000, Turner Lake (1 AB); 58.1833, -133.3167, Crescent Lake (1 UAM); 58.5333, -133.6833, Taku River, Fish Creek (1 UAM); 58.5200, -133.9700, Taku River, between Hole-In-The-Wall and West Twin Glaciers (2 AB); 58.4881, -133.9394, Juneau, Taku Inlet, Taku Ledge (1 MVZ); 58.5428, -133.8989, Twin Glacier Lake, Juneau (3 MVZ). **YAKUTAT QUAD:** 59.5469, -139.7272, Yakutat (9 MVZ); Yakutat area (13 ROM, 3 USNM).

Family **Hylidae** Rafinesque, 1815

Pacific Chorus Frog
Pseudacris regilla (Baird and Girard, 1852)

OTHER COMMON NAMES. Pacific Treefrog.

TAXONOMY. Formerly known as the Pacific Treefrog, *Hyla regilla*, the species was transferred to the genus of chorus frogs, *Pseudacris*, based on allozyme data (Hedges, 1986), a move further corroborated by da Silva (1997) and Moriarty and Cannatella (2004) (but see Cocroft, 1994). An assessment of recent studies suggest that *P. regilla* likely encompasses more than one species but that further analysis of material from across the entire range is needed to help clarify the situation (Highton, 2000). A number of subspecies have been proposed, though infrequently used in the literature. The subspecies of Pacific Chorus Frog translocated to Alaska from Kirkland, King County, Washington is considered *P. r. regilla* by some authors (Crother et al., 2000).

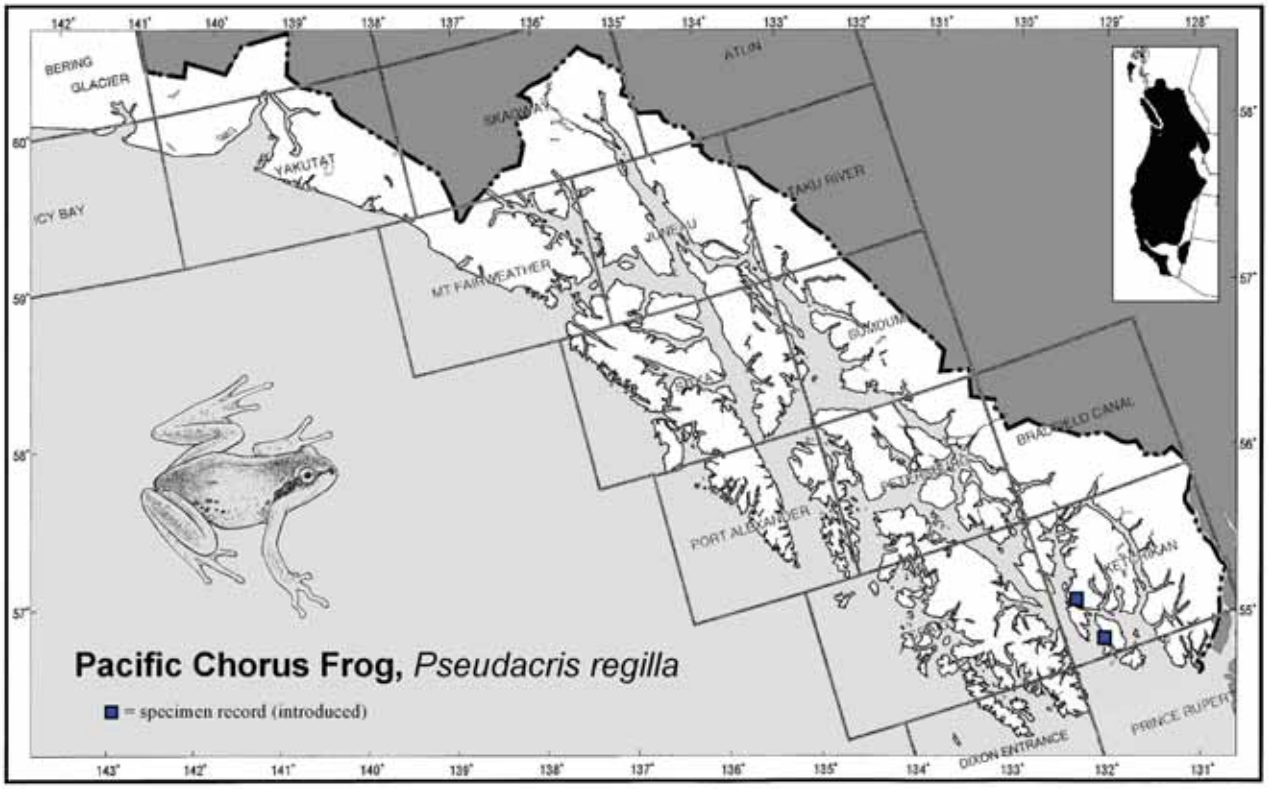
REVISIONS AND REVIEWS. da Silva (1997), Crother et al. (2000).

STATUS. IUCN-Least concern. The Pacific Chorus Frog is an exotic species in Southeast Alaska. The region's only known population was introduced to Revillagigedo Island near Ketchikan from western Washington in about 1960 (Waters et al., 1996; Waters et al., 1998). The only other amphibians known to occur on this island are Western Toad and Roughskin Newt. These native species have bred, apparently successfully, in the same muskeg ponds as the introduced chorus frog.

DISTRIBUTION. This frog is found at various elevations from southern British Columbia, including Vancouver Island, to Baja California and east to Idaho and Utah. It has been introduced on Haida Gwaii (Burles et al., 2004; Matsuda et al., 2006) off the coast of British Columbia, and in the Alexander Archipelago on Revillagigedo Island near Ward Lake. This population was still extant in 2005 (pers. obs.; MSB) and may have been the source of a lone frog found calling at Metlakatla on Annette Island in April 2005 (J. Pringle, pers. comm., with photo voucher) and several chorus frogs (of unknown current status) observed in years past not far from Ward Lake at Point Higgins (L. Carson, pers. comm., 2005).

SPECIMENS. **KETCHIKAN QUAD:** 55.4000, -131.7167, Revillagigedo Island, ponds ESE Ward Lake (2 UAM, 6 AB, 5 MSB).

Pacific Chorus Frog from Ward Lake ponds, Revillagigedo Island, July 2005 (*courtesy of B. Delehanty*)



Family **Ranidae** Rafinesque-Schmaltz, 1814

Red-legged Frog
Rana aurora Baird and Girard, 1852

OTHER COMMON NAMES. None.

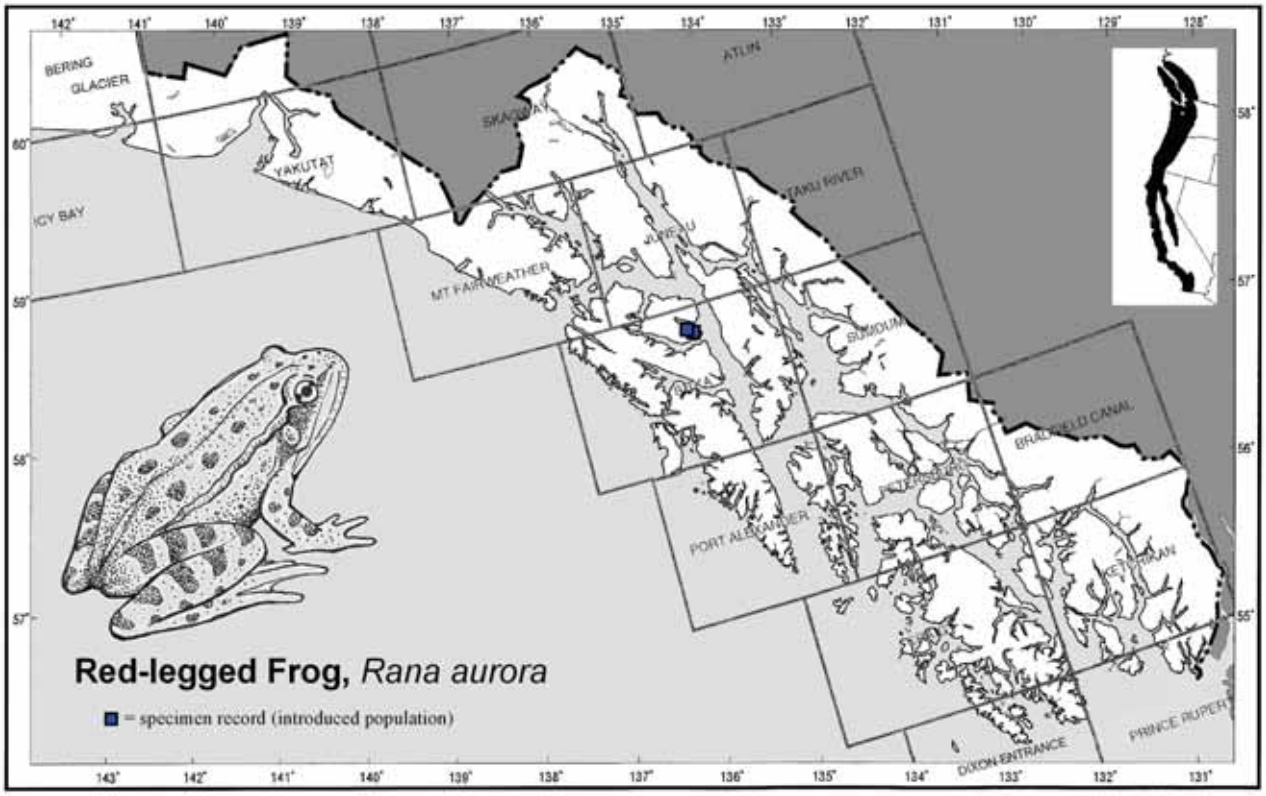
TAXONOMY. Frost et al. (2006) retained this frog in the genus *Rana*. The source population of Red-legged Frogs introduced on Chichagof Island in Southeast Alaska is believed to be from a commercial frog source (Sargent et al., 2003). Two subspecies of this Pacific Coast frog are generally recognized, although it has been suggested that the two may be distinct species (Hayes and Miyamoto, 1984). *Rana aurora aurora* (Northern Red-legged Frog) occurs from southwestern British Columbia, including Vancouver Island, to northern California, and *R. a. draytonii* (California Red-legged Frog) is found from California south to northern Baja California. The presence (in *R. a. draytonii*) or absence (*R. a. aurora*) of a light center in the dorsal spots may help identify the Alaska population.

REVISIONS AND REVIEWS. Altig and Dumas (1972), Matsuda et al. (2006).

STATUS. IUCN-Near threatened; COSEWIC-Special concern. The Red-legged Frog is an exotic species in Southeast Alaska. The status, distribution, and possible impacts of this introduced frog have not been studied. Declines in and extirpations of local populations of Red-legged Frogs have been reported from Oregon and California (Nussbaum et al., 1983; Davidson et al., 2001).

DISTRIBUTION. Introduced populations of this western North America frog have become established in the Kennel Creek and Pavlof River drainages of Freshwater Bay, NE Chichagof Island. It is thought they were planted there from a commercial frog source by a local person in the early 1990s (Sargent et al., 2003). Recent reports of this frog at Tenakee Springs and possibly Hoonah suggest a rapidly expanding population.

SPECIMENS. **SITKA QUAD:** 57.8300, -135.0700, Chichagof Island, Pavlof Bay drainage (8 AB).



Columbia Spotted Frog
Rana luteiventris Thompson, 1913

OTHER COMMON NAMES. Spotted Frog, Western Spotted Frog.

TAXONOMY. Frost et al. (2006) retained this frog in the genus *Rana*. *Rana luteiventris* was recently recognized as a distinct species from *R. pretiosa* (Oregon Spotted Frog) based primarily on allozyme and morphometric differences between allopatric populations (Green et al., 1997). No subspecies are currently recognized. Spotted frogs on Mitkof Island near Petersburg may exhibit a distinct ventral phenotype of heavy dusky gray coloring (Norman and Hassler, 1996).

Rana luteiventris

Original Description. 1913. *Rana pretiosa luteiventris* Thompson, Proc. Biol. Soc. Washington 26:53-56.

Type Locality. Annie Creek, Elko Co., Nevada.

Type Specimen. UMMZ 43037

Range. Extreme southern Yukon Territory, northwestern British Columbia, and coastal Southeast Alaska (Swarth, 1936; Hodge, 1976; Slough, 2002), southward away from the coast to central Nevada and Utah (Green, 1999).

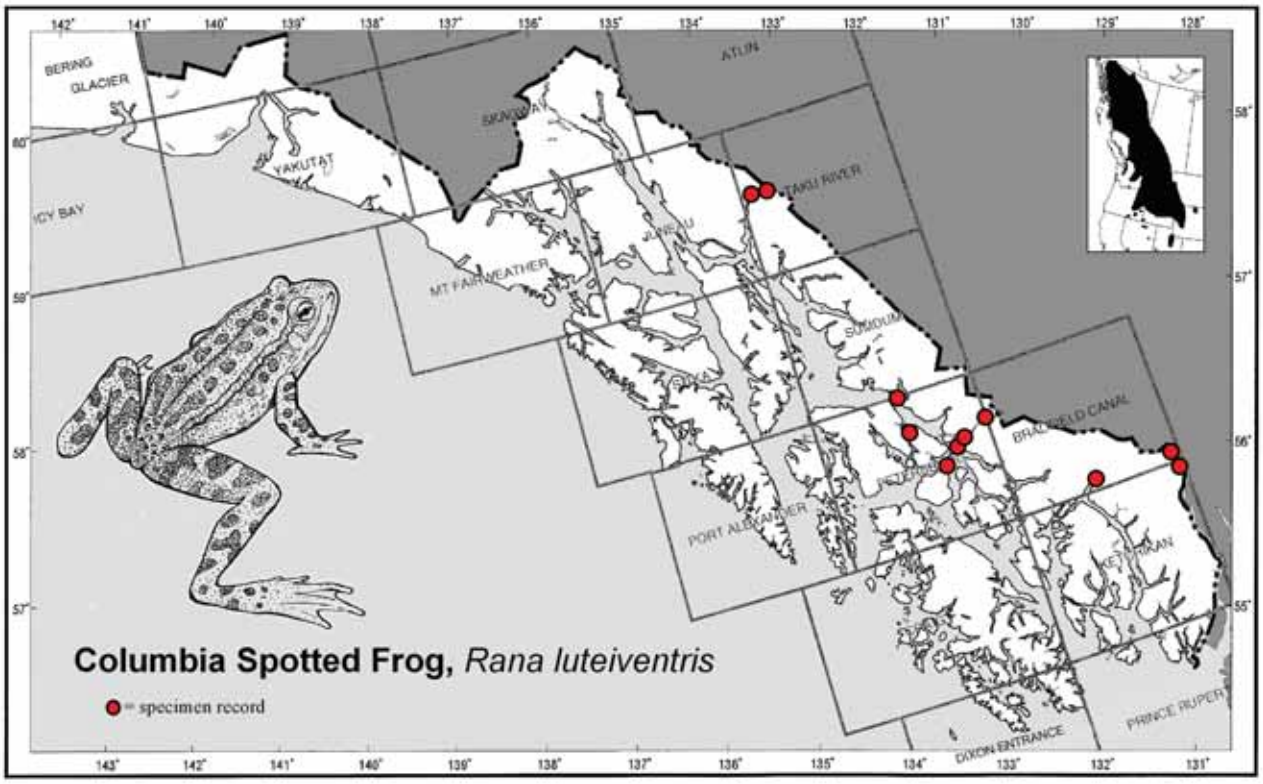
REVISIONS AND REVIEWS. Turner and Dumas (1972), Green et al. (1997).

STATUS. IUCN-Least concern; COSEWIC-Not at risk. Columbia Spotted Frogs from some areas in their range are declining, but are still considered common in British Columbia (NatureServe Explorer, 2002). The current status of Alaska populations is unknown.

DISTRIBUTION. Columbia Spotted Frogs have been documented along the mainland of Southeast Alaska at Salmon River near Hyder, Unuk River, Stikine River (including the delta islands of Farm, Little Dry, and Sergief), Point Agassiz, Taku River, and on Vank and Mitkof islands (Swarth, 1936; Hodge, 1976; Norman and Hassler, 1996; Waters, 1992; Lindell and Grossman, 1998).

SPECIMENS. **BRADFIELD CANAL QUAD:** 56.0938, -131.0972, Unuk River, Eulachon River (2 UAM); 56.1300, -130.1800,

Unuk River (1 AB). **KETCHIKAN QUAD:** 55.9442, -130.0492, Hyder, Salmon River, Fish Creek (1 UAM); 55.9728, -130.0553, Hyder, Salmon River, Fish Creek (1 UAM); 55.9400, -130.0500, Hyder, Salmon River (2 AB). **PETERSBURG QUAD:** 56.8000, -132.9700, Mitkof Island, Petersburg (2 AB; 3 LACM); 56.4667, -132.6000, Vank Island, Stikine River Delta (2 UAM); 56.7104, -132.5214, Mallard Slough, Stikine River, (2 UAM); 56.7233, -132.0436, beaver pond near mouth of Ketili River and Stikine River (1 UAM); 56.5897, -132.4256, Sergief Island, mouth of Stikine River (17 MVZ); 56.9780, -132.9025, Thomas Bay (1 UAM); 56.7000, -132.2700, Stikine River, Figure Eight Lake (1 AB); Stikine River (2 AB). **TAKU RIVER QUAD:** 58.5333, -133.6833, Taku River, Fish Creek (8 UAM); 58.5200, -133.9900, Taku River, Sockeye Creek (2 UAM); 58.5200, -133.9700, Taku River, between Hole-In-The-Wall and Twin Glaciers (2 AB); 58.5428, -133.8989, Taku River, Twin Glacier Lake (3 MVZ).



Wood Frog
Rana sylvatica LeConte, 1825

OTHER COMMON NAMES. Northern Wood Frog.

TAXONOMY. Frost et al. (2006) partitioned the genus *Rana* worldwide and recognized two genera of these frogs in North America and Canada. This new rearrangement places the wood frog in the genus *Lithobates*, and if adopted, requires its specific name to change to *sylvaticus*. Despite considerable variation within and between populations of Wood Frogs in Alaska and other northern areas (Martof and Humphries, 1959; Hodge, 1976; Cook, 1984), no subspecies are currently recognized.

Rana sylvatica

Original Description. 1925. *Rana sylvatica* LeConte, Ann. Lyc. Nat. Hist. New York. 1:282.

Type Locality. Not stated in original description. Designated as "vicinity of New York" by Schmidt, 1953, Check List North Am. Amph. Rept. 6th ed. p.81).

Type Specimen. Unknown.

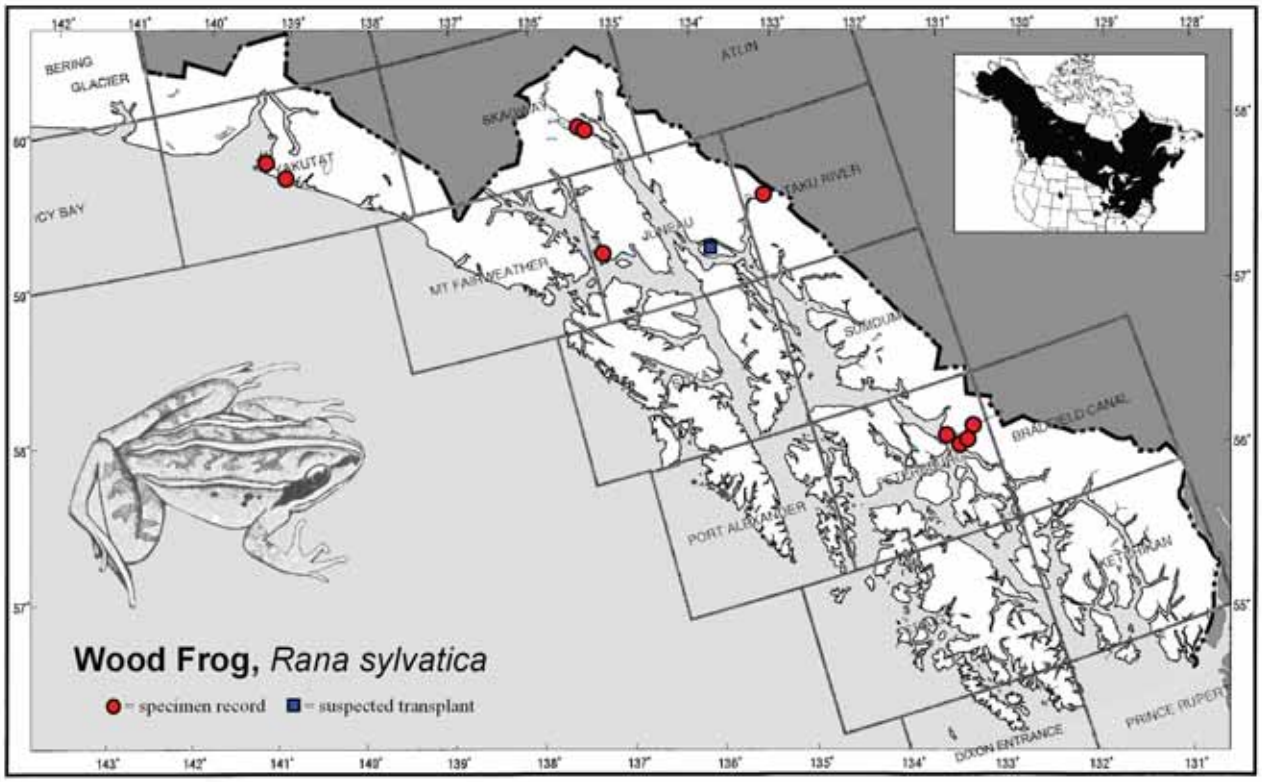
Range. Central Alaska to Labrador, southward to northern-central and eastern USA to southern Appalachian Mountains (Stebbins, 1985).

REVISIONS AND REVIEWS. Martof (1970), Green (1999), Frost et al. (2006).

STATUS. IUCN-Least concern. Abnormalities in Wood Frogs (missing, shrunken, or misshaped limbs, abnormal eyes) have been found at much higher rates than expected in both remote and developed sites, and on all National Wildlife Refuges studied in Alaska (Reeves and Trust, 2006). The causes for these abnormalities remain unknown although stressors such as disease, chemical contaminants, parasites, ultraviolet radiation, and interactions among these factors may be involved, with climate change serving as a major driver in the background (Woodford, 2006). The prevalence of abnormalities in Southeast frog populations has yet to be examined.

DISTRIBUTION. The documented occurrence of Wood Frogs in Southeast Alaska is currently restricted to the Stikine, Taku, and Chilkat drainages, Glacier Bay, and the Yakutat area. A localized population of Wood Frogs on Douglas Island near Juneau are suspected transplants. A specimen reported from Mitkof Island was later re-identified as a Columbia Spotted Frog (Norman and Hassler, 1996), and a specimen from Chichagof Island turned out to be *R. aurora* (L. Lerum, pers. comm.).

SPECIMENS. **JUNEAU QUAD:** Douglas Island (1 AB); Glacier Bay (NPS photograph). **PETERSBURG QUAD:** 56.7104, -132.5214, Mallard Slough, Stikine River (2 UAM); 56.7000, -132.2700, Stikine River, Figure Eight Lake (2 AB); Stikine River, Hot Springs (2 AB); 56.5897, -132.4256, Stikine River, Sergief Island (5 MVZ). **SKAGWAY QUAD:** 59.2970, -135.6992, Chilkat River Valley, mile 11 Haines Highway (8 MVZ, 9 CAS); 59.2800, -135.6600, E. side Chilkat River, 9 miles W. Haines (20 KU); 59.3747, -135.8336, Haines Hwy. (2 MVZ). **TAKU RIVER QUAD:** 58.4881, -133.7706, Taku River, Yehring Creek (1 MVZ). **YAKUTAT QUAD:** 59.5500, -139.7300, Yakutat (2 ROM, 9 MVZ); 59.4500, -139.5700, Yakutat, Situk River (1 ROM).



Discussion

Southeast Alaska supports a diverse and endemic fauna that likely results from the intersection between a dynamic history of climate change and a contemporary landscape that is highly fragmented and largely isolated from other terrestrial regions. We are still early in the discovery phase of our exploration of this diversity, but already significant new finds include cryptic structure (e.g., new species) and new ways to access long-standing questions (e.g., faunal interchange between Asia and North America).

Biogeography

The distribution of organisms through space and time is the raw material of biogeography (Myers and Giller, 1988). In Southeast Alaska, we are still defining the most basic biogeographic patterns such as "What is the distribution of species?" Given the complex and highly dissected landscapes of the archipelago and coast, this question must be resolved if we hope to identify the processes that have generated, structured, and maintained this coastal biome.

History. What were the origins of the Southeast Alaska mammal fauna? Most of Southeast Alaska was ice-covered during the last (Fraser) glaciation (Dawson, 1888; Heusser, 1960; Clague, 1989) and ice sheets are believed to have extended almost to the edge of the continental shelf (Blaise et al., 1990; Carrara et al., 2003). Thus, during maximum glacial extent, much of the region was probably inhabitable by only ice-adapted arctic (e.g., *Pusa hispida*, *Vulpes lagopus*; Heaton and Grady, 2003) or periglacial (e.g., *Mustela erminea*) faunas. An example of a potential ice-adapted relict may be the dwindling population of Beluga, *Delphinapterus leucas* (now isolated along the North Gulf Coast). As the climate moderated and ice retreated after the end of the Fraser Glacial Advance about 10,000 years ago, the arctic fauna largely was replaced by more temperate animals (and plants) that colonized the region northward along the southern coast or from the east through the larger river corridors that extend from interior British Columbia (Pielou, 1991). Less commonly, mammals colonized southward from the former Beringia refugium (Table 4). Swarth (1936) concluded that the fauna is of recent origin and that most of the mammals are immigrants from the east, with notable exceptions including deer (*Odocoileus hemionus*) from the south and Brown Bear (*Ursus arctos*) and Root Vole (*Microtus oeconomus*) from the north.

In addition to recent immigrants, Swarth (1936) also recognized that a portion of the vertebrate fauna of this region was highly distinctive and (after Nelson, 1887) termed the area the "Sitkan District." A growing body of evidence suggests a portion of the diversity found along the coast arose "in situ" during glacial periods when outer coastal refugia persisted along the North Pacific (Baichtal, 1993a; Clague, 1983; Heusser, 1989; Heaton et al., 1996; Carrara et al., 2003; Burles et al., 2004). Refugia may have been located west of the major Cordilleran glaciers along the then exposed continental shelf. A refugium has been postulated for eastern Graham Island in Haida Gwaii (formerly the Queen Charlotte Islands; Heusser, 1989) where high levels of endemism occur in birds and mammals (Foster, 1965; Cowan, 1989), crustaceans (Bousfield, 1958), insects (Kavanaugh, 1980, 1989), and plants (Ogilvie, 1989). Just to the north of Haida Gwaii, stands of Subalpine Fir (*Abies lasiocarpa*) on Dall, Heceta, and Prince of Wales islands also suggest some of these areas may have escaped Late Wisconsin glaciation

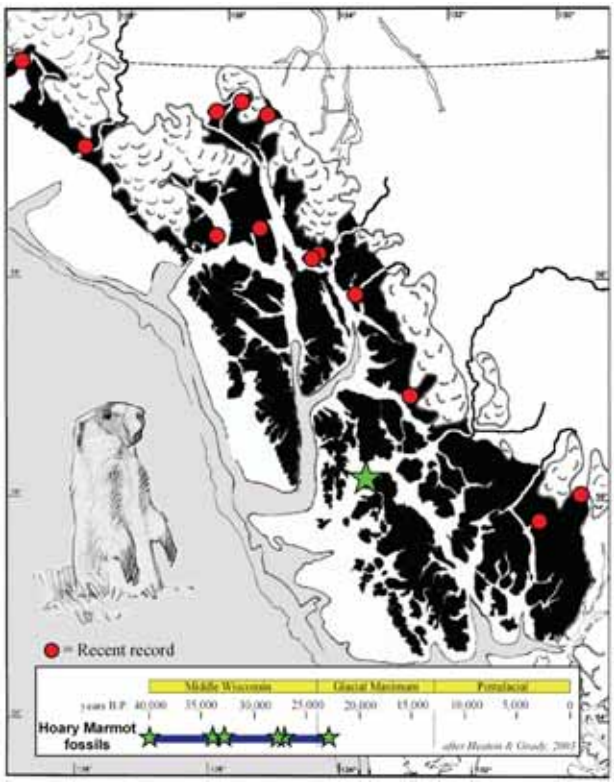


Figure 14. Prior to the last glacial, marmots occurred on Prince of Wales Island in the Alexander Archipelago.

Table 4. Probable refugial origins of Southeast Alaska's land mammal and amphibian faunas. Those based on phylogeographic studies are footnoted (see also Cook et al., 2006).

SPECIES	Continental	Southern Coastal	Northern (Beringia)	Pacific Coastal (In Situ Refugia)
Glaucomys sabrinus	X[1]	X[1]		
Marmota caligata	X			
Spermophilus parryii			X[2]	
Tamiasciurus hudsonicus		X		
Castor canadensis	X	X		
Zapus hudsonius	X			
Zapus princeps		X		
Lemmus trimucronatus			X	
Microtus longicaudus		X[3]		
Microtus oeconomus			X[4]	
Microtus pennsylvanicus	X			
Myodes gapperi	X[5]			
Myodes rutilus			X[5]	
Neotoma cinerea	X			
Ondatra zibethicus	X			
Peromyscus keeni		X		X?
Phenacomys intermedius	X			X?
Synaptomys borealis	X			
Erethizon dorsatum	X			
Ochotona collaris			X	
Lepus americanus	X			
Sorex alaskanus				X?
Sorex cinereus		X	X?	
Sorex monticolus		X	X[6]?	
Sorex palustris	X[7]			
Lasionycteris noctivagans		X		
Myotis californicus		X		
Myotis keenii		X		
Myotis lucifugus		X		
Myotis volans		X		
Lynx canadensis			X	
Puma concolor	X			
Canis latrans	X			
Canis lupus		X[8]		
Vulpes vulpes			X	
Ursus americanus		X[9]		
Ursus arctos			X[10]	X[10]
Gulo gulo			X[11]	
Lontra canadensis		X		
Martes americana	X[12]			
Martes caurina		X[12]		
Martes pennanti	X			
Mustela erminea		X[13]	X[13]	X[13]
Neovison vison		X		
Alces americanus	X[14]		X[14]	
Odocoileus hemionus		X		
Rangifer tarandus			X	X?
Oreamnos americanus		X		
Ovis dalli			X	
Ambystoma gracile		X		
Ambystoma macrodactylum	X			
Taricha granulosa		X		
Bufo boreas		X		
Rana luteiventris	X			
Rana sylvatica			X?	

[1]Demboski et al., 1998; Bidlack and Cook, 2001; 2002. [2]Eddingsaas et. al, 2004. [3]Conroy and Cook 2000. [4]Galbreath and Cook, 2004. [5]Runck, 2001; Cook et al., 2004; Runck, 2006; Runck and Cook, 2005. [6]Demboski and Cook, 2003. [7]O'Neill et al., 2005 (Cordilleran or western montane clade). [8]Weckworth et al., 2005; unpublished manuscript. [9]Byun et al., 1997; Stone and Cook, 2000; Peacock, 2004. [10]Talbot and Shields, 1996; Paetkau et al., 1998; Barnes et al., 2002. [11]Tomasik and Cook, 2005. [12]Small et al., 2003; Stone and Cook, 2002; Stone et al., 2002. [13]Fleming and Cook, 2002. [14]Darimont et al., 2005; Hundertmark et al., 2006.

(Heusser, 1989; but see Worley and Jacques, 1973). Whether these areas supported land mammals during glacial maxima is unknown, but is testable by using molecular techniques to examine genetic relationships among extant taxa (e.g., Moritz, 1994). Indeed, Fleming and Cook (2002) postulated that the Haida Ermine (*M. erminea haidarum*) is an example of such a paleoendemic. Although North Pacific Coastal refugia were originally supported by molecular genetic analysis of the Three-spined Stickleback (O'Reilly et al., 1993), further surveys indicated that the Haida Gwaii haplotype was widespread (termed the Japanese haplotype; Deagle et al., 1996). Similarly, work on Black Bear (Byun et al., 1998) suggested a relictual lineage in Haida Gwaii, but further sampling suggests this is a widespread coastal form extending from Juneau southward into Oregon (Stone and Cook, 2002; Peacock, 2004).

The extensive karst systems of Southeast Alaska (Baichtal, 1993a, 1993b; Aley et al., 1993) also are providing a wealth of new information regarding the historical status of the mammals. Discovery of hundreds of caves in the extensive karst formations of the Southern Outer Islands and the Northern Outer Islands produced an extensive fossil record that is leading to a more complete understanding of Late Wisconsin paleoenvironments and the dynamic history of the fauna of the North Pacific (Fedje et al., 2004; Fedje and Mathewes, 2005; Al-Suwaidi et al., 2006). Large quantities of fossil bones have been recovered from several of these caves (especially on Prince of Wales Island), including specimens of *Marmota* (Figure 14)*, Phenacomys, Lemmus, Rangifer, Ursus*, and *Vulpes lagopus* dated at more than 30,000 years BP (Heaton and Grady, 1992, 2003; Wigen, 2005). The continuing excavation and analyses of these materials is shedding considerable light on our understanding of past and present zoogeographic patterns, glacial extent and possible Pleistocene refugia. Those paleocollections are providing an excellent complement for interpreting the results from molecular genetic analyses (Heaton et al., 1996; Barnes et al., 2002). To understand the historical zoogeography of Southeast Alaska and accurately interpret the paleofaunal remains preserved in the caves, a comprehensive database relating to the status of extant taxa must be assembled (e.g., Graham et al., 1987).

Islands, Species Richness and Endemics. For North America, a large number of mammalian taxa have been described as endemic (i.e., unique taxa restricted entirely) to this region (Cook and MacDonald, 2001; Cook et al., 2006), especially to the islands. A number of critical questions need to be addressed for these forms. Why are so many endemics clustered in the Alexander Archipelago? Where precisely are they found? What processes are responsible for their divergence? Will these endemics persist through episodic habitat modification due to logging and climate change? What will be the impact of invasive, exotic species on long-term persistence of endemics?

Swarth (1936), Klein (1965), MacDonald and Cook (1996), and our updated analyses note patterns of increasing species richness (number of species) (Figure 15) and decreasing endemism as one travels from outer islands of the Alexander Archipelago eastward toward the mainland. Hence, the proportion of endemic taxa (to total number of taxa present) across the landscape of Southeast Alaska decreases as one moves eastward from the more isolated outer islands of the Alexander Archipelago toward the mainland. This pattern is most pronounced across the southern end of the archipelago and suggests that the Prince of Wales Archipelago, which has experienced some of the heaviest deforestation in the region, is a hotspot for endemics (Dickerman and Gustafson, 1996; Cook et al., 2006). Nonetheless, the highest absolute number of endemics is found along the mainland, reflecting its extensive latitudinal span, rugged topography, and isolation from the remainder of North America (MacDonald and Cook, 1996). MacDonald and Cook (1996) further identified a south-to-north increase in species richness along the mainland with the upper Lynn Canal area supporting the highest number of mammal species for Southeast Alaska. This latitudinal pattern is contrary to the general relationship of decreasing species richness with increasing latitude (Stevens, 1989).

Relative isolation of the entire region since the Pleistocene may be the primary factor responsible for an elevated level of endemism (Anderson, 1994), however, the possibility that some endemics are much older than previously suggested (Swarth, 1936; Klein, 1965) is likely (e.g., Fleming and Cook, 2002). Essential to our interpretation of the evolution of this fauna, is knowing whether all members of the current fauna immigrated to these subregions since the last glaciation (ca. 10-16,000 years ago) and subsequently differentiated (i.e., are neoendemics; Myers and Giller, 1988) or whether some endemics are remnants of a relictual fauna that persisted in the region through the last glaciation

(paleoendemics). Characterization of endemics using multiple approaches is helping to establish conservation priorities for this large region (Cook and MacDonald, 2001; Cook et al., 2006; Dawson et al., 2007).

Species Assemblages. Examination of distribution maps and related species accounts for each taxon indicates distinctive distributions across the complex landscape of Southeast Alaska. Some species are cosmopolitan, while others have very restricted distributions or are seldom encountered. Mammals can be grouped (Figure 16) according to the extent of their distribution throughout the region.

Common patterns of species distributions then can be used as a basis for identifying biogeographic subregions; areas where the fauna or flora likely share common evolutionary histories. Significant biotic breaks between subregions often reflect the influence of common geologic or climatic events. By analogy, the arid southwest of North America can be classified into several distinctive deserts (e.g., Sonoran, Chihuahuan). Recognizing that the peculiarities of each desert primarily are due to independent biogeographic histories (Riddle and Hafner, 2006) provides a finer spatial scale to develop

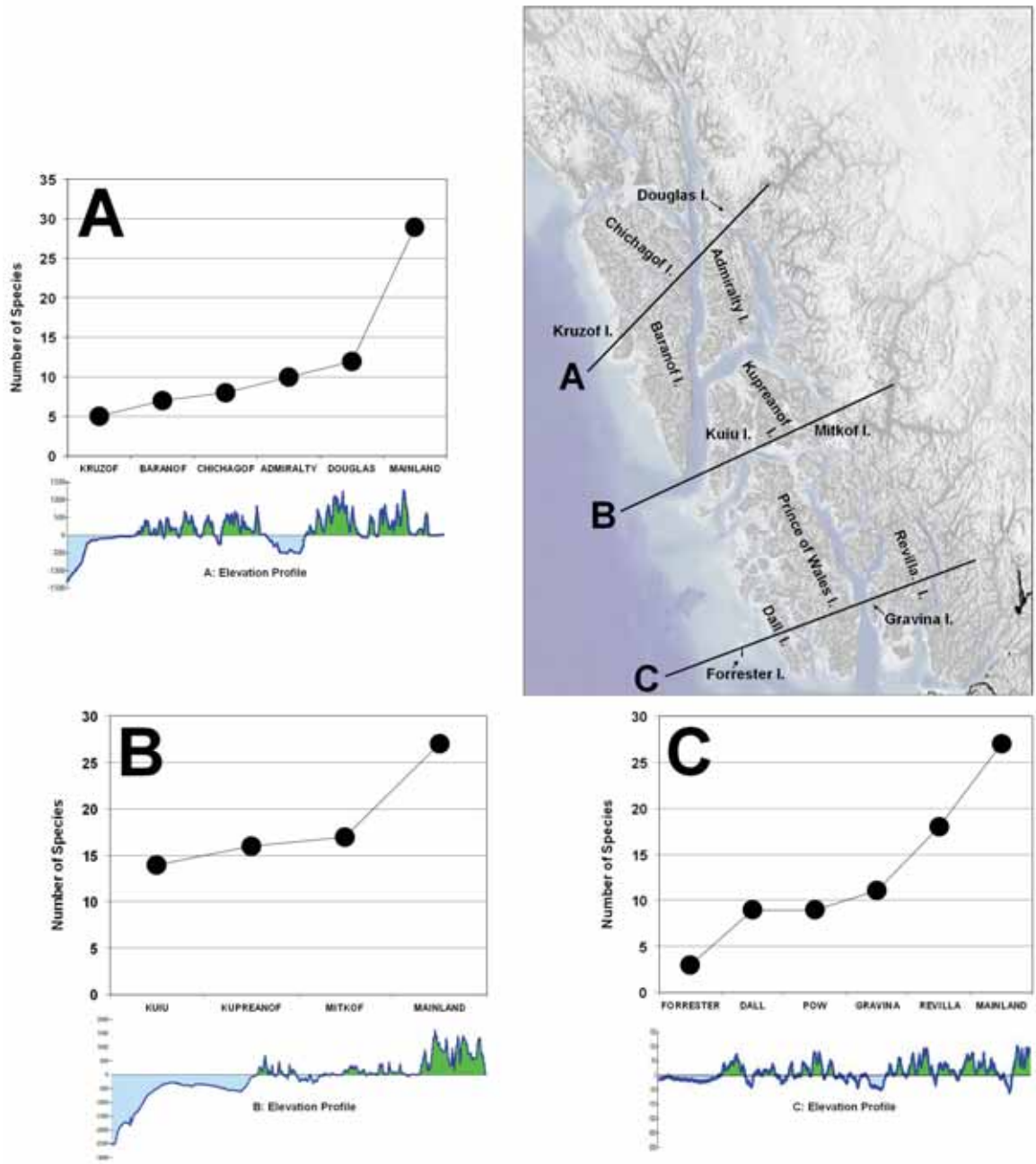


Figure 15. Changes in species richness as one moves from west to east across the Alexander Archipelago.

management strategies. Once identified, research efforts and agency resources then can be scaled to more meaningful spatial units. In turn, the validity of the biogeographic subregions should be continually tested and refined. Do subregions that were defined based on mammal and amphibian distributions (e.g., Prince of Wales Archipelago) coincide with those emerging from studies of plants, birds, or insects?

MacDonald and Cook (1996) proposed five biogeographic terrestrial subregions based on the presence of endemic taxa and unique combinations of native species. Herein, we add amphibian species and further refine the mainland into three subregions in recognition of unique combinations of taxa found along this wide expanse (Figure 16, 17). These subregions generally agree with the ideas of Swarth (1911, 1936) but should be viewed as working hypotheses. Because of the extreme complexity of this archipelago (>2,000 islands), it is critical that management efforts focus at appropriate scales. For example, biogeographic subregions may assist managers as they attempt to prioritize conservation efforts at geographic scales larger than single islands.

By defining and refining these patterns of species distribution, we can begin to explore the processes responsible for non-random aggregations of species. Southeast Alaska has tremendous potential for examining the role of abiotic and biotic processes on species composition. Large-scale abiotic processes include changes in sea level (Mann, 1986; Mann and Hamilton, 1995; Jacobs et al., 2004), ocean circulation, and climate; all are potentially important factors in this

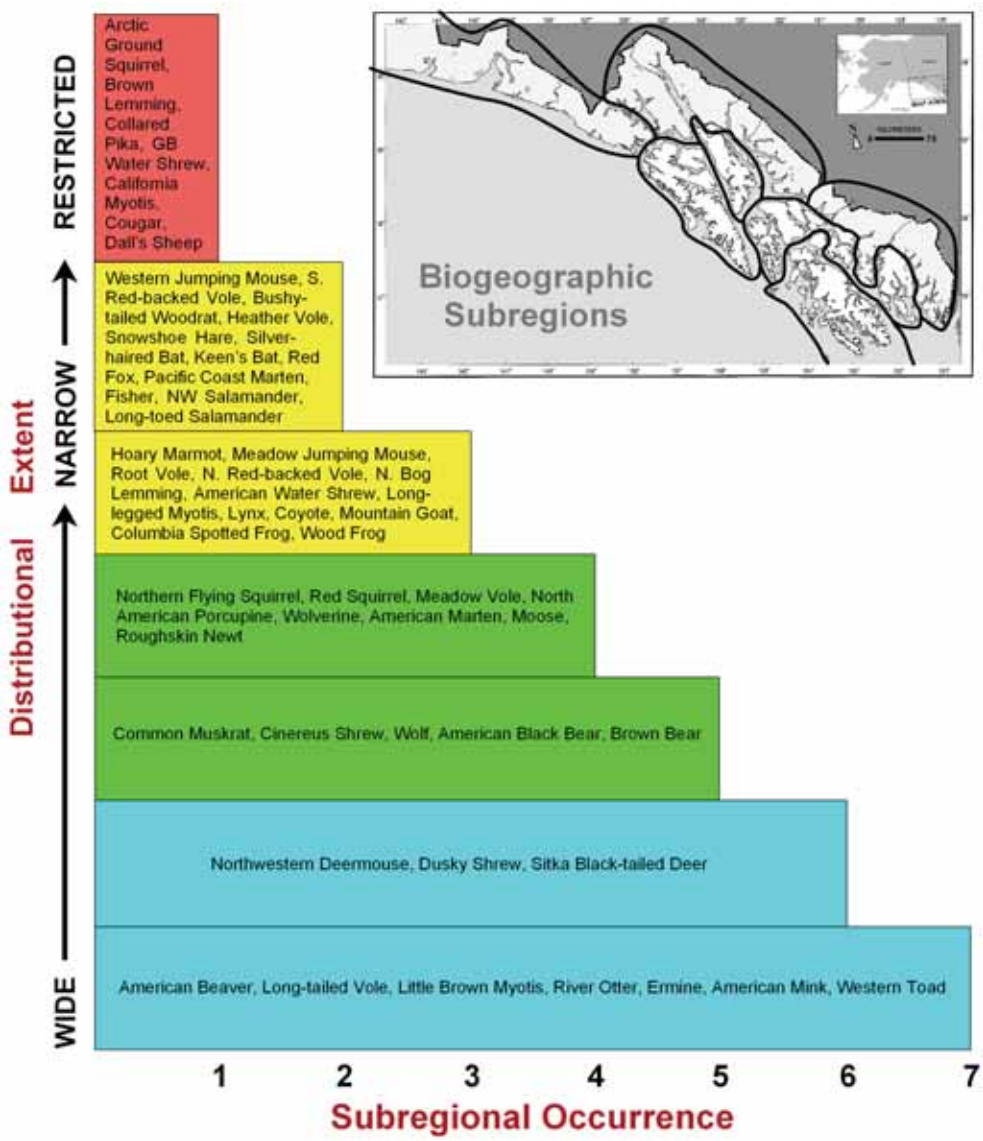


Figure 16. Distributional extent of mammal and amphibian species across seven subregions of Southeast Alaska.

region. Climatic change, including the movement of glaciers and isostatic rebound of land, has had a significant impact on the distribution of the fauna and flora of Southeast Alaska. Biotic factors affecting distribution include both evolutionary components such as adaptation, divergence, and extinction and ecological factors like competition, predation, and colonization ability.

Random events and human intervention have also played a role, and the latter will become a prime shaper of diversity in the future. Two important process-oriented theories, island biogeography theory and vicariance biogeography, could be critically tested by examining the fauna and flora of this complex landscape. Conroy et al. (1999), for example, explored the relative effects of island area and isolation on the faunal composition of the Alexander Archipelago. They studied the 24 islands with the best documentation of the presence or absence of mammal species and concluded that these island faunas were significantly nested. They suggested that unlike most landbridge and mainland archipelagos studied, island isolation (distance from nearest source) is the primary factor determining species richness in this high latitude landbridge archipelago. Thus colonization ability of particular taxa, rather than their likelihood of extinction, seemed to be key to determining species composition in the Alexander Archipelago.

Once species lists have been assembled and subregions defined, assessments of genetic and morphologic variation within each species provide crucial tests of the spatial extent of management units. Molecular genetic studies, in particular, are beginning to provide a clearer view of when and how the fauna and flora arrived and subsequently diversified in Southeast Alaska. Careful documentation of geographic variation will further refine the underlying biogeographic framework. Molecular genetic analyses allow us to establish connections or identify barriers among subregions or islands throughout this rich coastal biome. These kinds of information will facilitate future decisions aimed at managing these complex systems. Investigations of biotic diversity could be easily initiated at different temporal and geographic scales. For example, studies of genetic diversity of particular taxa are beginning to shed insight into the historical and contemporary barriers and connections among islands (e.g., Demboski et al., 1998; Peacock, 2004), along the narrow strip of mainland (Runck, Matocq, and Cook, submitted), and through the large river corridors linking many taxa with populations in British Columbia (Weckworth et al., 2005). Complex abiotic and biotic factors have shaped species assemblage on the islands and mainland through the late Quaternary. Despite such complexity, however, a basic understanding of major biogeographic units across the region is critical to conservation evaluation.

Linkages and Corridors. Within and among the seven subregions are areas that likely serve as important corridors for the movement or dispersal of terrestrial vertebrates. These corridors allow mammals and amphibians to move among areas, facilitating gene flow and colonization as well as the potential introduction of parasites and pathogens. Straits and water passages are undoubtedly also important in structuring variation for select marine mammals. We have attempted to identify some of these major linkage areas at the regional and subregional scale (Figures 17-19) for terrestrial mammals and amphibians. Additional corridors (and barriers) emerge if the landscape is viewed at finer spatial scales. The historical significance of such geographic features can be assessed through molecular genetic analyses, such as those conducted in insular black bears (Peacock, 2004). Protecting the habitat and reducing disturbance in such corridors may be critical to maintaining viable populations between habitat fragments (e.g., clearcuts), within islands (e.g., geographic pinch-points on northern Kuiu Island or southern Prince of Wales Island), and within subregions (e.g., Rocky Pass between Kuiu and Kupreanof islands). Molecular phylogeography, in particular, is a way to characterize (and test) spatial and temporal associations and connectivity of organisms across large regional landscapes (e.g., Avise, 1998; Moritz and Faith, 1998; Carstens et al., 2005).

Phylogeography. These investigations use analyses of molecular variation (usually DNA sequences) within a particular species to evaluate the relative roles of historical and contemporary processes in shaping the genetic structure of populations. Past events that can be inferred include population expansion, population bottlenecks, vicariance and migration (Avise, 2000). For Southeast Alaska, these studies have been completed at various spatial scales.

At the continental scale, Coastal Southeast Alaska may have played a prominent role in the exchange of faunas between Asia and North America throughout the Quaternary. Anthropologists are reconsidering the possibility of a coastal route for the very earliest entry of humans into the Americas (Rogers et al., 1991; Fedje et al., 2004). For other species, the history of coloniza-

tion of Northwest North America has been addressed primarily through analyses of current species distributions (e.g., Hoffmann, 1981), fossils, and the palynological record (Edwards et al., 2004). Other investigators now are tracking this dynamic biogeographic history by examining variation in DNA sequences across a number of selected organisms. For mammals, northwestern coastal populations of *Sorex monticolus, S. cinereus, Peromyscus keeni, Myodes rutilus, M. gapperi, Microtus oeconomus, M. longicaudus, Mustela erminea, Neovison vison, Martes americana, Gulo gulo, Canis lupus, Ursus arctos,* and *U. americanus* have been examined (Cook et al., 2006). By comparing across species, common themes begin to emerge regarding the response of organisms following deglaciation of the high latitudes of North America (Jacobs et al., 2004).

At the regional scale, molecular analyses indicate that Southeast Alaska mammals generally can be categorized into species comprised of single lineages in the region or species comprised of multiple lineages. Populations of *Sorex cinereus, Myodes rutilus, M. gapperi, Microtus oeconomus, Gulo gulo, Canis lupus,* and *Neovison vison* generally exhibit low levels of molecular divergence (based on sequences of the cytochrome *b* gene) within Southeast Alaska. Low variation and minimal sequence divergence likely reflects a single, relatively recent colonization of the coastal region by these widespread species (Cook et al., 2006).

In contrast, other mammals (*Sorex monticolus, Microtus longicaudus, Martes americana, Ursus arctos,* and *U. americanus*) are comprised of two distinctive lineages that can be characterized as coastal and continental. Among species with multiple lineages in Southeast Alaska, some show surprisingly high levels of interlineage genetic differentiation; a finding that reflects deep history and the possibility that some of these lineages began to diverge long ago in the late Pliocene or early Pleistocene. These distinctive lineages persisted over multiple glacial advances and retreats, evolving independently to the point that they represent cryptic or incipient species. For example, we previously considered *Martes americana* a single species, but it is comprised of two distinctive lineages (3.5% divergent based on cytochrome *b* sequences). Nuclear DNA variation (Small et al., 2003) and morphological assessments (Merriam, 1895) also suggested that these two forms of marten should be recognized as distinct species (continental *Martes americana* and coastal *M. caurina*). These species colonized Southeast Alaska independently during the Holocene, although the possibility that *M. caurina* existed in a refugium located somewhere along the North Pacific Coast during the last glacial maximum should be further examined (Demboski et al. 1999). Another small carnivore, *Mustela erminea* is represented by three distinctive lineages (Beringian, island, and continental) in Southeast Alaska. A coastal refugium in the vicinity of Prince of Wales Island or Haida Gwaii seems a promising hypothesis for the existence of the "island" lineage identified in ermine (Fleming and Cook, 2002).

In other species, multiple lineages have been identified, but these are minimally diverged and likely reflect recent response to contemporary barriers to gene flow (e.g., oceanic straits between islands) rather than deeper historical events such as glacial advances. *Glaucomys sabrinus* (Demboski et al., 1999; Bidlack and Cook, 2001, 2002) is an example of this group. Colonization of flying squirrels into the region likely coincided with the development of mature forests within the last 10,000 years (Pielou, 1991). The Prince of Wales Flying Squirrel (*G. s. griseifrons*) originally was described based primarily on darker pelage coloration (Howell, 1938) from a few specimens from Prince of Wales Island. Mitochondrial and nuclear DNA sequence variation is consistent with that classification (Bidlack and Cook, 2001, 2002). Minimal genetic divergence of these island populations from mainland populations (and the low genetic variability within island populations), however, suggests a relatively recent (post-Pleistocene) colonization of Prince of Wales and neighboring islands.

A number of potential contact zones have been identified between these lineages within species and between closely related species. Along the mainland, two divergent lineages of Long-tailed Voles are in contact in the vicinity of Haines. Just to the south along the mainland of Lynn Canal, two lineages of Dusky Shrew likely form a contact zone. Farther south along the coast, Runck (2001) and Cook et al. (2004b) identified a zone of contact between the Northern and Southern Red-backed Voles based on mtDNA. This contact apparently predates the last glacial maximum (Runck, 2006; Runck et al., submitted) and is characterized by substantial mtDNA introgression from the Northern Red-backed Vole into populations of Southern Red-backed Vole, extending from Thomas Bay south to the Cleveland Peninsula. On Kuiu Island, the Pacific Coast Marten and American Marten coexist, but the dynamics of interactions between these forms has not yet been thoroughly investigated. These contact zones provide intriguing

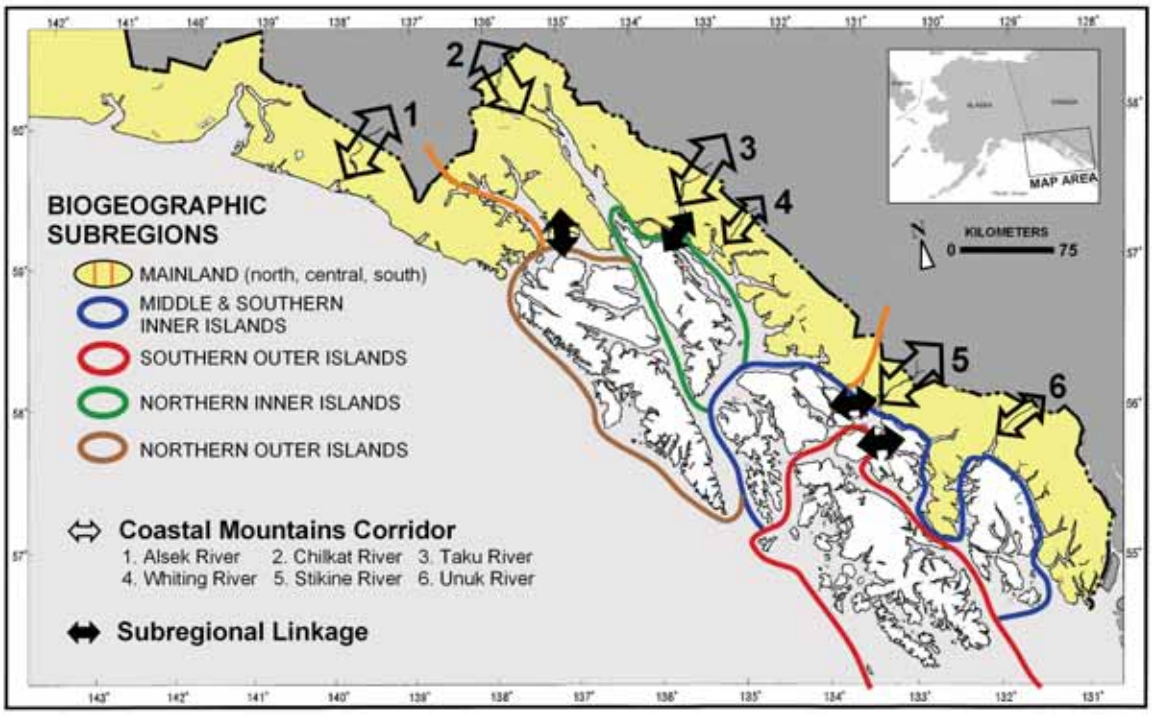


Figure 17. Biogeographical subregions and connectivity of Southeast Alaska.

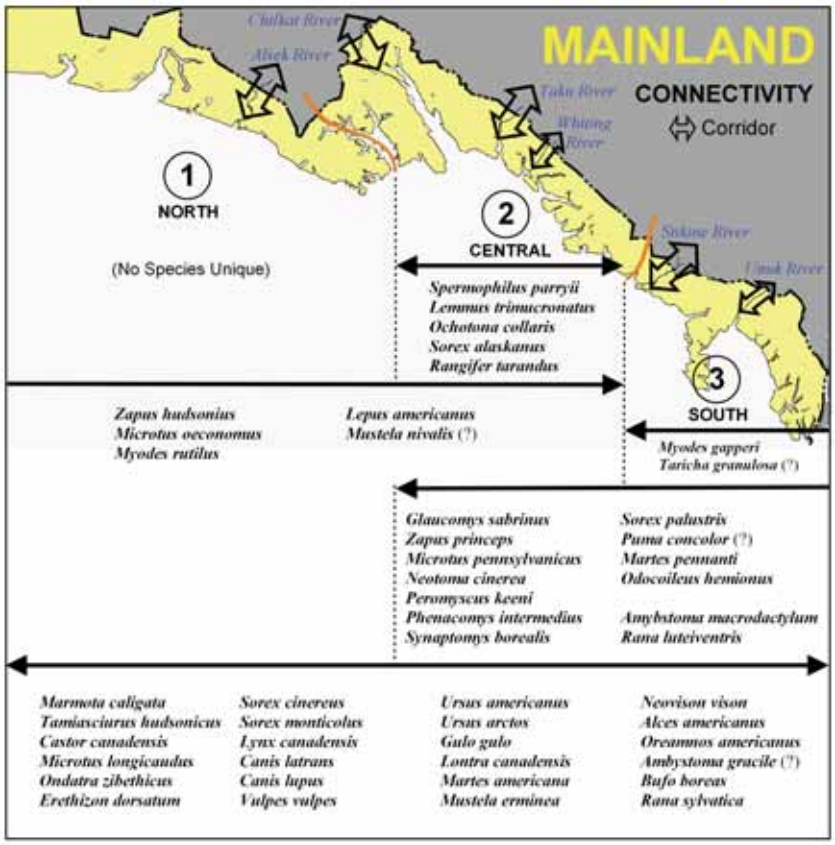


Figure 18. Subregions, species occurrence, and connectivity of Southeast Alaska's mainland.

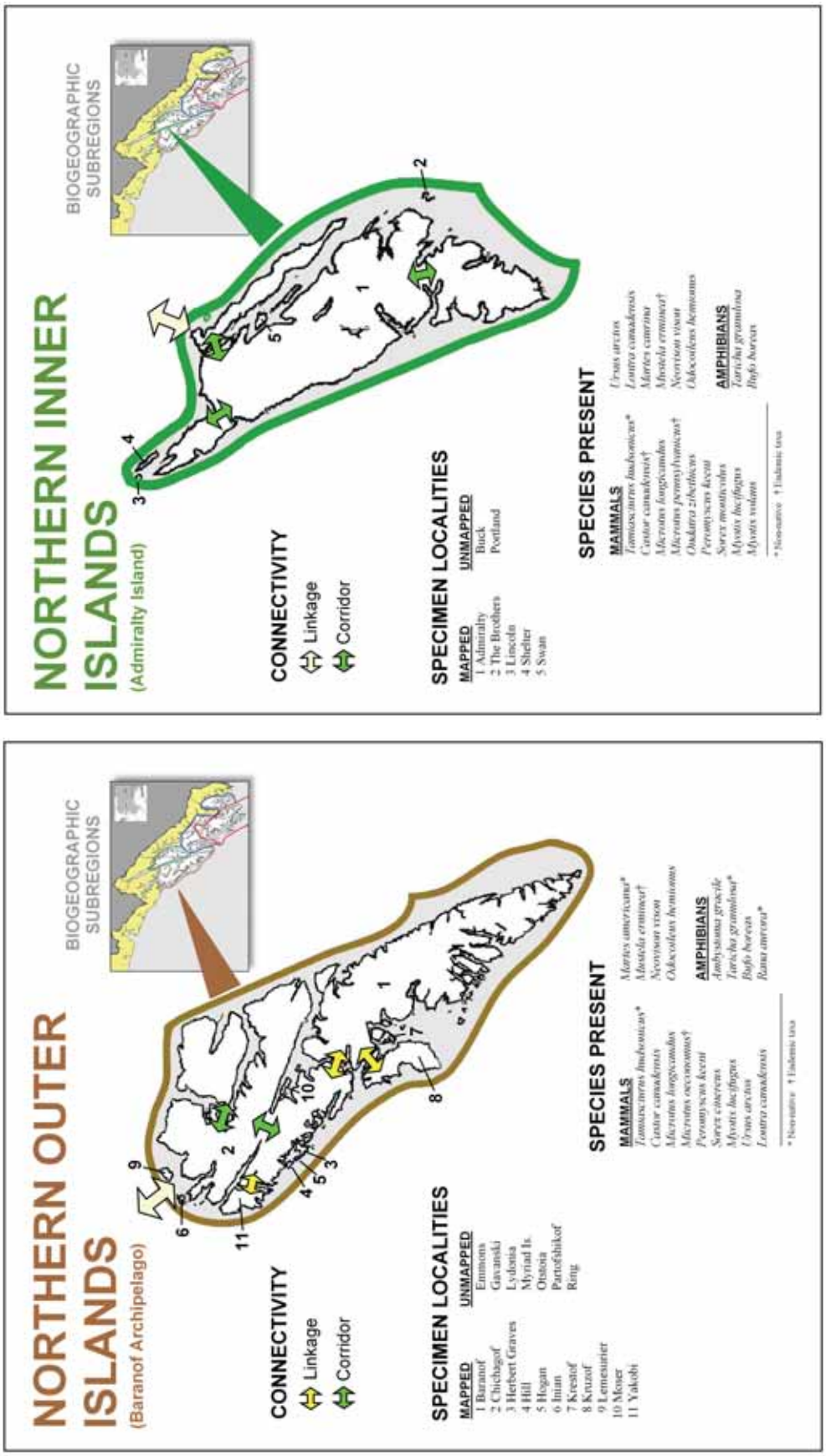
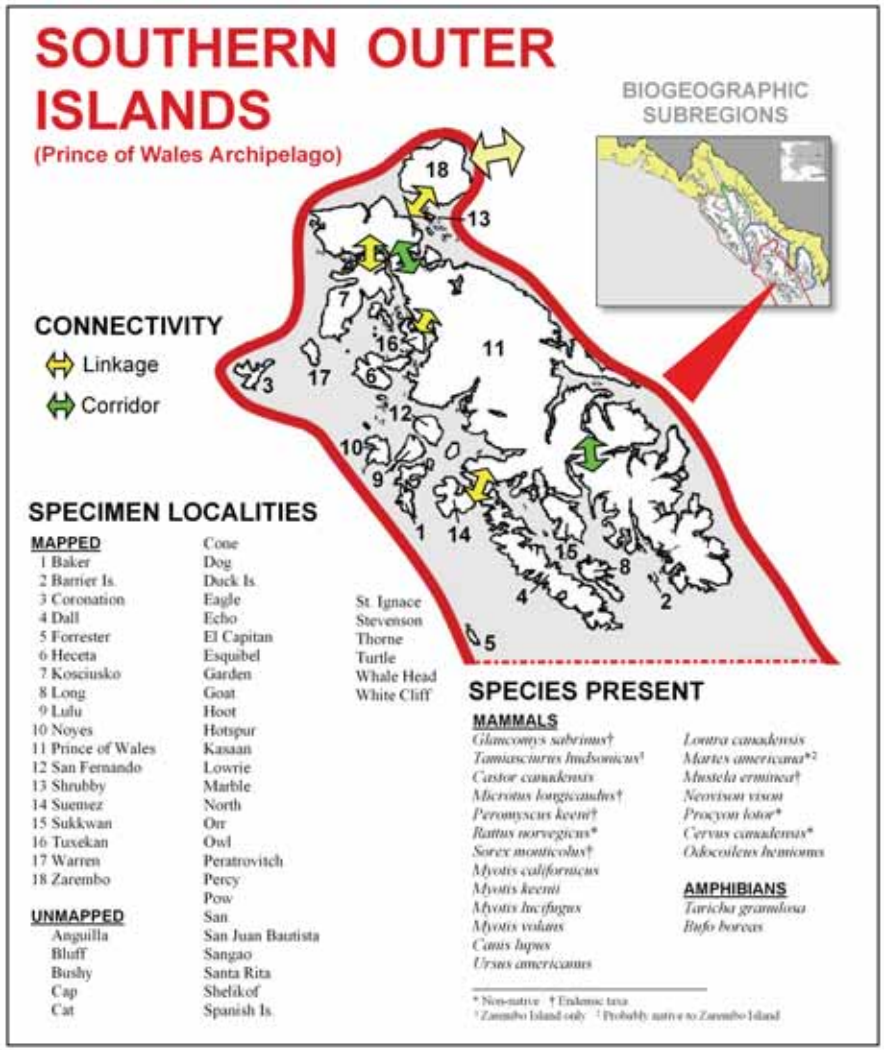


Figure 19. Connectivity, species occurrence, and specimen localities within the four distinct subregions of the Alexander Archipelago, Southeast Alaska.



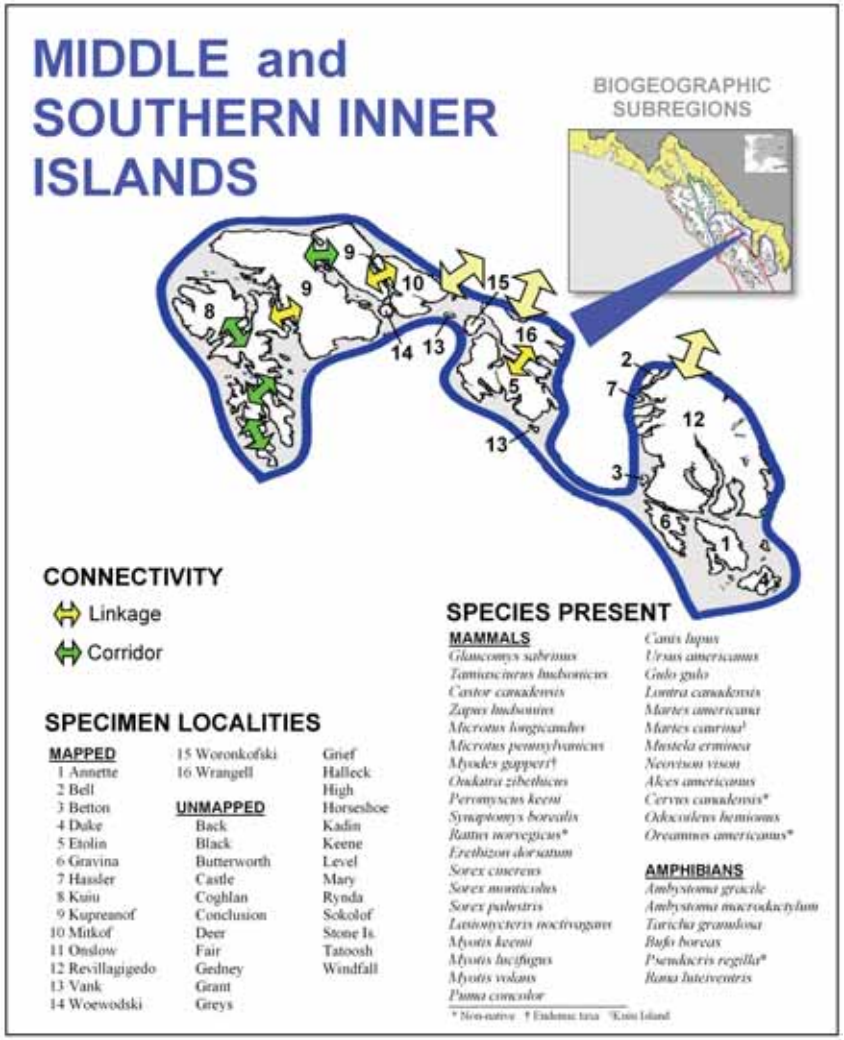


Figure 19 (concluded)**.** Connectivity, species occurrence, and specimen localities.

opportunities to study the dynamics of hybridization or reinforcement.

Further comparison of patterns across species that are comprised of multiple lineages in Southeast Alaska indicates that most lineages are closely related to populations outside the glaciated region (Paetkau et al., 1998; Demboski et al., 1999; Conroy and Cook, 2000; Cook et al., 2006). These close connections indicate the probable post-glacial (Holocene) colonization of coastal regions by independent genetic stocks. When these lineages (especially coastal and continental) are mapped for each species and then compared, several species share overlapping ranges and geographic discontinuities among lineages. These coincident phylogeographic breaks suggest a common history of colonization of the North Pacific Coast and should be a significant consideration for management and conservation (Avise, 1994; Bermingham and Moritz, 1998; Moritz and Faith, 1998, Rissler et al., 2005). At a minimum, distinctive regions identified on the basis of the shared spatial extent of coastal or continental lineages should be managed as independent biogeographic units. More extensive sampling, other taxa, and additional molecular markers are necessary to test and interpret these emerging patterns so that we can identify processes responsible for structuring and maintaining this fauna (Cook et al., 2006). Future molecular studies should provide powerful assessments of connectivity at a variety of geographic scales including within and among islands. Few molecular assessments of organisms other than mammals have been completed for this coastal region, although those studies suggest similar levels of endemism may be uncovered (Burg et al., 2005; Hickerson and Cunningham 2005).

Specimen-based Inventories

This coastal biome is of global significance, yet the region is experiencing substantial environmental change that will likely be accelerated by increased human invasion of these natural systems and climate change. To effectively monitor the impacts on natural systems, solid baselines must be rigorously developed. One of the tragedies of the Exxon Valdez oil spill is that lack of baseline information on the marine and terrestrial ecosystems of Prince William Sound and the Gulf of Alaska weakened most assessments of the impact of the spill and also crippled recovery efforts. Much of the biotic diversity of southcoastal Alaska also remains poorly documented.

Perhaps the most rigorous, enduring, and powerful (in terms of stimulating multiple and diverse studies) approaches to monitoring environmental change in a region is to begin with a specimen-based inventory that is followed by periodic re-sampling of selected sites. Accurate species lists for each island that are based on verifiable specimen records are an important first step in understanding how diversity is partitioned across the landscape and ultimately how disturbances may be impacting diversity. For example, the impact of timber removal over the past 50 years cannot be rigorously assessed for vertebrates at this time because information as basic as presence and absence of species on particular islands across the archipelago or at sites on mainland is incomplete. Species lists also provide our first glimpse into whether finer scale geographic structure can be identified within this large, complex landmass.

We still lack important information on the distribution and status of many of the mammal and amphibian species that occur in Southeast Alaska. Alpine regions are virtually unexplored and inventories could help clarify the ranges of species such as *Spermophilus parryii*, *Ochotona collaris, Neotoma cinerea, Phenacomys intermedius, Microtus oeconomus*, *Lemmus trimucronatus, Mustela nivalis, Rangifer tarandus* and *Ovis dalli.* Several other species (*Sorex hoyi, S. tundrensis, Marmota monax, Tamias minimus,* and *Microtus miurus*) occur nearby in British Columbia and may soon be recorded from Southeast Alaska. The great expanse and complexity of this region contribute to uneven specimen representation, particularly given the numerous islands that comprise the Alexander Archipelago. Similarly, most islands have never been sampled or have experienced only cursory inventory effort. Recent discovery of *Sorex palustris* on Wrangell Island, *Glaucomys sabrinus* on Dall Island, and *Synaptomys borealis* on Kupreanof and Kuiu islands exemplify the kinds of documentation gaps that remain to be filled.

We emphasize that the inventory phase of the region's amphibians and mammals is just beginning. Most species are poorly documented (Appendix 2-4) with 53% of mammals represented by fewer than 10 specimens and 64% by fewer than 30 specimens. Mean number of specimens per mammalian species is 281, however, the median number is only 5, suggesting that relatively few species are well documented. Numbers based on the review of 22 museum collections range from 0 (15 species) to 6420 (*Peromyscus keeni*). Cetacean material is especially lacking. Minimal documentation also characterizes amphibians. Beyond simply

documenting the distribution of species, serious investigations of these organisms have been hampered by lack of specimens and associated materials. For many analytical procedures at the intraspecific scale, a sample size >20 individuals per location are necessary to provide adequate views of population-level variation (Weir, 1996). Much larger samples are needed, however, when attempting to detect attributes that may occur at low frequencies (> 5%) such as some pathogenic parasites and viruses. Hence, many investigations aimed at assessing changes in populations over space and time cannot be completed for the majority of species in this region, effectively obviating attempts to monitor health of these wildlife populations or their response to environmental perturbation.

If we examine particular islands for individual species (Appendices 4-6), a parallel situation arises. Across the archipelago, 111 islands have at least one specimen that documents the occurrence of any species. Of those "species present" islands, however, 41% are represented by 10 or fewer specimens of any species and 62% by 30 or fewer specimens of any species. Poor specimen representation on both a species and location basis substantially constrains the potential of molecular genetics and stable isotope ecology; tools that are providing powerful new perspectives on the status of wildlife populations elsewhere.

Specimen-based Monitoring. Inventory and monitoring studies must include a rigorous protocol for the physical documentation of the data including the systematic collection, preparation, and preservation of modern museum specimens. Inventory projects and the concomitant preservation of scientific specimens and archiving of related data requires long-term support from individuals, institutions, and agencies, because often the benefit of geographically extensive and site intensive collections is not immediately apparent. Over time, the value of these specimens increases dramatically as they become our prime opportunity to view past environmental conditions (Winker 2005). Some of our highest quality assessments of environmental impacts or emerging threats have been derived from museum specimens (and their related data) that were systematically collected years ago (Banks, 1979; Yates et al., 2002; Chapman 2005). Specimens also provide the physical documentation for species identifications and associated data on reproduction, habitat, and parasites, among others (Yates et al., 1996).

Certain mammals and amphibians have attributes that make them excellent organisms for long-term ecological studies, once basic taxonomic and distribution data are available from inventories (Cook et al., 2004a). Studies of small mammal communities have considerable potential for providing insight into long-term environmental or evolutionary change. Van Horne (1981, 1982), Hanley (1996) and others conducted studies on small mammals related to timber harvest regimes in Southeast Alaska (reviewed in Hanley at al., 2005). The classic studies of "insular effects" on mammals (Foster, 1965) were conducted on nearby islands in British Columbia.

Mammals and amphibians are sensitive indicators of pollutants as many of these materials bioaccumulate in tissues including fat, liver, kidneys, muscle, and bone (Berlin et al., 1979; Winker, 2004). Systematically sampling vertebrate populations through time and preparation of diverse voucher specimens will facilitate a number of future investigations of persistent organic pollutants and other biotoxins by establishing historical baselines. Fluid preserved specimens can be used for analyses of heavy-metals, pesticides, and radionuclides (Barber et al., 1972). Bone may be used to assess lead and strontium-90 levels (Harley, 1979) and hair from museum specimens can provide data on heavy metals (Jenkins, 1979). Inventory studies have tremendous potential for documenting environmental change through time by providing well-documented specimens that encompass a variety of preparations.

Specimens and Ecosystem Health. Mammals and amphibians are essential components of ecosystems and provide key views to the status of many systems (Wilson and Peter, 1988; IUCN et al., 2004; Stuart et al., 2004). The paucity of data on these vertebrates continues to hamper our more general understandings of what constitutes healthy and functional ecosystems in Southeast Alaska, important considerations if we are to maintain ecological and evolutionary processes. Amphibians, in particular, seem to be excellent sentinels of ecosystem health (Lannoo, 2005; Mendelson et al., 2006).

Mammals play a significant role in ecosystems as primary herbivores, seed and seedling consumers, predators of insect pests (Churchfield, 1990), birds, and other mammals,

prey for furbearers (Magoun and Johnson, 1991) and predatory birds (Pearson, 1985). In more specific instances they may play an integral role in forest health (e.g., mycorrhizal fungi relationships; Maser et al., 1978; 1986a,b). Some mammals have the potential to alter plant communities and determine the habitat structure and resources available to other species in a particular area (Rose and Birney, 1985). High latitude mammals are well known for dramatic fluctuations in population sizes. Still little is known about the effects of population irruptions on the other members of the community. Cricetids, in particular, are known to be important in the diet of many raptors (Craighead and Craighead, 1956; Pearson, 1985) including short-eared owls, great horned owls, and red-tailed hawks (Beacham, 1979; Boonstra, 1977). Similarly, mustelids may prey to a large extent on arvicolines (Fitzgerald, 1977; Ben-David et al., 1999).

Specimens and Pathogens. Frozen tissue collections have been important in studies of epidemiology in wild populations (Cook et al., 2005). The Center for Disease Control (CDC) has relied heavily on museum specimens in its efforts to understand and control the Hantavirus disease. Sin Nombre Virus (SNV), first discovered in 1993, has been responsible for 416 instances of hantavirus cardiopulmonary syndrome (HCPS) in humans in the United States through Jan 2006 (CDC, 2005) and over 150 deaths. Without museum specimens, the CDC would not have been able to respond as quickly or as efficiently (Kreeger, 1994). The majority of HCPS cases occurred in western North America, but cases throughout the range of deermice (*Peromyscus*) have been documented. Sudden outbreak of this viral disease, coupled with its high mortality, necessitated research into its origins. The virus is transmitted to humans through the inhalation of fecal material from rodents. The North American Deermouse (*Peromyscus maniculatus*) has been implicated as the primary host for this virus in the lower 48 states, however, screening of frozen tissue samples from museum specimens has uncovered related hantaan viruses in other murid rodent species (Kreeger, 1994; Yates et al., 2002).

Was SNV a new virulent strain or had the virus always been present in the host and simply not previously identified? That question was effectively addressed only because tissues from the host species (*Peromyscus maniculatus*) have been systematically archived at the Museum of Southwestern Biology (New Mexico) and other museums over the past 14 years. Does SNV occur in *Peromyscus keeni*, a species closely related to *P. maniculatus*? This is the common commensal rodent that is often found in recreational cabins and in rural homes in Southeast Alaska. Samples from our inventory have been screened at the CDC and University of Hawaii. To date, none of the Southeast Alaska deermice (>700) has tested positive for hantaan-related virus, although this pathogen is now documented in *Microtus* and *Myodes* samples from Southcentral, Interior, and recently Southeast Alaska (Goade et al., unpubl. data). Positive *Myodes gapperi* were found near Ketchikan and at several locations along the southern mainland. Additional samples of cricetid rodents will be screened in the future. Similar crises in other wild mammals such as canine distemper in seals of the North Seas (Dickson, 1988) suggest the value of building a baseline of tissue samples for these organisms.

Specimens and Conservation. The role of systematics and biogeography in conservation biology, land management practices, and compliance with federal laws is well established. Effective management within the multiple-use approach requires baseline documentation of the fauna and flora. Such information was missing for the majority of the mammal and amphibian species in Southeast Alaska resulting in a serious gap in the ability of wildlife managers, biologists, and land planners to critically evaluate impacts of perturbations on the vertebrate biota (Kiester and Eckhardt, 1994). Apparent decline of Western Toads across Southeast Alaska and the discovery of chytrid fungus in 2006 in toads from Dyea underscore this point because too few specimens are available to examine conditions in these declining populations over the past few decades. Indeed lack of specimens has been one of the key stumbling blocks to a rigorous assessment of the extent and causes of declining amphibian populations worldwide (Young et al., 2001; Stuart et al., 2004). The situation is further exacerbated by the highly insular landscape and associated high level of biotic endemism (Cook and MacDonald, 2001). One of the main facets of maintaining biodiversity is the ability to recognize and conserve unique endemic taxa. Among mammals, 27 mammalian taxa are endemic to the region and an additional 11 have ranges largely confined to Southeast Alaska (Cook and MacDonald, 2001); probably the largest number of endemic mammals of any U.S. National Forest. Because the overwhelming

majority of vertebrate extinctions in the last 400 years have occurred on islands (Diamond, 1989; Reid and Miller, 1989), we must carefully mitigate impacts on the insular fauna of the Alexander Archipelago. Habitat destruction, introduction of exotic species and associated pathogens, over-exploitation, and secondary ripple effects may have profound impacts on the long-term conservation of the insular mammalian fauna of this region (Cook and MacDonald, 2001). Maintenance of viable populations requires knowledge of evolutionary history, ecology and contemporary connectivity of this region's fauna (Suring et al., 1992, Cook and MacDonald, 2001). Preliminary studies are helping to define significant elements of biotic diversity and centers of endemism (e.g., Dawson et al., 2007). Those analyses are providing opportunities to assess the current status of impacts, such as the large-scale deforestation of the past 50 years (Figure 20) and also, to predict the future of this dynamic fauna and flora (Cook et al., 2006). Far too little management effort has been driven by planning aimed at preserving the high potential for evolutionary hot spots (Sechrest et al., 2002) and extinction of island endemics (Cook et al., 2006; Dawson et al., 2007). Recent documentation of extremely elevated rates of morphological evolution in mammals on islands (Millien, 2006) reinforces the necessity of thoughtful management.

Specimens resulting from the inventory work are being used in numerous conservation genetic assessments. Specimen-based fieldwork has provided fundamental insights into the distribution of species. In a little more than a decade, six new mammal species have been documented for Southeast Alaska (e.g., *Puma concolor*, *Martes pennanti, Phenacomys intermedius, Lemmus trimucronatus, Pseudorca crassidens, Kogia breviceps*), "new" species have been delimited (e.g., *Martes caurina*), and inventories have revealed large range extensions for many species, including new species records for numerous islands. In addition, material from the inventory is providing new perspectives on the ecology, evolution, and conservation of the North Pacific mammalian and amphibian faunas. Nonetheless, our knowledge of this component of the fauna is still based on a relatively limited number of specimens given the complexity and vastness of the region. By continuing to amplify this database and stimulating related research efforts (see Appendix 11), we will be able to build an informed and scientifically sound basis for future management decisions in this incomparable coastal biome.

Aerial view of Long Island in 1994, one of the most heavily impacted islands in the region. This island had high potential for unique taxa and reinforces the conclusion that endemics have not been adequately addressed in forest management plans (*photograph by J. Gustafson*).

Figure 20. Extent of deforestation and associated impacts (roads) mirror areas designated as hotspots of endemism (i.e., southern outer islands; Cook et al., 2006) (*forest conditions map reprinted by permission of Ecotrust, from www.inforain.org/tongass*).

The former Haida village at Howkan, Long Island, in c. 1895 (*courtesy of the Alaska State Library, Winter and Pond, P87-0091*).

Juneau was a booming mining camp in 1929 (*courtesy of the Alaska State Library, George A. Parks Collection, U.S. Navy Alaska Aerial Survey Expedition, P240-135*).

Extensive glaciers cover much of the Coast Range as seen near Twin Glacier, Taku River, 1929 (*courtesy of the Alaska State Library, George A. Parks Collection, U.S. Navy Alaska Aerial Survey Expedition, P240-093*).

Rudyerd Bay, southern mainland of Southeast Alaska (*undated photograph courtesy of the Alaska State Library Place File Collection, RudyerdBay-1*).

The old military station of Fort Tongass, extreme southern mainland, 1868 (*courtesy of the Alaska State Library Place File Collection, TongassFort-2*).

Hyder at the head of Portland Canal in winter (*undated photograph courtesy of the Alaska State Library Place File Collection, Hyder-4*).

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The Chickamin River, southern mainland, is now part of Misty Fjords National Monument Wilderness (1973 *photograph by S. O. MacDonald*).

Appendices

Appendix 1. Islands of the Alexander Archipelago, Southeast Alaska, larger than 1000 hectares.

ISLAND	Size*	ISLAND (Ranked)	Size*
Admiralty	431,309	Prince of Wales	578,202
Annette	35,130	Chichagof	545,317
Baker	13,512	Admiralty	431,309
Baranof	424,016	Baranof	424,016
Bell	5,067	Revillagigedo	302,659
Betton	1,689	Kupreanof	282,415
Blashke	1,291	Kuiu	193,455
Brownson	3,378	Etolin	88,995
Chichagof	545,317	Dall	65,869
Coronation	9,120	Wrangell	56,948
Dall	65,869	Mitkof	54,753
Deer	3,357	Kosciusko	48,259
Douglas	20,274	Zarembo	47,263
Duke	15,538	Kruzof	44,680
Etolin	88,995	Annette	35,130
Fillmore	2,702	Gravina	23,307
Forrester	1,013	Douglas	20,274
Goat	1,689	Heceta	18,916
Gravina	23,307	Yakobi	18,736
Halleck	3,616	Sukkwan	17,903
Hamilton	1,567	Duke	15,538
Hassler	2,027	Suemez	15,200
Heceta	18,916	Long	14,187
Inian	1,653	Baker	13,512
Khantaak	1,327	Noyes	12,836
Kosciusko	48,259	Coronation	9,120
Krestof	2,841	San Fernando	8,782
Kuiu	193,455	Tuxekan	8,523
Kupreanof	282,415	Lulu	6,022
Kruzof	44,680	Woronkofski	4,132
Lemesurier	2,813	Bell	5,067
Long	14,187	Warren	5,067
Lulu	6,022	Woewodski	4,132
Marble	2,364	Halleck	3,616
Mitkof	54,753	Brownson	3,378
Moser	2,324	Deer	3,357
Noyes	12,836	Partofschikof	3,357
Onslow	1,351	Thorne	3,099
Orr	2,364	Krestof	2,841
Partofschikof	3,357	Lemesurier	2,813
Prince of Wales	578,202	Fillmore	2,702
Revillagigedo	302,659	Tiedeman	2,540
San Fernando	8,782	Orr	2,364
San Juan Bautista	2,364	Marble	2,364
Shrubby	1,549	San Juan Bautista	2,364
Smeaton	1,351	Moser	2,324
Stevenson	1,291	Hassler	2,027
Suemez	15,200	Goat	1,689
Sukkwan	17,903	Betton	1,689
Swan	1,658	Swan	1,658
Thorne	3,099	Inian	1,653
Tiedeman	2,540	Hamilton	1,567
Tuxekan	8,523	Shrubby	1,549
Vank	1,191	Onslow	1,351
Warren	5,067	Smeaton	1,351
Woewodski	4,132	Khantaak	1,327
Woronkofski	4,132	Stevenson	1,291
Wrangell	56,948	Blashke	1,291
Yakobi	18,736	Vank	1,191
Zarembo	47,263	Forrester	1,013

* hectares

Appendix 2. Specimen representation of Southeast Alaska mammals by institution. Other institutions (*) include DMNH, FMNH, MCZ, MSUM, PSM, ROM, SDNHM, UBC, UCM, UMNH, and UMMZ. Museum acronyms are defined on page 12.

SPECIES	UAM	AMNH	CAS (SU)	CMNH	KU	LACM	MSB	MVZ	UCLA	USNM	UWBM	Other*	Total
RODENTIA													
Sciuridae													
Glaucomys sabrinus	376		3			8		12	5			1	405
Marmota caligata	14							12				4	30
Spermophilus parryii	10												10
Tamiasciurus hudsonicus	250	15	16		6	9		68	10	66	14	16	470
Castoridae													
Castor canadensis	7							8		20		1	36
Dipodidae													
Zapus hudsonius	59		4	5	27			1	1	4		7	108
Zapus princeps	53		1					1					55
Cricetidae													
Lemmus trimucronatus	2												2
Microtus longicaudus	924	6	24		451		10	91	29	100	5	21	1661
Microtus oeconomus	214	14	2	7	131	1	1	54	40	54		6	524
Microtus pennsylvanicus	176		2		34	1		107	2	9		3	334
Myodes gapperi	1033	20	21			19		45	72	52	7	15	1284
Myodes rutilus	348	16	38		295		1	1	19	108	32	15	873
Neotoma cinerea												4	4
Ondatra zibethicus	18							15		2			35
Peromyscus keeni	5420	12	72		47	7	42	314	88	372	10	36	6420
Phenacomys intermedius	4												4
Synaptomys borealis	36							7	7	5			55
Muridae													
Mus musculus			2									2	4
Rattus norvegicus	2			1						5			8
Erethizontidae													
Erethizon dorsatum	6		6		2			4	4			1	23
LAGOMORPHA													
Ochotonidae													
Ochotona collaris	2								2				4
Leporidae													
Lepus americanus								5	6				11
SORICOMORPHA													
Soricidae													
Sorex alaskanus	1									2			3
Sorex cinereus	1512	14	12	10	54		9	74	40	100	2	22	1849
Sorex monticolus	1679	21	45	23	115	15	8	193	66	188	12	37	2402
Sorex palustris	12		1		2				1	1			17
CHIROPTERA													
Vespertilionidae													
Lasionycteris noctivagans	3	1											4
Myotis californicus	11							2					13
Myotis keenii	2									1			3
Myotis lucifugus	151			2	2	1	3	26		13		3	201
Myotis volans	3							1					4
CARNIVORA													
Felidae													
Lynx canadensis								2		1			3
Puma concolor	2												2
Canidae													
Canis latrans	1					1							2
Canis lupus	437	6		18	2	1	34	8		41	1	6	554
Vulpes lagopus							1	4		2			7
Vulpes vulpes	1	1	1					2					5
Ursidae													
Ursus americanus	170	24	3	19			50	39		162		17	484
Ursus arctos	150	12	5	6			7	48		544		23	795

Appendix 2 (concluded).

SPECIES	UAM	AMNH	CAS (SU)	CMNH	KU	LACM	MSB	MVZ	UCLA	USNM	UWBM	Other*	Total
Otariidae													
Callorhinus ursinus	1									109			110
Eumetopias jubatus	11									5			16
Zalophus californicus													
Phocidae													
Mirounga angustirostris										1			1
Phoca vitulina	243	19		5				2		4		2	275
Mustelidae													
Enhydra lutris	90				6			2		2	6	1	107
Gulo gulo	7	1	2		1				1	3		3	18
Lontra canadensis	133		1	7	1			15	2	9		3	171
Martes americana/caurina	1693		5					6	3	9		17	1733
Martes pennanti	3												3
Mustela erminea	199		5		1	9		61		18		3	296
Mustela nivalis													
Neovison vison	605		1	5		3		54	9	113		11	801
Procyonidae													
Procyon lotor													
ARTIODACTYLA													
Cervidae													
Alces americanus	3											1	4
*Cervus canadensis**	1												1
Odocoileus hemionus	49	19	2	23				32	3	38	1	8	175
Rangifer tarandus													
Bovidae													
Oreamnos americanus	3		3					1	3	5		8	23
Ovis dalli													
CETACEA													
Balaenidae													
Eubalaena japonica													
Balaenopteridae													
Balaenoptera acutorostrata										1			1
Balaenoptera borealis													
Balaenoptera musculus											2		2
Balaenoptera physalus		2											2
Megaptera novaeangliae	3	1	2							4			10
Eschrichtiidae													
Eschrichtius robustus													
Delphinidae													
Globicephala macrorhynchus													
Grampus griseus													
Lagenorhynchus obliquidens													
Orcinus orca										1			1
Pseudorca crassidens													
Monodontidae													
Delphinapterus leucas													
Phocoenidae													
Phocoena phocoena										6	1	1	8
Phocoenoides dalli								1		13		1	15
Physeteridae													
Kogia breviceps	1												1
Physeter catodon											1		1
Ziphiidae													
Berardius bairdii													
Mesoplodon stejnegeri													
Ziphius cavirostris	2									2			4
TOTAL	16,136	204	279	131	1,177	75	166	1,318	413	2,195	94	299	22,487

Appendix 3. Specimen representation of Southeast Alaska amphibians by institution. Other institutions (*) include CMNH, SDNHM, TCWC, and UMMZ. Museum acronyms are defined on page 12.

SPECIES	UAM	AB	CAS (SU)	CUMV	KU	LACM	MSB	MVZ	PSM	ROM	USMN	Other*	Total
CAUDATA													
Ambystomatidae													
Ambystoma gracile		2									1		3
Ambystoma macrodactylum		4											4
Salamandridae													
Taricha granulosa	49	35	53	1		11	16	88	2		8	3	266
ANURA													
Bufonidae													
Bufo boreas	66	38	68	5	43	4	16	133	6	13	30	20	442
Hylidae													
Pseudacris regilla	2	6					5						13
Ranidae													
Rana aurora		8											8
Rana luteiventris	21	11				3		20					55
Rana sylvatica	2	5	9		20			25		3			64
TOTAL	140	109	130	6	63	18	37	266	8	16	39	23	**855**

Logging along the Stikine River near Wrangell in 1864 (*courtesy of the Alaska State Library, Early Prints of Alaska Collection, P297-049*).

Appendix 4. Specimen representation of rodents on islands in the Alexander Archipelago, Southeast Alaska. Count of UAM specimens followed, parenthetically, by count from 21 other collections (Appendix 2).

ISLAND	RODENTS																				
	Glaucomys sabrinus	*Marmota caligata*	*Spermophilus parryii*	*Tamiasciurus hudsonicus*	*Castor canadensis*	*Zapus hudsonius*	*Zapus princeps*	*Lemmus trimucronatus*	*Microtus longicaudus*	*Microtus oeconomus*	*Microtus pennsylvanicus*	*Myodes gapperi*	*Myodes rutilus*	*Neotoma cinerea*	*Ondatra zibethicus*	*Peromyscus keeni*	*Phenacomys intermedius*	*Synaptomys borealis*	*Mus musculus*	*Rattus norvegicus*	*Erethizon dorsatum*
Admiralty				1	1 (9)				(4)		53 (64)				(1)	142 (171)					
Anguilla									1							10					
Annette									(2)							(76)					
Back																		2			
Baker																18					
Baranof				9						75 (49)						300 (70)			(3)	(1)	
Barrier Is.	18																				
Bell												9									
Betton				2												58		13			
Black												3									
Brothers																12					
Bushy																20					
Cat																1					
Chichagof				36 (1)					29 (3)	5 (12)						497 (50)					
Coronation									16 (24)							18 (4)					
Dall	1								21 (2)							176 (18)					
Deer				1								1				33					
Dog									1							76					
Douglas		3		3 (12)					3 (2)				12 (1)			8				1	1
Duke																167 (3)					
El Capitan	24																				
Esquibel																2					
Etolin	1 (1)			7 (2)					9			77				80 (20)					
Forrester									4 (5)							112 (34)					
Garden (near)	2																				
Gedney				2																	
Goat																9					
Grant				3																	
Gravina				2 (1)												39 (6)		1			
Hassler												2									
Heceta	23				1											122 (2)					
Hill				2																	
Hoot									5												
Horseshoe				1																	

Appendix 4 (continued).

ISLAND	RODENTS																				
	Glaucomys sabrinus	*Marmota caligata*	*Spermophilus parryii*	*Tamiasciurus hudsonicus*	*Castor canadensis*	*Zapus hudsonius*	*Zapus princeps*	*Lemmus trimucronatus*	*Microtus longicaudus*	*Microtus oeconomus*	*Microtus pennsylvanicus*	*Myodes gapperi*	*Myodes rutilus*	*Neotoma cinerea*	*Ondatra zibethicus*	*Peromyscus keeni*	*Phenacomys intermedius*	*Synaptomys borealis*	*Mus musculus*	*Rattus norvegicus*	*Erethizon dorsatum*
Inian				1						(6)						2 (11)					
Kadin											24					5					
Kosciusko	3 (1)								6 (1)							25 (2)					
Kruzof				4												25					
Kuiu				3 (7)					9 (29)							92 (83)		(1)			
Kupreanof				7 (15)					4 (15)							77 (35)		(1)			1
Lemesurier										1											
Lester									(2)												
Lincoln																13					
Long																43					
Lowrie																41					
Lulu																21					
Marble									2							27					
Mary									13							6					
Misery												(1)									
Mitkof	23			65 (11)					4 (13)		16 (1)					367 (53)				(2)	
Moser				3					30							17					
North	3																				
Noyes									1							10					
Orr	2								2							25					
Owl									2												
Partofshikof				1												4					
Pow									1							4					
Prince of Wales	165				(15)				39 (66)							658 (155)					
Read				1																	
Revillagigedo	5 (1)			4 (14)	(1)	7 (1)			21 (3)			71 (33)			(5)	167 (61)		1		1 (2)	
Saint Ignace																18					
San Fernando																65					
San Juan Bautista																68					
Santa Rita									4							17					
Sergief											(4)				(6)	1 (1)					
Shelikof									2												
Shelter																8					
Shrubby																126					
Spanish Is.																2					
Stevenson									2 (2)												

Appendix 4 (concluded).

ISLAND	RODENTS																				
	Glaucomys sabrinus	*Marmota caligata*	*Spermophilus parryii*	*Tamiasciurus hudsonicus*	*Castor canadensis*	*Zapus hudsonius*	*Zapus princeps*	*Lemmus trimucronatus*	*Microtus longicaudus*	*Microtus oeconomus*	*Microtus pennsylvanicus*	*Myodes gapperi*	*Myodes rutilus*	*Neotoma cinerea*	*Ondatra zibethicus*	*Peromyscus keeni*	*Phenacomys intermedius*	*Synaptomys borealis*	*Mus musculus*	*Rattus norvegicus*	*Erethizon dorsatum*
Suemez	28								7							28 (2)					
Sukkwan									4							36					
Sullivan				(1)					(7)												
Swan																(1)					
Tatoosh				1																	
Thorne	2								4							12					
Tuxekan	27								12							57					
Vank				2							2					30					
Warren									8 (5)							64 (9)					
Woewodski									(1)							(4)					
Woronkofski				1 (14)												147 (6)					
Wrangell	1 (16)			6 (23)					5 (7)		(2)	349 (164)				106 (64)		1 (8)	(1)		(1)
Yakobi				4						1											
Young													(1)								
Zarembo				7	1				4							65 (5)					
# islands with at least 1 specimen	16	1	0	28	8	1	0	0	37	5	6	8	2	0	3	61	0	7	2	4	3
# islands with ≥ 10 specimens	8	0	0	7	2	0	0	0	12	2	3	3	1	0	0	48	0	1	0	0	0
# islands with ≥ 30 specimens	1	0	0	2	0	0	0	0	5	1	1	3	0	0	0	31	0	0	0	0	0

Appendix 5. Specimen representation of lagomorphs, shrews, bats, and hoofed mammals on islands in the Alexander Archipelago, Southeast Alaska. Count of UAM specimens followed, parenthetically, by count from 21 other collections (Appendix 2).

	LAGOMORPHS and SHREWS						BATS					ARTIODACTYLS			
ISLAND	*Ochotona collaris*	*Lepus americanus*	*Sorex alaskanus*	*Sorex cinereus*	*Sorex monticolus*	*Sorex palustris*	*Lasionycteris noctivagans*	*Myotis californicus*	*Myotis keenii*	*Myotis lucifugus*	*Myotis volans*	*Alces americanus*	*Cervus canadensis*	*Odocoileus hemionus*	*Oreamnos americanus*
Admiralty					49 (26)					4	(1)			12 (17)	
Anguilla					2										
Annette					(16)										
Baker					8										
Baranof				101 (47)						1 (11)				7 (21)	
Barrier Is.					3										
Beardslee Is.					(1)										
Bell				4	9									(1)	
Betton					23										
Black				8	3										
Cap					7										
Chichagof				292 (45)						24				(12)	1
Coronation					14 (12)									(1)	
Dall					13 (1)					2					
Deer				26	10										
Dog					8										
Douglas				6 (1)	6 (1)									1	
Duke					38 (2)										
Eagle					7										
Etolin				12 (2)	40 (3)								1	(1)	
Forrester					20 (23)										
Gedney				4	3										
Grant				7						(1)					
Gravina				2	9 (1)										
Halleck				11											
Hassler				25	6										
Heceta					22 (1)									13 (1)	
Herbert Graves				1											
Hoot					1										
Horseshoe												1			
Hotspur					5										
Inian					3 (1)									(3)	
Kadin				8	10										
Kosciusko					8										
Krestof				8											
Kruzof				70										(2)	
Kuiu				24 (23)	29 (29)									(3)	
Kupreanof				18 (11)	22 (30)									2 (25)	
Lemesurier				4	20										
Lester				(1)	(1)										
Long					5			(2)						(1)	
Lowrie					17										
Lulu					3										
Marble					4										
Mary					1										
Mitkof				52 (9)	56 (21)		1			12		1		2 (15)	
Moser				16											
Noyes					5										
Onslow														1	
Owl					4										
Partofshikof				8											
Percy					8										
Pleasant					13									(4)	
Prince of Wales					112 (43)			11	1	26	1			(7)	

Appendix 5 (concluded).

ISLAND	LAGOMORPHS and SHREWS						BATS					ARTIODACTYLS			
	Ochotona collaris	*Lepus americanus*	*Sorex alaskanus*	*Sorex cinereus*	*Sorex monticolus*	*Sorex palustris*	*Lasionycteris noctivagans*	*Myotis californicus*	*Myotis keenii*	*Myotis lucifugus*	*Myotis volans*	*Alces americanus*	*Cervus canadensis*	*Odocoileus hemionus*	*Oreamnos americanus*
Read				1											
Revillagigedo				68 (10)	94 (25)		1		1	9 (9)				3	
Ring										1					
San					1										
San Fernando					60										
San Juan Bautista					4										
Sangao					5										
Santa Rita					3										
Shelikof					8										
Shelter					1										
Shrubby					36										
Spanish Is.					1										
Stone Is.					1										
Suemez					23									1	
Sullivan					(2)										
Tuxekan					4										
Warren					6 (10)									(2)	
Woewodski					(4)										
Woronkofski					4										
Wrangell				141 (47)	266 (157)	1	1		(1)	1	2			1 (3)	
Yakobi				2										(3)	
Young					(3)										
Zarembo					42 (1)									1 (1)	
# islands with at least 1 specimen	0	0	0	27	63	1	3	2	3	10	3	2	1	23	1
# islands with ≥10 specimens	0	0	0	13	26	0	0	0	0	5	0	0	0	6	0
# islands with ≥30 specimens	0	0	0	6	13	0	0	0	0	0	0	0	0	1	0

Appendix 6. Specimen representation of carnivorous mammals on islands in the Alexander Archipelago, Southeast Alaska. Count of UAM specimens followed, parenthetically, by count from 21 other collections (Appendix 2).

	CARNIVORES														
ISLAND	*Lynx canadensis*	*Puma concolor*	*Canis latrans*	*Canis lupus*	*Vulpes lagopus*	*Vulpes vulpes*	*Ursus americanus*	*Ursus arctos*	*Gulo gulo*	*Lontra canadensis*	*Martes amer./caurina*	*Martes pennanti*	*Mustela erminea*	*Neovison vison*	*Procyon lotor*
Admiralty								39 (224)		(5)	64 (10)		9 (29)	1 (16)	
Anguilla														1	
Annette				1									(1)		
Baker				1											
Baranof								6 (95)		31 (3)	133 (11)		1 (5)	44 (13)	
Bluff														(7)	
Buck								1							
Castle							1							13	
Chichagof								23 (172)		41	440		9 (1)	26	
Conclusion				(1)											
Coronation														(3)	
Couverdon							1								
Dall				(1)			1 (3)						(1)		
Douglas						1							2		
Duck Is.				1											
Echo														(3)	
El Capitan													1		
Etolin				8 (4)			1				(2)		3	1 (10)	
Fair									1						
Gavanski										1					
Gravina														6	
Grief				1											
Halleck										1					
Heceta				4									3		
Herbert Graves								1							
Inian														9	
Keene				1											
Kosciusko				1			(1)				12				
Krestof								1 (1)		6					
Kruzof								5 (6)		8	21			4	
Kuiu				6 (7)			7 (53)			(3)	62 (2)		(2)	37 (21)	
Kupreanof		1		87 (16)			9 (35)			(1)	39		1	8 (8)	
Long										(7)			(1)	(5)	
Marble										(1)					
Mitkof				32 (3)	(5)		6 (7)		(3)		101 (3)		58 (1)	97 (1)	
Otstoia											1				
Partofshikof											2				
Peratrovitch														7	
Prince of Wales				133 (14)			37 (12)			13 (4)	381		25 (23)	121 (73)	
Rapids										1					
Revillagigedo				37 (9)			43 (3)		1 (1)	1	46 (2)		4 (3)	79 (10)	
Shrubby										(2)				(4)	
Suemez				3									1 (1)	(1)	
Sullivan					(2)										
Thorne				1										(2)	
Warren										(1)					
Woewodski				12 (2)							5			27	
Woronkofski										2					
Wrangell		1		9 (18)			1 (2)			3 (1)	5		5 (1)	49 (6)	
Zarembo				1 (5)									(1)	(1)	
# islands with at least 1 specimen	0	2	0	20	2	1	11	7	3	18	15	0	18	25	0
# islands with ≥10 specimens	0	0	0	8	0	0	5	4	0	3	10	0	4	12	0
# islands with ≥30 specimens	0	0	0	3	0	0	4	3	0	2	8	0	3	6	0

Appendix 7. Specimen representation of amphibians on islands in the Alexander Archipelago, Southeast Alaska. Count of UAM specimens is followed, parenthetically, by count from 14 other collections (Appendix 3).

	AMPHIBIANS							
ISLAND	*Ambystoma gracile*	*Ambystoma macrodactylum*	*Taricha granulose*	*Bufo boreas*	*Pseudacris regilla*	*Rana aurora*	*Rana luteiventris*	*Rana sylvatica*
Admiralty			(7)	3 (3)				
Annette			10 (22)	(11)				
Baker				1				
Baranof				8 (5)				
Bushy				1				
Chichagof	(1)			(3)		(8)		
Chilkat (N.)				(1)				
Dall			1 (4)	5 (1)				
Dog			1					
Douglas								(1)
Etolin			(16)	(10)				
Gedney			1					
Gravina			(26)					
Hassler			1	2				
Heceta				2 (1)				
Herbert Graves				1				
Hotspur				2				
Kosciusko			(3)	(2)				
Kuiu			(16)	6 (16)				
Kupreanof			1	1 (7)				
Long				4				
Mary	(1)			1 (2)				
Mitkof			4 (10)	(4)			(5)	
Prince of Wales			16 (11)	2 (2)				
Revillagigedo			13 (33)	(6)	2 (11)			
Shelter			(24)					
Stikine R., Sergief				(11)			(17)	(5)
Suemez				5				
Sullivan				(2)				
Vank				2			2	
Woronkofski				(1)				
Wrangell			(5)	(4)				
Yakobi				2				
Zarembo			1	1				
# islands with at least 1 specimen	2	0	17	29	1	1	3	2
# islands with ≥10 specimens	0	0	8	5	1	0	1	0
# islands with ≥30 specimens	0	0	2	0	0	0	0	0

Appendix 8. Conservation status of Southeast Alaska mammals and amphibians. Sources: NatureServe <http://natureserv.org/explorer (26 September 2006); Canada <http://www.cosewic.gc.ca> (4 January 2007); British Columbia <http://www.env.gov.bc.ca/atrisk/toolintro.html> (4 January 2007).

TAXA	Distributional Status	Heritage Alaska	Heritage Global	ADFG	ESA	IUCN	CITES	COSEWIC	British Columbia
RODENTIA – rodents									
Castor canadensis		SNR	G5			LC			YELLOW
C. c. phaeus	Island Endemic	S3				DD			
Erethizon dorsatum		S5	G5			LC			YELLOW
Glaucomys sabrinus		S4	G5		PS	LC			YELLOW
G. s. griseifrons	Island Endemic	S2?				EN			
Lemmus trimucronatus	Marginal	SNR	G5			LC			YELLOW
Marmota caligata		SNR	G5			LC			YELLOW
M. c. vigilis	Endemic	S3?				DD			
Microtus longicaudus		SNR	G5			LC			YELLOW
M. l. coronarius	Endemic	S3				DD			
Microtus oeconomus		SNR	G5			LC			YELLOW
M. o. sitkensis	Island Endemic	S3				DD			
M. o. yakutatensis	Endemic	S4							
Microtus pennsylvanicus		SNR	G5		PS	LC			YELLOW
M. p. admiraltiae	Island Endemic	S3				NT			
Mus musculus	Exotic	SNR	G5						
Myodes gapperi		SNR	G5			LC			YELLOW
M. g. solus	Island Endemic	S3				DD			
M. g. stikinensis		SNR							
M. g. wrangeli	Island Endemic	S2S3							
Myodes rutilus		SNR	G5			LC			YELLOW
M. r. glacialis	Endemic	S3							
Neotoma cinerea	Marginal	SNR	G5			LC			YELLOW
Ondatra zibethicus	Uncommon	SNR	G5			LC			YELLOW
Peromyscus keeni		S3	G5			LC			YELLOW
P. k. hylaeus	Endemic	SNR							
P. k. oceanicus	Island Endemic	SNR							
P. k. sitkensis	Island Endemic	SNR							
Phenacomys intermedius	Marginal	SNR	G5			LC			YELLOW
Rattus norvegicus	Exotic	SNR	G5			LC			
Synaptomys borealis	Uncommon	S4	G4			LC			YELLOW
Spermophilus parryii	Marginal	SNR	G5			LC			YELLOW
Tamiasciurus hudsonicus	{Island Exotic}	S5	G5		PS	LC			YELLOW
T. h. picatus	Endemic	S3?							
Zapus hudsonius	{Isolated Island population}	S5?	G5		PS	LC			BLUE
Zapus princeps		SNR	G5			LC			YELLOW
LAGOMORPHA – pikas, hares									
Lepus americanus	Marginal	SNR	G5			LC			YELLOW
Ochotona collaris	Marginal	S5	G5			LC			YELLOW
SORICOMORPHA – shrews									
Sorex alaskanus	Endemic	SH	GHQ			LC			
Sorex cinereus		S5	G5			LC			YELLOW
S. c. streatori		SNR				LC			
Sorex monticolus		SNR	G5			LC			YELLOW
S. m. elassodon	Island Endemic	SNR							
S. m. malitiosus	Island Endemic	S3							
Sorex palustris	Uncommon?	SNR	G5			LC			YELLOW
CHIROPTERA – bats									
Lasionycteris noctivagans	Rare?	S1S3B	G5			LC			YELLOW
Myotis californicus	Rare?	S1S3B	G5			LC			YELLOW
Myotis keenii	Rare?	S1S3	G2G3			LC		DD	RED
Myotis lucifugus		S3S4	G5			LC			YELLOW
Myotis volans	Rare?	S2?B	G5			LC			YELLOW

Appendix 8 (continued).

TAXA	Distributional Status	Heritage Alaska	Heritage Global	ADFG	ESA	IUCN	CITES	COSEWIC	British Columbia
CARNIVORA – carnivores									
Callorhinus ursinus		S3	G3			VU		T	BLUE
Canis latrans	Marginal	S5	G5			LC			YELLOW
Canis lupus		S4	G4		PS	LC	A2	NAR	YELLOW
C. l. ligoni	Endemic	S2S3					A2		
Enhydra lutris	Reintroduced	S4	G4		PS		A2	T	RED
E. l. kenyoni		S2S3			PS:LT	EN	A2		
Eumetopias jubatus		S2	G3		LE, LT	EN		SC	RED
Population east of 144° W		S2		SSOC	LT				
Gulo gulo	{Coastal Endemic}	SNR	G4			VU		SC	BLUE
Lontra canadensis		SNR	G5			LC	A2		YELLOW
L. c. mira	Coastal Endemic	S3S4					A2		
Lynx canadensis	Marginal	S4?	G5		PS	LC	A2	NAR	YELLOW
Martes americana	{Island Exotic}	SNR	G5			LC			YELLOW
Martes caurina	Island Endemic	SNR	GNR						
Martes pennanti	Rare?	SNR	G5		PS:C	LC			BLUE
Mirounga angustirostris	Uncommon?	SNR	G5			LC		NAR	YELLOW
Mustela erminea		SNR	G5			LC			YELLOW
M. e. alascensis	Coastal Endemic	SNR							
M. e. celenda	Island Endemic	S4?							
M. e. initis	Island Endemic	SNR							
M. e. salva	Island Endemic	SNR							
M. e. seclusa	Island Endemic	S2?							
M. (*e.*) *haidarum* (incl. *celenda, seclusa*)	Island Endemic	SNR						T	RED
Mustela nivalis	Marginal?	SNR	G5			LC			YELLOW
Neovison vison		SNR	G5			LC			YELLOW
Phoca vitulina		S3	G5			LC		NAR	YELLOW
Procyon lotor	Island Exotic	SNR	G5			LC			YELLOW
Puma concolor	Rare	SNR	G5		PS	NT	A2		YELLOW
Ursus americanus		SNR	G5		PS	LC	A2	NAR	YELLOW
U. a. emmonsii	Coastal Endemic	S3?					A2		
U. a. pugnax	Endemic	SNR							
Ursus arctos		SNR	G4		PS	LC	A2	SC	BLUE
U. a. sitkensis	Island Endemic	SNR							
Vulpes vulpes	Uncommon	S5	G5			LC			YELLOW
Zalophus californianus	Rare	SNR	G5			LC		NAR	YELLOW
ARTIODACTYLA – even-toed ungulates									
Alces americanus		SNR	G5			LC			YELLOW
Cervus canadensis	Island Exotic	SNR	G5		PS				YELLOW
Odocoileus hemionus	Coastal Endemic	SNR	G5		PS	LC			YELLOW
Oreamnos americanus	{Island Exotic}	SNR	G5			LC			YELLOW
Ovis dalli	Marginal	SNR	G5			LC			YEL/BLUE
Rangifer tarandus	Marginal?	SNR	G5		PS	LC		SC	BLUE
CETACEA – whales									
Balaenoptera acutorostrata		SNR	G5			NT	A1	NAR	YELLOW
Balaenoptera borealis		S2B	G3		LE	EN	A1	E	BLUE
Balaenoptera musculus		S2B	G2	E	LE	EN	A1	E	BLUE
Balaenoptera physalus		S2B	G3G4		LE	EN	A1	T	BLUE
Berardius bairdii		SNR	G4			CD	A1	NAR	YELLOW
Delphinapterus leucas		SNR	G4		PS	VU	A2		
Cook Inlet population	Marginal	S1			SC	CR			
Eschrichtius robustus		S3B	G4		PS:LE	CD	A1	SC	BLUE
Eubalaena japonica		S1	G1	SSOC	LE	EN	A1	E	RED
Globicephala macrorhynchus	Marginal	SNR	G5			CD	A2	NAR	YELLOW
Grampus griseus	Rare?	SNR	G5			DD	A2	NAR	YELLOW
Kogia breviceps	Vagant?	SNR	G4			LC	A2	NAR	
Lagenorhynchus obliquidens		SNR	G5			LC	A2	NAR	YELLOW
Megaptera novaeangliae		S2B	G3	E	LE	VU	A1	T	BLUE
Mesoplodon stejnegeri		SNR	G3			DD	A2	NAR	BLUE
Orcinus orca		SNR	G4G5			CD	A2		
NE Pacific resident population		SNR						T	RED
NE Pacific offshore population		SNR						SC	BLUE
NE Pacific transient population		SNR						T	RED

Appendix 8 (concluded).

TAXA	Distributional Status	Heritage Alaska	Heritage Global	ADFG	ESA	IUCN	CITES	COSEWIC	British Columbia
Phocoena phocoena		S2S3	G4G5			VU	A2	SC	BLUE
Phocoenoides dalli		SNR	G4G5			CD	A2	NAR	YELLOW
Physeter catodon		S2S3	G3G4		LE	VU	A1	NAR	BLUE
Pseudorca crassidens	Vagrant	SNR	G4			LC	A2	NAR	
Ziphius cavirostris		SNR	G4			DD	A2	NAR	YELLOW
AMPHIBIA – amphibians									
Ambystoma gracile	Rare	S2?	G5			LC		NAR	YELLOW
Ambystoma macrodactylum	Restricted	S2?	G5		PS	LC			YELLOW
Bufo boreas		S2?	G4			NT		SC	YELLOW
Pseudacris regilla	Exotic	SNR	G5			LC			YELLOW
Rana aurora	Exotic	SNR	G4		PS	NT		SC	BLUE
Rana luteiventris	Restricted	S2?	G4		PS	LC		NAR	YELLOW
Rana sylvatica	Marginal	S2S3	G5			LC			YELLOW
Taricha granulosa		S2?	G5			LC			YELLOW

KEY

DISTRIBUTION STATUS.
{ } = subpopulation or evolutionary significant unit (ESU) of concern within the region
Exotic = not native; introduced by human agency

HERITAGE. National Heritage Network and The Nature Conservancy (http://www.natureserve.org/explorer)
G = global (status throughout its range)
Q = taxonomic status questionable
S = subnational (status in Alaska)

1 = critically imperiled; 2 = imperiled; 3 = rare or uncommon; 4 = not rare, long-term concern; 5 = widespread, abundant, secure; ? = insufficient data; NR = not ranked; SH = occurred historically

ADFG. Alaska Department of Fish & Game (http://www.wildlife.alaska.gov)
E = endangered
SSOC = state species of concern

ESA. U.S. Endangered Species Act of 1973, as amended by the U.S. Fish and Wildlife Service and the U.S. National Marine Fisheries Service (http://fws.gov/endangered)
C = candidate
LE = listed endangered
LT = listed threatened
PS = partial status (applies only to portion of species' range)
SC = special concern

IUCN. International Union for Conservation of Nature and Natural Resources (http://www.redlist.org)
CD = Conservation dependent
CR = Critically endangered
DD = data deficient
EN = endangered
LC = least concern
LR = lower risk
NT = near threatened
VU = vulnerable

CITES. Convention on International Trade in Endangered Species of Wild Fauna and Flora (http://www.cites.org)
A1 = Appendix I (most critically endangered)
A2 = Appendix II (species not necessarily now threatened with extinction but may become so unless trade is closely controlled)

COSEWIC. Committee on the Status of Endangered Wildlife in Canada (http://www.cosewic.gc.ca)
DD = data deficient
E = endangered and facing imminent extirpation or extinction
NAR = not at risk
SC = special concern
T = threatened and likely to become endangered if limiting factors are not reversed
XT = extirpated

BRITISH COLUMBIA Provincial Red and Blue List (http://www.env.gov.bc.ca/atrisk/toolintro.html)
RED = extirpated, endangered, or threatened
BLUE = vulnerable
YELLOW = not at risk

Appendix 9. Introductions and translocations of mammals and amphibians in Southeast Alaska.

Northern Flying Squirrel *Glaucomys sabrinus*	"Nuisance" flying squirrels from El Capitan Island were relocated to a number of nearby small islands in Sea Otter Sound before 1999 (S. Geraghty, pers. comm.).
Hoary Marmot *Marmota caligata*	According to Burris and McKnight (1973), three marmots from the Juneau area were released near Klawock in 1930, and five pairs from the same source were released on the west coast of Prince of Wales Island in 1931. None are believed to have survived.
Red Squirrel *Tamiasciurus hudsonicus*	Most evidence suggests Red Squirrels were introduced to the north end of Admiralty island sometime in the late 1940s or early 1950s; they now are believed to occur throughout the island (MacDonald and Cook, 1996; UAM). Red Squirrels from the Juneau area were successfully transplanted to Baranof and Chichagof islands in 1930 and 1931 (Burris and McKnight, 1973). Since then, Red Squirrels have been found on Inian, Kruzof, Moser, Partofshikof, Yakobi islands, and on islands in Sitka Sound (MacDonald and Cook, 1996). An apparently unsuccessful introduction occurred on Prince of Wales Island (Fay and Sease, 1985).
American Beaver *Castor canadensis*	Ten beavers from Prince of Wales Island were successfully (re)introduced to Baranof Island in 1927 (Burris and McKnight, 1973). It remains unclear if beaver were released on Kruzof Island in 1925.
Common Muskrat *Ondatra zibethicus*	There were unsuccessful attempts in 1929 to transplant muskrats from Haines to Klawock Lake on Prince of Wales Island (Burris and McKnight, 1973).
House Mouse *Mus musculus*	Four House Mouse specimens, dating from 1891 to 1946, are preserved from Wrangell and Sitka (CAS). C. P. Streator (1885), US Biological Survey, in his notes from Juneau mentions catching three *Mus* in the forest near town; he stated that this species was common. The current status of this non-native species is unknown.
Brown Rat *Rattus norvegicus*	Brown Rats have been introduced to numerous towns and islands throughout Alaska, but their current status and distribution is poorly known. Preserved specimens from Southeast Alaska are from Baranof, Mitkof, Revillagigedo, and Douglas islands, and on the mainland from Juneau (UAM, USNM, KU, MVZ; Manville and Young, 1965; MacDonald and Cook 1996). Brown Rats have been observed at the landfill near Sitka (by SOM in 1982), where they are very common at times (L. Johnson pers. comm., 1994).
Snowshoe Hare *Lepus americanus*	Snowshoe Hares now present on Douglas Island were probably introduced from Haines stock "a few years previous" (Bailey, 1920; also Wenrich, 1922). The extant population of hares found on the mainland near Juneau may be derived from those introduced animals. In 1923 and 1924, the Alaska Game Commission released Snowshoe Hares from Washington stock to Point Retreat, Admiralty Island; Otstoia Island, Peril Strait; and Smeaton Island, Behm Canal. Stock from the Anchorage area were also released in 1924 on Cape Island, Prince of Wales Island; and on Village Island, Zimovia Strait. All these transplant attempts were considered failures (Burris and McKnight, 1973).
Domestic Rabbit *Oryctolagus cuniculus*	Several residents of Ketchikan have reported (in 1995) the presence of feral rabbits on Betton Island, Clover Pass. Their current status is unknown.

Appendix 9 (continued).

Arctic Fox *Vulpes lagopus*	During the period of extensive fur farming in Alaska, Arctic Foxes were released on many of the islands along the Gulf Coast to Southeast Alaska (Bailey, 1993). No extant populations now occur in Southeast Alaska.
Red Fox *Vulpes vulpes*	Red Foxes were introduced for commercial harvest on Cleft, Dry, Kupreanof, Passage, and Sokoi islands between 1894 and 1929; none is known to have survived (Bailey, 1993). We know of no verified records of this species from any island in the Alexander Archipelago, although there are second-hand reports of Red Fox sightings from the West Coast of Chichagof Island and from northern Baranof Island "a number of years ago" (J. McClung, USFWS, pers. comm., 1995).
Wolf *Canis lupus*	Wolves were introduced experimentally to Coronation Island in 1960 and 1963; none remained there by the early 1970s (Burris and McKnight, 1973).
American Marten *Martes americana*	In 1934, American Marten from Behm Canal and Thomas Bay on the mainland were introduced on Prince of Wales Island and Baranof Island. Between 1949 and 1952, American Marten were introduced successfully on Chichagof Island with stock taken from Baranof Island, Revillagigedo Island, the Stikine River drainage, Wrangell Island, Mitkof Island, and near Anchorage (Elkins and Nelson, 1954; Burris and McKnight, 1973). In addition, UAM has specimens of martens from the vicinity of Baranof Island from Kruzof, Otstoia, Catherine, Partofschikof, and Yakobi islands. These specimens likely originated from undocumented transplants.
American Mink *Neovison vison*	Mink raised at the Petersburg Fur Experimental Farm were introduced to Strait Island in 1956 (Burris and McKnight, 1973).
Domestic Ferret *Mustela putorius*	A number of feral ferrets were observed and at least one preserved as a skin just north of Ketchikan on Revillagigedo Island during the 1980s. There were also reports at that time of ferrets on nearby Grant Island, Clover Pass (R. Wood, fide R. Jahnke, pers. comm., 1999). There have been no recent reports.
Raccoon *Procyon lotor*	Eight melanistic Raccoons from Indiana were released by private individuals on Singa Island, Sea Otter Sound, in October 1941, spreading to nearby El Capitan and several other islands in this area (Scheffer, 1947; Burris and McKnight, 1973). An unknown number of Raccoons still occurred on El Capitan Island as of June 1999, with reports of a sighting within the past few years of a "black" Raccoon near Staney Cr., Prince of Wales Island, and another, also melanistic, in the Shakan Strait area, Kosciusko Island (S. Geraghty, El Capitan Island resident, pers. comm., June 1999).
Moose *Alces americanus*	Moose were transplanted to Berners Bay, north of Juneau, from the Susitna and Matanuska valleys in 1958 and 1960, and to the Chickamin River from Anchorage-area stock in 1963 and 1964. Burris and McKnight (1973) noted that prior to their introduction, Moose were infrequent visitors to the Chickamin River Valley. Moose first arrived in the Yakataga area during the mid 1970s, the result of an eastward expansion of the Copper River Delta population that originated from translocations during 1949-1958 from Kenai Peninsula, Anchorage, and Matanuska-Susitna stocks (Crowley, 2004).

Wapiti
Cervus canadensis

There have been a number of attempts to introduce Wapiti to southeastern Alaska (Burris and McKnight, 1973), beginning in 1926 and 1927 with the release of seven animals (from the state of Washington) on Kruzof Island.

Three attempts were made to introduce Wapiti to Revillagigedo Island, the first in 1937 (Washington stock), then again in 1963 and 1964 (from the Afognak Island herd which was originally from Washington). Animals were also released on Gravina Island in 1962, and on Annette Island in 1963, both from Afognak or Raspberry Island stocks and, like all of the previous attempts, failed.

In 1987, 50 Wapiti from Oregon were released on Etolin Island. Since then this population has continued to increase and extend its range by establishing a breeding population on nearby Zarembo Island. By June 2003, the number of Wapiti on both of these islands was estimated at 350-450 animals. Wapiti sightings have been reported from Bushy, Deer, Kupreanof, Mitkof, Prince of Wales, and Wrangell islands and the Cleveland Peninsula.

Sitka Black-tailed Deer
Odocoileus hemionus sitkensis

Deer are unknown along the coastal mainland northward from Cape Spencer except in the Yakutat area, where they were successfully transplanted to islands in Yakutat Bay in 1934 (from Rocky Pass stocks; Burris and McKnight, 1973; MacDonald and Cook, 2000). Other transplants included the Taiya Valley near Skagway in 1951, 1952, and 1956 (all unsuccessful); and on Sullivan Island, Lynn Canal, in 1951-1954 (successful).

Mountain Goat
Oreamnos americanus

Mountain Goats successfully introduced on Baranof Island in 1923 (Burris and McKnight, 1973). Transplant attempts on Chichagof Island in 1954 and 1955 were failures (Burris and McKnight, 1973; L. Johnson, pers. com. 1994). A successful transplant of Mountain Goats to Revillagigedo Island occurred in 1983 at Swan Lake and in 1991 at upper Mahoney Lake. The Swan Lake population now numbers about 120-160 animals, and the upper Mahoney Lake population is estimated at 100-140 animals and expanding.

Pacific Chorus Frog
Pseudacris regilla

Pacific Chorus Frogs were introduced in the Alexander Archipelago on Revillagigedo Island near Ward Lake in the early 1960s (Waters et al., 1998). This population was still extant in 2005.

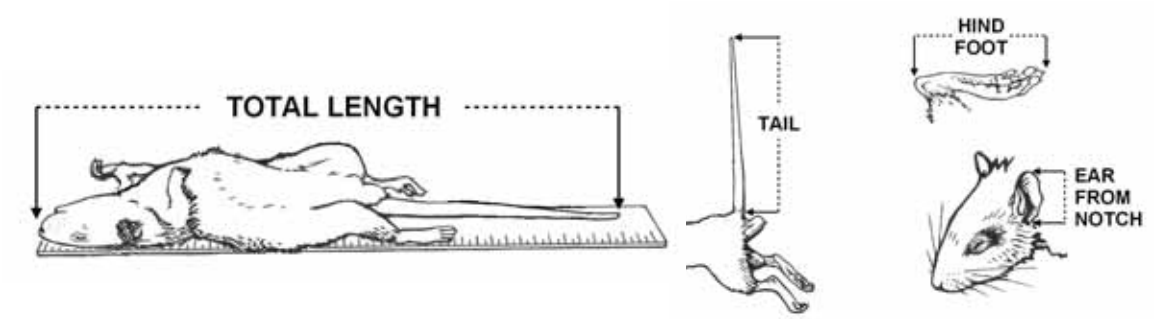
Red-legged Frog
Rana aurora

Introduced populations of this western North America frog have become established in the Kennel Creek and Pavlof River drainages of Freshwater Bay, NE Chichagof Island. It is thought they were planted there from a commercial frog source by a local person in the early 1990s (Sargent et al., 2003).

Roughskin Newt
Taricha granulosa

Roughskin Newts are unknown west of Chatham Strait except for two islet populations in the Galankin Islands group in Sitka Sound close to Sitka. Their presence there is thought to be from transplants from Ketchikan-area stock in about 1980 (J. Whitman, pers. comm., 2003). In 2005, about 50 newts from Kuiu Island were accidentally introduced to wetlands near Sitka on Baranof Island by high school students (Miller, 2005).

Appendix 10. Standard measurements (in millimeters and grams) of select Southeast Alaska mammals.



SPECIES	TOTAL LENGTH	TAIL	HIND FOOT	EAR FROM NOTCH	WEIGHT	REMARKS
Northern Flying Squirrel (*Glaucomys sabrinus*)	299 (191-345) *n = 325*	134 (89-196) *n = 325*	39 (31-46) *n = 324*	22 (10-27) *n = 323*	129.3 (28.4-198) *n = 300*	
Hoary Marmot (*Marmota caligata*)	486 (401-690) *n = 8*	134 (108-175) *n = 9*	78 (70-95) *n = 9*	27 (23-33) *n = 9*	2182.5 (600-5750) *n = 4*	
Arctic Ground Squirrel (*Spermophilus parryii*)	360 (348-369) *n = 5*	93 (82-103) *n = 5*	53 (52-55) *n = 5*	11 (10-13) *n = 5*	555 (535-585) *n = 3*	
Red Squirrel (*Tamiasciurus hudsonicus*)	295 (204-340) *n = 189*	115 (60-170) *n = 189*	47 (37-59) *n = 188*	21 (9-28) *n = 186*	174.0 (50.8-271) *n = 165*	
Meadow Jumping Mouse (*Zapus hudsonius*)	221 (193-236) *n = 26*	133 (119-152) *n = 27*	31 (28-33) *n = 26*	13 (10-17) *n = 27*	19.6 (15.5-26) *n = 24*	
Western Jumping Mouse (*Zapus princeps*)	233 (187-258) *n = 47*	145 (116-159) *n = 47*	32 (29-35) *n = 47*	14 (11-18) *n = 47*	20.7 (10.3-43.7) *n = 46*	
Brown Lemming (*Lemmus trimucronatus*)	114 106	12 13	18 18	12 10	31.0 27.0	♂ ♀ with 1 embryo
Long-tailed Vole (*Microtus longicaudus*)	167 (15-230) *n = 683*	61 (21-107) *n = 683*	21 (12-28) *n = 683*	13 (6-20) *n = 682*	31.8 (9.6-79) *n = 657*	
Root Vole (*Microtus oeconomus*)	153 (114-199) *n = 115*	38 (14-63) *n = 116*	20 (15-25) *n = 117*	13 (9-19) *n = 112*	38.7 (14-75) *n = 115*	
Meadow Vole (*Microtus pennsylvanicus*)	145 (112-178) *n = 123*	38 (23-52) *n = 124*	19 (11-23) *n = 123*	12 (6-21) *n = 118*	30.0 (12.4-56.4) *n = 117*	
Southern Red-backed Vole (*Myodes gapperi*)	130 (84-170) *n = 856*	34 (17-50) *n = 856*	18 (10-38) *n = 855*	12 (5-21) *n = 850*	21.1 (6.2-49) *n = 850*	
Northern Red-backed Vole (*Myodes rutilus*)	123 (84-155) *n = 260*	29 (12-49) *n = 260*	18 (13-22) *n = 255*	13 (7-20) *n = 248*	21.1 (7.2-44) *n = 240*	
Bushy-tailed Woodrat (*Neotoma cinerea*)	390 (370-422)	166 (157-185)	46 (43-50)	28 (26-30)	275.4 (291.8-442.7)	4 from Juneau Ice Fields
Common Muskrat (*Ondatra zibethicus*)	514 (489-572)	217 (200-251)	77 (73-81)	17 (14-22)	--	18 from Farm Island, Stikine River
Northwestern Deermouse (*Peromyscus keeni*)	192 (110-300) *n = 4825*	98 (35-194) *n = 4825*	23 (9-33) *n = 4823*	17 (7-29) *n = 4809*	23.8 (6-70.2) *n = 4739*	
Western Heather Vole (*Phenacomys intermedius*)	130 (115-156) *n = 4*	31 (26-37) *n = 4*	17 (16-19) *n = 4*	12 (10-14) *n = 4*	22.6 (14.6-33.9) *n = 4*	
Northern Bog Lemming (*Synaptomys borealis*)	117 (103-135) *n = 31*	20 (14-25) *n = 31*	19 (14-21) *n = 31*	12 (10-14) *n = 28*	21.8 (12.2-33.5) *n = 30*	
NA Porcupine (*Erethizon dorsatum*)	643 (463-800) *n = 3*	181 (150-235) *n = 3*	91 (86, 97) *n = 2*	23 (18, 29) *n = 2*	--	
Collared Pika (*Ochotona collaris*)	172	9	32	23	158.6	♂ from White Pass
Cinereus Shrew (*Sorex cinereus*)	104 (73-135) *n = 1264*	45 (25-73) *n = 1264*	12 (6-21) *n = 1264*	--	4.3 (2.4-11.5) *n = 1168*	
Dusky Shrew (*Sorex monticolus*)						Northern populations genetically (and probably specifically) distinct from southern populations (Demboski and Cook, 2001)
Northern Mainland	114 (96-143) *n = 101*	48 (27-62) *n = 101*	13 (11-16) *n = 101*	--	6.6 (3.4-11.1) *n = 101*	
Juneau and Admiralty Island southward	121 (126-149) *n = 1245*	53 (35-65) *n = 1374*	14 (7-28) *n = 1376*	--	7.0 (3.0-14.5) *n = 1338*	
American Water Shrew (*Sorex palustris*)	145 (134-153) *n = 11*	71 (66-76) *n = 11*	19 (18-20) *n = 11*	--	9.6 (6.8-15.6) *n = 11*	

ISLES—Island Surveys to Locate Endemic Species

Why survey? Don't we already know the status and location of endemics on the Tongass National Forest and other lands in Southeast Alaska? As is demonstrated in the species accounts of this volume, there currently exists very limited (in some cases, no) documentation for many of Southeast Alaska's mammals. Preliminary investigations of mammals clearly indicate inadequacies in our current understanding of diversity and of the outdated taxonomic designations still in use for characterizing diversity and identifying forms unique to the region, i.e., are endemic there. These investigations also show that past logging efforts are strongly correlated with the occurrence of hot spots of endemicity (Cook et al., 2006). To avoid such mistakes in the future, a well-annotated set of natural history collections will be critical to developing an understanding of the status and distribution of endemics.

Museums are essentially natural history libraries that are full of on the status of organisms. Each carefully prepared specimen may be thought of as a book that contains a set of data documenting that individual (population or species) at a particular locality on a particular date. Changes in the status of particular species or ecological communities can be monitored with these archives. The library analogy is limited, however, as none of the museum "volumes" can be replaced. We cannot go back in time and recollect a particular specimen at a particular location. As they represent historical populations, the value of these specimens increases through time, particularly as the diversity of many localities is degraded. We have lost the opportunity to document changes in the biota in many areas because no baseline inventory was ever conducted.

The value of these specimens depends on the quality and variety of the data that were collected with it. Mammalogists have established standard measurements and kinds of data that should be collected with each specimen. The specimen may then provide the physical documentation for a number of studies and today museums are witnessing a veritable explosion of different kinds of studies that use natural history specimens. The Hantavirus example, noted in the discussion of this volume, illustrates the point that these historic records are invaluable and that we never know what line of investigation will be enhanced by this resource. Who would have suspected that the Center for Disease Control would be able to quickly and efficiently determine the extent of this disease using museum collections.

With PCR (polymerase chain reaction) and other innovations in the study of DNA, we now can examine genetic variation in populations of animals that were collected during different time periods; thus providing a more rigorous view of temporal genetic variation. For example, known contact zones between taxa can now be reanalyzed for temporal stability (if specimens from the contact zone were collected at regular intervals). Recent advances in isotope analyses allow other investigators to examine diets of individual specimens thus opening a whole range of studies to the paleo-ecologist. The effects of climate change (or other perturbations) on the distributions of species may be critically evaluated if species distributions have been carefully documented with voucher specimens. These are a few examples and the list of potential studies is primarily limited by the availability of specimens.

What is needed now? A sustained and coordinated effort to survey the biota of this region is urgently needed and should include the following:

1) Interagency Agreement (USDA Forest Service, USFWS, ADF&G, Museum of Southwestern Biology, NPS) that acknowledges the need to complete this survey, makes a solid commitment (financial and logistic), and establishes procedures to see this work is completed.
2) Establish a 5 year time-line
3) Formalize Procedures for Field Surveys (e.g., manuals)
    a. Datasheets
    b. Specimen-based procedures
    c. Cross-discipline involvement
4) List of Priority Areas to be Surveyed

Appendix 11 (concluded).

5) List of Threats to Endemics and Plan for Mitigating
    a. Invasives
    b. Habitat modification
    c. Human encroachment
    d. Disease
6) Education Outreach to General Public, Local K-12 grade students, Native Communities
7) List of Deliverables
    a. Permanent specimen archives and online database
    b. GIS data layers
    c. Website on Tongass endemics
    d. Island-based science curriculum for students
    e. International conference (BC/Alaska) on Pacific Coastal endemics
    f. Peer-reviewed publications, including formal taxonomic revisions, field guides, conservation action plans

Toad carving on a Tlingit grave house at Chilkat Village, 1895 (*courtesy of the Alaska State Library, Winter and Pond Collection, P87-0028*).

Museum of
Southwestern
Biology