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Phillip M. Youngman

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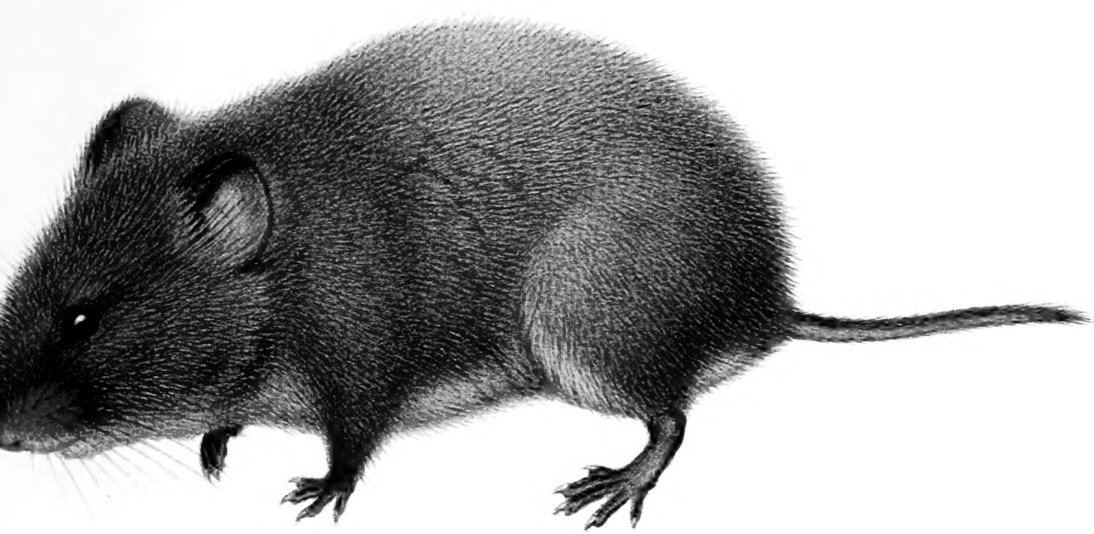
Chestnut-cheeked vole, *Microtus xanthognathus* (adult female, left; adult male, right; 88 per cent of life size). Collected at Hungry Lake, Yukon Territory, July 1965. Painted from life by Richard Philip Grossenheider.



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Résumé

La présente étude de 64 espèces de mammifères de l'époque récente, signalés au Yukon (Canada), est avant tout taxonomique. Elle a pour but de retracer l'origine immédiate d'espèces terrestres des zones arctique et subarctique du nord-ouest. On y trouvera des données écologiques sur certaines espèces et des cartes indiquant les aires de répartition de toutes les espèces terrestres indigènes.

Soixante pour cent de celles-ci, au Yukon et en Alaska, proviennent du principal îlot de l'Amérique du Nord qui n'a pas subi la glaciation et qui se situait au sud de la calotte glaciaire continentale. Trente-cinq pour cent sont venues d'une région qui englobe la Sibérie, l'Alaska, le Yukon et les Territoires du Nord-Ouest, connue sous le nom de "Béringie" et qui a également échappé à la glaciation; les autres, proviendraient d'autres petits réfugia ou seraient des espèces introduites.

Summary

This primarily taxonomic study of the 64 species of Recent mammals recorded from the Yukon Territory of Canada attempts to discover the proximate origins of terrestrial species in the northwestern Arctic and Subarctic. Ecological data are included for some species, and distributional maps are provided for all native terrestrial species.

Sixty per cent of the Yukon and Alaskan terrestrial mammals originated in the main unglaciated portion of North America to the south of the main continental glaciers, and 35 per cent of the fauna in the unglaciated region in Siberia, Alaska, the Yukon and the Northwest Territories known as "Beringia". The remainder are thought to have been derived from other small refugia, or are introduced species.

Резюме

Цель изучения в основном классификации 64 видов современных млекопитающих, встреченных на территории Юкон Канады, — установить приблизительное происхождение наземных видов в северо - восточной части Арктики и Приполярья. Для некоторых видов даются экологические данные, а для всех местных наземных видов подготовлены карты их распределения.

60% наземных млекопитающих Юкона и Аляски происходят из главной необледененной части Северной Америки, далее на юг от основных континентальных ледников. 35% фауны получено из необледененных районов Сибири, Аляски, Юкона и Северо-Западных территорий — все эти районы известны под именем "Берингия", — а остальные получено, должно быть, или же из других небольших необледененных районов, или же являются введенными видами.

Biographical Note

Phillip M. Youngman received his M.A. in Zoology at the University of Kansas. He has worked as a marine biologist in the West Indies, and as a mammalogist with the United States Army in Korea. He has taught at the University of Tampa, Florida, and at St. Patrick's College, Ottawa. Among the scientific papers that he has contributed to various journals are studies on the ecology of Korean rodents, the systematics of pocket gophers, the systematics and distribution of arctic mammals, the systematics of insular populations of voles, and the serology of arctic ground squirrels.

A member of several scientific societies, Mr. Youngman was Associate Editor (Mammalogy) of the *Canadian Field Naturalist* from 1961 to 1970. He was Curator of Mammals from 1960 to 1972 at the National Museum of Natural Sciences, Ottawa, and is currently supervising the production of loan and mobile exhibitions for the Museum.

Acknowledgements

For the loan of specimens or for permission to examine specimens in their care I am grateful to: S. Anderson, K. Koopman and R. G. Van Gelder, of the American Museum of Natural History, New York; R. L. Rausch, Arctic Health Research Center, College, Alaska; R. T. Orr, California Academy of Sciences, San Francisco; D. A. Smith, Carleton University, Ottawa; J. C. Moore, Field Museum of Natural History, Chicago; I. M. Cowan, Department of Zoology, University of British Columbia; B. Lawrence and C. Mack, of the Museum of Comparative Zoology, Harvard University; S. B. Benson and W. Z. Lidicker, Jr., of the Museum of Vertebrate Zoology, University of California; E. R. Hall and J. K. Jones, Jr., of the Museum of Natural History, University of Kansas; W. R. Burt, E. Hooper and G. Musser, of the Museum of Zoology, University of Michigan; R. R. Grant, Jr., Academy of Natural Sciences of Philadelphia; R. L. Peterson, Royal Ontario Museum, Toronto; C. O. Handley, Jr., D. H. Johnson, R. H, Manville, and J. L. Paradiso, of the National Museum of Natural History, Washington; and C. J. Guiguet, British Columbia Provincial Museum, Victoria.

For logistical support, collecting permits, and many kindnesses I am indebted to G. Bidlake, G. Cameron, J. Classen, J. B. Fitzgerald, R. Flanagan, J. Langevin, D. F. Merrill, D. Nowlan, and A. Reeve of the Yukon Territorial Government, and to Arthur Ellis, Monty Alford, Lou Green, Owen Hughes, Elizabeth Phillips, and Victor Prest, of the Canada Department of Energy, Mines and Resources. Maps 2 to 5 were derived from Prest (1969).

During the course of this study many persons from the Yukon extended friendship, hospitality and assistance. I owe many thanks to Alfred and Palma Berger, Chris Boland, Sue Cerny, the Rudy Burian family, Grace Chambers, Charlie Peter Charlie, Don Christie, Ron Connolly, Tom and Shirley Connolly, Philippe Dicquemare, John Dumas, Sara Frost, Steven Frost, Chester Henderson, Joe Kay, Mr. and Mrs. Al Kapty, Ed Krish, Roy Lambert, Effie Linklater, Peter Lord, Neil Macdonald, Len and Rhona Millar, Danny and Erica Nowland, Arthur M. Pearson, Louis Pospisl, Jim Robb, Howard Truman, Lorna Walmsley, Alan and Iris Warner, Tony Worbets, and Fred Whitlinger.

A number of persons assisted me in the field, prepared specimens and collected the data that have been used in this report. Members of field parties, with dates, are as follows:

1961 and 1962 P. M. Youngman, G. D. Tessier, R. Chambers
1963 P. M. Youngman, G. D. Tessier, R. A. Fortier, W. Baker
1964 P. M. Youngman, G. D. Tessier, A. Peter, I. Sterling, N. Warn
1965 P. M. Youngman, G. D. Tessier, N. Olsen
1966 W. Butler, N. Olsen
1968 D. A. Gill, R. W. Wrigley
1969 D. A. Gill, D. Campbell.

A. E. Porsild kindly identified many specimens of plants. I am grateful to Richard Philip Grossenheider who contributed the frontispiece. Edward Hearn drew part of Map 1 and Maps 2 to 4; Robert Thomson the base for the distribution maps, Charles H. Douglas Figures 7 and 8; and David A. Gill and Thomas L. Pickett assisted with lists of specimens examined and the distribution maps.

I wish to thank Irwin M. Brodo, Robert L. Rausch, Donald E. McAllister and Andrew McPherson for their critical reviews and comments on the manuscript. I have also benefitted from many discussions with W. E. Godfrey.

Introduction

In 1960, when I joined the staff of the National Museum of Canada, and was considering possible areas of research, Dr. A. W. F. Banfield, then Chief Zoologist, suggested several regions in Canada where the mammals were poorly known. I chose the Yukon Territory because it was probably the least known, and because of its unique glacial history as part of a great unglaciated land mass connecting Asia with North America during the Ice Age.

During the Pleistocene epoch, glaciers covered much of northern North America except for a region in Alaska, the Yukon Territory, and District of Mackenzie—the "Beringia" of Hultén (1937)—a few areas in Greenland, parts of the Arctic Archipelago, the Queen Charlotte Islands, and a few other driftless areas, notably the Rocky Mountains and the Mackenzie Mountains. Mammals now occupying the formerly glaciated regions were derived entirely from Beringia or other northern refugia, or from refugia south of the margins of the glaciers, as was much of the fauna of the remainder of North America.

What began as a faunal study of the mammals of a political region gradually developed into a search for Holarctic relationships and an attempt to discover more about the origins of the Recent mammals now occupying Beringia.

Numerous authors have pointed out that much can be learned about the effects of glacial isolation on plants and animals by studying the distribution, fossil record, geographical variation, and genetics of Recent species. Many studies on mammals relating to the Beringian concept have demonstrated Holarctic taxonomic relationships of single species (Zimmermann 1942; Rausch 1953; Kurtén and Rausch 1959; Banfield 1960; Rausch 1964). Unfortunately North American mammalogists have been slow to accept these concepts. Other studies have been based largely on the fossil record (Simpson 1947; Repenning, Hopkins and Rubin 1964; Repenning 1967; Guthrie 1968*a*, 1968*b*).

Some authors have suggested refugial origins for certain species and subspecies of mammals based on taxonomic, distributional, ecological, and biogeographical grounds (Peterson 1952; Rand 1954; Banfield 1960; Dillon 1961; Macpherson 1965; Hoffmann and Peterson 1967). Notable among these studies are those of Peterson (moose) and Banfield (caribou), who based their conclusions on their own extensive taxonomic revisions.

Rand (1954) emphasized the importance of studying geographical variation, intergradation, introgressive hybridization, and the evolution of semispecies as means of understanding the effects of isolation by glaciers and also for postulating refugial origins. His paper gave several examples.

Macpherson (1965) plotted the distribution of Canadian arctic mammals and applied some of Rand's methods in analyzing the distribution of 17 species of mammals that he considered to be tundra specific. To these he assigned probable places of origin including Beringia, Peary Land, and "south". His valuable study utilized evidence derived chiefly from older studies of geographical variation and from distributional patterns.

My study, in addition to utilizing some ecological, geological and palaeontological data, attempts to clarify the distribution and taxonomic status of the mammals involved, especially as they relate to the Beringian concept.

I have relied heavily on the theory of refugial origin to explain speciation in arctic and subarctic mammals. Several colleagues have pointed to the possibility that the speciation that I attribute to refugial isolation may have occurred postglacially in response to climatic change and the expansion of habitat in previously glaciated regions. I recognize that divergence has occurred in such postglacial immigrants as *Marmota monax* and *Microtus pennsylvanicus.* However, the present study shows that there are fewer endemic subspecies even among postglacial immigrants than was previously thought. Furthermore, I do not believe that postglacial speciation can explain the origin of the majority of strongly differentiated species such as *Sorex arcticus* and *Sorex tundrensis,* nor that of the strongly differentiated polytypic species such as *Spermophilus parryii, Lemmus sibiricus, Dicrostonyx torquatus, Mustela erminea, Mustela nivalis, Mustela vison, Rangifer tarandus,* and *Ovis nivicola.*

A number of early arctic explorers, such as Sir John Franklin, Peter Dease, Thomas Simpson, and Lieut, W. J. S. Pullen, passed along the coast of the Yukon. Other than a few comments on occasional sightings of "reindeer", whales and seals, they contributed little to knowledge about the mammals of the region. In the interior of the Territory, in 1843, Robert Campbell, Hudson's Bay Company Factor at Glenlyon House, Frances Lake, commented on some of the nearby mammals (Elton 1935). However, it was not until 1860, 1861 and 1862 that the first trained zoologist, Robert Kennicott, and his followers collected specimens from the vicinity of Lapierre House on the Bell River in the northern Yukon, for the Smithsonian Institution (James 1942). B. R. Ross of the Industrial Museum of Scotland and W. H. Dall of the United States Biological Survey also collected some specimens from the Yukon at this time.

In 1894, Frank Russell travelled between the Mackenzie River and Herschel Island and collected some specimens for the State University of Iowa (Russell 1898).

Wilfred H. Osgood, an assistant in the U.S. Biological Survey, made the greatest contribution to knowledge of the mammals of the Yukon. In June and July of 1899 he and Louis Bishop travelled by boat from Bennett Lake in the southern Yukon, through Tagish and Marsh lakes, and down the Yukon River into Alaska, collecting along the way (Osgood 1900). In early July of 1904, Osgood returned to the Yukon Territory, accompanied by Charles Sheldon and Carl Rungius. The party made substantial collections in the western edge of the Ogilvie Mountains of the west-central Yukon until August 11 and then collected in the Macmillan River region from August 21 to October 9 (Osgood 1909*b*).

Between 1906 and 1913 the boundary between Canada and Alaska was surveyed by representatives of both countries. Numerous specimens were collected along or near the 141st meridian for the Smithsonian Institution and for the National Museum of Canada.

The biologist E. A. Preble did not visit the Yukon, but he summarized information on specimens of mammals from the northern Yukon (Preble 1908).

In 1912, the National Museum of Canada purchased an important collection of mammals from the southern Yukon from Clement Lewis, a trapper, who lived at Teslin.

Rudolph Martin Anderson traversed the coast of the Yukon for the American Museum of Natural History in 1909, and again as Chief of the Southern Party, Canadian Arctic Expedition, in 1914 and 1916, but he obtained few specimens.

In 1921, Copley Amory collected on the Firth River, Joe Creek, and Old Crow River for the Smithsonian Institution.

O. J. Murie collected specimens on the Porcupine and Old Crow rivers for the U. S. Biological Survey during the summer of 1926.

In 1943, C. H. D. Clarke made a survey of the central and southwest Yukon, collected a few specimens, and produced a mimeographed report on the status of many mammals.

During the summer of 1944, a field party from the National Museum of Canada composed of A. L. Rand, A. E. Porsild, W. H. Bryenton and A. Breitung obtained important specimens along the Canol Road in the southeastern Yukon Territory and adjacent areas of the Northwest Territories (Rand 1945*a*). The following year Rand published *Mammals of Yukon, Canada* (Rand 1945*b*), based on his fieldwork, on the literature, on early collections, and on specimens in the National Museum of Canada.

J. R. Alcorn, assisted by his wife and son, made important collections along the Alaska Highway in the southern Yukon during parts of the summers of 1947, 1948, and 1951. Specimens obtained during 1947 and 1948 were reported upon by Baker (1951).

In 1949, W. Earl Godfrey, Colin Thacker, Ian V. Allen and C. Waterson collected mammals in the southwestern Yukon for the National Museum of Canada (Cameron 1952).

During 1957, F. S. L. Williamson collected mammals in the northern Yukon, mostly from the vicinity of Old Crow. Most of this collection is in the National Museum of Natural Sciences, Ottawa (Youngman 1964).

Several collections were made under the auspices of George P. Holland, Entomology Research Institute, Canada Department of Agriculture, by collectors R. Leach, J. E. H. Martin, P. J. Skitsko, and J. R. Vockeroth, mostly from the central and northern Yukon (Youngman 1964).

My own studies on the mammals of the

Yukon Territory began in 1961. Each year thereafter through 1965, I was accompanied by Gaston D. Tessier on field parties to various parts of the Yukon and adjacent Northwest Territories. Others who accompanied us, at various times, were Robert Baker, Ronnie Chambers, Robert Fortier, Neil Oslen, Abraham Peter, Ian Stirling, and Nicol Warn (Youngman 1964, 1968).

During the summer of 1966, W. H. Butler and Neil Olsen collected under my direction in various parts of the Yukon.

From 1961 through 1967 the National Museums purchased many specimens from trappers in the Yukon, notably Rudolph M. Burian, Grace Chambers, and T. O. Connolly.

During the summer of 1968, David A. Gill and Robert E. Wrigley collected under my direction in the central Yukon, and during the summer of 1969, D. A. Gill and David Campbell made a small collection on the Yukon coast.

Others who have collected specimens in the Yukon, or have contributed significantly to the knowledge of the mammals, include A. J. Stone (1900), H. S. Swarth (1926), George G. Goodwin (Youngman 1968), W. W. Judd (1950), M. Y. Williams (1925), and A. W. F. Banfield (1961*a*).

Materials and Methods

For this study I examined 7,273 specimens of mammals from the Yukon, and approximately 2,500 specimens from Alaska, Alberta, British Columbia, the Northwest Territories, and Siberia. Approximately 4,800 of these specimens are in the National Museum of Natural Sciences, Ottawa, and the bulk of the remainder is in the National Museum of Natural History, Washington.

The checklist of mammals of the Yukon is followed by a key to the orders of mammals. Keys to the species, adapted from various sources, precede the accounts of species and subspecies.

The phylogenetic arrangement largely follows Hall and Kelson (1959). The contents of the species and subspecies accounts are arranged as follows:

1 The scientific name of the species.

2 The suggested vernacular name of the species.

3 The trinomen here assigned to the specimens under discussion, followed on the same line by the name of the authors.

4 The synonymy, in which the first citation is to the original description, followed by the type locality, The second citation is to the first use of the name combination used here, followed, in chronological order, by citations in the literature pertaining to Yukon specimens or to a precise locality of occurrence. The word "part" appears in parenthesis after a name that was applied only in part, in any combination, with reference to the Yukon.

5 Geographical distribution in the Yukon.

6 Measurements. External measurements, in millimetres, were copied from labels in the following order, unless otherwise noted: total length, length of tail, length of hind foot, weight. Cranial measurements, in millimetres, were taken with dial calipers, or ocular micrometer. Means, extremes, and standard deviations from, and standard errors of, the mean are listed in tables of measurements or in the text.

7 The Remarks are primarily taxonomic, with some comments on Pleistocene distribution, ecology, and economic importance. The use of the abbreviation n.o. refers to joint non-overlap as expressed by the Coefficient of Difference (Mayr, Linsley and Usinger 1953). Capitalized colour terms are those of Munsell (1954). Colour measurements were standardized by the use of Munsell colour charts and by a Macbeth "Superskylight" (Macbeth Corp., Newburgh, N.Y.) that provided 7400°K at better than 200 foot-candles.

8 Records of occurrence includes "Specimens examined" and "Additional records". Both categories pertain only to specimens or observations from the Yukon, but records from the 141st meridian (Alaska–Yukon boundary) are included here as Yukon Territory records. Under "Specimens examined", the total number I examined is given, followed by a list of the localities from which the specimens came, and the number examined from each locality. Localities are listed from north to south. If two or more localities have the same latitude the westernmost is listed first. In "Additional records", the manuscripts cited consist largely of field-notes and correspondence on file in the National Museum of Natural Sciences, Ottawa.

Most of the place names cited can be found in the *Gazetteer of Canada: Northwest Territories and Yukon* (Canadian Board of Geographical Names, 1958, and supplements) or on maps available from the Map Distribution Office, Surveys and Mapping Branch, Department of Energy, Mines and Resources, Ottawa. The most useful maps are the following: Yukon Territory (1963), MCR 47, 1:2000,000; the National Topographic Series, 1:50,000, 1:250,000, 1: 5000,000; and World Aeronautical Charts, ICAO, National Topographic Series, 1: 1000,000.

Unless otherwise noted, specimens examined are in the National Museum of Natural Sciences, Ottawa. The names of institutions where specimens are stored are represented by the following abbreviations:

AHRC	Arctic Health Research Center, College, Alaska
AMNH	American Museum of Natural History, New York
ANSP	Academy of Natural Sciences of Philadelphia
BCPM	British Columbia Provincial Museum, Victoria
CAS	California Academy of Sciences, San Francisco
CU	Carleton University, Ottawa
DMNH	Denver Museum of Natural History
FMNH	Field Museum of Natural History, Chicago
KSU	Kansas State University, Manhattan

KU	Museum of Natural History, University of Kansas, Lawrence
MCZ	Museum of Comparative Zoology, Harvard University
MVZ	Museum of Vertebrate Zoology, University of California, Berkeley
MZ	Museum of Zoology, University of Michigan, Ann Arbor
NMNH	National Museum of Natural History, Washington
ROM	Royal Ontario Museum, Toronto
UBC	Department of Zoology, University of British Columbia, Vancouver

Distribution maps accompany most of the species accounts. Localities in the Yukon from which specimens have been collected are marked with black dots. Marginal records, unverified by specimens, are represented by white dots. Each dot is approximately fifteen miles in diameter in relation to the scale of the map; therefore, a dot often overlaps one or more localities. In these instances only one locality is plotted on the map; additional localities covered by the dot are printed in italics in the lists of "Specimens examined" and "Additional records". A shaded overlay shows my estimate of the area in the Yukon in which the species occurs provided suitable habitat is available. Approximate natural worldwide distribution of the species is shown in a small inset map.

Geography

Yukon Territory — 207,076 square miles of mountains, glaciers, forests, tundra, rivers, and lakes, located in northwestern Canada — is bounded by the Beaufort Sea to the north, Alaska to the west, British Columbia to the south, and the Northwest Territories to the east. It became a provisional district of the Northwest Territories in 1895, a judicial district in 1897, and a separate territory in 1898.

The population of the Yukon is estimated at 17,000 (1970) of which 2,350 are Indians. Whitehorse, the capital, has 4,771 residents (1966).

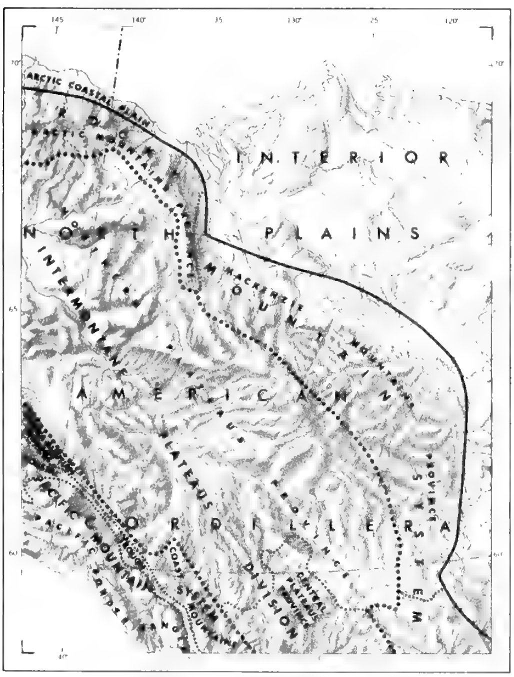
The unpaved Alaska Highway traverses the southern Yukon, and a connecting road links Whitehorse with Dawson to the north. Other smaller roads, notably the Cantung Road in the southeast and the Dempster Road to the north of Dawson, penetrate short distances from the main roads. Most of the Territory, however, is accessible only by air, water, tracked vehicle, or dog team.

Bostock (1948) and Wahrhaftig (1965) have treated the physiography of the Yukon. The following outline is largely derived from their accounts. Numerous publications on the geology of the Yukon are available in the Memoirs series published by the Geological Survey of Canada, Department of Energy, Mines and Resources, Ottawa.

Two of the major physiographic divisions of North America extend into the Yukon and Alaska—the Interior Plains and the North American Cordillera (Map 1). The Arctic Coastal Plain is a continuation of the Interior Plains in the Yukon Territory and Alaska. The North American Cordillera, which includes most of the Yukon and Alaska, consists of three major subdivisions—the Rocky Mountain system, the Intermontane Plateaus, and the Pacific Mountain system.

The Arctic Coastal Plain (Figure 1) is a narrow, smooth plain bordering the Arctic Ocean to the north and gently rising to meet the foothills of the Arctic Mountains in the Rocky Mountain system to the south.

The Rocky Mountain system may be further divided into the Arctic Mountains province and the Mackenzie Mountains province. The Arctic Mountains are eastern extensions of the Brooks Range, and consist of the British Mountains (with peaks to 5,500 feet) in the northwest (Figure 2), and in the northeast, the Richardson Mountains (with peaks to 6,500 feet), which separate the Intermontane Plateaus from the Arctic Coastal Plain, and also separate the Pacific and Arctic Ocean drainages. The Mackenzie Mountains province is located



Map 1
Physiographic provinces of the Yukon

Figure 1
The Arctic Coastal Plain, 4 mi. WSW mouth Blow River, 68°57′/137°05′, 5 August 1964. Evidence of a previous large population of *Dicrostonyx torquatus* was found here. *Microtus oeconomus* and *Lemmus sibiricus* occurred on low ground. *Spermophilus parryii* occupied the ridges, and *Alces alces* and *Ursus americanus* were found along stream banks.

Figure 2
The Arctic Mountains province, British Mountains, 20 mi. SE mouth Joe Creek, 68°47'/140°14', 7 August 1962. *Dicrostonyx torquatus* habitat in foreground.

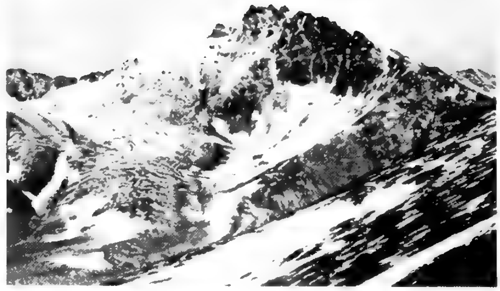


Figure 3
The northern plateaus province, Ogilvie Mountains, 20 mi. S Chapman Lake, 64°35'/138°13', 29 August 1964. Type locality of *Dicrostonyx torquatus nunatakensis* on slope lower left centre.

mostly in the Northwest Territories, with only a small portion, the Peel Plateau, located in the northeastern Yukon.

The Intermontane Plateaus are divided into the northern plateaus province, comprising most of the Yukon, and the central plateaus province in the southwestern corner of the Territory. The northern plateaus province varies in relief from gently rounded, unglaciated ridges and mountains (such as the Klondike Plateau south of Dawson) to the rugged glaciated peaks of the Ogilvie Mountains. Prominent in this province is an arc of precipitous mountains extending from the Selwyn Mountains in the southeastern Yukon (peaks to more than 9,000 feet) to the sharp crests, precipitous slopes, and deep valleys of the Ogilvie Mountains (peaks to more than 7,000 feet) (Figure 3). Much of the region to the north of the Ogilvie Mountains has relatively little relief, being composed mostly of widely spaced, rolling hills, but this region also includes some mountain ranges, the Porcupine Plain and Old Crow Flats. The latter is a great flat basin dotted with oriented thaw lakes and ponds, meandering streams, oxbows, and soil polygons. The gently rolling Hyland Plateau in the southeastern Yukon (see Youngman 1968 for description) is included in the central plateaus province.

The Pacific Mountain system is an arcuate chain of high peaks bordering the Pacific Ocean. Generally, the system consists of the northerly Alaska–Aleutian Province (Kluane Ranges) and the more southerly Pacific border ranges (St. Elias Mountains), separated by the Coastal Trough (Duke Depression). Wahrhaftig (1965) described the St. Elias Mountains as, "probably the most spectacular mountains of North America", with "massive isolated blocklike mountains 14,000–19,000 feet in altitude". All parts of the range gentle enough to hold snow are covered with glacial ice. The extreme southwestern portion of the Pacific Mountain system is the northernmost extension of the rugged Coast Mountains. The Pacific Mountain system is an important barrier to climatic influence from the Pacific Ocean and to faunal interchange between the coastal Gulf of Alaska and the interior Yukon.

Climate*

The climate of the Yukon Territory is characteristically subarctic continental. The St. Elias Mountains, with many summits over 15,000 feet, and the Coast Mountains of southeastern Alaska and southwestern Yukon form a strong barrier to the maritime influences from the Pacific. To the east, the Mackenzie Mountains form a barrier against extreme winter cold-waves from the Northwest Territories.

In winter the countryside is covered with snow and ice, and rivers are frozen several feet deep, but only in the uplands is there a

*This section is largely paraphrased from Kendrew and Kerr 1956.

deep snowfall. The days are short, and the sun is at a low angle or absent (at Old Crow the sun disappears about December 9 and reappears about January 3). The sky is clear, the air usually calm, clear and dry.

Anticyclonic conditions dominate the weather. Wide variations in winter temperature may result from control either by modified maritime air from the North Pacific or by intensely cold air from the frozen Beaufort Sea. Thus, the region records both the highest and the lowest winter temperatures in arctic North America. Mean January temperatures are 5°F at Whitehorse and −16°F at Dawson. Snag holds the low temperature record for North America, −81°F. Other records are −62°F at Whitehorse, −63°F at Teslin, and −74°F at Watson Lake. Winter precipitation is usually associated with frontal activity, but because of the low absolute humidity, snowfall is generally light and fairly uniform, 40 inches or less on the arctic coast, rising to 60 inches in the southwest and considerably more in the St. Elias Mountains.

By March there are signs that winter is ending; the mean temperature rises and the days lengthen. But spring is elusive in the North, a rapid transition between winter and summer. Mean temperatures rise from 28°F to 57°F between mid-April and mid-June in Dawson.

Summers (June, July, August) are short but pleasantly warm. The midnight sun hangs high in the sky, and, on adequate soils, plant growth is rapid in the warmth of 24 hours of possible sunshine. Late in the summer, brilliantly coloured skies dominate the evenings. The mean summer circulation is featureless, the day-to-day weather often consisting of a succession of shallow disturbances passing eastward. The summer cyclones bring thick clouds and often thunderstorms with exceptionally heavy rain, July and August being the wettest months. In summer, mean temperatures remain above 50°F throughout the Territory. Both Dawson and Mayo have recorded 95°F, but frost has occurred in all months.

Autumn comes in September with snow in the uplands and ice on the ponds. The days shorten by six minutes a day (lat. 62°N). The fall colours of the tundra are as spectacular as the profusion of spring blooms. By October the land is in the grip of snowdrifts, and all the lakes are freezing.

Vegetation

The flora of the Yukon Territory has been treated by Porsild (1951, 1966), Rowe (1959), and Hultén (1941–50, 1967, 1968).

Four main phytogeographical regions occur in the Territory: boreal forest, subarctic taiga, alpine tundra (Figure 2), and arctic tundra (Figure 1).

The boreal forest, a closed-canopy, primarily coniferous forest, occupies the lower altitudes throughout all but the Arctic Mountain region, and the Arctic Coastal Plain. White spruce (*Picea glauca*) on well-drained soils and black spruce (*P. mariana*) in the muskegs are characteristic species. Other important species are larch (*Larix laricina*), alpine fir (*Abies lasiocarpa*), lodgepole pine (*Pinus contorta*), white birch (*Betula papyrifera*) and poplars (*Populus tremuloides* and *P. balsamifera*). Fire is an important influence in the boreal forest (Hardy and Franks 1963; Lutz 1963) and may affect the distribution and geographical variation of certain mammals (Guthrie 1967).

The subarctic taiga, or lichen-woodland, is altitudinally and latitudinally intermediate between the boreal forest and the tundra. It is characterized by open, parklike stands, usually of low black or white spruce, with a caribou lichen (*Cladonia* spp.) groundcover. Wooded and unwooded boggy sites are common. Larch is common on peat fens, and balsam poplar follows river banks. The altitudinal tree-line is usually sharper than the latitudinal tree-line in areas of low relief.

With increase in altitude, the lichen-woodland gives way to alpine tundra at the tree-line, and with increase in latitude, the lichen-woodland blends into the arctic tundra that, in the Yukon, covers most of the Arctic Slope and Coastal Plain. Arctic and alpine tundra differ in origin but are similar floristically. Tundra vegetation is composed of low, dwarfed, often mat-like herbaceous and shrubby forms. Characteristic plants include Labrador tea (*Ledum procumbens*), arctic white heather (*Cassiope tetragona*), mountain cranberry (*Vaccinium Vitis-Idaea*), crowberry (*Empetrum nigrum*), cottongrass (*Eriophorum vaginatum*), arctic poppy (*Papaver radicatum*), arctic lupine (*Lupinus arcticus*), and sweet coltsfoot (*Petasites frigidus*). Sedges and grasses also occur as part of the ground cover.

Cenozoic History*

During the early and middle Tertiary period the Old and New Worlds were connected by land across the Bering Strait, thus enabling a relatively free exchange of land mammals across this Bering Land Bridge. A marine transgression of the land bridge occurred in late Miocene time. The land connection was again restored for much of the Pliocene epoch, but Bering Strait was reopened again near the end of the Pliocene, 3.5 to 4.0 million years ago.

The drying and progressive cooling of world climate during the Tertiary period culminated in a time of major climatic fluctuations known as the Quaternary period. During this time, continental glaciers stored large quantities of water, causing the sea level to fall as much as 150 metres below the present shoreline during the Illinoian and Wisconsin glacial intervals and thus exposing a broad land connection between Siberia and Alaska. During interglacial periods the glaciers waned, causing the sea level to rise perhaps as much as 100 metres above its present level and thus breaking the land connection. The Quaternary period included at least four major glacial periods (Nebraskan, Kansan, Illinoian, Wisconsin) and three interglacials (Aftonian, Yarmouth, Sangamon), besides the one we live in today.

During early Wisconsin time, the sea level lowered 115 to 135 metres, exposing a land bridge approximately 1,500 kilometres wide. Oscillations of sea level produced an exposed land bridge 20,000 (−120 metres), 13,000 (−50 metres), and 11,000 (−50 metres) years ago. A transgression about 10,000 years ago inundated the Bering Land Bridge for the last time, and isolated St. Lawrence Island from the mainland. Later minor regressions may have briefly re-established land connections between the Alaskan mainland and St. Lawrence Island.

During the Illinoian and Wisconsin periods of maximum glaciation, ice sheets covered much of northern North America in the form of the Laurentide ice sheet and the Cordilleran glacier system that merged in the Rocky Mountains. At this time, the Bering Land Bridge was part of a larger unglaciated region in Alaska, the Yukon and the District of Mackenzie, which was known as Beringia (Hultén 1937). This region acted as a northern refugium for many species of plants and animals. An ice-free corridor opened between Beringia and central North America during periods of mild climate, functioning as a valve allowing certain species that had crossed the Bering Land Bridge to penetrate central North America, and permitting certain southern species to penetrate Beringia.

Various other Wisconsin glacial refugia have been postulated, including: northeastern Greenland or "Pearyland" (Gelting 1934), Kodiak Island (Ball 1963), sections of the Mackenzie Mountains (Hammer 1955; Calder and Savile 1960; Ball 1963; Calder and Taylor 1968), part of the Queen Charlotte Islands (Osgood 1901; Calder and Taylor 1968), Vancouver Island (Heusser 1960), nunataks within glaciated areas of Beringia (Youngman 1967), parts of the Cascade Mountains and the Olympic Mountains, as well as areas in southern Alberta and southern Saskatchewan (Calder and Taylor 1968; Prest, Grant and Rampton 1967), portions of the Atlantic Coastal Plain (Youngman 1968), and parts of the southern periglacial region (Rand 1954; Dillon 1956).

From Oligocene through middle Miocene times there was little pronounced zonation of climate in Beringia. A mixed mesophytic forest stretched from Japan through Alaska, the Yukon, British Columbia and Oregon. Broad-leaved conifer deciduous forests were present at high altitudes.

The first opening of the Bering Strait, 12 to 15 million years ago, in the late Miocene, was accompanied by a decline in summer temperatures that resulted in the divergence of the boreal forests in northeastern Asia and northwestern North America. Climatic deterioration apparently prevented the rejoining of Asian and North American boreal forests on the Bering Land Bridge.

By the beginning of the Quaternary period, the flora of Beringia had become similar to the modern arctic flora. During glacial oscillations, the summers were cooler and shorter than at present. The arctic climate of Beringia during the Illinoian and Wisconsin times caused an eastward retreat of the tree line (on the Land Bridge) and an altitudinal lowering of the tree line of about 400 metres. At this time the Bering Land Bridge supported a herbaceous tundra with perhaps a more steppe-like aspect than now possessed by high-Arctic tundra.

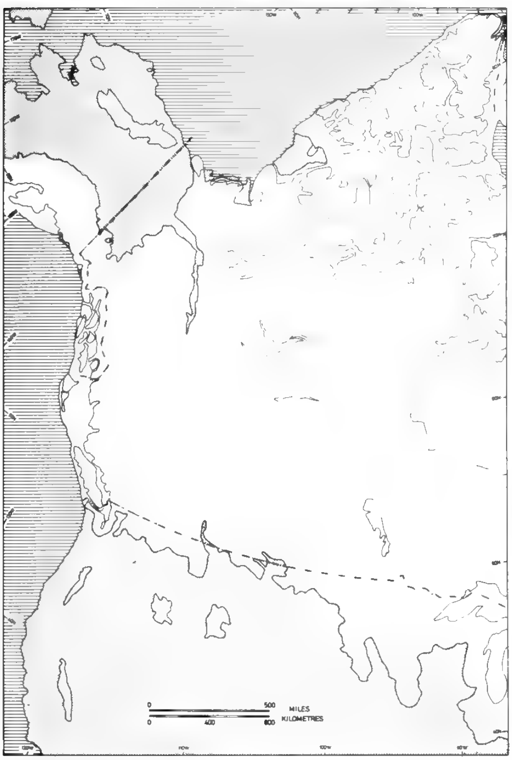
*The following account is largely after Hopkins 1967.

In addition to the tundra and reduced boreal forest in Beringia during Wisconsin time, there is also evidence of the existence of grasslands, or steppe, that supported an extensive fauna of large grazing mammals (Guthrie 1968*b*).

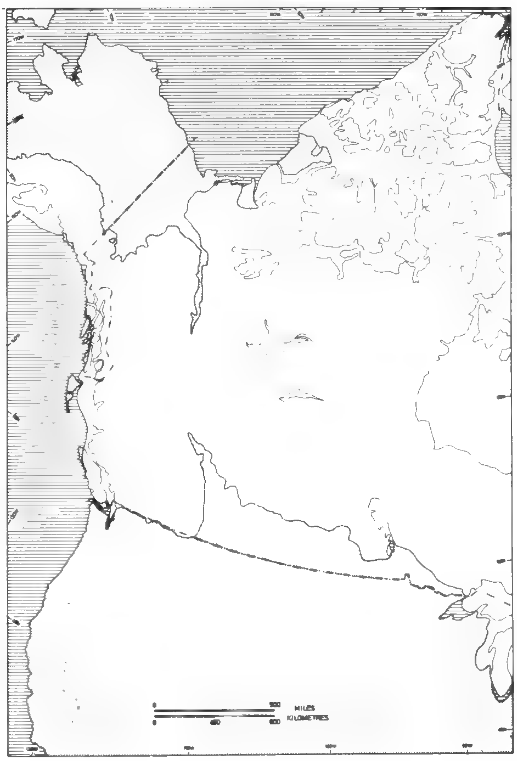
Wisconsin glaciation ended with climatic warming, glacial recession, and an expansion of forests. The rapid changes in vegetation reduced the available grazing land, perhaps causing the dramatic mass extinction of an entire fauna of large grazing mammals.

The glacial recession that began approximately 15,000 years ago rapidly opened an unglaciated corridor between Beringia and the region south of the drift border (Map 2), permitting an exchange of mammals between the two regions. The corridor began as an invagination of the glacial margin in what is now Alberta (Map 3). Recession proceeded more rapidly along the southeastern extremity of the corridor, causing it to become funnel-shaped. By 12,300 B.P. the eastern edge of the base of the corridor was located east of the Mississippi River, and its northern extreme was located in the Peace River drainage. By 12,000 B.P. the narrow unglaciated corridor was complete (Map 4). By 10,500 B.P. a wide, funnel-shaped corridor existed between Beringia and the region east of the Rocky Mountains while the Cordilleran ice had receded but little. Probably this factor accounts for the eastern affinities of most of the postglacial immigrants to Beringia. By 9500 B.P. much of the lowlands in the Cordilleran region were free of glaciers, and a wide unglaciated corridor stretched from the coast of Labrador through the Great Plains to parts of the Arctic Archipelago (Map 5).

The postglacial movement of mammals was mostly from the southern unglaciated region into Beringia, with only a few Beringian species moving very far south along the unglaciated corridor. However, several spe-



Map 2
Retreat of Wisconsin ice, glacial maximum, ca. 1700–1500 years B.P.



Map 3
Beginning of deglaciated corridor between Cordilleran glacial complex and Keewatin glacier, ca. 12,300 B.P.

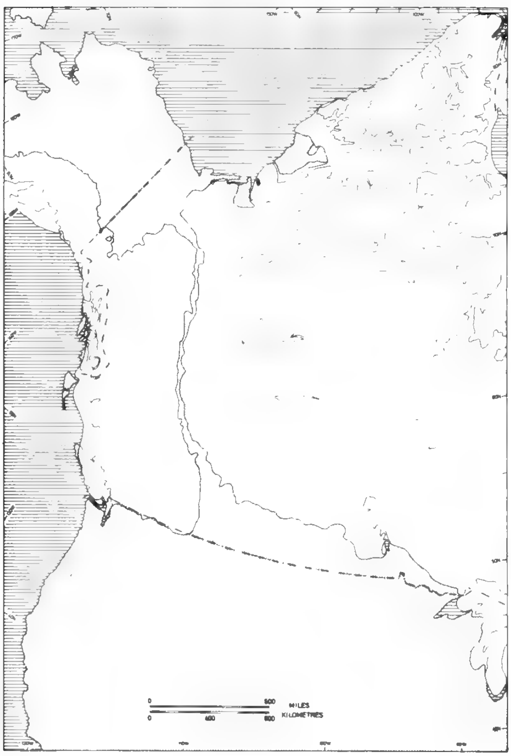
cies moved east and occupied the recently deglaciated tundra and taiga of Mackenzie and Keewatin districts. Presumably the remaining depauperate Beringian fauna was heavily tundra or taiga-specific, and as the climate ameliorated a large number of boreal niches became available to immigrants from the south.

Discussion

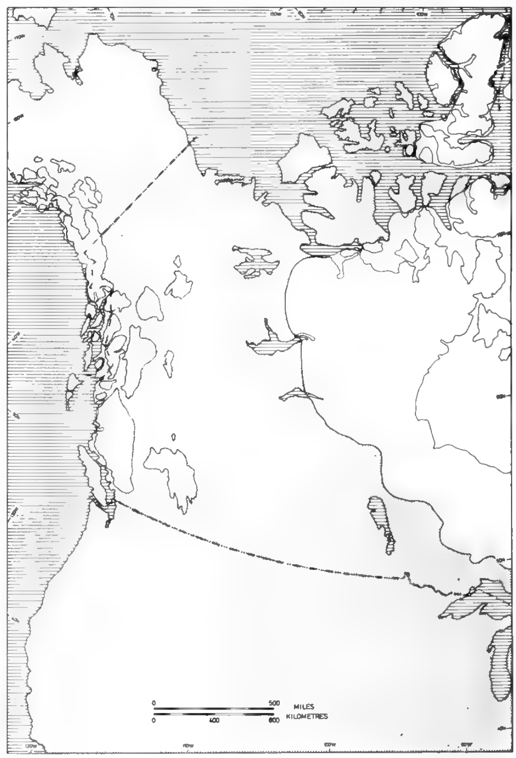
The species density of the terrestrial mammal fauna of the Yukon Territory and Alaska reflects the large range of seasonal environmental fluctuations and the generally low productivity of the arctic ecosystem. The taxonomic composition of the mammalian fauna reflects the complex glacial history of the region, with the imprint of the last (Wisconsin) glaciation the most evident. The proximate origins of many of the Recent terrestrial mammals of the Yukon, Alaska, and nearby portions of the Northwest Territories and British Columbia may be inferred by utilizing geological, taxonomic, and biogeographical evidence.

Approximately 33 per cent of the terrestrial mammal fauna of the Yukon are Beringian in origin, whereas about 6 per cent are postglacial immigrants from the south. The remainder are thought to be from other refugia, or are introduced species.

There appear to have been two principal refugia from which Yukon and Alaskan mammals were derived (Table 1). These are Beringia (in which I include several more-or-less isolated centres of speciation) and the main unglaciated portion of North America. Other regions that have contributed to a much lesser degree to the Yukon mammal fauna are: a Rocky Mountain refugium, a high-Arctic (Peary Land?) refugium, Banks Island (including part of the now-submerged coastal shelf), and the southwest coast of Alaska.



Map 4
Deglaciated corridor open between Beringia and region south of drift border, ca. 12,200 B.P.



Map 5
Wide deglaciated corridor, open ca. 9500 B.P.

The Beringian Refugium

Most of the species here considered to be of Beringian origin (Table 1) are well documented as such, but the status of *Mustela vison* is less certain. The distribution and divergence of *Mustela vison ingens* point to the probability of its being of Beringian origin, although a more complex postglacial origin for both subspecies of mink might be postulated.

Geographical variation in a number of species suggests several centres of speciation other than Beringia proper. The Arctic Slope of Alaska, isolated from most of the remainder of Beringia by the glaciated Brooks Range, appears to be the centre of radiation for *Sorex cinereus ugyunak, Marmota broweri, Spermophilus parryii parryii, Dicrostonyx torquatus alascensis,* perhaps *Microtus miurus muriei,* and possibly others.

The Ogilvie Mountain–Mackenzie Mountains region appears to have been the centre of speciation for *Dicrostonyx torquatus nunatakensis* a local deme of *Microtus miurus muriei;* and *Spermophilus parryii plesius.* This region was, at various times, probably isolated from Beringia proper by extensive valley glaciers in the Ogilvie, Wernecke, and Selwyn mountains. Porsild (1951) arrived at similar conclusions regarding the plants of this region.

Table 1 Probable refugial origins of Recent Yukon native terrestrial mammals (subspecific names used where a species is thought to have been isolated in more than one refugium)

Beringian Refugium	Southern Immigrants
Sorex cinereus ugyunak	*Sorex cinereus cinereus*
Sorex tundrensis	*Sorex arcticus*
Ochotona princeps collaris	*Sorex obscurus*
Spermophilus parryii parryii	*Sorex palustris*
Castor canadensis	*Microsorex hoyi*
Clethrionomys rutilus dawsoni	*Myotis lucifugus*
Microtus miurus	*Lepus americanus*
Microtus oeconomus	*Eutamias minimus*
Lemmus sibiricus trimucronatus	*Marmota monax*
Dicrostonyx torquatus	*Marmota caligata*
Ursus arctos horribilis	*Spermophilus parryii plesius*
Ursus maritimus	*Tamiasciurus hudsonicus*
Mustela erminea arctica	*Glaucomys sabrinus*
Mustela nivalis eskimo	*Peromyscus maniculatus*
Mustela vison ingens	*Neotoma cinerea*
Gulo gulo	*Phenacomys intermedius*
Alces alces gigas	*Microtus pennsylvanicus*
Rangifer tarandus groenlandicus	*Microtus longicaudus*
Ovis nivicola dalli	*Microtus xanthognathus*
Canis lupus ssp.	*Ondatra zibethicus*
	Synaptomys borealis
High-Arctic (Peary Land?) Refugium	*Zapus hudsonius*
Rangifer tarandus pearyi	*Zapus princeps*
	Erethizon dorsatum
Rocky Mountains Refugium	*Canis latrans*
Lemmus sibiricus helvolus	*Vulpes vulpes*
Ovis nivicola stonei	*Ursus americanus*
	Martes americana
	Martes pennanti
	Mustela vison energumenos
	Lontra canadensis
	Felis concolor
	Felis canadensis
	Odocoileus hemionus
	Rangifer tarandus caribou
	Oreamnos americanus

Several small unglaciated regions in the southwestern Yukon were probably the centre of subspeciation for *Microtus miurus cantator*. Porsild (1966) theorized that unglaciated mountain refugia existed above the 5,000-to-6,000-foot level in this region.

The relationships of amphiberingian species are among the most fascinating and vexing problems for mammalogists and palaeontologists alike. I hope that in the near future scientists from the Union of Soviet Socialist Republics and North America can cooperate on the study and collection of mammals on both sides of the Bering Strait.

Southern Unglaciated North America

Most Recent Yukon and Alaskan mammals were derived from the region to the south of the main glacial systems. These postglacial immigrants, which have penetrated Beringia during the past 12,000 years, are primarily boreal forest species. However, a few (*Sorex obscurus, Marmota caligata, Neotoma cinerea, Microtus longicaudus, Zapus princeps, Oreamnos americanus*) are western montane in origin.

Many postglacial immigrants have ranges extending over much of Alaska (Table 2) and are either medium or large size, highly mobile species.

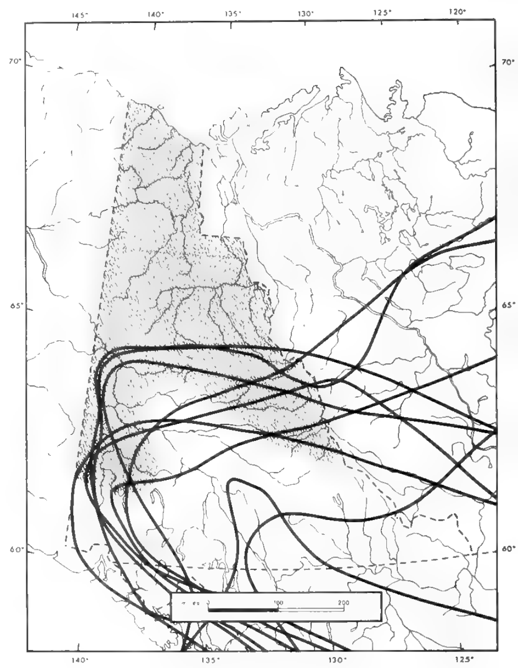
The ranges of some other postglacial immigrants (Table 3, Map 6) extend only as far as 65° latitude. Either their ranges do not extend into Alaska or their distribution there is limited. The factors limiting the spread of these species are largely unknown.

Table 2 Postglacial immigrants from the south with extensive ranges in the Yukon and Alaska

Sorex obscurus
Microsorex hoyi
Lepus americanus
Tamiasciurus hudsonicus
Microtus pennsylvanicus
Microtus xanthognathus
Ondatra zibethicus
Erethizon dorsatum
Canis latrans
Vulpes vulpes
Ursus americanus
Martes americana
Lontra canadensis
Felis canadensis

Many may be relatively recent immigrants to the Yukon and Alaska (*Marmota monax, Neotoma cinerea, Sorex arcticus, Martes pennanti, Zapus princeps*). The northern extent of the ranges of most species in this group coincides fairly closely with the 25°F mean annual isotherm and the southern limits of widespread permafrost in the discontinuous permafrost zone.

Some postglacial immigrants (*Sorex cinereus cinereus, Spermophilus parryii plesius, Clethrionomys rutilus gapperi, Lemmus sibiricus helvolus, Mustela erminea richardsonii, Mustela vison energumenos, Canis lupus* ssp., *Rangifer tarandus caribou, Alces alces americana, Ovis nivicola stonei*) met intraspecific competition from Beringian populations. Some immigrants (*Clethrionomys rutilus, Canis lupus, Ovis nivicola)* intergraded broadly with their Beringian counterparts, whereas others (*Lemmus sibiricus, Spermophilus parryii, Mustela erminea*) have rela-



Map 6
Approximate ranges of nine postglacial immigrants with limited ranges in the Yukon *(Sorex arcticus, Eutamias minimus, Peromyscus maniculatus, Neotoma cinerea, Phenacomys intermedius, Martes pennanti, Felis concolor, Odocoileus hemionus).* The lower margin of the patterned overlay approximates the 25°F mean annual isotherm, and the southern limits of widespread permafrost.

tively narrow zones of intergradation. A few immigrants, originally from the same stock as their Beringian counterparts, apparently diverged to the species level (*Sorex arcticus*), or appear to have nearly reached this status (*Mustela vison energumenos*).

The Beringian and southern isolates of *Ochotona princeps* have not rejoined during postglacial time, nor is there adequate evidence that the Beringian and southern populations of *Mustela nivalis* have met yet.

The study of postglacial secondary intergradation, or what in some instances may be allopatric hybridization, will certainly be one of the most interesting facets of future research on Beringian problems.

At least 65 per cent of the postglacial immigrants to the Yukon and Alaska show subspecific taxonomic affinities to eastern North America. This is not surprising considering the speed with which the Keewatin ice sheet retreated from the Interior Plains. The postglacial immigrants that originated in the western montane region probably utilized the more mountainous route north with the retreat of the cordilleran glacial complex.

Good (1966) gave interesting data on the sequence of mammalian occupancy of a recently deglaciated area at Muir Inlet, southeastern Alaska. *Sorex obscurus* and *Peromyscus maniculatus* invaded new terrain about 25 years after deglaciation, *Microtus oeconomus* invaded about 30 years after, and *Sorex cinereus* and *Clethrionomys rutilus* invaded about 100 years after deglaciation. The distribution patterns of southern immigrants suggest that many factors—such as sequence of occupancy, availability of species to the deglaciated corridor, plant succession, temperature, climate, availability of niches, physiological requirements, competitive interaction, the presence of glaciers, permafrost, postglacial lakes, and tundra—have influenced, and continue to influence, the present limits of the ranges of these species.

Table 3 Postglacial immigrants from the south with limited ranges in the Yukon and Alaska

*Sorex arcticus**
Sorex palustris
Myotis lucifugus
*Eutamias minimus**
Marmota monax
Marmota caligata
Spermophilus parryii plesius
Glaucomys sabrinus
*Peromyscus maniculatus**
*Neotoma cinerea**
*Phenacomys intermedius**
Microtus longicaudus
Zapus hudsonius
*Zapus princeps**
*Martes pennanti**
Mustela erminea richardsonii
*Felis concolor**
*Odocoileus hemionus**
Rangifer tarandus caribou
Oreamnos americanus
*Ovis nivicola stonei**

*An asterisk marks the names of species with ranges that end in the southern Yukon.

Influences from Other Refugia

Species derived from other refugia constitute only a small part of the Yukon–Alaska mammal fauna.

The existence of a Rocky Mountains refugium has been postulated by some authors (Calder and Taylor 1968), and there is geological evidence of at least one driftless area in the Okanagan Range of the Similkameen district in southern British Columbia. The present distributions of *Lemmus sibiricus helvolus* (Map 33) and *Ovis canadensis stonei* (Map 60) would seem to argue for the existence of such a refugium. The present distribution of *Spermophilus parryii plesius* (Figure 5) could indicate origin in the Mackenzie Mountains region of the Beringian portion of the Beringian refugium. How ever, its ectoparasitic complement points to origin in a Rocky Mountains refugium or in a more southern periglacial region (Holland 1958; Nadler and Youngman 1969).

Interestingly, the areas of intergradation of *Lemmus sibiricus helvolus* with *L. s. trimucronatus,* and *Ovis nivicola dalli* with *Ovis n. stonei,* follow the margin of the glaciated–unglaciated areas in the Yukon and the Northwest Territories. This suggests that these areas of intergradation are the result of the northward movement of southern populations and their meeting and intergrading with their Beringian counterparts.

A species that may be a Peary Land (or other high-Arctic) derivative, the diminutive Peary caribou (*Rangifer tarandus pearyi),* occasionally wanders into the northern Yukon. Large brown bears (*Ursus arctos middendorffi*) wander occasionally into the southwestern Yukon from the Gulf of Alaska coast, but like the Peary caribou are not permanent residents.

The varying lemming (*Dicrostonyx torquatus kilangmiutak*) is intermediate between the grey, high-Arctic derivative, *D.t. groenlandicus,* and the brilliant red-and-black *D.t. alascensis* from the Arctic Slope of Alaska. *Dicrostonyx t. kilangmiutak* appears to have been derived from Banks Island, and the adjacent exposed continental shelf, which was not glaciated during the Wisconsin but which may have had a heavy snow cover at times, thus possibly making the connection between the high-Arctic subspecies and the Arctic-Slope subspecies a late-Wisconsin or postglacial event.

Checklist of the Mammals of the Yukon

The 64 species (74 subspecies and monotypic species) of Recent mammals that have been recorded from the Yukon represent 8 orders, 20 families, and 45 genera. Of 3 Recent species that are extinct in the Yukon (marked by a dagger), 2 have been reintroduced (marked by an asterisk). However, one introduction was unsuccessful. The resident native mammal fauna is composed of 58 species (53 terrestrial, 5 marine). The remainder are probably regular wanderers to the Yukon (*Ursus arctos middendorffi, Ursus maritimus, Callorhinus ursinus, Rangifer tarandus pearyi*) and a commensal introduced by man (*Mus musculus*).

A list of 11 species that have not been recorded in the Yukon, but may occur there, follows the Accounts of Species and Subspecies.

Key to Orders of Recent Yukon Mammals

1	Limbs modified as flippers	2
1′	Limbs not modified as flippers	3
2	Hind limbs absent externally; tail modified as a horizontal fluke . . . CETACEA, p.	122
2′	Hind limbs present externally; tail not modified as a horizontal fluke . . . . PINNIPEDIA, p.	156
3	Forelimbs modified as wings . . . . CHIROPTERA, p.	53
3′	Forelimbs not modified as wings	4
4	Feet modified as hoofs . . . . ARTIODACTYLA, p.	159
4′	Feet not modified as hoofs, toes with claws	5
5	Canines present; anterior and posterior teeth not separated by a diastema	6
5′	Canines absent; anterior and posterior teeth separated by a diastema	7
6	Canines no larger than incisors . . . . INSECTIVORA, p.	41
6′	Canines larger than incisors . . . . CARNIVORA, p.	124
7	Incisors 2/1, the second small and located immediately behind the first . . . . LAGOMORPHA, p.	55
7′	Incisors 1/1 . . . . RODENTIA, p.	60

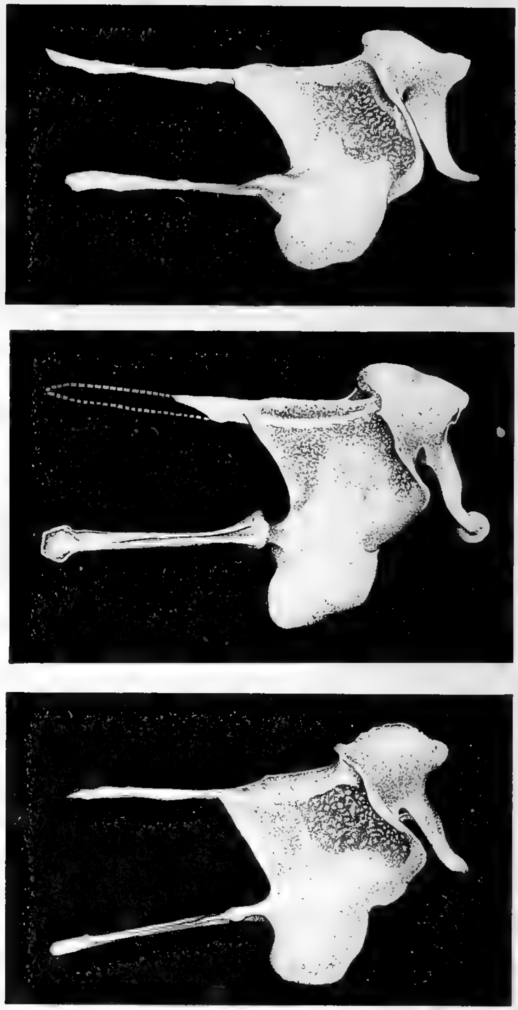


Figure 4
Ventral views of auditory ossicles, ×30 natural size
a) *Sorex arcticus,* No. 25006, Rennie, Man.
b) *Sorex tundrensis,* No. 24369, Tuktoyaktuk, N.W.T.
c) *Sorex arcticus,* No. 33419, Yukon Crossing, Yukon Territory.

Order INSECTIVORA – Insectivores

Key to Yukon Soricids

1	Only 3 upper unicuspids easily visible in lateral view, the third and fifth small and inconspicuous . . . . *Microsorex hoyi*, p.	51
1′	At least 4, usually 5, upper unicuspids easily visible in lateral view	2
2	Post mandibular foramen present; upper unicuspids lack pigmented ridge from apex to cingulum	3
2′	Post mandibular foramen absent; upper unicuspids with pigmented ridge from apex to cingulum	3
3	Tail short 25–36 mm; maxillary tooth-row 6.0–6.7 mm; condylobasal length 17.0–18.4 mm; lateral margin at union of head of malleus with slender process indented (Fig. 4b) . . . . *Sorex tundrensis*, p.	45
3′	Tail long 36–44 mm; maxillary tooth-row 6.8–7.8 mm; condylobasal length 18.5–20.3 mm; lateral margin at union of head of malleus with slender process not indented (Figs. 4a and 4c) . . . . *Sorex arcticus*, p.	44
4	Hind foot more than 18 mm and fimbriated; pelage greyish . . . *Sorex palustris*, p.	51
4′	Hind foot less than 18 mm and not fimbriated; pelage brownish	5
5	Third upper unicuspid not smaller than fourth; maxillary breadth less than 4.6 mm . . . . *Sorex cinereus*, p.	41
5′	Third upper unicuspid smaller than fourth; maxillary breadth greater than 4.6 mm . . . . *Sorex obscurus*, p.	48

Family **Soricidae** – Shrews
Sorex cinereus – Masked shrew

Sorex cinereus cinereus **Kerr**
Sorex arcticus cinereus Kerr, 1792:206; type locality, Fort Severn, Ont.
Sorex cinereus cinereus, Jackson 1925:56; Jackson 1928:40; Rand 1945*a*:24; Baker 1951:92; Cameron 1952:178; Banfield 1961*a*:128; Youngman 1964:1; Youngman 1968:73.
Sorex personatus streatori, Osgood 1900:44.

Distribution
Occurs in all but the extreme northern part of the Yukon (Map 7).

Measurements
Average (and extreme) measurements of 16 specimens from the Canol Road area in the southern Yukon are 94 (87–101); 38 (36–41); 12 (11–13).* Eleven specimens from the Dawson–Mayo area measured 90 (83–98); 34 (34–37); 11 (11–12). The weights of 9 specimens from the southern Yukon averaged 4.3 (3.1–5.1) g. Twelve specimens from the northern part of the range of the subspecies had an average weight of 3.5 (2.6–4.6) g. For cranial measurements see Table 4.

Remarks
Shrews of this subspecies become smaller in a cline from the central Yukon to the northern part of the Territory where they intergrade with the smaller *S. c. ugyunak*.

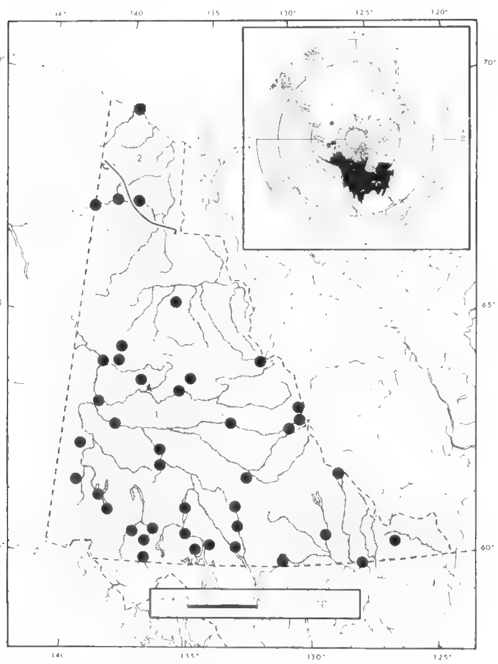
Sorex cinereus cinereus may be distinguished from *S. c. ugyunak* by its greater total length and tail length, and by its darker coloration. In summer pelage, many specimens of *S. c. cinereus* tend to be somewhat tricoloured like *S. c. ugyunak*, but the sides, back, and underparts are all paler, and the tail is much darker dorsally. In winter pelage,

*Measurements are in millimetres throughout.

S. c. cinereus lacks almost all traces of the side stripes that are especially contrasting in *S. c. ugyunak* in comparable pelage. In winter, the upper parts of *S. c. cinereus* are darker than those of *S. c. ugyunak,* and the differences in tail coloration are prominent. In both pelages the light fur of the underparts of *S. c. ugyunak* extends higher on the head, often including the region of the external ear.

Masked shrews have been collected between 800 and 4,100 ft in almost every habitat, from stabilized talus slope to a wet, mossy area. Two females collected in July and August had 6 and 7 embryos respectively.

Records of occurrence
Specimens examined, 179: Old Crow, 4; Rampart House, 4; Hungry Lake, 65°39′/135°59′, 2; Ogilvie Mountains, 48 mi. NE Dawson, 1; *North Fork Pass, Ogilvie Mountains,* 1; *North Fork Crossing, Mi. 43 Aklavik Road* [= *North Fork Crossing, Dempster Highway, Mi. 43*], *Ogilvie Mountains,* 1; Bonnet Plume Lake, 6; Chandindu River, 1 (NMNH); *Dawson,* 3 (1 NMNH); Benson Creek, 28 mi. ENE Dawson, 5; *14 mi. E Dawson City,* 8; Klondike Keno [= 1 mi. S Wernecke], 4; Gravel Lake, 58 mi. E Dawson City, 1; 6 mi. N Mayo, 1; 4½ *mi. N Mayo,* 1; *2 mi. NNE Mayo,* 1; Keele Lake, 13; Stewart River settlement, 1; Macmillan Pass, Canol Road, Mi. 282, 1; forks Macmillan River, 1 (NMNH); south fork Macmillan River, Canol Road, Mi. 249, 1; *Sheldon Lake, Canol Road, Mi. 222,* 3; 50 mi. below Fort Selkirk, 1 (NMNH); Snag Creek, 20 mi. NE Alaska Highway, Mi. 1188, 1; Yukon Crossing, 10; *7 mi. NNW Carmacks,* 1; ½ mi. NW Carmacks, Dawson–Mayo Highway, 1; *1 mi. WSW Carmacks,* 1; *11 mi. WSW Carmacks,* 1; Lapie River, Canol Road, Mi. 132, 8; Little Hyland River, 128 mi. N Watson Lake, 4; Edith Creek, 1 (ROM); *Tepee Lake* 4 (ROM); Rose River, Canol Road, Mi. 95, 4; 5 mi. N Burwash Landing, 1; *Burwash Landing, Alaska Highway, Mi. 1093,* 1 (MCZ); *Kluane Lake,* 2 (CU); Lake Laberge, 1 (NMNH); head Kluane Lake, 1; *Alaska Highway, Mi. 1054,* 2 (CU); *6 mi. SW Kluane,* 1 (KU); *Hungry Lake, 60°59′/138° 10′,* 2 (MCZ); Nisutlin River, Canol Road, Mi. 40, 5; 38 mi. NNW Watson Lake, 1; Kathleen River, 7; *Kathleen Lake, Haines Road, Mi. 142,* 1; Haeckel Hill, 1; *McIntyre Creek,* 2 (KU); *W side Lewes River, 2 mi. S Whitehorse,* 2 (KU); Dezadeash River, 3 mi. S Champagne, 1; Camp 9–W [= Canol Road, Mi. 9], 1 (MVZ); Dezadeash Lake, 4; *SW end Dezadeash Lake,* 5 (KU); *SW end Dezadeash Lake, Haines Road, Mi. 124,* 6; North Toobally Lake, 2; NE shore Little Atlin Lake, 2 (KU); *Little Atlin Lake, 6 mi. SSE Jakes Corner,* 1; *Little Atlin Lake, 8 mi. SSE Jakes Corner,* 1; Tagish River, 13 mi. SW Jakes Corner, 1; *Chooutla Lake, 4 mi. ENE Carcross,* 1; *Carcross,* 2; *Caribou Crossing* [= *Carcross*], 3 (NMNH); *1 mi. S Carcross,* 3; 5 mi. SE Dalton Post, 3; *1½ mi. S and 3 mi. E Dalton Post,* 10 (KU); Alcan 88E Teslin [= Alaska Highway, 88 mi. E Teslin], Upper Rancheria, 1; Alaska Highway, 313 mi. N Nelson, B.C. [near Irons Creek], 1.



Map 7
Distribution of *Sorex cinereus*
1 *S.c. cinereus*
2 *S.c. ugyunak*

Table 4
Cranial measurements of *Sorex cinereus*

Number of specimens averaged or catalogue number, and sex	Condylo-basal length	Cranial breadth	Least inter-orbital breadth	Palatal length	Maxillary breadth	Maxillary tooth-row
Sorex cinereus cinereus Old Crow						
29853 ♀	15.3		2.8	6.2	4.1	5.7
29854 ♂			3.0	6.3	4.1	5.6
29855 ♂	16.0	7.6	3.0	6.5	4.1	5.8
29857 ?	15.2	7.7	2.9	6.2	4.1	5.8
Dawson–Mayo region						
Average 11 (8 ♂, 2 ♀, 1 ?)	15.9^{10}	7.7	2.9^{10}	6.5	4.0^{9}	5.8
Max.	16.3	8.0	3.0	6.8	4.2	6.1
Min.	15.5	7.4	2.8	6.2	3.9	5.8
SD	0.31	0.16	0.08	0.15	0.10	0.13
SE	0.93	0.05	0.03	0.05	0.03	0.04
Keele Lake						
Average 6 (2 ♂, 3 ♀, 1 ?)	15.9	7.9	2.9^{5}	6.5	4.1^{5}	5.9
Max.	16.1	8.0	3.0	6.7	4.2	6.0
Min.	15.6	7.7	2.8	6.4	4.0	5.9
SD	0.22	0.12	0.07	0.10	0.09	0.05
SE	0.09	0.05	0.03	0.04	0.04	0.02
Canol Road region						
Average 14 (4 ♂, 7 ♀, 3 ?)	15.8		2.9	6.5^{13}	4.1^{12}	5.8^{13}
Max.	16.0		3.0	6.6	4.2	6.0
Min.	15.5		2.8	6.3	4.0	5.7
SD	0.14		0.09	0.12	0.06	0.13
SE	0.04		0.02	0.03	0.02	0.03
Sorex cinereus ugyunak Tuktoyaktuk, N.W.T.						
Average 20 (8 ♂, 8 ♀, 4 ?)	14.8^{18}	7.4^{18}	2.8	6.1	4.1^{19}	5.5^{19}
Max.	15.3	7.6	3.0	6.4	4.2	5.7
Min.	14.5	7.0	2.3	5.9	3.9	5.2
SD	0.24	0.14	0.15	0.13	0.09	0.12
SE	0.06	0.03	0.03	0.03	0.02	0.03
Head Point, near Herschel Island						
24445 ♀	15.6	8.2	3.0	6.3	4.2	5.5
Driftwood River, 60 mi. NE Old Crow						
29856 ♂			3.0	6.2	4.5	5.7

Sorex cinereus ugyunak Anderson and Rand

Sorex cinereus ugyunak Anderson and Rand, 1945*b*:62; holotype from Tuktuk (Tuktuyaktok) [=Tuktoyaktuk], NE side of Mackenzie River Delta, S of Toker Point, District of Mackenzie, N.W.T.; Youngman 1964:2 (part).
Sorex cinereus cinereus, Youngman 1964:1 (part).

Distribution
Extreme northern part of the Yukon (Map 7).

Measurements
A male from Driftwood Creek, 60 mi. NE Old Crow, and a female from Head Point near Herschel Island measured respectively 92, 87; 31, 26; 11, 10. No weights have been recorded for specimens from the Yukon. For cranial measurements see Table 4.

Remarks
For differences between *Sorex cinereus ugyunak* and *S. c. cinereus,* see the subspecies account of the latter. The two specimens of *S. c. ugyunak* from the Yukon are, cranially, slightly larger than specimens from Tuktoyaktuk. In this way they resemble specimens from the southern slope of the Brooks Range, Alaska (Bee and Hall 1956: 15). Otherwise, the Yukon specimens closely resemble topotypical specimens. In colour, the Yukon specimens show little evidence of intergradation with *S. c. cinereus.*

It is interesting to note that *Sorex cinereus cinereus* exists at Aklavik, in the wooded region of the Mackenzie River Delta (Youngman 1964: 1), while *S. c. ugyunak* occurs approximately 96 miles to the northeast at Tuktoyaktuk.

Macpherson (1965) postulated a Beringian origin for *Sorex cinereus ugyunak.* This seems especially likely if Stroganov's (1957) identifications of *Sorex cinereus* from Anadyr and Yakutsk, Siberia, are correct. Hoffman and Peterson (1967) also claimed a Beringian origin for some populations of *Sorex cinereus* that resulted in the evolution of Asian populations, and of *S. c. ugyunak* and *S. c. hollisteri* (?) on the North American mainland, and of *Sorex pribilofensis* and *S. c. jacksoni* on St. Paul Island and St. Lawrence Island respectively.

Records of occurrence
Specimens examined, 2: Head Point, near Herschel Island, 1; Driftwood Creek [= Driftwood River], 60 mi. NE Old Crow, 1.

Sorex arcticus – Arctic shrew

Sorex arcticus arcticus Kerr

Sorex arcticus Kerr, 1792:206; type locality, settlement on Severn River, Hudson Bay, now known as Fort Severn, Kenora District (55°59′/87°38′), Ont.

Distribution
Known only from Yukon Crossing (Map 8). This species should be looked for in wooded portions of the southern half of the Yukon.

Measurements
No external measurements are available from the specimen from the Yukon. For cranial measurements see Table 5.

Remarks
Sorex arcticus, in the Yukon, is represented by only one skull collected by Mrs. Sue Cerny from Yukon Crossing. This skull is larger than that of any specimen of *Sorex arcticus* known to me from North America. A comparison of this specimen with a series of *Sorex arcticus arcticus* from Edmonton, Alberta, shows that the probability of exceeding the observed value of *t.* is much smaller than .001 for all cranial measurements.

Conclusions based on a single specimen must necessarily be tentative, but there is nothing about the Yukon Crossing specimen to suggest that it is abnormal in size. The large size of this specimen indicates that it may represent an undescribed subspecies of *Sorex arcticus.*

Record of occurrence
Specimens examined, 1: Yukon Crossing vicinity, 1.

Sorex tundrensis – Tundra shrew

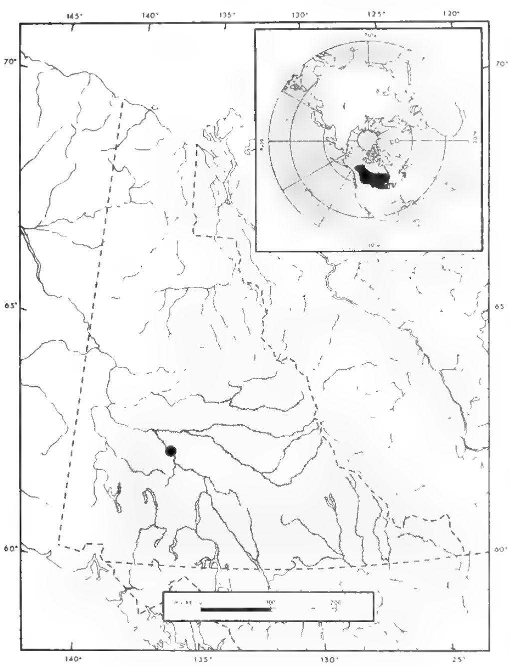
Sorex tundrensis Merriam
Sorex tundrensis Merriam, 1900*a*:16; holotype from St. Michael, Alaska; Jackson 1928:72; Osgood 1900:45; Osgood 1909*b*:58; Rand 1945*b*:11; R. M. Anderson 1947:16.
Sorex arcticus tundrensis, Bee and Hall 1956:22; Hall and Kelson 1959:44; Youngman 1964:2.

Distribution
Known only from the northern half of the Yukon (Map 9).

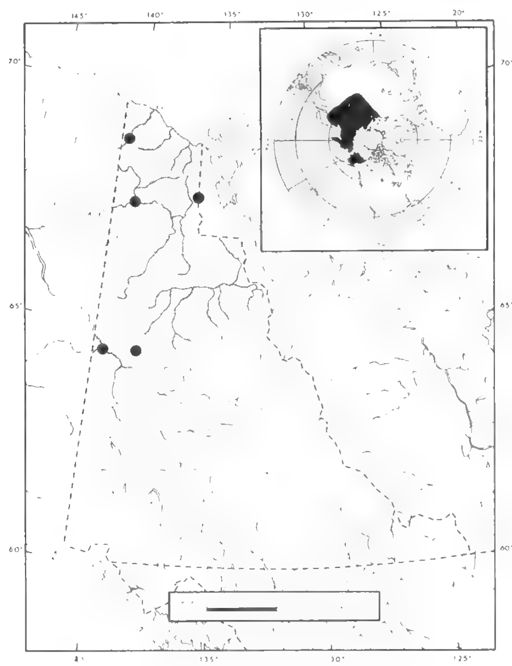
Measurements
A male from the Firth River, a female from Old Crow, and a female from near Chapman Lake measured respectively 98, 97, 115; 30, 29, 36; 19, 13, 13; 5.8 g, 5.6 g, —. For cranial measurements see Table 5.

Remarks
Jackson (1928:72) described *Sorex tundrensis* as differing from *Sorex arcticus* in colour and in being smaller, with a shorter tail, smaller skull, smaller and lower rostrum, shorter mesopterygoid space, smaller postglenoid processes, shorter palate, and smaller teeth. He stated further, "In none of the specimens of *S. tundrensis* has anything been observed that can be construed to be an approach toward *S. arcticus*. Although *S. tundrensis* occurs at Fort Anderson, Northwest Territories, and *S. a. arcticus* at Fort Norman, only a comparatively short distance away, the two forms retain their characters and do not differ appreciably from specimens from their respective type regions."

Bee and Hall (1956:22) considered *Sorex tundrensis* to be conspecific with *Sorex arcticus* since they could find no difference in length of mesopterygoid space or size and height of rostrum, and indicated that palatal length and length of maxillary tooth-row differed by only one-tenth of a millimetre. I agree that the length of mesopterygoid space and size and height of rostrum do not appear to differ (these are difficult characters to measure), nor can I find a difference in



Map 8
Distribution of *Sorex arcticus arcticus*



Map 9
Distribution of *Sorex tundrensis*

Table 5
Cranial measurements of *Sorex arcticus* and *Sorex tundrensis*

Number of specimens averaged or catalogue number, and sex	Condylo-basal length	Cranial breadth	Least inter-orbital breadth	Palatal length	Maxillary breadth	Maxillary tooth-row
			Sorex tundrensis St. Michael, Alaska			
Average 15 NMNH (4♂,8♀,3?)	18.0^{10}	9.1^{9}	3.4^{14}	7.4	5.0^{6}	6.6
Max.	18.4	9.3	3.5	7.7	5.2	6.9
Min.	17.7	8.9	3.2	7.1	4.8	6.4
SD	0.25	0.14	0.07	0.16	0.13	0.13
SE	0.08	0.05	0.02	0.04	0.05	0.03
			Northern Alaska (Umiat; Bettles)			
Average 7 NMNH (5 ♂, 2 ?)	17.9^{6}	9.0^{6}	3.5^{7}	7.3^{6}	5.0^{5}	6.5
Max.	18.3	9.3	3.6	7.5	5.1	6.6
Min.	17.5	8.8	3.3	7.0	4.8	6.3
SD	0.26	0.19	0.09	0.21	0.13	0.10
SE	0.11	0.08	0.03	0.08	0.06	0.04
			Northeastern Alaska (Eagle – Circle – Charlie Creek area)			
Average 13 NMNH (6 ♂, 7 ♀)	17.9	9.1	3.5	7.3	5.1^{11}	6.6
Max.	18.5	9.4	3.6	7.5	5.2	6.8
Min.	17.2	8.7	3.4	7.0	4.9	6.4
SD	0.33	0.22	0.09	0.13	0.13	0.12
SE	0.09	0.06	0.02	0.04	0.04	0.03
			Aklavik, N.W.T.			
Average 13 (7 ♂, 6 ♀)	17.8	9.0^{12}	3.6	7.4	5.2^{9}	6.6
Max.	18.4	9.4	3.8	7.8	5.2	7.0
Min.	17.3	8.5	3.4	7.1	5.1	6.5
SD	0.27	0.26	0.08	0.22	0.05	0.15
SE	0.07	0.07	0.02	0.06	0.02	0.04
			Tuktoyaktuk, N.W.T.			
Average 42 (13 ♂, 29 ♀)	17.5^{37}	8.9^{34}	3.5^{40}	7.1^{39}	5.0	6.5
Max.	18.0	9.5	3.7	7.5	5.2	6.7
Min.	17.0	8.6	3.2	6.8	4.8	6.0
SD	0.23	0.21	0.12	0.13	0.11	0.14
SE	0.04	0.03	0.02	0.02	0.02	0.02
			Old Crow			
33695 ♀	18.1	9.0	3.7	7.4	5.0	6.6
			20 mi. S Chapman Lake			
29384 ♀	17.9	9.3	3.5	7.4	4.9	6.6
			Forty Mile			
147392 NMNH, ♂	18.2	9.4	3.5	7.3	4.8	6.5

Number of specimens averaged, or catalogue number, and sex	Condylo-basal length	Cranial breadth	Least inter-orbital breadth	Palatal length	Maxillary breadth	Maxillary tooth-row
			Sorex arcticus arcticus Yukon Crossing			
33419 ♀	20.3	10.4	4.1	8.6	5.5	7.8
			Fort Norman, N.W.T.			
Average 4 (3 AMNH, 1 NMNH)	18.9	9.4	3.5	7.8	5.2^{3}	7.0
Max.	19.2	9.5	3.6	8.1	5.3	7.0
Min.	18.7	9.1	3.4	7.6	5.2	7.0
			25 mi. S Fort Rae, N.W.T.			
110048 NMNH, ♀	18.7	9.3	3.5	7.8	5.2	7.1
110050 NMNH, ♀	18.8	9.3	3.4	7.6	5.1	7.0
110062 NMNH, ♀	18.3	8.9	3.5	7.5	5.1	6.9
			Fort Simpson, N.W.T.			
133751 NMNH, ♀	19.3	9.5	3.6	8.0		7.0
133758 NMNH, ♀	18.6	9.4	3.5	7.8	5.2	7.0
			Slave River, 10 mi. below Peace River, N.W.T.			
115829 NMNH, ♂	19.3		3.4	8.0	5.3	7.6
			Swampy Lake, N.W.T.			
107040 NMNH, ♀	19.7	9.6	3.4	8.0		7.1
			Vicinity Edmonton, Alta.			
Average 24 (9 ♂, 11 ♀, 4 ?)	18.9^{23}	9.4^{22}	3.4	7.7	5.1^{13}	7.1
Max.	19.4	9.6	3.6	8.1	5.3	7.3
Min.	18.5	9.1	3.3	7.2	5.1	6.8
SD	0.26	0.13	0.09	0.20	0.06	0.13
SE	0.05	0.03	0.02	0.04	0.02	0.03

the size of the postglenoid processes. However, when specimens of *Sorex arcticus* from Edmonton, Alberta (which do not differ significantly from specimens from other provinces in Canada) are compared with specimens of *Sorex tundrensis* from Tuktoyaktuk, N.W.T., all external measurements except length of hind foot, and all cranial measurements except least interorbital breadth and maxillary breadth differ greatly (92–100 per cent joint non-overlap).

Specimens of *Sorex tundrensis* from the Eagle–Circle–Charlie Creek areas of Alaska, and specimens from the central Yukon, all at the southern edge of the range of the species, average slightly larger than specimens from Tuktoyaktuk. Nevertheless, these southern specimens of *S. tundrensis* differ greatly from the series of *S. arcticus* from Edmonton, approaching them only in cranial breadth (> 75 per cent joint non-overlap) in addition to the previously mentioned measurements of hind foot, least interorbital breadth, and maxillary breadth. Thus, contrary to the situation in Alaska (Bee and Hall 1956:23), specimens of *Sorex tundrensis* become larger in the southern portion of their range—the Yukon and eastern Alaska—whereas if the specimen of *Sorex arcticus* from Yukon Crossing is representative, *S. arcticus* becomes larger in the northwestern (Yukon) part of its range.

In addition to the differences in size between *Sorex arcticus* and *S. tundrensis*, the unicuspids average 38 per cent of the toothrow in the former, but 35 per cent in the latter (significant at the .01 per cent level). The auditory ossicles of the two species also differ. In ventral view, the union of the head of the malleus with the slender process of the malleus in *S. tundrensis* is incised, while in *S. arcticus* the margin is more gradually curved (Figure 4).

I agree with Rand (1954:32) that the distribution, ecology, and divergence of *Sorex tundrensis* and *Sorex arcticus* suggest Beringian and southern origins respectively. The present distribution of *S. tundrensis* is completely within the boundaries of Beringia, while *S. arcticus* occurs in the boreal forest in areas previously covered by Wisconsin glaciers. *Sorex arcticus* is also known from Pleistocene deposits from sites in Oklahoma and Virginia (Guilday 1962:98).

A specimen from 20 mi. S Chapman Lake was collected in alpine tundra at 5,500 ft (Figure 3), in association with *Dicrostonyx torquatus, Microtus oeconomus, Clethrionomys rutilus,* and *Sorex obscurus.* A specimen from the Firth River, 15 mi. S mouth Joe Creek was in tundra at 1,560 ft in association with *Microtus miurus* and *Microtus oeconomus.*

Records of occurrence
Specimens examined, 7: Firth River, 15 mi. S mouth Joe Creek,1; Summit Lake, 67°43′/136°29′, 3; Old Crow, 1; 20 mi. S Chapman Lake, 1; Forty Mile, 1 (NMNH).

Sorex obscurus – Dusky shrew

Sorex obscurus obscurus **Merriam**
Sorex vagrans similis, Merriam 1891:34; holotype from Timber Creek, 8,200 ft, Salmon River Mts. [now Lemhi Mts.] 10 mi. W Junction [near present town of Leadore] Lemhi County, Idaho.
Sorex obscurus, Merriam 1895:72, a renaming of *S. vagrans similis.*
Sorex obscurus obscurus, Osgood 1900:45; Jackson 1928:117; Rand, 1945*a*:24; Rand 1945*b*:12; R. M. Anderson 1947:18; Baker 1951:93; Youngman 1968:73.
Sorex vagrans obscurus, Findley 1955:43.

Distribution
Probably occurs throughout the Yukon (Map 10).

Measurements
Average (and extreme) measurements of 20 males and 20 females from southeastern Yukon are respectively 109 (100–115), 111 (100–120); 44 (41–48), 43 (39–50); 13 (12–14), 13 (12–14).

An adult male from Old Crow, and 2 adult males from Little Hyland River, 128 mi. N Watson Lake, weighed 5.8, 6.6, and 7.5 g. Two nonparous adult females from Keno

Table 6
Cranial measurements of *Sorex obscurus obscurus* and *Sorex palustris*

Number of specimens averaged or catalogue number, and sex	Condylo-basal length	Cranial breadth	Least inter-orbital breadth	Palatal length	Maxillary breadth	Alveolar length of maxillary tooth-row
			Sorex obscurus obscurus Old Crow			
29858 ♂	17.6	8.8	3.6	7.2	5.1	6.7
			2 mi. S Chapman Lake			
29396 ♀	17.5	8.7	3.8	7.3	5.5	6.6
29397 ♀	17.3	8.6	3.7	7.0	5.1	6.5
33696 ♀	17.6	8.7	3.7	7.4	5.0	6.7
			SW Yukon			
28518 KU, ♀	16.7	8.8	3.4	6.9		6.3
18184 ♂	16.2	8.7	3.6	6.8	4.9	6.0
29402 ♀	17.4	8.5	3.7	7.2	5.0	6.5
29403 ♂	17.7	8.8	3.8	7.3	5.0	6.7
28524 ♂	17.5	8.6	3.5	7.5	4.9	6.6
			SE Yukon			
Average 19 ♂	17.0	8.6[16]	3.6	7.1	5.0[18]	6.5
Max.	17.4	9.0	3.8	7.4	5.3	6.8
Min.	16.2	8.1	3.5	6.7	4.8	6.0
SD	0.28	0.23	0.08	0.18	0.13	0.18
SE	0.06	0.06	0.02	0.04	0.03	0.04
Average 14 ♀	17.2	8.6[10]	3.6	7.1	5.1	6.6[13]
Max.	17.5	9.1	3.9	7.4	5.3	6.8
Min.	16.8	8.2	3.4	6.9	4.9	6.4
SD	0.21	0.28	0.13	0.15	0.12	0.13
SE	0.06	0.09	0.04	0.04	0.03	0.04
			Sorex palustris navigator Southern Yukon			
Average 16 (10 ♂, 6 ♀)	19.7	9.8[15]	3.8	8.5	5.8[15]	7.6
Max.	20.2	10.2	4.0	8.9	6.1	8.0
Min.	18.6	9.4	3.7	8.0	5.5	7.3
SD	0.41	0.25	0.11	0.23	0.17	0.18
SE	0.10	0.06	0.03	0.06	0.04	0.04

Summit and Little Hyland River, 128 mi. N Watson Lake, weighed 5.4 and 6.3 g. For cranial measurements see Table 6.

Remarks

The dusky shrew is remarkably constant in colour and size throughout its range in the Yukon.

Although the northernmost specimen from the Yukon is from Old Crow, a record from Tuktoyaktuk, N.W.T. (Banfield 1960) suggests that this species also inhabits the extreme northern Yukon.

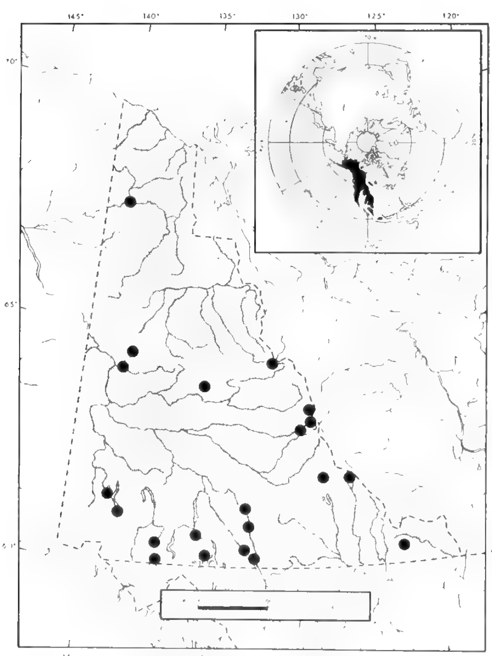
I agree with Findley (1955:23) that *Sorex obscurus* is a postglacial immigrant to Alaska, Yukon Territory, and the Northwest Territories, from the south. Good (1966) has shown that *S obscurus* in southeastern Alaska was one of the earliest invaders of recently deglaciated terrain.

The dusky shrew has been trapped in moist habitat in grass, deep moss, and dwarf alder between 1,300 and 6,400 ft.

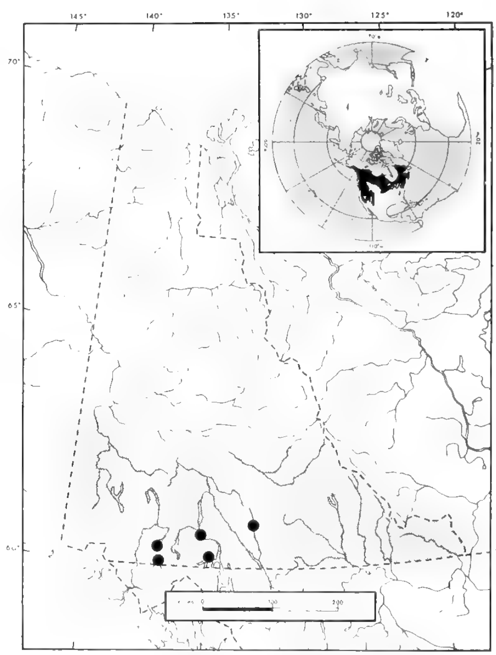
Nine and 10 embryos were found in 2 females in mid-June in the southeastern Yukon.

Records of occurrence

Specimens examined, 92: Old Crow, 1; 20 mi S Chapman Lake, 3; Bonnet Plume Lake, 18; 14 mi E Dawson, 1; *junction Klondike River and North Klondike River,* 1; Keno Summit, 1; Klondike Keno [= *1 mi. S Wernecke*], *Keno Hill,* 2; Keele Lake, 1; Macmillan Pass, Canol Road, Mi. 282, 2; south fork Macmillan River, Canol Road, Mi. 249, 5; *Sheldon Lake, Canol Road, Mi. 222,* 8; Ida Lake [=McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 4 (AMNH); Little Hyland River, 128 mi N Watson Lake, 5; Rose River, Canol Road, Mi. 95, 10; Burwash Landing, 1; Christmas Creek, Alaska Highway, Mi 1048, 1 (CU); *Kluane range, 25 mi. SSE Destruction Bay,* 2; Nisutlin River, Canol Road, Mi. 40, 9; Haeckel Hill, 8 mi. NW Whitehorse, 1; *Haeckel Hill,* 1; *McIntyre Creek,* 1 (KU); Canol Road, Mi. 11, 5; Dezadeash Lake, 2; *SW end Dezadeash Lake,* 1 (KU); North Toobally Lake, 3; 1½ mi. S Carcross, 1; Teslin Post, near Teslin Lake, 1; 1½ mi. S and 3 mi. E Dalton Post, 1 (KU).



Map 10
Distribution of *Sorex obscurus obscurus*



Map 11
Distribution of *Sorex palustris navigator*

Sorex palustris – Water shrew

Sorex palustris navigator (Baird)

Neosorex navigator, Baird 1857:11; holotype from near head Yakima River, Cascade Mts., Wash.
Sorex palustris navigator, Merriam 1895:92; Rand 1945*a*:25; Rand 1945*b*:12; Baker 1951:94; Cameron 1952:178; Hall and Kelson 1959:39.

Distribution
Southern Yukon Territory (Map 11).

Measurements
Average (and extreme) measurements of 16 specimens (10 males, 6 females) from the southern Yukon are 151 (143–163); 72 (67–76); 20 (19–21). A male from 2 mi. S Carcross weighed 11.2 g. For cranial measurements see Table 6.

Remarks
Three specimens from Nisutlin River, Canol Road, Mi. 40, collected in late July, closely resemble topotypes and near topotypes of *Sorex palustris navigator* (Black, Munsell value 2). Two specimens from Carcross are considerably lighter (Black, Munsell values 2.7 and 3.5).

Water shrews have been collected from only a few localities in the Yukon. Further collecting in the southern part of the Territory, along streams, edges of lakes, and marshes, may show that the species ranges slightly farther north.

Records of occurrence
Specimens examined, 22: Nisutlin River, Canol Road, Mi. 40, 3; McIntyre Creek, 3 mi. NW Whitehorse, 11 (KU); SW end Dezadeash Lake, 2 (KU); Carcross, 1; *1 mi. S Carcross,* 1; 1½ mi. S and 3 mi. E Dalton Post, 4 (KU).

Microsorex hoyi – Pygmy shrew

Microsorex hoyi intervectus Jackson

Microsorex hoyi intervectus, Jackson 1928:125; holotype from Lakewood, Oconto County, Wis.; Rand 1944*b*:35; Rand 1945*a*:25; R. M. Anderson 1947:22; Hall and Kelson 1959:51; Youngman 1964:2, 1968:74.

Distribution
Known only from the southern half of the Yukon (Map 12).

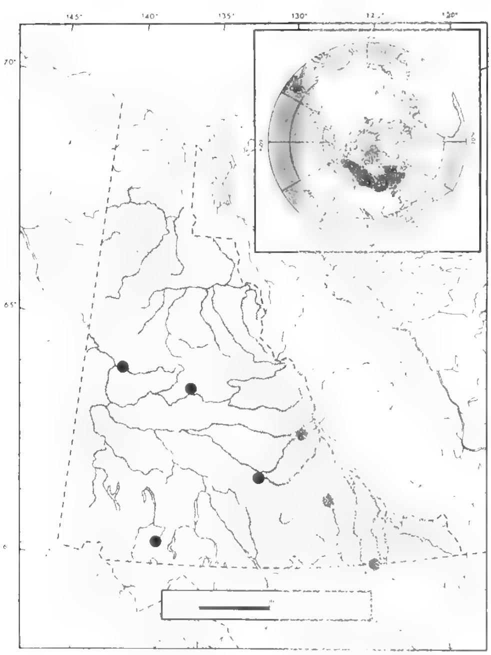
Measurements
Measurements of 2 males and 2 females from Dezadeash Lake are respectively 92, 89, 85, 88; 30, 29, 28, 29; 11, 11, 10, 11. A nonparous female from 6 mi. N Mayo measured 71; 28; 10; 4.2 g, and a male from 14 mi. E Dawson measured 88; 31; 10; 5.3 g. For cranial measurements see Table 7.

Remarks
Specimens of *Microsorex hoyi intervectus* from most of the Yukon closely resemble those from the type locality both cranially and in colour (mass effect of upper parts Very Dark Brown, 7.5YR 3/2). The specimen from 14 mi. E Dawson has a slightly more grizzled appearance than others from the Yukon probably because it was overstuffed. The previously published cranial measurements for this specimen (NMC 30646) are incorrect (Youngman 1964:2). The correct measurements are given in Table 7. As previously pointed out (Youngman 1964), the cranial measurements of this specimen are larger than those of all others from the Yukon, perhaps indicating intergradation with *M. h. eximius* in Alaska. *Microsorex hoyi eximius* is, however, a weakly defined subspecies. Further studies might show that *M. h. eximius* is merely at one end of a slight cline in size and colour.

Records of occurrence
Specimens examined, 15: 14 mi E Dawson City, 1; 6 mi. N Mayo, 1; Sheldon Lake, Canol Road, Mi. 222, 3; Lapie River, Canol Road, Mi. 132, 3; Frances Lake, 1; Dezadeash Lake, 4; Liard Valley, Alaska Highway, 313 Mi. N Nelson, B.C. [near Irons Creek], 2.

Table 7
Cranial measurements of *Microsorex hoyi intervectus*

Number of specimens averaged or catalogue number, and sex	Condylo-basal length	Cranial breadth	Least inter-orbital breadth	Palatal length	Maxillary breadth	Maxillary tooth-row
			14 mi. E Dawson			
30646 ♂	15.1	7.1	3.2	5.7	4.6	4.9
			Canol Road (Lapie River and Sheldon Lake)			
Average 6 (1 ♂, 3 ♀, 2 ?)	14.3[5]	6.7[2]	3.0	5.6	4.3	5.2
Max.	14.5	6.9	3.1	6.0	4.4	5.3
Min.	14.0	6.5	2.8	5.4	4.1	5.1
SD	0.20		0.10	0.21	0.12	0.07
SE	0.09		0.04	0.08	0.05	0.03
			Frances Lake			
24116	14.4		2.9	5.6	4.5	5.1
			Dezadeash Lake			
Average 4 (2 ♂, 2 ♀)	14.4		3.0	5.3[3]	4.5[3]	5.0
Max.	14.6		3.0	5.6	5.0	5.1
Min.	14.3		2.9	5.4	4.2	4.9



Map 12
Distribution of *Microsorex hoyi intervectus*

Order CHIROPTERA – Bats

Family **Vespertilionidae** – Vespertilionid Bats
Myotis lucifugus – Little brown bat

***Myotis lucifugus pernox* Hollister**
Myotis pernox Hollister, 1911*b*:4; holotype from Henry House, Alta.
Myotis lucifugus pernox, Crowe 1943:395.
Myotis lucifugus, Osgood 1900:45.
Myotis lucifugus lucifugus, Miller and Allen 1928:47; Rand 1945*b*:14; Cameron 1952:179; Hall and Kelson 1959:161.

Distribution
The southern half of the Yukon at least as far north as Dawson (Map 13).

Measurements
Average (and extreme) measurements of 7 specimens (4 males, 3 females) from ½ mi. E Mayo are 92 (89–100); 42 (39–48); 11 (10–12); 14 (13–15); forearm, 38 (36.5–40.1); weight, 9.1 (7.9–9.6) g. A male and nonparous female from Nordenskiold River, 1 mi. NW Carmacks, measured respectively 84, 96; 33, 37; 10, 11; ear, 11, 16; forearm, 38.4, 38.5; weight, 9.3, 11.0 g. For cranial measurements see Table 8.

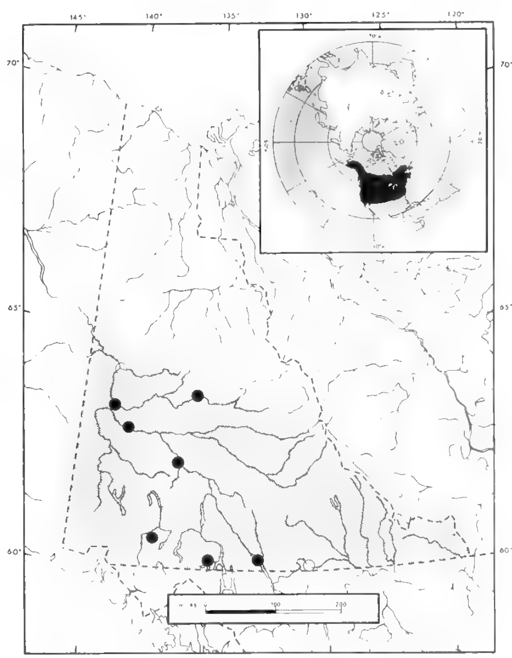
Remarks
Specimens of *Myotis lucifugus pernox* from the Yukon Territory closely resemble the holotype, a topotype, and near topotypes both in colour and measurements. Specimens from the Yukon average larger than specimens of *M. l. lucifugus* and *M. l. alascensis* in all cranial measurements.

The range of *Myotis lucifugus pernox* extends from western Alberta, south-central District of Mackenzie, the Northwest Territories (Salt River, NMC 6291) and northern British Columbia (Lower Post; Screw Creek, 10 mi. S 50 mi. E Teslin Lake, Yukon Territory; NE end Muncho Lake) through the southern half of the Yukon into interior Alaska.

Bats are not conspicuous in the northern part of their range in the Yukon during the bright nights of early summer. Most specimens were shot in late summer at dusk, or were found roosting in cabins and caches during the daytime. On one occasion I watched a bat fly into a cabin in the bright light of dawn.

Owing to the severe winters and the almost complete absence of caves, bats may not overwinter in the Yukon. On 14 August 1965, a cache at Kathleen River, at the foot of Kathleen Lake, held only 4 bats (including an immature, not able to fly), the main breeding colony of several hundred having left several days earlier.

Records of occurrence
Specimens examined, 61: Mayo Landing, 1; *½ mi. E Mayo,* 39; Stewart River, 5; 50 mi. below Fort Selkirk, 1 (NMNH); Nordenskiold River, 1 mi. NW Carmacks, 3; Kathleen River, 1; *Haines Junction,* Alaska



Map 13
Distribution of *Myotis lucifugus pernox*

Highway, 1; *Kathleen River, foot Kathleen Lake,* 8; near Teslin Lake, 1; Caribou Crossing [= Carcross], 1 (NMNH).

Additional records
Dawson, 1961 (seen, P.M. Youngman, MS); North Toobally Lake, 15 July 1961 (seen P.M. Youngman, MS); Rancheria River, (Rand 1945*b*:14).

Table 8
Cranial measurements of *Myotis lucifugus pernox*

Catalogue number, and sex of specimens	Greatest length of skull	Zygomatic breadth	Breadth of braincase	Length of tooth-row	Maxillary breadth at M3
		½ mi. E Mayo			
35280 ♀	15.0		7.9	6.5	5.6
35281 ♀	15.6	9.4	8.2	6.0	6.0
35284 ♂	15.2	9.5	7.9	6.7	6.0
		Nordenskiold River, 1 mi. NW Carmacks			
34793 ♀	15.9	9.4	8.2	6.9	6.4
34791 ♂	15.1	9.2	8.0	6.7	5.8
34792 ♂	15.0		7.7	6.7	5.7
		Caribou Crossing [= Carcross]			
99363 NMNH, ♀	15.0		7.9	6.6	5.7
		Kathleen River, foot of Kathleen Lake			
34787 ♀	15.4	9.5	8.2	6.8	6.0
34784 ♂	15.0	9.0	7.8	6.4	5.7

Order LAGOMORPHA – Pikas and hares

Key to Yukon Lagomorphs

1 Hind legs scarcely larger than forelegs; hind foot less than 37 mm; nasals widest anteriorly; no supraorbital process on frontal; 5 cheek-teeth on each side above . . . . *Ochotona princeps*, p. 55

1′ Hind legs notably larger than forelegs; hind foot more than 40 mm; nasals widest posteriorly; supraorbital process on frontal; 6 cheek-teeth on each side above . . . . *Lepus americanus*, p. 57

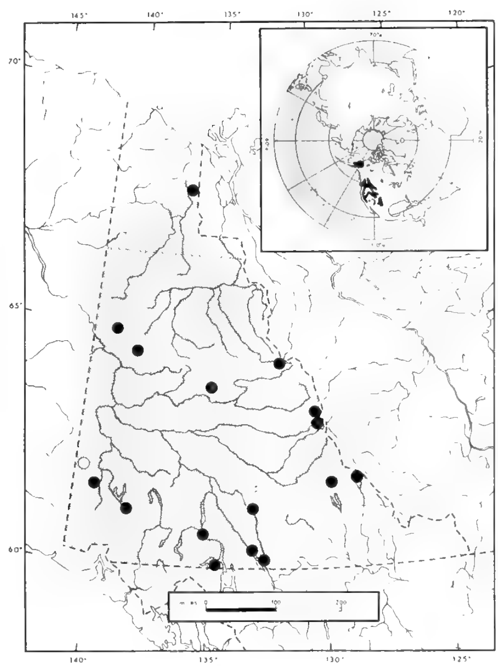
Family **Ochotonidae** – Pikas
Ochotona princeps – Pika

Ochotona princeps collaris **(Nelson)**
Lagomys collaris Nelson, 1893:117; holotype from near head of Tanana River, Alaska.
Ochotona princeps collaris, Youngman 1968:74.
Ochotona collaris, Osgood 1909*b*:56; A. H. Howell 1924:34; Rand 1945*a*:47; Rand 1945*b*:72; R. M. Anderson 1947:94; Baker 1951:95; Hall 1951*a*:126; Banfield 1961*a*:131; Youngman 1964:2, 1968:74.

Distribution
Mountainous areas throughout most of the Yukon (Map 14).

Measurements
Average (and extreme) measurements of total length, hind foot, and ear of 6 males and 9 females from several localities in the Ogilvie Mountains are respectively 175 (155–190), 170 (154–187); 31 (30–35), 31 (29–34); 21 (19–22), 21 (19–24). Average weights of 8 males and 6 nonparous females from various localities in the Yukon are respectively 150 (142–156), 146 (138–154) g. For cranial measurements see Table 9.

Remarks
On the basis of morphology, behaviour, and habitat, Broadbooks (1965:332) suggested that *Ochotona princeps* and *O. collaris* might be conspecific. Characters previously used to separate *Ochotona collaris* from *O. princeps* (Hall 1951*a*; Hall and Kelson 1959; A. H. Howell 1924) can be summarized as follows: (1) underparts of *O. collaris* are creamy white, lacking the buffy wash of *O. princeps;* (2) *O. princeps* lacks the distinct greyish "collar" on the shoulders of *O. collaris;* (3) the interpterygoid fossa of *O. collaris* is "broader and more spatulate, its sides not parallel, but expanding slightly near anterior end and constricting pos-



Map 14
Distribution of *Ochotona princeps collaris*

Table 9
Cranial measurements of *Ochotona princeps collaris*

Number of specimens averaged, and sex	Occipito-nasal length	Zygomatic breadth	Breadth of braincase	Least interorbital breadth	Width of palatal bridge	Length of nasals	Alveolar length of maxillary tooth-row
Central Yukon (Wernecke Mountains, Ogilvie Mountains)							
Average 14 (7 ♂, 7 ♀)	43.5[13]	22.1[13]	17.8[12]	5.6	2.5	13.4[13]	8.5
Max.	44.6	22.6	19.4	6.1	2.6	14.0	8.9
Min.	41.2	21.6	16.6	5.3	2.2	12.7	8.1
SD	0.89	0.33	0.86	0.25	0.13	0.36	0.22
SE	0.25	0.09	0.25	0.07	0.03	0.10	0.06
Southwestern Yukon (Keele Lake, Canol Road)							
Average 16 (8 ♂, 8 ♀)	44.5[15]	22.4	18.1	5.6	2.5	13.6	8.8
Max.	45.7	23.5	19.3	6.0	2.8	14.0	9.4
Min.	43.1	21.5	16.3	5.4	2.2	13.0	8.3
SD	0.88	0.54	0.84	0.24	0.22	0.29	0.29
SE	0.23	0.13	0.21	0.06	0.05	0.07	0.07

teriorly" (A. H. Howell 1924:35); (4) the skull of *O. collaris* is relatively broad; (5) the tympanic bullae of *O. collaris* are large.

The underparts of *Ochotona collaris* are whiter than any subspecies of *O. princeps.* However, this condition is approached by some specimens of the similar *O. p. princeps* and, to a lesser degree, by *O. p. fennisex.* The greyish collar of *O. collaris* is duplicated to some extent by specimens of *O. p. fennisex* from British Columbia, but it is largely lacking in the other subspecies of *O. princeps.* These characters are, at best, useful only at the subspecific level.

The only cranial character separating *Ochotona collaris* and *O. princeps* is the large bullae of the former, but differences of greater magnitude may be found between subspecies of *O. princeps.* Compared with specimens of *O. princeps* from Hanceville, B.C., specimens of *O. collaris* from various parts of the Yukon do not have broader skulls, the nasals are not significantly shorter, there are no differences in the interpterygoid fossa. *Ochotona collaris* is, therefore, considered conspecific with *O. princeps* and should be considered as a subspecies of the latter.

Gureev (1946) considered *Ochotona princeps, O. collaris* and the Eurasian *O. hypoborea* (Pallas) to be conspecific with *O. alpina* (Pallas). However, the diploid chromosome number for both *O. princeps* (Adams 1971) and *O. collaris* (Rausch and Ritter 1973) is 68, whereas the diploid chromosome number of *O. hypoborea* is 40 (Vorontsov and Lyapunova 1969). Vorontsov and Ivanitskaya (1973) suggested that the obvious close relationship is between *O. princeps* and the Eurasian plains–steppe species *O. pusilla* (Pallas) (also 2 n = 68).

Ochotona princeps collaris occupies the largest area of any subspecies of pika in North America and shows no geographical variation. This indicated to Broadbooks (1965) that *O. p. collaris* owes its origin to isolation in Beringia. It is separated from the nearest known populations of *O. p. princeps* by 500 miles of country in which pikas are not known.

Pikas have been collected in the Yukon between 2,300 and 6,000 ft, usually in talus, but often in exposed fractured rock. A specimen collected by Miss H. Tinker near the shore of Cultus Bay, Kluane Lake, had a burrow just above water level under six-inch willows in grass and horsetail (H. Tinker, fieldnotes).

Few pregnant pikas have been collected in the Yukon. Two lactating females were collected in the Ogilvie Mountains, one on 12 June 1961, the other on 16 July 1963. A female collected at Haeckel Hill, 8 mi. NW Whitehorse, 4 June 1963, had 4 embryos.

Records of occurrence
Specimens examined, 77: Richardson Mountains, 16 mi. NE Lapierre House, 1; *Richardson Mountains, 13 mi. NE Lapierre House,* 1; head Coal Creek, 64°47′/139°54′, 4 (NMNH); 13 mi. S Chapman Lake, 9; *Ogilvie Mountains, 52 mi. NE Dawson, 14 mi. S Lomond Lake,* 1; *Ogilvie Mountains, 48 mi. NE Dawson,* 6; *Dempster Highway, Mi. 51,* 2 (AHRC); *North Fork Pass, Ogilvie Mountains,* 1; *Dempster Highway, Mi. 43,* 1 (AHRC); Bonnet Plume Lake, 2; Keno Summit, 3: *Klondike Keno* [= *1 mi. S Wernecke*], 1; Keele Lake, 15; Macmillan Pass, Canol Road, Mi. 282, 2; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 3; *Little Hyland River, 128 mi. N Watson Lake,* 3; Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 2 (AMNH); Edith Creek, 2 (ROM); *Tepee Lake,* 3 (2 ROM); Rose River, Canol Road, Mi. 95, 8; Cultus Bay, Kluane Lake, 1 (CU); Haeckel Hill, 8 mi. NW Whitehorse, 2; Canol Road, Mi. 11, 2; near Teslin Lake, 1; Conrad, 1.

Additional records
Upper White River (Osgood 1900:39).

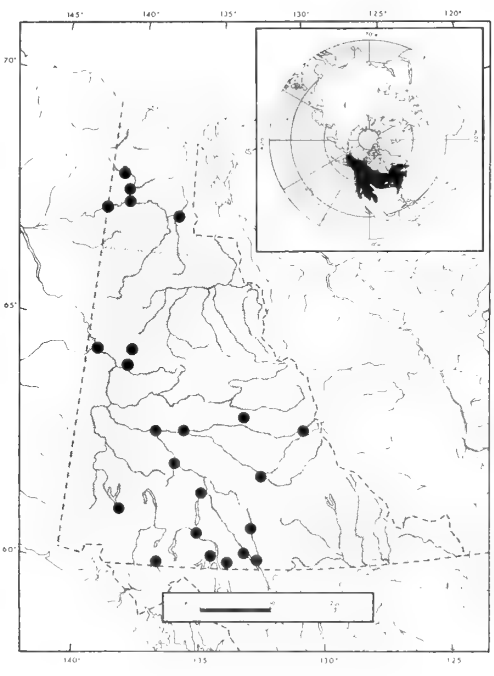
Family **Leporidae** – Hares
Lepus americanus – Varying hare

Lepus americanus dalli **Merriam**
Lepus americanus dalli, Merriam, 1900*a*:29; holotype from Nulato, Alaska.
Lepus americanus macfarlani, Merriam 1900*a*:30; Nelson 1909:98; Osgood 1909*b*:56, 80; Rand 1945*a*:48; Rand 1945*b*:74; Baker 1951:96; Hall 1951*a*:175; Cameron 1952:183; Hall and Kelson 1959:275.
Lepus americanus americanus, Coues and Allen 1877:304.
Lepus saliens, Osgood 1900:39.

Distribution
Found throughout the Yukon where suitable habitat exists (Map 15).

Measurements
The mean (and extreme) measurements of 5 specimens from several localities near Old Crow are 447 (420–472); 38 (33–42); 143 (140–150). The mean (and extreme) measurements of 14 specimens from several localities in the southern Yukon are 462 (417–505); 31 (23–41); 138 (130–148). For cranial measurements see Table 10.

Remarks
In his revision of the hares and rabbits of North America, Nelson (1909:100) acknowledged that *Lepus americanus macfarlani* was a weakly defined subspecies differing from *L. a. dalli* primarily by its "slightly darker color and larger size" and that the rostrum of *L. a. dalli* tapered "much more rapidly to a narrow, rounded muzzle, giving a sharply pointed form contrasting with the broader and more flattened muzzles of *macfarlani*." Nelson had only two specimens of *L. a. dalli* in summer pelage, and his table



Map 15
Distribution of *Lepus americanus dalli*

Table 10
Cranial measurements of *Lepus americanus dalli*

Number of specimens averaged, and sex	Basilar length	Zygomatic breadth	Breadth of rostrum	Inter-orbital breadth	Nasal length	Alveolar length of maxillary tooth-row
			Northern Yukon (several localities)			
Average 7 ♀	60.8	39.4	19.6	16.4	31.8	15.3
Max.	63.2	40.8	21.8	18.8	33.5	15.8
Min.	58.6	37.5	17.5	14.3	29.9	14.0
SD	2.42	1.28	1.41	1.66	1.38	0.61
SE	0.91	0.52	0.53	0.63	0.52	0.23
			Southern Yukon (several localities)			
Average 13 ♀	61.5	39.1	19.8	17.1	31.0	15.4
Max.	66.0	41.3	22.2	18.7	33.9	16.2
Min.	59.0	38.0	18.1	15.5	28.9	14.1
SD	2.04	0.98	1.29	1.07	1.38	0.74
SE	0.57	0.28	0.36	0.30	0.40	0.20
Average 7 ♂	62.4	39.4	19.7	16.0	32.4	15.4
Max.	68.2	40.4	20.5	17.7	34.6	16.0
Min.	61.3	38.0	19.0	14.4	30.6	14.4
SD	2.94	0.87	0.53	0.99	1.38	0.59
SE	1.11	0.33	0.20	0.38	0.52	0.22

of measurements shows no significant difference between the two subspecies. All of the specimens of *L. a. macfarlani* that I have examined fit well within the colour range of *L. a. dalli.* Comparison of 30 skulls from Pelly River, Yukon Territory, 5 from Fort Anderson, N.W.T., 4 from the Mackenzie Delta region, N.W.T., and others from various localities in the Yukon and the Northwest Territories, with 30 specimens from Nulato River, Bethel, and Koyukuk River, Alaska, fails to confirm any of the cranial differences mentioned by Nelson (1909). The Coefficients of Differences for the majority of cranial measurements show that less than 75 per cent of the Alaskan sample differs from less than 75 per cent of the specimens from Pelly River and, in the measurement of tooth-row, from less than 80 per cent of the Pelly River sample. All of these differences are well below the level of conventional subspecific distinctness, therefore *L. a. macfarlani* is here considered a synonym of *L. a. dalli.*

Lepus americanus dalli is the largest, darkest and greyest subspecies in western North America.

The hare population in the Yukon was at a high in 1961 and in 1963. Eleven pregnant females collected in May and June had an average of 3 (2–4) embryos.

The sequence of moult is poorly known for varying hares in the Yukon. At Rampart House (lat. 67°25′) specimens collected 24 and 25 April 1951 are in white pelage, while specimens collected May 17 are mostly in summer pelage. Similarly, specimens collected 5 mi. SE Dalton Post (lat. 60°07′) 19 May 1965 are mostly brown, and by May 24 are all brown. The fall moult is less well known. Specimens from near Teslin Lake collected October 2 and 3 have some white in the pelage, whereas by October 10 and 16 specimens are mostly white.

Records of occurrence
Specimens examined, 353: Old Crow River, at Timber Creek, 1 (NMNH); *SE Crow Base [Crow Base = 68°13′/141°00′]*, 1 (NMNH); *Old Crow River, mouth Black Fox Creek,* 2 (NMNH); 60 mi. SE Crow Base, 1 (NMNH); *Old Crow River, 19 mi. N Old Crow, 1 mi. N mouth Johnson Creek,* 1; *Johnson Creek, 1 mi. from mouth, 17 mi. N Old Crow,* 1; *70*

mi. SE Crow Base, 1 (NMNH); mouth Crow River [= mouth Old Crow River], 3 (NMNH); Rampart House, 4; Bell River, 1 mi. SW Lapierre House, 3; 25½ mi. S Chapman Lake, 1; *North Fork Crossing, Aklavik Road, Mi. 42* [= *North Fork Crossing, Dempster Highway, Mi. 42*], *Ogilvie Mountains,* 1; Forty Mile, 1 (NMNH); *Forty Mile, Yukon River,* 2 (MVZ); Benson Creek, 28 mi. ENE Dawson, 2; Russell Mountains, near forks Macmillan River, 1 (NMNH); south fork Macmillan River, Canol Road, Mi. 249, 1; *Sheldon Lake, Canol Road, Mi. 222,* 1; Macmillan River, 4 (NMNH); Selkirk, 4 (NMNH); *near Fort Selkirk,* 1 (NMNH); Tantalus, 1; Pelly River, 230 mi. from mouth, 41 (NMNH); *Ross River area,* 5; *Pelly River, Ross River,* 1 (NMNH); *Lapie River, Canol Road, Mi. 132,* 8; Thirty Mile River [= Yukon River, between Lower Laberge and Teslin River], 2 (NMNH); Kluane Lake, 3 (MCZ); *head Kluane Lake,* 2; head Lake Laberge, 1 (NMNH); *Haeckel Hill, 8 mi. NW Whitehorse,* 2; *Louise Lake, 7½ mi. W Whitehorse,* 1; *west side Lewes River, 2 mi. S Whitehorse,* 1 (KU); Nisutlin River, Canol Road, Mi. 40, 2; Hootalinqua River [= Teslin River], near Teslin Lake, 13; *Hoot River* [= *Teslin River*], 1; *5 mi. W Teslin River, 16 mi. S and 53 mi. E Whitehorse,* 1 (KU); *31 mi. ENE Tagish,* 2; 15 mi. N Teslin Lake, 5; *near Teslin Lake,* 11; *Settlin River* [= *Nisutlin River*] *near Teslin Lake,* 8; *Nisutlin Bay, Teslin Lake,* 1; *Eagle Bay, near Teslin Lake,* 3; *Teslin Post, near Teslin Lake,* 11; 5 mi. E Tagish, 1; *1 mi. N Carcross,* 2; *Carcross,* 1; *Caribou Crossing* [= *Carcross*], *between Lake Bennett and Lake Tagish,* 1 (NMNH); Little Atlin Lake, 8 mi. SSE Jakes Corner, 1; 5 mi. SE Dalton Post, 7.

Localities not plotted
Pelly River, 146 (NMNH); Pelly River, mouth Indian Creek, 24 (NMNH); Pelly River, Steamboat Island, 7 (NMNH).

Additional records
Irons Creek camp, Mile 313 [= Alaska Highway, 313 mi. N Nelson, B.C.] (Rand 1944*b*:47).

Order RODENTIA – Rodents

Key to Yukon Rodents

1	Infraorbital canal not transmitting any part of medial masseter muscle (or at least not modified for transmission of the muscle)	2
1′	Infraorbital canal transmitting medial masseter muscle and enlarged for that purpose	8
2	Tail broad, flat, scaly; toes of hind feet webbed . . . . *Castor canadensis*, p.	77
2′	Tail not broad, flat, scaly; toes on hind feet not webbed.	
3	Membrane present between foreleg and hind leg; modified for gliding; zygomatic plate low, slightly tilted upward . . . . *Glaucomys sabrinus*, p.	76
3′	Membrane not present between foreleg and hind leg; not modified for gliding; zygomatic plate (usually) tilted strongly forward	4
4	No antorbital canal, the antorbital foramen piercing the zygomatic plate of the maxillary . . . . *Eutamias minimus*, p.	62
4′	Antorbital canal present	5
5	Zygomatic breadth more than 43 mm; anterior lower premolar with a paraconulid	6
5′	Zygomatic breadth less than 43 mm; anterior lower premolar without paraconulid	7
6	Upper tooth-rows parallel; 8 mammae (only 1 pair abdominal) . . . . *Marmota monax*, p.	64
6′	Upper tooth-rows divergent anteriorly; 10 mammae (2 pairs abdominal) . . . . *Marmota caligata*, p.	66
7	Zygomata not parallel, but converging anteriorly with anterior part twisted toward a horizontal plane . . . . *Spermophilus parryii*, p.	67
7′	Zygomata nearly parallel and nearly vertical throughout, not twisted . . . . *Tamiasciurus hudsonicus*, p.	72
8	Infraorbital foramen greatly enlarged . . . . *Erethizon dorsatum*, p.	120
8′	Infraorbital canal moderately enlarged except in Zapodidae	9
9	Hind legs much elongated; infraorbital foramen much enlarged; cheek-teeth 4/3	10
9′	Hind legs not greatly elongated; infraorbital foramen moderately large; cheek-teeth 3/3	11
10	Skull small; incisive foramina shorter than 4.6 mm; condylobasal length averaging less than 20 mm; length of maxillary tooth-row averaging less than 3.7 mm . . . . *Zapus hudsonius*, p.	117
10′	Skull large; incisive foramina longer than 4.7 mm; condylobasal length more than 21 mm; maxillary tooth-row averaging more than 3.8 mm . . . . *Zapus princeps*, p.	119
11	Cheek-teeth tuberculate, occlusal surfaces not composed of lakes of dentine surrounded by enamel	12
11′	Cheek-teeth flat-crowned, comparatively angular and sculptured; occlusal surfaces composed of lakes of dentine surrounded by enamel	14
12	Molar teeth with tubercles arranged in 3 longitudinal series . . *Mus musculus*, p.	117
12′	Molar teeth with tubercles arranged in 2 longitudinal series or if not tuberculate, prisms not arranged as alternating triangles	13

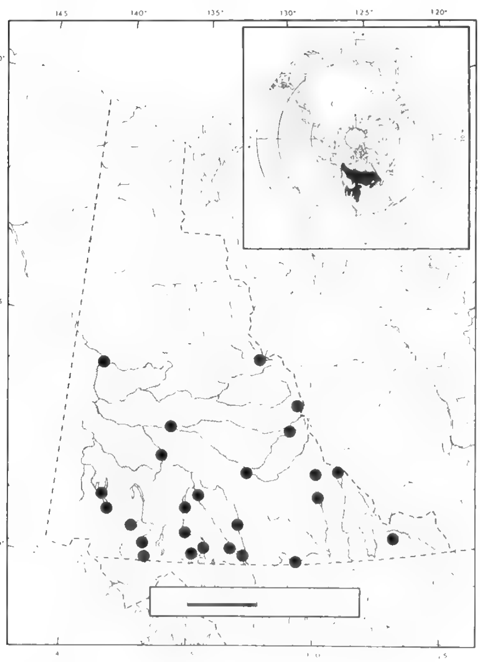
13	Upper cheek-teeth specialized, their normal tuberculate pattern not apparent at any time; molars prismatic and flat-crowned . . . . *Neotoma cinerea*, p.	83
13′	Upper cheek-teeth not markedly specialized, the tuberculate pattern usually apparent; molars usually not flat-crowned . . . . *Peromyscus maniculatus*, p.	79
14	Lower incisors usually lingual to molars, and terminating in horizontal ramus opposite or in front of alveolus of m3	15
14′	Lower incisors passing from lingual to labial side of molars between bases of roots of m2 and m3 and ascending behind molars in termination within or near condylar process	17
15	Cheek-teeth longitudinally complex (many loops); inner and outer salient angles approximately equal in size; m1 with 7 closed triangles between terminal loops; supraorbital ridges strong but not fusing in interorbital region . . . . *Dicrostonyx torquatus*, p.	114
15′	Cheek-teeth longitudinally simplified (few loops); inner salient angles of upper molars and outer angles of lower molars smaller than those of the opposite sides; m1 with 3 closed triangles between termination loops (or with 2 transverse loops if closed triangles absent); supraorbital ridges fusing in adults, forming median orbital crest	16
16	Posterior palate not terminating as simple transverse shelf; upper incisors strongly grooved; tooth-rows not, or less widely divergent posteriorly; soles of feet almost hairless and ungual phalanges not noticeably lengthened; glands located on flanks . . . . *Synaptomys borealis*, p.	112
16′	Posterior palate terminating as simple transverse shelf; upper incisors not grooved; tooth-rows widely divergent posteriorly; soles of feet almost concealed by hairs and ungual phalanges noticeably lengthened; sebaceous gland located on rump . . . . *Lemmus sibiricus*, p.	107
17	Cheek-teeth rooted in adults	18
17′	Cheek-teeth not rooted in adults	20
18	External form modified for aquatic life in that tail is laterally compressed, and swimming fringes on hind feet conspicuous; basal length of skull more than 50 mm . . . . *Ondatra zibethicus*, p.	104
18′	External form not modified for aquatic life; basal length of skull less than 50 mm	20
19	Posterior palate terminating as a simple transverse shelf; lower molars with inner reentrant angles little if any deeper than outer reentrant angles . . . . *Clethrionomys rutilus*, p.	84
19′	Posterior palate terminating with a median spinous process converted into a sloping septum between posterolateral pits; lower molars with inner reentrant angles deeper than outer . . . . *Phenacomys intermedius*, p.	88
20	Skull long and narrow, cheeks yellowish; tail less than 28 mm . . . . *Microtus miurus*, p.	101
20′	Skull not so long and narrow, cheeks not yellowish, tail more than 28 mm.	
21	Tail averaging 1/3 or more of total length . . . . *Microtus longicaudus*, p.	97
21′	Tail averaging less than 1/3 of total length	22
22	Cheeks reddish . . . . *Microtus xanthognathus*, p.	98
22′	Cheeks not reddish	23
23	M2 with 4 closed angular sections and a rounded posterior loop; posterolateral sebaceous glands absent . . . . *Microtus pennsylvanicus*, p.	89
23′	M2 with 4 closed angular sections and no posterior loop; posterolateral sebaceous glands located on hips . . . . *Microtus oeconomus*, p.	93

Family **Sciuridae** – Squirrels and allies
Eutamias minimus – Least chipmunk

***Eutamias minimus borealis* (J. A. Allen)**
[*Tamias asiaticus*] var. *borealis* J. A. Allen, *in* Coues and Allen 1877:793; holotype from Fort Liard, District of Mackenzie, N.W.T.
Eutamias minimus borealis, A. H. Howell 1922:183; Youngman 1968:74.
Eutamias caniceps Osgood, 1900:28, 1909*b*:77.
Eutamias minimus caniceps, A. H. Howell 1922:184, 1929:58; Rand 1945*a*:37; R. M. Anderson, 1947:114; Baker 1951:100; Cameron 1952:180; Hall and Kelson 1959:300.

Distribution
Southern half of the Yukon (Map 16).

Measurements
Average (and extreme) measurements of 9 specimens (4 males, 5 females) from Kluane Lake are 207 (178–215); 91 (69–98); 33 (30–34). Average (and extreme) measurements of 9 specimens (1 male, 8 females) from 138 and 128 mi. N Watson Lake are 208 (191–232); 94 (80–112); 33 (31–36). The male weighed 48.1 g and 6 nonparous females averaged 54.1 (43.4–65.8) g. Average (and extreme) measurements of 10 specimens (6 males, 4 females) from the south-central Yukon are 205 (194–216); 88 (81–94); 33 (32–35). For cranial measurements see Table 11.



Map 16
Distribution of *Eutamias minimus borealis*

Remarks
Osgood (1900), in his description of *Eutamias caniceps,* thought that specimens from the Yukon were greyer than *E. m. borealis* and that the skull had a slightly more inflated braincase and larger bullae. Howell (1929: 58) referred specimens from northern British Columbia, the "Nahanni River Mountains", District of Mackenzie, N.W.T., and the Yukon, to *E. m. caniceps.* Comparing these specimens with specimens of *E. m. borealis,* he listed the distinguishing characters as "Similar to *Eutamias minimus borealis,* but, head more grayish (less ochraceous); sides slightly paler; upper parts averaging more grayish in general tone; tail much paler beneath; hind foot larger." A comparison of cranial and hind-foot measurements of specimens from the Yukon with measurements of specimens from near the type locality of *E. m. borealis* fails to show any significant differences. There may be a tendency toward greyness in chipmunks from the Yukon but as most specimens in collections are in the grey winter pelage, or have only partially moulted into the brighter new pelage, it is difficult to make a detailed colour comparison. If a colour difference exists it is very slight, and considering the overall geographical variation within this species, it is not significant at the subspecific level.

Records of occurrence
Specimens examined, 164: Bonnet Plume Lake, 4; Dawson, 1 (UBC); Keele Lake, 5; Macmillan River, 2 (NMNH); Sheldon Mountain, Canol Road, Mi. 222, 1; Rink Rapid, 4 (NMNH); *7 mi. NW Carmacks,* 2; *5½ mi. NW Carmacks,* 1; *Nordenskiold River, 1 mi. NW Carmacks,* 6; *½ mi. NW*

Table 11
Cranial measurements of *Eutamias minimus borealis*

Number of specimens averaged or catalogue number, and sex	Greatest length	Zygomatic breadth	Cranial breadth	Least inter-orbital breadth	Length of nasals	Alveolar length of maxillary tooth-row
			Kluane Lake			
173240 ♂	34.1	19.1	16.0	7.0	10.5	5.6
202280 ♂	33.6	18.0		6.9	9.8	5.5
20226 ♀	33.1	18.5	15.5	7.0	9.9	5.5
			South-central Yukon			
Average 10 (5 ♂ 5 ♀)	32.7	18.5^{9}	14.6^{9}	6.8	10.0^{9}	5.5
Max.	33.6	19.1	15.8	7.1	10.7	5.6
Min.	32.2	18.1	14.2	6.5	9.1	5.3
SD	0.47	0.36	0.48	0.20	0.46	0.11
SE	0.15	0.12	0.16	0.06	0.15	0.04
			North of Watson Lake			
Average 10 (1 ♂ 8 ♀ 1 ?)	32.8^{6}	18.3^{7}	14.3^{7}	6.6^{7}	9.8^{6}	5.5^{5}
Max.	33.9	18.7	14.6	6.8	10.3	5.6
Min.	31.8	17.7	14.0	6.4	8.7	5.2
SD	0.68	0.40	0.21	0.17	0.62	0.19
SE	0.28	0.15	0.08	0.06	0.25	0.09

Carmacks, 2; *¼ mi. NW Carmacks,* 4; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 9; *Little Hyland River, 128 mi. N Watson Lake,* 1; Lapie Valley, Canol Road, Mi. 136, 1; *Lapie River, Canol Road, Mi. 132,* 10; Ida Lake [= McPherson Lake], 1 (AMNH); Semenow Hills [= Semonof Hills], 1 (NMNH); Burwash Landing, 2; *Kluane Lake,* 6 (4 MCZ, 2 CU); Frances Lake, 1; Lake Laberge, 14 (NMNH); W Sheep Mountain, E Sheep Creek, near old Alaska Highway, Mi. 1061, 1; *head Kluane Lake,* 4; *E side Kluane Lake,* 4; (CU); *S end Kluane Lake, Alaska Highway, Mi. 1054,* 9 (CU); Nisutlin River, Canol Road, Mi. 40, 4; McIntyre Creek, 3 mi. NW Whitehorse, 2 (KU); *2 mi. NNW Whitehorse,* 1 (KU); *W side Lewes River* [= *W side Yukon River*], *2 mi. S Whitehorse,* 1 (KU); *6¾ mi. SW Whitehorse,* 2; Haines Road Junction, 1; Squanga Lake, 1; *5 mi. W Teslin River, 16 mi. S and 53 mi. E Whitehorse,* 3 (KU); *Alcan Highway* [= *Alaska Highway*], *Johnsons Crossing,* 1 (MZ); Lake Marsh, 5 (NMNH); *1 mi. NE Tagish,* 1; *2½ mi. NE Tagish,* 1; *5 mi. W Tagish,* 1; *10 mi. E Tagish,* 1; *Little Atlin Lake, 8 mi. SSE Jakes Corner,* 2; SW end Dezadeash Lake, 15 (KU); North Toobally Lake, 2; near Teslin Lake, 5; *Indian village, near Teslin Lake,* 1; *Teslin Post, near Teslin Lake,* 4; Carcross, 2; *Caribou Crossing* [= *Carcross*], 4 (NMNH); 5 mi. SE Dalton Post, 1; *1½ mi. S and 3 mi. E Dalton Post,* 5 (KU); Rancheria River, Mi. 708, [Alaska Highway], 2 (ROM).

Additional records
Watson Lake, 1 July 1963 (seen, G. D. Tessier, MS).

Marmota monax – Woodchuck

Marmota monax ochracea **Swarth**
Marmota ochracea Swarth, 1911:203; holotype from Fortymile Creek, Alaska.
Marmota monax ochracea, A. H. Howell 1915*a*:34; Rand 1945*a*:35; R. M. Anderson 1947:106; Hall and Kelson 1959:323.

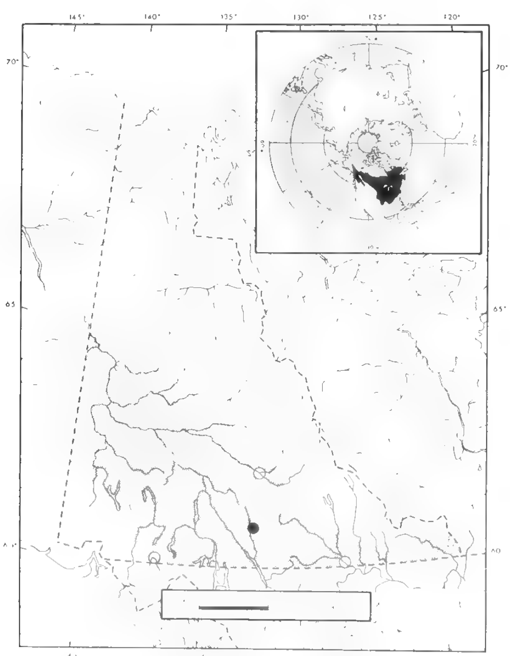
Distribution
Spotty distribution in southern half of the Yukon (Map 17).

Measurements
There are no specimens with external measurements available from the Yukon. For cranial measurements see Table 12.

Remarks
Marmota monax ochracea is a weakly defined subspecies, intergrading with, and more closely resembling, *M. m. canadensis* to the east rather than *M. m. petrensis* to the south.

Cowan and Guiguet (1965) referred specimens from near junction Liard and Trout rivers, and from Lower Liard Crossing (Mi. 213, Alaska Highway), B.C., to this subspecies, but I have examined these specimens and refer them to *M. m. petrensis*. Thus *M. m. ochracea* is confined to east-central Alaska, southern Yukon Territory and extreme northwestern British Columbia (Atlin).

Only 4 woodchucks have been collected in the Yukon, and there are few recorded sightings. In the early 1960's some woodchucks occupied a small cave in a rocky cliff on the outskirts of Dawson and at various times they have raided gardens in the Dawson area.



Map 17
Distribution of *Marmota monax ochracea*

Records of occurrence
Specimens examined, 4: Nisutlin River, Canol Road, Mi. 40, 3; *Thirtymile Mountain* [=*Thirtymile Range*], *near Teslin Lake,* 1.

Additional records
Hunker Creek (Judd 1950:361); Dominion Creek (seen by J. Langevin, G. D. Tessier, MS, 30 June 1965); Ross Post (Rand 1945*a*:35); Takhanne River, 5 mi. ESE Dalton Post, 17 May 1963 (seen, P.M. Youngman, MS); Liard Crossing (reports, G. D. Tessier, MS, 15 July 1965).

Table 12
Cranial measurements of two species of *Marmota*

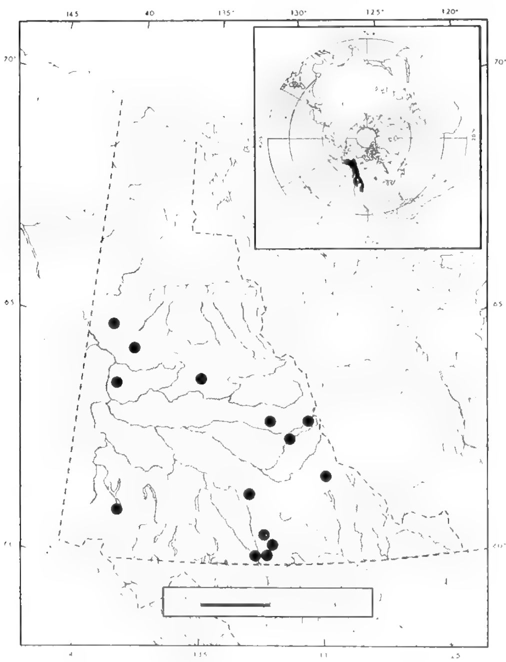
Number of specimens averaged or catalogue number, and sex	Condylobasal length	Palatal length	Postpalatal length	Length of nasals	Zygomatic breadth	Breadth across mastoids	Least interorbital breadth	Maxillary tooth-row
				Marmota caligata caligata Chapman Lake region				
29474 ♂	103.3	58.4	39.8	42.3		46.7	25.5	23.2
29473 ♀	94.4	52.7	35.7	39.7	61.4	42.6	23.5	22.0
				Head of Coal Creek				
135163 NMNH, ♂	100.3	57.4	37.6	42.5	62.0	44.4	23.8	23.1
135162 NMNH, ♂	93.5	54.3	34.0	41.6	63.4	44.7	22.7	20.9
135161 NMNH, ♀	94.1	53.7	35.7	38.2	62.3	43.1	23.7	21.9
				Ruby Creek				
34504 MCZ, ♀	92.6	53.0	34.3	36.7	60.1	42.0	23.5	22.8
34507 MCZ, ♀	97.0	54.4	37.2	39.8	62.8	43.3	23.1	22.1
				Keno Hill				
35343 ♂	100.1	57.4	37.4	43.7	66.5	44.7	24.8	23.0
35342 ♀	100.8	57.8	38.0	44.2	67.1	45.4	24.3	23.9
31241 ♀	95.8	54.8	37.1	43.8	64.7	45.1	24.7	21.8
				Teslin region				
1942 ♂	99.7	57.0	36.5	40.6	65.0	42.7	23.7	22.9
1946 ♂	95.8	54.6	36.0	41.3			24.2	23.1
1951 ♂	101.2	57.0		42.9	62.4	44.9	24.7	22.6
1926 ♀	96.2	54.6	36.9	40.2	61.9	41.3	22.8	22.4
1936 ♀	98.8	57.0		42.4	62.2	45.5	22.4	22.6
1941 ♀	93.2	53.0	34.8	39.7	59.6	42.4	23.2	21.6
1948 ♀	94.3	52.8	35.8	40.9	60.6	44.9	23.0	21.0
				Marmota monax ochracea Thirtymile Mountains, near Teslin Lake				
1924 ♀	68.0	40.6	23.7	25.9	44.8	33.1	15.9	18.3

Marmota caligata – Hoary marmot

***Marmota caligata caligata* (Eschscholtz)**
Arctomys caligatus Eschscholtz, 1829; type locality, near Bristol Bay, Alaska.
Marmotta [sic] *caligata,* J. A. Allen 1903:539.
Marmota caligata, Osgood 1909*b*:55; Cameron 1952:180; Youngman 1968:74.
Marmota caligata caligata, A. H. Howell 1915*a*:59 (part); Rand 1945*b*:45; (part); Hall and Kelson 1959:327 (part).
Marmota caligata oxytona, A. H. Howell 1915*a*:64 (part); Rand 1945*a*:35; Rand 1945*b*:45 (part); R. M. Anderson 1947:108 (part); Miller and Kellogg 1955:186 (part); Hall and Kelson 1959:329 (part).

Distribution
Recorded as far north as the headwaters of the Porcupine River, perhaps farther north in the Mackenzie Mountains (Map 18).

Measurements
Two males and 2 females from the Ogilvie Mountains (Chapman Lake region and Coal Creek) measured respectively 740, 715, 655, 675; 230, 218, 182, 190; 102, 91, 87, 95. A male and female from Keno Hill measured respectively 700, 750; 170, 180; 92, 97; 12, 15 lb. For cranial measurements see Table 12.



Map 18
Distribution of *Marmota caligata caligata*

Remarks
Specimens from the vicinity of Teslin Lake and the Canol Road, Yukon Territory, have been referred to as intermediates between *Marmota caligata caligata* and *M. c. oxytona* (holotype from head of Moose Pass, branch of Smoky River, Alta.), with most authors referring them to the latter subspecies.

In his revision of the North American marmot, A. H. Howell (1915*a*) characterized *Marmota caligata oxytona* as differing from *M. c. caligata* in being blacker and in having a larger and relatively narrower skull. Howell's own measurements (1915*a*) do not confirm these and other supposed cranial differences. The colour of specimens from Teslin Lake, and the Canol Road, Yukon Territory, and Jasper, Alta., differs little from near topotypes of *M. c. caligata* from Alaska. A number of study skins from the Teslin Lake region, Yukon Territory, from British Columbia, and from Fort Liard, and Fort Good Hope, N.W.T., referred by A. H. Howell (1915*a*) to *M. c. oxytona,* are greasy and dirty and are therefore darkened specimens.

Specimens from various localities in central British Columbia such as the Sustut Mountains (56°N/126°W) and Thutade Lake (56°N/126°W) belong to a dark subspecies (*M. c. raceyi*?), but specimens from McDame Creek (59°N/129°W), Dease Lake (58°N/130°W), and Cassiar (59°N/129°W), in northern British Columbia, are referable to *M. c. caligata.*

Porsild (1945:14) reported a possible sight record of a hoary marmot from the Richardson Mountains ("Black Mountain, southwest of Aklavik"); R. M. Anderson (1947:107) and Rausch (1953:120) discussed the possibility that *Marmota caligata broweri* [= *Marmota broweri,* Rausch and

Rausch 1965] might be the form occurring there. My own fieldwork in the Richardson Mountains in 1962 and 1965, and that of David A. Gill in 1968, produced no evidence of the existence of marmots. Neither botanist J. A. Calder, who collected in the Richardson Mountains in 1962, nor geologists working in the same area in the same year, saw any evidence of marmots (personal communications).

Ognev (1947:261) and Ellerman and Morrison-Scott (1951:513) thought that *Marmota caligata* and *M. camtschatica* from Kamchatka, eastern Siberia, might be conspecific. Rausch (1953:117) supposed *Marmota caligata* to be conspecific with *Marmota marmota,* but later Rausch and Rausch (1965:621) considered this concept to be erroneous.

Rausch and Rausch (1965) considered *Marmota caligata* to be a postglacial invader of the northwest on "zoogeographic evidence and by the fact that certain parasites are not shared with palaerctic species."

To explain the present distribution of *Marmota caligata,* Hoffman and Taber (1967:162) offered alternative hypotheses of either a Beringian origin or a southern periglacial origin, but favoured the latter theory. Their premise is that the present distributions of *Marmota caligata* and the mountain goat, *Oreamnos americanus,* result from a common refugial origin. They also cited the occurrence of an undated Pleistocene specimen from Montana provisionally referred to *M. caligata,* the present absence of *M. caligata* from the Brooks Range, Alaska, and the absence of vicariant or conspecific species in northeastern Siberia, as other reasons for postulating a southern periglacial origin. That there are no Beringian subspecies of *Marmota caligata* lends further weight to the theory of southern origin.

Records of occurrence
Specimens examined, 59: head Coal Creek 64°47'/139°54', 4 (NMNH); 14 mi. S Chapman Lake, 3; *13 mi. S Chapman Lake,* 1; *20 mi. S Chapman Lake,* 5; *Dempster Highway, Mi. 51,* 4 (AHRC); Keno Summit, 1; *Klondike Keno [= 1 mi. S Wernecke], Keno Hill,* 2; Ruby Creek, 63°46'/139°16', 6 (MCZ); Canol Road, Mi. 268, 1; Mount Selous, North Macmillan River, 1; Mount Sheldon, Canol Road, Mi. 222, 1; Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 6 (AMNH); 6 mi. S Lapie Lakes, Canol Road, Mi. 105, 1; *Rose River, Canol Road, Mi. 95,* 3; Slims River, 2; Nusetlan River Mountains [= Thirtymile Range], near Teslin Lake, 5; *Nisetlin Mountains [= Thirtymile Range], near Teslin Lake,* 3; *Mountains, 40 mi. NE of NW end Teslin Lake [= Thirtymile Range],* 3; Wolf Lake, near Teslin Lake, 60°38'/131°40', 2; English Creek Mountains [= Englishmans Range], near Teslin Lake, 2; near Teslin Lake, 1.

Localities not plotted
Yukon Territory, 2.

Additional records
Keele Lake, 10 and 16 August 1966 (sign seen and whistling heard, W. H. Butler, MS).

Additional records not plotted
Mountains about headwaters Porcupine River (Preble 1908:161).

Spermophilus parryii – Arctic ground squirrel

***Spermophilus parryii parryii* (Richardson)**
Arctomys Parryii Richardson, *in* Parry 1825:316; type locality, Five Hawser Bay, Lyon Inlet, Melville Peninsula, Hudson Bay.
Citellus (Colobotus) parryi kennicotti, Preble 1908:164.
Citellus parryii parryii, A. H. Howell 1938:95; Rand 1945*b*:46; R. M. Anderson 1947:110.
Spermophilus undulatus kennicottii, Bee and Hall 1956:46.

Distribution
Known only from the northern Yukon, north of the Porcupine River. Southern limit not defined (Map 19).

Measurements
Average (and extreme) measurements of 5 females from the northern Yukon are 361 (325–390); 104 (93–120); 59 (55–64). Three of these individuals weighed respec-

Table 13
Cranial measurements of *Spermophilus parryii*

Number of specimens averaged or catalogue number, and sex	Greatest length	Palatilar length	Zygomatic breadth	Cranial breadth	Least interorbital breadth	Postorbital breadth	Nasal length	Alveolar length of maxillary tooth-row
Spermophilus parryii parryii Northwestern Yukon (Old Crow River and Firth River regions)								
Average 10 ♂ (7 NMNH)	60.0	30.0[9]	38.9	26.4	12.8	13.2	21.9	13.3
Max.	62.2	30.5	41.2	27.3	13.6	14.2	23.2	13.9
Min.	58.4	28.6	37.6	25.4	11.6	12.3	21.0	21.1
SD	1.23	0.69	1.28	0.61	0.56	0.67	0.63	0.54
SE	0.39	0.23	0.41	0.19	0.19	0.21	0.20	0.17
Average 12 ♀ (8 NMNH)	57.1	28.7	37.0[11]	25.1[11]	12.1[11]	13.5	20.8	13.1
Max.	59.2	30.3	39.1	25.9	13.3	14.9	21.7	13.4
Min.	56.4	27.6	35.7	24.4	11.2	13.0	20.2	12.5
SD	0.83	0.80	1.06	0.46	0.64	0.50	0.54	0.38
SE	0.24	0.23	0.32	0.14	0.19	0.14	0.16	0.11
Spermophilus parryii plesius Ogilvie Mountains (various localities)								
134945 NMNH, ♂	56.1	28.6	36.3	24.1	11.6	13.0	20.0	12.9
33746 ♂	56.6		37.2	25.7	12.0	11.5	20.7	12.3
Average 8 ♀ (5 NMNH)	52.3	26.2	33.3	23.3	10.6	12.4	18.5	12.1
Max.	54.2	29.0	35.2	24.6	11.3	13.1	19.4	12.5
Min.	51.3	25.0	32.0	22.8	9.8	11.3	17.4	11.7
SD	1.05	1.29	0.99	0.57	0.45	0.68	0.80	0.28
SE	0.37	0.46	0.35	0.20	0.16	0.24	0.28	0.10

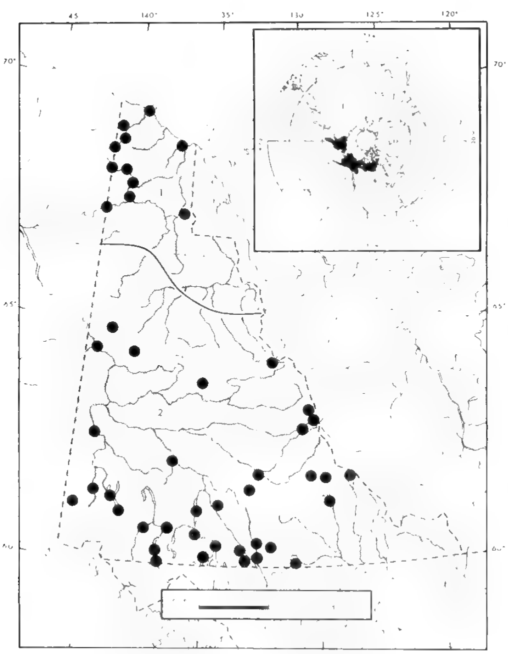
Number of specimens averaged or catalogue number, and sex	Greatest length	Palatilar length	Zygomatic breadth	Cranial breadth	Least interorbital breadth	Postorbital breadth	Nasal length	Alveolar length of maxillary tooth-row
				Ida Lake, Yukon Territory				
Average 7 ♂	52.4	26.2	33.5^{4}	23.8	10.8	12.5^{6}	18.3	12.2
Max.	55.7	27.5	35.9	25.6	12.0	13.1	19.9	13.0
Min.	50.5	25.4	32.0	22.8	9.8	11.8	17.7	11.6
SD	1.80	0.71	1.73	1.01	0.79	0.57	0.92	0.58
SE	0.68	0.27	0.86	0.38	0.30	0.23	0.34	0.22
CV	3.43	2.73	5.17	4.25	7.32	4.61	5.01	4.79
Average 7 ♀	51.4	26.0^{6}	33.6^{5}	23.4^{6}	10.4^{6}	12.4^{6}	17.9^{6}	12.0^{6}
Max.	52.2	26.4	35.2	23.9	10.8	12.8	18.5	12.6
Min.	50.1	25.5	32.7	23.2	9.8	12.1	17.5	11.5
SD	0.75	0.35	1.02	0.27	0.39	0.27	0.36	0.44
SE	0.28	0.14	0.45	0.11	0.16	0.11	0.14	0.17
CV	1.47	1.35	3.04	1.16	3.80	2.21	2.03	3.64
				Bennett, B.C.				
Average 19 ♂	53.0	26.0^{16}	34.4^{16}	23.8^{16}	11.0	12.7^{16}	18.6^{16}	12.0^{16}
Max.	57.0	27.9	35.4	26.7	12.2	13.5	20.3	12.7
Min.	51.0	23.9	33.4	22.9	10.3	11.6	17.5	11.7
SD	1.43	0.93	0.66	1.01	0.57	0.50	0.76	0.25
SE	0.32	0.23	0.16	0.25	0.14	0.12	0.19	0.06
CV	2.69	3.60	1.91	4.25	5.15	3.94	4.09	2.08
Average 13 ♀	51.7	25.2	33.2^{12}	22.6	10.5	12.2	18.2^{12}	11.9
Max.	53.1	26.0	34.8	23.7	11.5	13.4	19.3	12.5
Min.	50.4	24.5	31.4	21.7	9.8	10.9	17.6	11.1
SD	0.87	0.46	0.94	0.57	0.50	0.63	0.48	0.36
SE	0.24	0.12	0.27	0.16	0.14	0.17	0.13	0.10
CV	1.68	1.84	2.83	2.54	4.79	5.19	2.63	3.05

tively 590.7 g, 321.4 g, 614.1 g. For cranial measurements see Table 13.

Remarks

This subspecies differs from *Spermophilus parryii plesius* in being larger externally and cranially, and in having the spots of the dorsal pelage correspondingly larger and often fewer in number.

Bee and Hall (1956:46) applied the name *Spermophilus undulatus kennicottii* (Ross) to specimens from Fort Anderson, N.W.T., west as far as Point Hope, Alaska, since they thought these specimens were lighter in colour than specimens (*S. parryii parryii*) from the eastern Arctic. Bee and Hall (1956) thought that the dark colour of specimens from northeastern Alaska, northern Yukon Territory, and northwestern District of Mackenzie was due to their having been salted in the field and restuffed at the National Museum of Natural History, Washington. However, specimens in the National Museums of Canada from the northern Yukon and western District of Mackenzie that were prepared in the field without the use of any preservatives average as dark as specimens in similar pelage from several localities in the eastern Arctic.



Map 19
Distribution of *Spermophilus parryii*
1 *S. p. parryii*
2 *S. p. plesius*

There is some geographical variation within the subspecies *Spermophilus parryii parryii*. There is an east-west cline in size, both externally and cranially, with the largest specimens in the eastern Arctic. There is also an east-west cline in tail colour. Specimens from the eastern Arctic have darker tails dorsally.

Various authors (Rausch 1953; Hall and Kelson 1959; Nadler and Youngman 1969) have applied the name *Spermophilus undulatus* to North American and eastern Siberian arctic ground squirrels. However Gromov et al. (1965) considered *S. undulatus* to be restricted to southern Siberia, the Amur region, Mongolia, and northern and northeastern China, whereas *S. parryii* occupied northeastern Siberia, and parts of arctic and subarctic North America. Also, Vorontsov and Lyapunova (1969) have shown major morphological and numerical differences between the chromosomes of *Spermophilus undulatus* from west of the Lena River, U.S.S.R., and *Spermophilus parryii* from east of the Lena and from arctic and subarctic North America.

The cheek pouches of a specimen from the northern Yukon (Firth River) contained the following plants: *Tofieldia pusilla* (Michx.) Pers. (entire inflorescences of almost mature capsules, some with ripe seed —about 90 per cent of the total cheek-pouch contents), *Silene acaulis* L. (almost mature capsules with seed), *Oxytropis* sp. (stems, leaves, and seeds), *Pedicularis lanata* Cham. & Schlecht. (fragments of capsules and seeds), *Potentilla* sp. (few seeds), *Luzula? parviflora* (Ehrh.) Desv. (few seeds), *Hedysarum Mackenzii* Richards (one segment of legume), *Carex* spp. (achenes of at least six species), and *Dryas* sp. (a few achenes).

Records of occurrence

Specimens examined, 83: Firth River, [near mouth], 1; Alaska–Yukon boundary, 69°20′, 10 (NMNH); *Alaska–Yukon boundary, 69°10′*, 2; *Joe River* [= *Joe Creek*], 17 (NMNH); 4 mi. WSW mouth Blow River, 7; Firth River, 13 mi S mouth Joe Creek, 1; *Firth River, 15 mi. S mouth Joe Creek, 7; British Mountains, 20 mi. SE mouth Joe Creek,* 5; *Emmerman Creek, Firth River* [= *68°46′/140°45′*], 1 (NMNH); "U" [= You] Creek, 90 mi. N Rampart House, 141°W, 2 (1NMNH); *Alaska–Yukon boundary, Firth River,* 5; *Alaska–Yukon boundary, 80 mi N Porcupine River,* 1 (NMNH); Old Crow River, 50 mi. above Timber Creek, 3 (NMNH); *Old Crow River, 15 mi. below Timber Creek,* 1 (NMNH); *Old Crow River, 20 mi. above Black Fox Creek,* 1 (NMNH); Crow Base [= 68°13′/141°00′], 1 (NMNH); Old Crow River, Black Fox Creek, 2 (NMNH); *Old Crow River, 19 mi. N Old Crow, 19 mi. N mouth Johnson Creek,* 3; *Johnson Creek, 5 mi. from mouth, 1 mi. NNE Old Crow,* 3; Old Crow Mountains, 1; *Old Crow River, Shafer Mountain* [= *Mount Schaeffer*], 1 (NMNH); *Old Crow,* 1; *mouth Old Crow River,* 1 (NMNH); Richardson Mountains, 16 mi. NE Lapierre House, 1; *Richardson Mountains, 13 mi. NE Lapierre House,* 1; Rampart House, 4 (2 NMNH).

***Spermophilus parryii plesius* Osgood**
Spermophilus empetra plesius Osgood, 1900:29; holotype from Bennett City, head of Bennett Lake, B.C.
Spermophilus parryii plesius, Banfield 1961*a*:130.
Citellus plesius, Osgood 1909*b*:53.
Citellus plesius plesius, R. M. Anderson 1947:110.
Citellus parryi plesius, Rand 1945*a*:36, 1945*b*:46; Baker 1951:98; Cameron 1952:180.
Spermophilus undulatus plesius, Hall and Kelson 1959:343; Youngman 1968:75.

Distribution
Approximately the southern three-quarters of the Yukon. Northern limit not defined (Map 19).

Measurements
Average (and extreme) measurements of 6 females from various localities in the Ogilvie Mountains are 336 (327–360); 86 (78–97); 54 (52–58). Measurements of 4 males from the same locality are respectively 359, 368, 364, 340; 104, 94, 111, 90; 58, 58, 59, 50. For cranial measurements see Table 13.

Remarks
For comparison with *Spermophilus parryii parryii* see account of that subspecies.

I have not seen any intergrades between *Spermophilus parryii plesius* and *S. p. parryii,* (although *S. p. plesius* intergrades with *S. p. ablusus* in Alaska the latter, in turn, intergrading with *S. p. parryii).* I believe this suggests different refugial origins for the two subspecies with limited, if any, postglacial contact.

Nadler and Youngman (1969) showed *Spermophilus parryii plesius, S. p. parryii,* and *S. p. ablusus* to be characterized by remarkably constant protein differences, and postulated a southern refugial origin for *S. p. plesius.*

On some sandy soils in the southern Yukon, the mounds of arctic ground squirrels have a profound effect on the microrelief and plant succession (Figure 5).

Records of occurrence
Specimens examined, 264: head Coal Creek, 64°47′/139°54′, 15 (NMNH); 13 mi. S Chapman Lake, 4; *20 mi. S Chapman Lake,* 11; *Ogilvie Mountains, 48 mi. NE Dawson,* 2; *Dempster Highway, Mi. 51,* 3 (AHRC); Coal Creek, 64°29′/140°26′ 2 (1 NMNH, 1 FMNH); ½ mi. NE Bonnet Plume Lake, 1; *Bonnet Plume Lake,* 22; Keno Hill Summit, 2; Keele Lake, 5; Macmillan Pass, Canol Road, Mi. 282, 2; Sheldon Mountain, Canol Road, Mi. 222, 3; Donjek River, 1 (NMNH); Rink Rapid, 1 (NMNH); *Tantalus,* 1; *Nordenskiold River, 1 mi. NW Carmacks,* 1; *¼ mi. NW Carmacks,* 1; *Carmacks,* 2; *3 mi. WSW Carmacks,* 1; Pelly Lake, 1 (NMNH);

Figure 5
Old mounds of *Spermophilus parryii plesius,* near Tagish, 24 May 1963. Mounds were 6 to 10 in. high, and 2 to 3 ft in diameter. In a little over an acre, 150 were counted.

Pelly River, Lapie River, 6 (NMNH); *Ross River Post, Pelly Valley,* 2; *Lapie River, Canol Road, Mi. 132,* 20; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 4; Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 16 (AMNH); peak E Lapie Lake, Canol Road, Mi. 105, 1; *Rose River, Canol Road, Mi. 95,* 3; Wolverine Creek, head Donjek River, 1 (NMNH); Burwash Landing, 2 (1ROM); *Kluane Lake,* 1; Livingstone, 1 (FMNH); Frances Lake, 1; Mount Wood, 1 (AMNH); Lake Laberge, 2 (NMNH); Kluane Lake, Alaska Highway, Mi. 1064, 4 (MCZ); *head Kluane Lake,* 3; *S end Kluane Lake, Alaska Highway, Mi. 1054,* 12 (CU); *Kluane,* 1 (MCZ); *6 mi. SW Kluane,* 1 (KU); *Kluane Range, 25 mi. SSE Destruction Bay,* 6; Alaska Highway, Mi. 980. 1; Haeckel Hill, 8 mi. NW Whitehorse, 6; *Haeckel Hill,* 3; *McIntyre Creek, 3 mi. NW Whitehorse,* 1 (KU); *2 mi. NNW Whitehorse,* 1 (KU); *1 mi. NE Whitehorse,* 1 (KU); *½ mi. W Whitehorse,* 1 (KU); *Fifty Mile River* [= *Yukon River*], 1 (NMNH); *Lewes River* [= *Yukon River*], *Whitehorse,* 1; *Louise Lake, 7½ mi. W Whitehorse,* 2; *Miles Canyon,* 1 (NMNH); *6¾ mi. SW Whitehorse,* 1; Kathleen River, 3; *Haines Road Junction,* 1; 30 mi. N Teslin Lake, 1; *mountains, 30 mi. NE Teslin Lake,* 1; *30 mi. NE Teslin Lake,* 2; Surprise Lake, near Teslin Lake, 3; *2 mi. W Teslin River, 16 mi. S and 56 mi. E Whitehorse,* 7 (KU); *31 mi. ENE Tagish,* 3; mountains, 40 mi. NE of N end Teslin Lake, 1; near Whitehorse, Alaska Highway, Mi. 879, 1; *Lake Marsh,* 6 (4 NMNH, 2 AMNH); mountains NE Teslin Lake, 1; *near Teslin Lake,* 5; *Nisutlin River, near Teslin Lake,* 2; SW end Dezadeash Lake, 6 (KU); *5 mi. SE Dalton Post,* 9; Carcross, 2 (1 MVZ, 1 NMNH); *Caribou Crossing* [= *Carcross*], 4 (NMNH); *1 mi. S Carcross,* 2; *Lake Bennett, Yukon River,* 1 (NMNH); Atlin Trail, near Teslin Lake, 6; 1½ mi. E Tatshenshini River, 1½ mi. S and 3 mi. E Dalton Post, 3 (KU); Rancheria, 3 (AMNH); *Alcan 88E Teslin* [= *Alaska Highway, 88 mi. E Teslin*], *Upper Rancheria,* 1.

Localities not plotted
Alaska Highway, 1.

Tamiasciurus hudsonicus – Red squirrel

Tamiasciurus hudsonicus preblei A. H. Howell

Tamiasciurus hudsonicus preblei A. H. Howell 1936*a*:133; holotype from Fort Simpson, District of Mackenzie, N.W.T.; Rand 1945*b*:49 (part); R. M. Anderson 1947:120 (part); Baker 1951:98 (part).
Sciurus hudsonicus, Osgood 1900:26 (part), 1909*b*:54, 77.
Tamiasciurus hudsonicus columbiensis, Rand 1945*a*:38, 1945*b*:49 (part); R. M. Anderson 1947:118 (part); Baker 1951:97 (part); Hall and Kelson 1959:399 (part).
Tamiasciurus hudsonicus petulans, Rand 1945*b*:49 (part); Anderson 1947:119 (part); Baker 1951:97 (part); Cameron 1952:181; Hall and Kelson 1959:402 (part); Banfield 1961*a*:130.
Tamiasciurus hudsonicus, Youngman 1968:75.

Distribution
All but the northern Coastal Plain (Map 20).

Measurements
Average (and extreme) measurements of 19 specimens (9 males, 10 females) from Old Crow are 317 (270–338); 123 (92–140); 51 (48–54). Average (and extreme) weights of 9 males are 231.5 (211.9–250.0) g. Average (and extreme) measurements of 7 specimens (1 male, 6 females) from the southwestern Yukon (Klukshu, Dalton Post, Kluane Lake, Kathleen River) are 324 (313–333); 127 (117–135); 49 (46–52). Average (and extreme) measurements of 19 specimens (7 males, 12 females) from the southeastern Yukon (North Toobally Lake, 128 mi. N Watson Lake, and 38 mi. NNW Watson Lake) are 317 (272–350); 122 (105–135); 49 (43–54). For cranial measurements see Table 14.

Remarks
Hall and Kelson (1959:399) expressed doubt about the taxonomy of red squirrels and generally followed the classification of

R. M. Anderson (1947). The present cursory study of red squirrels in the northwest emphasizes that this hesitancy was not without foundation. Part of the confusion has resulted from an apparent lack of recognition by many authors that red squirrels in this region have an erythristic phase, the proportions of which may vary at different times (Preble 1908:169).

There is little doubt that the red squirrels from the Yukon do not belong to the nominate subspecies. The oldest applicable name, *Tamiasciurus hudsonicus preblei* (A. H. Howell 1936*a*:133), was originally applied to all red squirrels from the Yukon except those from the southern part of the Territory, which Howell (1936*a*:135) assigned to *T. h. columbiensis* (type locality, Raspberry Creek, about 30 miles SE of Telegraph Creek, B.C. Howell (1936*a*) described *T. h. columbiensis* as differing from *T. h. preblei* in having a smaller skull; shorter tail; upper parts in winter pelage darker, more olive and less buffy; feet tawny, rather than grey; tail darker; and upper parts in summer pelage buffy brown or olive brown, rather than tawny olive mixed with fuscous.

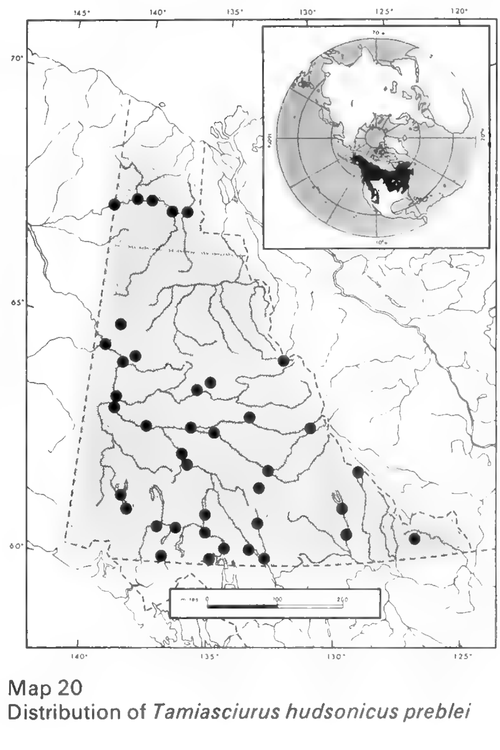
Near topotypes of *Tamiasciurus hudsonicus columbiensis* that I have examined do not have a shorter tail or smaller skull than *T. h. preblei.* I interpret the slightly darker colour of these specimens as indicating intergradation between *T. h. preblei* and *T. h. petulans.* Red squirrels from areas in the Yukon that A. H. Howell (1936*a*:135) assigned to *T. h. columbiensis* do not differ in external or cranial measurements, nor in colour, from topotypes and near topotypes of *T. h. preblei.*

Specimens from the southwestern Yukon assigned to *T. h. petulans* by various authors (on supposed geographical grounds) show no relationship to that Dark Red (2.5YR 3/6) subspecies. Some specimens in the erythristic phase from the vicinity of Teslin Lake are dark, perhaps indicating intergradation with *T. h. petulans*, but these are old, somewhat soiled specimens. More collecting is needed in that region.

No more than 4 embryos have been found in females from the Yukon although one specimen was collected with 5 uterine scars.

Records of occurrence

Specimens examined, 352: Old Crow, 18; Porcupine River, 20 mi. NE Old Crow, 1; 11 mi. NE Lapierre House, 1; *10 mi. NE Lapierre House,* 1; *Bell River, 10 mi. NE Lapierre House,* 3; *Richardson Mountains, 13 mi. NE Lapierre House,* 3; *4 mi. W Lapierre House,* 8; *3½ mi. SW Lapierre House,* 1; *Bell River, 1½ mi. SW Lapierre House,* 1; *1 mi. SW Lapierre House,* 6; *2½ mi. SW Lapierre House,* 2; Porcupine River, mouth Berry Creek, 1; Rampart House, 13; head Coal Creek, 64°47′/139°54′, 1 (NMNH); Coal Creek, 64°29′/140°26′, 5 (4 CAS, 1 NMNH); *Forty Mile,* 17 (5 CAS, 2 NMNH, 10 MVZ); Bonnet Plume Lake, 1; Benson Creek, 28 mi. ENE Dawson, 15; *Dempster Highway, Mi. 10,* 3 (AHRC); Fort Reliance, 4 (NMNH); Keno Hill Summit, 1; *Klondike Keno* [= *1 mi. S Wernecke*], 5; 6½ mi. N Mayo, 4; Sixtymile Creek [= Sixty Mile River], Yukon River, 1 (NMNH); *Sixtymile Creek* [= *Sixty Mile River*], 1 (NMNH); *Stewart River settlement,* 3; *Stewart River settlement region,* 39; Russell Mountains [= Russell Range], near forks Macmillan River, 1 (NMNH); *forks Macmillan River,* 4 (NMNH); mouth White River, 2 (NMNH); south fork Mac-



Map 20
Distribution of *Tamiasciurus hudsonicus preblei*

Table 14
Cranial measurements of *Tamiasciurus hudsonicus* and *Glaucomys sabrinus*

Number of specimens averaged or catalogue number, and sex	Greatest length	Zygomatic breadth	Cranial breadth	Interorbital breadth	Least postorbital breadth	Nasal length	Maxillary tooth-row
			Tamiasciurus hudsonicus preblei Old Crow				
Average 17 (8 ♂, 9 ♀)	47.6^{16}	28.1^{16}	21.5	14.3^{15}	14.7^{15}	14.3	8.5
Max.	48.9	29.4	22.4	15.5	15.4	15.4	9.1
Min.	46.0	26.9	20.7	13.6	14.0	13.3	7.9
SD	0.82	0.69	0.51	0.56	0.37	0.52	0.32
SE	0.20	0.17	0.12	0.14	0.10	0.13	0.08
			Stewart River settlement region				
Average 32 (20 ♂, 12 ♀)	47.4	27.4	21.1	14.1	14.7	14.2	8.4
Max.	48.9	28.6	21.9	15.2	15.5	15.2	8.8
Min.	46.0	26.1	20.3	12.7	13.6	13.2	7.6
SD	0.65	0.62	0.41	0.51	0.47	0.55	0.26
SE	0.11	0.11	0.07	0.09	0.08	0.10	0.05
			Southwestern Yukon (Klukshu; Dalton Post; Kluane Lake; Kathleen River)				
Average 12 (1 ♂, 8 ♀, 3 ?)	47.6^{9}	27.5^{11}	21.1^{11}	14.0	14.9	14.0^{11}	8.4
Max.	48.7	28.1	21.5	15.0	16.2	15.1	9.1
Min.	46.2	26.9	20.8	13.2	13.6	12.9	7.9
SD	0.84	0.40	0.24	0.66	0.71	0.68	0.36
SE	0.28	0.12	0.07	0.19	0.20	0.20	0.10
			Southeastern Yukon (N Toobally Lake; Little Hyland River; 38 mi. NNW Watson Lake)				
Average 20 (7 ♂, 13 ♀)	47.1	27.5^{18}	21.0	13.9^{17}	14.6^{19}	14.1	8.3
Max.	48.9	28.7	22.0	14.8	15.1	14.6	8.9
Min.	46.4	26.7	20.2	13.0	14.0	13.5	7.9
SD	0.56	0.56	0.48	0.47	0.37	0.36	0.26
SE	0.13	0.13	0.11	0.11	0.08	0.08	0.06

Number of specimens averaged or catalogue number, and sex	Greatest length	Zygomatic breadth	Cranial breadth	Interorbital breadth	Least postorbital breadth	Nasal length	Maxillary tooth-row
Glaucomys sabrinus sabrinus Camp Davidson [64°40′51″/140°54′31″]							
35320 NMNH, ♀	41.3	25.2	19.6	8.1	9.5	11.9	8.3
Stewart River settlement region							
Average 6 (2 ♂, 4 ♀)	41.0^5	24.5	19.1^5	7.8	9.3	12.2	8.4
Max.	42.0	26.5	19.7	8.4	9.5	12.8	8.7
Min.	39.5	23.7	18.5	7.3	9.1	11.3	8.2
SD	1.04	1.11	0.50	0.47	0.15	0.54	0.21
SE	0.46	0.45	0.22	0.19	0.06	0.22	0.08
Southern Yukon (Dalton Post; Kathleen River; Whitehorse; Lapie River)							
Average 6 (2 ♂, 4 ♀)	40.9^5	25.5	19.2^5	7.9	9.0	12.3	8.4
Max.	41.6	25.9	19.7	8.5	9.6	12.7	8.7
Min.	40.0	24.7	18.6	7.1	8.5	11.7	8.1
SD	0.72	0.43	0.48	0.51	0.39	0.42	0.27
SE	0.32	0.17	0.22	0.21	0.16	0.17	0.11

millan River, Canol Road, Mi. 249, 2; *12 mi. above Sheldon Lake,* 1; *Sheldon Lake, Canol Road, Mi. 222,* 4; Macmillan River, 1 (NMNH); 20 mi. W Fort Selkirk, 1 (NMNH); Pelly River, 100 mi. downstream from Ross River, 1; Yukon Crossing, 6; *1 mi. S Yukon Crossing,* 2; *Rink Rapid,* 1 (NMNH); *Nordenskiold River, 1 mi. NW Carmacks,* 4; *Nordenskiold River,* 2 (1 NMNH); Lewes River [= Yukon River], near Carmacks, 1; *½ mi. NW Carmacks,* 2; *12 mi. SSE Carmacks,* 1; Ross River, near Pelly River, 1; *Ross River area,* 1; *Lapie River, Canol Road, Mi. 132,* 11; Little Hyland River, 128 mi. N Watson Lake, 3; Lapie Lake, Canol Road, Mi. 105, 2; *Rose River, Canol Road, Mi. 95,* 3; Burwash Landing, 1; *Kluane Lake,* 1; Frances River, 1 mi. S Frances Lake, 1; Lake Laberge, 2 (NMNH); *head Lake Laberge,* 4 (NMNH); Kluane Lake, Alaska Highway, Mi. 1064, 4 (MCZ); *head Kluane Lake,* 4; *near Kluane,* 5 (MCZ); *6 mi. SW Kluane,* 2 (KU); *N side Slims River,* 1; Nisutlin River, Canol Road, Mi. 40, 4; 38 mi. NNW Watson Lake, 3; Alaska Highway, Mi. 980, 1; Kathleen River, 6; McIntyre Creek, 3 mi. NW Whitehorse, 1 (KU); *4½ mi. W Whitehorse,* 1; *4¼ mi W Whitehorse,* 1; *Whitehorse,* 1 (PAS); *Lewes River* [= *Yukon River*], 1 (NMNH); *Louise Lake, 7½ mi. W Whitehorse,* 2; *W side Lewes River* [= *W side Yukon River*], *2 mi. S Whitehorse,* 1 (KU); Squanga Lake, 1; Lake Marsh, 2 (NMNH); *2 mi. E Tagish,* 1; *NE shore Little Atlin Lake,* 2 (KU); *Little Atlin Lake, 8 mi. SSE Jakes Corner,* 2; *Tagish Lake,* 4 (NMNH); North Toobally Lake, 33; 2 mi. NW Klukshu, 1; *5 mi. SE Dalton Post,* 3; *1½ mi S and 3 mi. E Dalton Post,* 2 (KU); Teslin Lake, 1; *near Teslin Lake,* 19; *Settlin River* [= Nisutlin River], *near Teslin Lake,* 7; *New Settlin River* [= Nisutlin River], *near Teslin Lake,* 3; 1 mi NE Carcross, 1; *1 mi. N Carcross,* 1; *Caribou Crossing* [= *Carcross*], 2 (NMNH); *1 mi. S Carcross,* 2; *Lake Bennett,* 1 (NMNH).

Localities not plotted
Porcupine River, 1 (NMNH).

Glaucomys sabrinus – Northern flying squirrel

***Glaucomys sabrinus sabrinus* (Shaw)**
Sciurus sabrinus Shaw, 1801:157, a renaming of *Sciurus hudsonius* Gmelin 1788; type locality, mouth of Severn River, Ont.
[*Glaucomys*] *sabrinus,* A. H. Howell 1915*b*:111.
Sciuropterus yukonensis, Osgood 1900:25.
Glaucomys sabrinus yukonensis, A. H. Howell 1918:41; Rand 1945*a*:39, 1945*b*:50; R. M. Anderson 1947:127; Cameron 1952:181; Hall and Kelson 1959:411 (part).
Glaucomys sabrinus zaphaeus, Baker 1951:100; Hall and Kelson 1959:411 (part).

Distribution
Wooded portions of the Yukon (Map 21).

Measurements
Average (and extreme) external measurements of 5 specimens from several locations in the southern Yukon are 325 (307–339); 144 (130–158); 42 (41–45). For cranial measurements see Table 14.

Remarks
Cowan and Guiguet (1965:158) referred specimens from northern British Columbia to *Glaucomys sabrinus alpinus* (Richardson), but I have been unable to distinguish between *G. s. alpinus* and *G. s. sabrinus.* There is a slight cline in skull length from Ontario to British Columbia and the Yukon, but I can find no trenchant characters for the recognition of *G. s. alpinus.*

Sciuropterus yukonensis was named on the basis of two specimens. It was described as being larger than both *Glaucomys sabrinus sabrinus* and *G. s. alpinus,* and was said to possess a long tail. The large external size of the holotype published in the description was probably obtained from measurements of the study skin. A. H. Howell (1918:41) listed large foot size and a larger skull as additional characters separating *G. s. yukonensis* from *G. s. sabrinus.* Measurements of the dried feet of the holotype, topotype, and near topotypes do not support foot size as a decisive character. The cranial measurements of specimens from the Yukon are slightly, but not significantly, larger than specimens from Ontario. Thus the small number of specimens available from the Yukon and Alaska do not support the subspecific distinctness of these populations.

Records of occurrence

Specimens examined, 18: Camp Davidson [= 64°40′51″/140°54′31″], 2 (NMNH); *Coal Creek, near Forty Mile*, 1 (MVZ); S side Mayo Lake, 1; 6 mi. W mouth Stewart River, 1; *3 mi. W mouth Stewart River*, 3; *2 mi. W mouth Stewart River*, 1; *5 mi. S mouth Stewart River*, 1; Fort Selkirk, 1; Lapie River, Canol Road, Mi. 132 1; east arm Frances Lake, 1; Kathleen River, Haines Road, 3; Louise Lake, 7½ mi. W Whitehorse, 1; 1½ mi. S and 3 mi. E Dalton Post, 1 (KU).

Family **Castoridae** – Beavers
Castor canadensis – Beaver

Castor canadensis canadensis **Kuhl**
Castor canadensis Kuhl, 1820:64; type locality, Hudson Bay.
Castor fiber canadensis, Youngman 1968:75.

Distribution

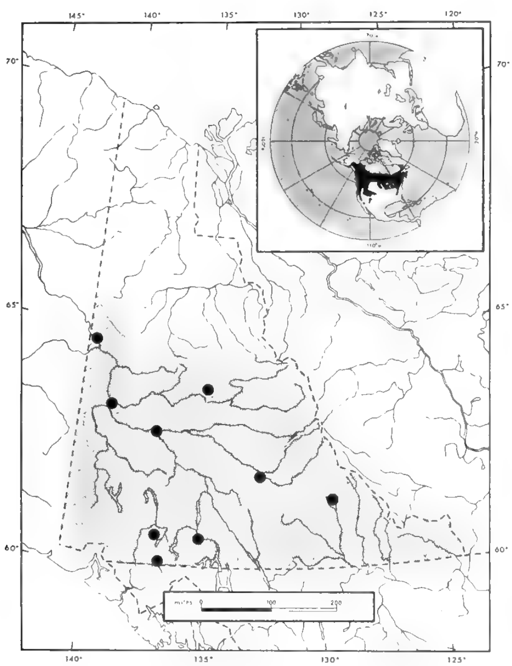
All of the Yukon (Map 22).

Measurements

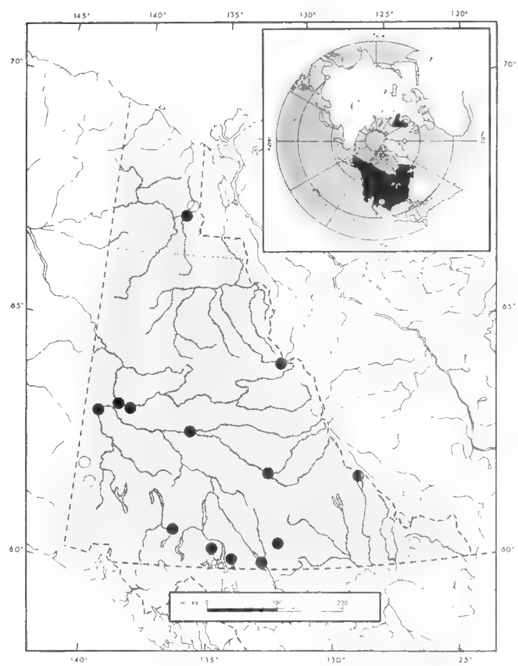
A subadult male from 138 mi. N Watson Lake and 5 mi. E Little Hyland River, and a subadult female from mouth Waters River, ½ mi. WSW Lapierre House, measured respectively 920, 924; 260, 308; 160, 173;—, 31 lb. For cranial measurements see Table 15.

Remarks

Freye (1960) considered *Castor fiber* and *Castor canadensis* to be conspecific. However, Lavrov and Orlov (1973) showed karyotypical and craniological differences between the two species. Taylor (1916) indicated that *Castor canadensis belugae* probably occupied the area from central mainland British Columbia "to the Alaskan Mountains on the North", thus inferring that *C. c. belugae* occurred in the Yukon Terri-



Map 21
Distribution of *Glaucomys sabrinus sabrinus*



Map 22
Distribution of *Castor canadensis canadensis*

Table 15
Cranial measurements of *Castor canadensis canadensis*

Catalogue number, and sex of specimens	Basilar length	Zygomatic breadth	Mastoidal breadth	Least interorbital constriction	Nasal length	Greatest nasal width	Alveolar length of maxillary tooth-row
			Stewart River settlement				
31754	112.3		65.0	23.6	49.9	22.4	
31756	105.4	86.3	59.6	21.3	44.7	21.7	28.1
			138 mi. N Watson Lake and 5 mi. E Little Hyland River				
31300	105.3	84.0	60.0	22.9	42.9	20.9	28.5
			Little Atlin Lake, 8 mi. SSE Jakes Corner				
31294	110.2		63.2	23.5	42.1	21.6	
31295 ♂		86.4		23.2	43.8	22.9	28.5
			Teslin Lake				
1962	115.7	89.5	63.4	21.4	46.8	21.8	29.9
1957	107.9		57.6	21.0	42.2	22.0	27.7
			Atlin Lake, 33 mi. SE Tagish				
31297 ♂	110.4	89.8	61.9		48.4	22.5	29.0
31298 ♀	112.4	90.3	62.2	23.7	46.7	21.4	28.4

tory. Benson (1933) restricted the range of *C. c. belugae* "from the Cook Inlet region of Alaska south along the coast of southern British Columbia" and stated, "the range of *Castor canadensis canadensis* Kuhl probably meets that of (*C. c.*) *sagittatus* in the Rocky Mountains."

In a range map, R. M. Anderson (1934: 4074) showed *Castor canadensis belugae* inhabiting most of Yukon Territory, but later (1947:133), he indicated that *C. c. canadensis* occurred in the northern Yukon and that *C. c. sagittatus* probably occurred in parts of the southeastern Yukon. Rand (1945*a*, 1945*b*) and Hall and Kelson (1959) referred records from the Yukon to *C. c. belugae* although apparently none of these records were substantiated by specimens.

Benson (1933:324) was correct when he said, "Among the described races of beaver in western North America differences in color and size between geographically adjacent races are slight, although races far distant from one another may differ greatly with respect to these characters." My assignment of beavers from the Yukon Territory to *C. c. canadensis* is somewhat arbitrary. Cranially, they are intermediate between the described subspecies, *canadensis, sagittatus,* and *belugae*, but in my opinion there is little justification for recognizing many of the subspecies of beaver in North America. The majority of characters that have been used to describe them vary greatly in individuals. The areas of intergradation between the nominal subspecies in northwestern North America are probably larger than the actual ranges, if they exist.

Records of occurrence

Specimens examined, 37: mouth Waters River, ½ mi. WSW Lapierre House, 1; Bonnet Plume Lake, 1; 8 mi. N mouth Stewart River, 1; *Stewart River settlement,* 3; *mouth Stewart River,* 2; *4 mi. S Stewart River,* 1; *8 mi. S mouth Stewart River,* 1; 30 mi. up from mouth Stewart River, 1; 28 mi. SW Stewart River, 1; *35 mi. SW Stewart River*, 1; Macmillan River, 1 (NMNH); 138 mi. N Watson Lake, 5 mi E. Little Hyland River, 1; mouth Ross River, 4 (NMNH); Champagne, Dezadeash River, 1; Wolf Lake, near Teslin Lake, 60°38′/131°40′, 1; Robinson, 1 (NMNH); Little Atlin Lake, 8 mi. SSE Jakes Corner, 2; *Atlin Lake, 33 mi. SE Tagish*, 5; Teslin Lake vicinity, 3; *Shallow River, near Teslin Lake*, 3; *Fat Creek, near Teslin Lake*, 1.

Localities not plotted
Yukon Territory, 1.

Additional records
Summit Lake, 67°43′/136°29′, 15 August 1968 (seen, D. A. Gill, MS); *Bell River, 10 mi. NE Lapierre House*, 25 July 1964 (seen, P. M. Youngman, MS); Keele Lake, August 1966 (seen, W. H. Butler, MS); Koidern River (Banfield 1961*a*:131); pond W Tepee Lake (Banfield, 1961*a*:131); North Toobally Lake, 15 July 1961 (seen, P. M. Youngman, MS); 1 mi. S Carcross, 1 September 1966 (sign seen, W. H. Butler, MS).

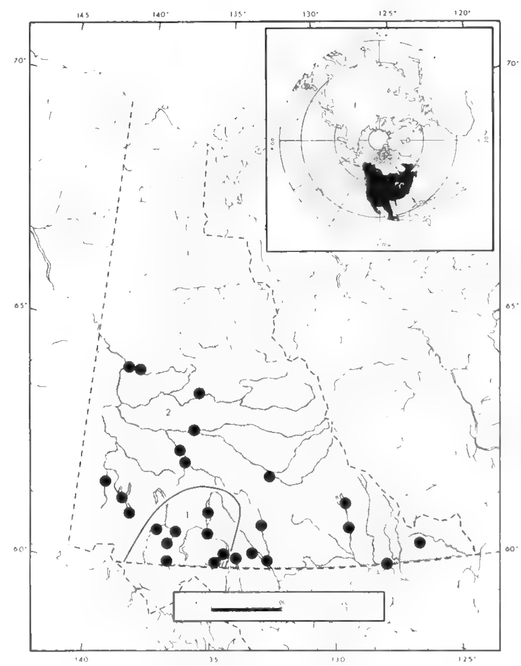
Family **Muridae** – Murids
Peromyscus maniculatus – Deer mouse

***Peromyscus maniculatus algidus* Osgood**
Peromyscus maniculatus algidus Osgood, 1909*a*:56; holotype from head of Bennett Lake (site of Bennett City), B.C.; Rand 1945*b*:54 (part); R. M. Anderson 1947:136 (part); Baker 1951:101 (part); Cameron 1952:181; Hall and Kelson 1959:613 (part); Banfield 1961*a*:130.
Peromyscus oreas, Osgood 1900:32 (part).
Peromyscus maniculatus arcticus, Osgood 1900:33 (part).

Distribution
Coast Mountains in the southwestern Yukon (Map 23).

Measurements
Average (and extreme) measurements of 19 males and 22 females from the Carcross–Marsh Lake region are 174 (163–191); 86 (73–100); 21 (18–23). Four males averaged 26.1 g and 6 nonparous females averaged 26.7 g. For cranial measurements see Table 16.

Remarks
This subspecies differs from *Peromyscus maniculatus borealis* by having a longer tail (averaging over 85 mm in series examined). Osgood (1909*a*:56) described *P. m. algidus* as being a weakly defined subspecies differing from *P. m. arcticus* (= *P. m. borealis*) by its longer tail, less dusky coloration, larger skull, and larger teeth, My analysis of external measurements confirms the longer tail of *P. m. algidus*, but I have not been able to confirm the colour difference, nor the size difference in skull and teeth (Table 16). None of the specimens from the Yukon have as long tails as do specimens from the type locality at Bennett, B.C., and they are considered to be intergrades with *P. m. borealis*.



Map 23
Distribution of *Peromyscus maniculatus*
1 *P. m. algidus*
2 *P. m. borealis*

Table 16
Cranial measurements of *Peromyscus maniculatus*

Number of specimens averaged, and sex	Greatest length of skull	Length of nasals	Zygomatic breadth	Least interorbital breadth	Length of palatal shelf	Length of diastema	Length of postpalatal shelf	Alveolar length of maxillary tooth-row
				Peromyscus maniculatus algidus Dawson region				
Average 7 (6 ♂, 1 ♀)	26.5	11.0	13.7	4.2	3.7	7.3	9.5	4.2
Max.	27.2	11.5	14.1	4.3	4.2	7.6	9.8	4.3
Min.	25.4	10.6	13.5	4.0	3.5	6.9	8.8	4.1
SD	0.59	0.35	0.28	0.09	0.24	0.26	0.33	0.07
SE	0.22	0.13	0.12	0.04	0.09	0.10	0.12	0.03
				Whitehorse region				
Average 16 (6 ♂, 10 ♀)	26.6	11.3	13.5	3.9	3.9	7.6	9.6	4.0
Max.	27.5	13.9	13.9	4.2	4.1	8.1	10.0	4.4
Min.	25.8	10.3	13.0	3.6	3.4	7.2	8.8	3.6
SD	0.56	0.94	0.28	0.19	0.23	0.21	0.35	0.17
SE	0.14	0.24	0.07	0.05	0.06	0.05	0.09	0.04
				Carcross–Marsh Lake region				
Average 41 (19 ♂, 22 ♀)	26.2	10.5	13.0[27]	4.0	3.9	7.3	9.4	4.0
Max.	28.0	11.8	14.0	4.3	4.4	7.8	10.1	4.4
Min.	25.3	9.5	12.1	3.7	3.6	6.8	8.6	3.6
SD	0.67	0.50	0.38	0.19	0.21	0.28	0.33	0.24
SE	0.11	0.08	0.06	0.02	0.03	0.04	0.07	0.04
				Dezadeash Lake–Kathleen River region				
Average 25 (15 ♂, 10 ♀)	26.6	10.9	13.7[22]	4.2	4.0	7.6	9.7	4.2
Max.	28.4	12.6	14.2	4.6	4.5	8.1	10.3	4.5
Min.	25.3	10.0	12.9	3.9	3.4	7.0	9.1	3.7
SD	0.72	0.58	0.34	0.16	0.24	0.33	0.34	0.19
SE	0.14	0.11	0.07	0.03	0.05	0.07	0.07	0.04

Number of specimens averaged, and sex	Greatest length of skull	Length of nasals	Zygomatic breadth	Least interorbital breadth	Length of palatal shelf	Length of diastema	Length of postpalatal shelf	Alveolar length of maxillary tooth-row
				Peromyscus maniculatus borealis Kluane Lake region				
Average 35 (18 ♂, 17 ♀)	26.8^{26}	10.9^{32}	13.8^{26}	4.2^{33}	4.1	5.8^{33}	9.7^{23}	4.2^{33}
Max.	28.8	11.6	14.5	4.6	4.5	6.1	12.0	4.7
Min.	25.7	10.0	13.2	4.0	3.7	5.4	8.9	4.0
SD	0.68	0.42	0.35	0.13	0.22	0.22	0.60	0.17
SE	0.13	0.07	0.07	0.02	0.04	0.04	0.12	0.03
				Teslin River region, 50 mi. E Whitehorse				
Average 21 (9 ♂, 12 ♀)	26.2	11.2	13.4^{20}	4.0	4.0	7.3	9.4	3.7
Max.	27.6	11.7	14.4	4.4	4.4	7.8	9.9	3.9
Min.	25.0	10.4	13.0	3.6	3.5	6.7	8.7	3.2
SD	0.74	0.37	0.46	0.19	0.24	0.29	0.34	0.15
SE	0.16	0.08	0.10	0.04	0.05	0.06	0.07	0.03
				Little Atlin Lake				
Average 21 (11 ♂, 10 ♀)	25.9	11.0	13.2	4.0	3.9	7.1	9.3	3.7
Max.	26.7	11.6	13.7	4.2	4.2	7.7	9.9	4.1
Min.	25.1	10.3	12.6	3.8	3.4	6.8	9.0	3.5
SD	0.56	0.32	0.29	0.10	0.24	0.23	0.29	0.16
SE	0.12	0.07	0.06	0.02	0.05	0.05	0.06	0.03

Records of occurrence
Specimens examined, 178: Lake Laberge, 14 (NMNH); Fifty Mile River [= Yukon River], near Lake Laberge, 1 (NMNH); *Haeckel Hill,* 6; *McIntyre Creek, 3 mi. NW Whitehorse,* 6 (KU); *2 mi. NNW Whitehorse,* 2 (KU); *Fifty Mile River* [= *Yukon River*], 3 (NMNH); *Lewes River* [= *Yukon River*], 1 (NMNH); *Whitehorse Rapids,* 5 (NMNH); *W side Lewes River* [= *W side Yukon River*], *2 mi. S Whitehorse,* 16 (KU); Alaska Highway, Mi. 1035, 6; *Pine Creek, Alaska Highway, Mi. 1019,* 1 (MCZ); *Experimental Farm, Alaska Highway, Mi. 1019,* 1; *Kathleen River,* 10; 3 mi. S Champagne, Dezadeash River, 1; Dezadeash Lake, 2; *SW end Dezadeash Lake,* 25 (KU); Lake Marsh, 9 (NMNH); *Tagish,* 1; *2 mi. E Tagish,* 1; *Tagish River, 13 mi. SW Alaska Highway, Mi. 866,* 1; *Chooutla Lake, 4 mi. ENE Carcross,* 2; *1 mi. N Carcross,* 10; *Carcross,* 11; *Caribou Crossing* [= *Carcross*], 2 (NMNH); *Tagish Lake,* 4 (NMNH); 1 mi. S Carcross, 16; *1½ mi. S Carcross,* 6; 1½ mi. S and 3 mi. E Dalton Post, 15 (KU).

Peromyscus maniculatus borealis Mearns

Hesperomys leucopus arcticus Mearns, 1890:285; holotype from Fort Simpson, District of Mackenzie, N.W.T. Not *Hesperomys arcticus* Coues, 1877 [=*Hesperomys maniculatus* Wagner]. Type locality, Labrador.
Peromyscus maniculatus borealis, Mearns 1911:102, a renaming of *arcticus* Mearns; Rand 1945*a*:40, 1945*b*:54 (part); R. M. Anderson 1947:138 (part); Baker 1951:101 (part); Hall and Kelson 1959:619 (part); Youngman 1964:2, 1968:76.
Peromyscus oreas, Osgood 1900:32 (part).
Peromyscus maniculatus arcticus, Osgood 1900:33 (part), 1909*a*:49 (part), 1909*b*:77.
Peromyscus maniculus algidus, Osgood 1909*a*:56 (part).

Distribution
Dawson and Mayo south in all but the south-central portion of the Yukon (Map 23).

Measurements
Average (and extreme) measurements of 11 males and 10 females from Little Atlin Lake are 164 (150–182); 72 (63–85); 21 (17–24). Eleven males averaged 22.7 (20.2–25.5) g. For cranial measurements see Table 16.

Remarks
For comparison with *Peromyscus maniculatus algidus* see account of that subspecies.

Despite the comparatively large number of specimens of *Peromyscus maniculatus* in collections from the Northwest Territories, the Yukon, and British Columbia, only a small fraction of these have adequate tail measurements; thus the distribution of subspecies presented here is tentative and needs further clarification.

Records of occurrence
Specimens examined, 345: Dawson, 3 (1 UBC); *14 mi. E Dawson,* 7; *16 mi. E Dawson,* 2; junction Klondike and North Klondike rivers, 1; 4½ mi. N Mayo, 3; *2 mi. NNE Mayo,* 3; Pelly River, mouth Macmillan River, 1 (NMNH); Yukon Crossing, 2; *Rink Rapid,* 2 (NMNH); Nordenskiold River, 1 mi. NW Carmacks, 5; *½ mi. NW Carmacks,* 1; *¼ mi. NW Carmacks,* 5; Lapie River, Canol Road, Mi. 132, 17; Donjek River, Kluane Park, 1 (ROM); 5 mi. N Burwash Landing, 2; *Kluane Lake, Gladstone Creek,* 1 (CU); *Kluane Lake,* 58 (54 CU); Frances Lake, 8 (1 NMNH); Cultus Bay, Kluane Lake, 13 (CU); *Sheep Mountain, Alcan Highway* [= *Alaska Highway*], *Mi. 1061,* 1; *W Sheep Mountain, E Sheep Creek, near Old Alaska Highway, Mi. 1061,* 7; *Christmas Bay, Kluane Lake,* 1 (CU); *Kluane Lake, Alaska Highway, Mi. 1064,* 4 (MCZ); *head Kluane Lake,* 2; *Silver City* [= *Kluane*], *Kluane Lake,* 13 (CU); *S end Kluane Lake, Alaska Highway, Mi. 1054,* 47 (CU); *delta Silver Creek,* 1 (CU); *Kluane Lake, Alaska Highway, Mi. 1053,* 3 (CU); *6 mi. SW Kluane,* 10 (KU); *Christmas Creek, Alaska Highway,* 1 (CU); *Kluane Lake, island near mouth Slims River,* 12 (CU); Nisutlin River, Canol Road, Mi. 40, 13; 38 mi. NNW Watson Lake, 4; 2 mi. W Teslin River, 16 mi. S and 56 mi. E Whitehorse, 8 (KU); *W side Teslin River, 16 mi. S and 58 mi. E White-*

horse, 24 (KU); *E side Teslin River, 16 mi. S and 59 mi. E Whitehorse*, 7 (KU); North Toobally Lake, 1; 12 mi. E Tagish, 1; *NE shore Little Atlin Lake*, 2 (KU); *Little Atlin Lake, 6 mi. SSE Jakes Corner*, 1; *Little Atlin Lake, 8 mi. SSE Jakes Corner*, 21; near Teslin Lake, 9; *Indian village, near Teslin Lake*, 5; *Teslin Post, near Teslin Lake*, 11; Alaska Highway, 313 mi. N Nelson, B.C. [near Irons Creek], 1.

Neotoma cinerea – Bushy-tailed wood rat

***Neotoma cinerea occidentalis* (Baird)**
Neotoma occidentalis Baird, 1855:331–33; holotype from Shoalwater [=Willapa] Bay, Pacific County, Wash.
Neotoma cinerea occidentalis, Osgood 1900:33.
Neotoma cinerea saxamans, Rand 1945*a*:40, 1945*b*:54; R. M. Anderson 1947:143; Hall and Kelson 1959:705.

Distribution
The southern half of the Yukon (Map 24).

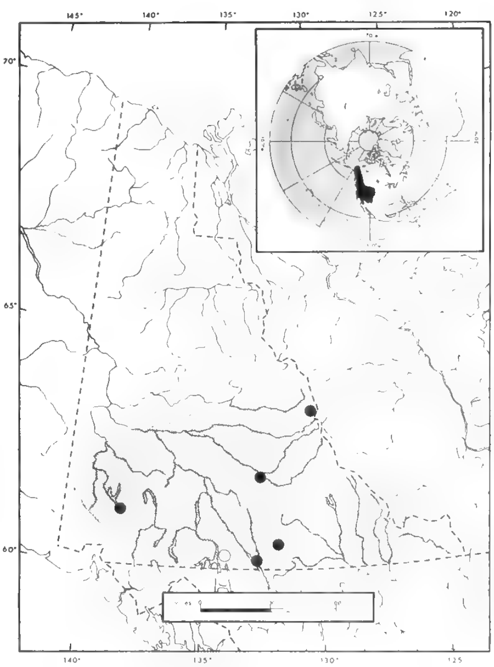
Measurements
A male from Lapie River, Canol Road, measured 407; 170; 46. Cranial measurements of the Lapie River specimen and a male from Wolf Lake, near Teslin Lake, are respectively: basilar length, 46.7, 47.9; zygomatic breadth, 27.4, 28.6; interorbital breadth, 5.6, 4.9; nasal length, 20.6, 22.1; length of incisive foramen, 13.1, 13.1; length of palatal bridge, 9.1, 9.9; alveolar length of maxillary tooth-row, 10.8, 10.8.

Remarks
The wood-rat habitat described by Rand (1945*a*:40) as "Rocky outcrops in the rather barren hillside" characterizes all of the areas occupied by wood rats that I have seen. The nests are made of twigs.

I agree with Cowan and Guiguet (1965: 195) that *Neotoma cinerea saxamans* is an invalid subspecies. *Neotoma c. occidentalis* is a dusky subspecies, especially in coastal British Columbia. It intergrades with *N. c. drummondi* in northern British Columbia and perhaps in the eastern Yukon.

Records of occurrence
Specimens examined, 9: Keele Peak, Selwyn Range, 275 mi. NNE Whitehorse, 1 (MZ); Lapie River, Canol Road, Mi. 132, 2; N Cultus Bay, Kluane Lake, 1 (CU); Wolf Lake, near Teslin Lake, 60°38′/131°40′, 1; *Liard Divide, near Teslin Lake*, 1; near Teslin Lake, 1; *Teslin Post, near Teslin Lake*, 1; *Morley River, near Teslin Lake*, 1.

Additional records
Little Atlin Lake, 6 mi. SSE Jakes Corner, 25 May 1963 (sign, P. M. Youngman, MS).



Map 24
Distribution of *Neotoma cinerea occidentalis*

Clethrionomys rutilus – Red-backed vole

***Clethrionomys rutilus dawsoni* (Merriam)**

Evotomys dawsoni Merriam, 1888:650; holotype from Finlayson River, 3,000 ft, (61°30'/129°30'), Yukon Territory; Osgood 1900:34; Preble 1908:181; Osgood 1909*b*:55.
Clethrionomys rutilus dawsoni, Rausch 1950:134; Baker 1951:103; Manning 1957:1; Banfield 1961*a*:131; Youngman 1968:77.
Evotomys rutilus, Coues and Allen 1877:136.
Clethrionomys dawsoni dawsoni, Orr 1945:70; R. M. Anderson 1947:154; Cameron 1952:182.

Table 17
Cranial measurements of *Clethrionomys rutilus dawsoni*

Number of specimens averaged, and sex	Condylobasal length	Zygomatic breadth	Least interorbital breadth	Mastoidal breadth	Depth of skull	Diastema	Length of nasals	Alveolar length of maxillary tooth-row
				Lapierre House Region				
Average 14 (9 ♂, 5 ♀)	24.1	13.2	3.9	11.5	8.9	7.4	7.5	5.1
Max.	25.9	13.6	4.0	11.9	9.1	7.7	7.9	5.6
Min.	23.3	12.6	3.7	11.1	8.7	6.9	7.0	4.8
SD	0.66	0.33	0.10	0.27	0.14	0.23	0.28	0.21
SE	0.17	0.09	0.03	0.07	0.04	0.06	0.07	0.06
				Old Crow Region				
Average 26 (16 ♂, 10 ♀)	24.3	13.4[25]	3.9[25]	11.6	8.9[23]	7.5	7.7	5.1[25]
Max.	25.0	14.2	4.1	12.2	9.2	8.0	8.3	5.5
Min.	23.2	11.5	3.6	11.2	8.5	7.0	7.0	4.7
SD	0.43	0.51	0.13	0.25	0.22	0.21	0.34	0.21
SE	0.08	0.10	0.02	0.05	0.04	0.04	0.07	0.04
				Rampart House				
Average 13 (8 ♂, 2 ♀, 3 ?)	23.7	13.3	4.0	11.3	8.6	7.2	7.5	5.3
Max.	24.7	13.9	4.1	11.6	9.0	7.7	9.3	5.7
Min.	22.9	12.7	3.9	10.9	8.4	6.7	7.1	5.0
SD	0.48	0.32	0.06	0.20	0.24	0.30	0.35	0.23
SE	0.13	0.09	0.02	0.05	0.07	0.08	0.10	0.06
				Hungry Lake				
Average 7 (4 ♂, 3 ♀)	25.1	13.9	4.0	12.0	9.1	7.7	7.8	5.2
Max.	25.5	14.4	4.1	12.3	9.3	8.0	8.3	5.5
Min.	25.0	13.6	3.9	11.7	8.7	7.5	7.2	5.0
SD	0.19	0.31	0.07	0.23	0.21	0.16	0.36	0.18
SE	0.17	0.12	0.03	0.86	0.08	0.06	0.14	0.07

Distribution

The entire Yukon (Map 25)

Measurements

Average (and extreme) measurements and some weights of adults from various localities are listed below. Lapierre House (14 specimens), 135 (128–144); 33 (29–39); 19 (16–21). Old Crow region (22 specimens), 138 (127–149); 35 (29–39); 19 (16–21); 28.8 (22.1–35.0) g (13 males). Rampart House (13 specimens), 126 (118–135); 29 (27–30); 20 (18–20). Hungry Lake (6 specimens), 144 (136–149); 32 (25–36); 20 (19–21). Dawson–Chapman Lake region (20 specimens), 147 (131–166); 36 (31–44); 19 (17–21). Stewart River (8 specimens), 137 (131–140); 32 (30–34); 18 (17–20). Carmacks region (6 specimens), 145 (136–159); 35 (28–40); 19 (18–20). Southeastern Yukon (50 specimens), 136 (125–151); 33 (27–43); 19 (17–22); 25.3 (23.5–27.4) g (10 males). For cranial measurements see Table 17.

Remarks

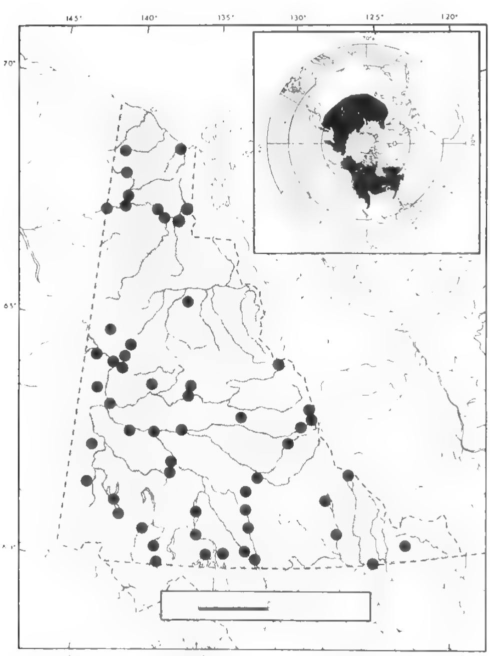
I consider this Holarctic species to be conspecific with *Clethrionomys gapperi*. James Bee (Bee and Hall 1956:117) also suggested that the two are conspecific.

The red-backed vole is, for the most part, constant in size and colour throughout the Yukon, but the specimens from Rampart House are small in external and cranial measurements, and in the latter measurements, resemble *Clethrionomys rutilus platycephalus* Manning (8 mi. S Tuktoyaktuk, N.W.T.). However, the restricted geograph-

Number of specimens averaged, and sex	Condylobasal length	Zygomatic breadth	Least interorbital breadth	Mastoidal breadth	Depth of skull	Diastema	Length of nasals	Alveolar length of maxillary tooth-row
Bonnet Plume Lake								
Average 5 (2 ♂, 3 ♀)	24.3	13.3[4]	4.0	11.8	9.0	7.2	7.6	5.3
Max.	25.2	13.9	4.2	12.2	9.3	7.5	7.8	5.5
Min.	23.7	12.8	3.9	11.3	8.7	6.9	7.2	5.2
SD	0.58	0.53	0.13	0.33	0.22	0.23	0.25	0.13
SE	0.26	0.26	0.06	0.15	0.10	0.10	0.11	0.06
Dawson–Chapman Lake region								
Average 24 (9 ♂, 15 ♀)	24.8	13.9	3.9	11.8	8.9	7.6	8.1	5.2
Max.	25.8	14.4	4.2	12.4	9.6	8.4	8.6	5.5
Min.	24.1	13.3	3.7	11.2	7.7	7.2	7.2	4.6
SD	0.53	0.35	0.12	0.34	0.48	0.26	0.36	0.22
SE	0.11	0.07	0.02	0.07	0.10	0.05	0.07	0.05
Mayo region (Keno Hill; Mayo)								
Average 9 (3 ♂, 6 ♀)	24.4	13.6	3.9	11.6	8.9	7.5	7.7	5.2
Max.	24.7	14.0	4.1	12.2	9.4	7.9	8.1	5.6
Min.	24.0	13.3	3.7	11.1	8.6	7.3	7.5	4.5
SD	0.26	0.28	0.13	0.34	0.22	0.18	0.23	0.35
SE	0.09	0.09	0.04	0.11	0.07	0.06	0.08	0.12
Southeastern Yukon (N Watson Lake, Canol Road; N Toobally Lake)								
Average 57 (33 ♂, 24 ♀)	24.0[54]	13.6[46]	3.9[56]	11.6[55]	9.1[54]	7.4[56]	7.7[55]	5.1
Max.	25.1	14.3	4.1	12.1	9.5	7.8	8.3	5.6
Min.	23.2	12.8	3.6	11.0	8.7	6.9	7.0	4.8
SD	0.42	0.31	0.11	0.23	0.19	0.22	0.30	0.17
SE	0.06	0.04	0.01	0.03	0.25	0.03	0.04	0.02

ical origin of this one series, and the fact that all specimens were collected in the spring of 1951, point to the probability that this sample owes its small size either to having been born in late fall or winter (Bee and Hall 1956:115), or to phase polymorphism in the microtine cycle (p. 111).

Manning's (1957) revision of *Clethrionomys rutilus* in Canada raised some interesting questions. He described a subspecies, *C. r. platycephalus*, from near Tuktoyaktuk, N.W.T., that he thought resembled specimens of *C. rutilus jochelsoni* from eastern Siberia more closely than it resembled nearby Canadian subspecies. To explain the origin of this subspecies he postulated accidental introduction from Siberia by whaling vessels, but he thought it was more probable that *C. r. platycephalus* was a remnant of a preglacial or interglacial population that survived glaciation in a nearby refugium. Isolation by glacial tongues and by the changing shoreline of the unglaciated shelf portion of the Beringian refugium could account for this variation. An alternative to Manning's theories is that this population sample may represent a morphological stage in the microtine cycle since most of the hypodigm for the subspecies is composed of specimens collected only during 1951 and 1952.



Map 25
Distribution of *Clethrionomys rutilus dawsoni*

Manning (1957) made little comment on the possible orgin of *Clethrionomys rutilus washburni* (type locality, Perry River, N.W.T.). Its unique distribution, surrounded by *C. r. dawsoni*, suggests that it may have been isolated by encroaching boreal forest during the Hypsithermal period.

Bolshakov and Schwartz (1962), who were not aware of Manning's revision (1957), attempted a minor revision of *Clethrionomys rutilus* in North America. They were impressed by the resemblance of specimens of *C. r. washburni* to specimens of *Clethrionomys rutilus* from Yamal, Siberia, and they attributed this resemblance to convergent evolution.

The series of 7 specimens from Hungry Lake are large cranially, approaching *Clethrionomys rutilus washburni* in many measurements. However, I think that this small collection also reflects the stage of the cycle of the population.

Red-backed voles have been collected up to 6,000 ft in all habitats, from dry arctic tundra to a floating bog, and thus have the widest range of any species in the Yukon. They reach their greatest density in dwarf willow, alder, and dwarf birch, or in overgrown talus.

The greatest number of pregnant females were taken in July and August. Forty-seven pregnant females averaged 5.4 embryos.

A red-backed vole collected at Porcupine River, 16 mi. W Old Crow had its mouth full of seeds of northern flax (*Linum Lewisii* Pursh). Flax-seeds are especially rich in oil.

Records of occurrence

Specimens examined, 1,079: 4 mi. WSW mouth Blow River, 3; Firth River, 13 mi. S mouth Joe Creek, 7; *Firth River, 15 mi. S mouth Joe Creek,* 11; *British Mountains, 20 mi. SE mouth Joe Creek,* 1; Old Crow River, at Timber Creek, 4 (NMNH); *Old Crow River, at Black Fox Creek,* 1 (NMNH); 19 mi. N Old Crow, 1 mi. N mouth Johnson Creek, 14; *Old Crow River, 19 mi. N Old Crow, 1 mi. N mouth Johnson Creek,* 1; *Old Crow River, Johnson Creek, 67°50'/139°46'*, 2 (NMNH); *Old Crow River, 50 mi. below Black Fox Creek,* 1 (NMNH); *Old Crow River, 18 mi. above mouth,* 1 (NMNH); *3 mi. NW Old Crow,* 8; *Old Crow,* 67 (7 AHRC); Summit Lake, 67°43'/136°29', 19; *11 mi. NE Lapierre House,* 3; *Richardson*

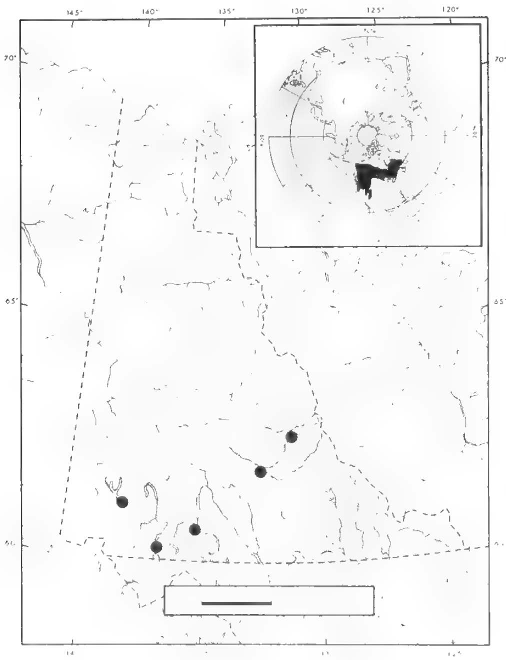
Mountains, 13 mi. NE Lapierre House, 1; *Bell River, 10 mi. NE Lapierre House,* 3; Driftwood Creek [= Driftwood River], 60 mi. NE Old Crow, 1 (AHRC); *Porcupine River, mouth Berry Creek,* 17; Porcupine River 16 mi. SW Old Crow, 13; 4 mi. S mouth Berry Creek, 5; Rampart House, 19 (1 NMNH); Lapierre House, 7 (1 MCZ); *4 mi. W Lapierre House,* 6; *Bell River, 1 mi. SW Lapierre House,* 7; *1 mi. SW Lapierre House,* 32; *Bell River, 2 mi. SW Lapierre House,* 5; *2½ mi. SW Lapierre House,* 15; Hungry Lake, 65°39'45"/135°59', 24; head Coal Creek, 64°47'/139°54', 2 (NMNH); 13 mi. S Chapman Lake, 9; *18 mi. S Chapman Lake,* 1; *20 mi. S Chapman Lake,* 34; *North Fork Crossing, Mi. 42, Aklavik Road [= North Fork Crossing, Dempster Highway, Mi. 42], Ogilvie Mountains,* 7; Forty Mile, Yukon River, 3 (MVZ); *Swede Dome, 34 mi. W Dawson,* 1; ½ mi. NE Bonnet Plume Lake, 1; *Bonnet Plume Lake,* 66; 32 mi. ENE Dawson, 1 mi. S Pea Soup Creek, 2; *Benson Creek, 28 mi. ENE Dawson,* 36; *14 mi. E Dawson City,* 5; *junction Klondike and North Klondike rivers,* 1; Yukon River, Chandindu River, 3 (NMNH); *Chandindu River,* 5 (NMNH); *Dempster Highway, Mi. 10,* 1 (AHRC); *Dawson,* 24 (7 NMNH, 1 UBC); *3 mi. NNE Dawson,* 11; *Dempster Highway, Mi. 4.8,* 1 (AHRC); *Klondike River, 5 mi. E Dawson,* 1; 16 mi. E Dawson, 1; Keno Hill Summit, 6; *Klondike Keno [= 1 mi. S Wernecke],* 79: *6 mi. N Mayo,* 1; *4½ mi. N Mayo, 12;* Gravel Lake, 58 mi. E Dawson City, 1; 2 mi. NNE Mayo, 2; mouth Sixty Mile Creek [= mouth Sixty Mile River], 2 (NMNH); Keele Lake, 73; Stewart River settlement, 38; Russell Mountains [= Russell Range], near forks Macmillan River, 5 (NMNH); Macmillan Pass, Canol Road, Mi. 282, 1; Macmillan River, Canol Road, Mi. 249, 3; *Sheldon Lake, Canol Road, Mi. 222,* 19; Macmillan River, 2 (NMNH); Selwyn River, 3 (NMNH); Fort Selkirk, 4 (NMNH); Ross Lake [= Lewis Lake], Ross River, 3 (NMNH); Donjek River, 1 (ROM); *Snag Creek, 20 mi. NE Alaska Highway, Mi. 1188,* 1; Yukon Crossing, 10; *Rink Rapid,* 14 (NMNH); *7 mi. NNW Carmacks,* 3; *5½ mi. NW Carmacks,* 4; *3½ mi. NW Carmacks,* 5; *Nordenskiold River, 1 mi. NW Carmacks,* 19; *½ mi. NW Carmacks,* 6; *¼ mi. NW Carmacks,* 2; 11 mi. WSW Carmacks, 18; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 3; *Little Hyland River, 128 mi. N Watson Lake,* 19; Lapie River, Canol Road, Mi. 132, 20; junction Grafe and Edith creeks, 2 (KU); *Tepee Lake,* 1 (ROM); Lapie Lake, Canol Road, Mi. 105, 3; *Rose River, Canol Road, Mi. 95,* 4; Finlayson River, 1; *Frances Lake,* 1; Burwash Landing, Mi. 1093, 3 (MCZ); *Burwash Landing,* 1; *Gladstone Bay, Kluane Lake,* 4 (CU); *Kluane Lake,* 9 (CU); *Cultus Bay, Kluane Lake,* 16 (CU); Lake Laberge, 2 (NMNH); W side Sheep Mountain, near Kluane Lake, 1 (CU); *Kluane Lake, Mi. 1064,* 2 (MCZ); *Kluane,* 1; *head Kluane Lake,* 1; *Alaska Highway, Mi. 1054, S end Kluane Lake,* 5 (4 CU); *6 mi. SW Kluane,* 4 (KU); *E side Kluane Lake,* 9 (CU); *Kluane Lake, Alaska Highway, Mi. 1055.5,* 1 (CU); *Christmas Creek, Alaska Highway, Mi. 1048,* 2 (CU); Quiet Lake, camp 62, 1 (MVZ); Nisutlin River, Canol Road, Mi. 40, 7; 38 mi. NNW Watson Lake, 6; Alaska Highway, Mi. 1035, 2; *Pine Creek, Alaska Highway, Mi. 1019,* 2 (MCZ); *Kathleen River,* 4; *Haines Road Junction,* 1; Haeckel Hill, 8 mi. NW Whitehorse, 1; *Haeckel Hill,* 4; *Fifty Mile River [= Yukon River],* 2 (NMNH); *2 mi. NNW Whitehorse,* 1 (KU); *W side Lewes River [= W side Yukon River], 2 mi. S Whitehorse,* 6 (KU); *Whitehorse Rapids,* 1 (NMNH); *Lewes River [= Yukon River, between Marsh Lake and Lake Laberge],* 2 (NMNH); Canol Road, Mi. 11, 1; *Johnson Crossing, Alcan Highway [= Johnson Crossing, Alaska Highway],* 1 (MZ); *31 mi. ENE Tagish,* 1; *Camp 9–W [= Canol Road, Mi. 9],* 2 (MVZ); SW end Dezadeash Lake, 34 (KU); North Toobally Lake, 13; Little Atlin Lake, 8 mi. SSE Jakes Corner, 1; *Little Atlin Lake, 11 mi. E Tagish, 13 mi. S Jakes Corner,* 2; Teslin Lake, 1; *Teslin Post, near Teslin Lake,* 3; 1 mi. N Carcross, 4; *Carcross,* 2; *1 mi. S Carcross,* 6; 5 mi. SE Dalton Post, 1; *6 mi. SE Dalton Post,* 1; Liard Valley, Alaska Highway, Mi. 313, N Nelson, B.C. [near Irons Creek], 1.

Phenacomys intermedius – Heather vole

***Phenacomys intermedius mackenzii* Preble**
Phenacomys mackenzii Preble, 1902:182; holotype from Fort Smith, Slave River, District of Mackenzie, N.W.T.
Phenacomys intermedius mackenzii, Crowe 1943:403; Rand 1945*a*:41; Baker 1951:104; Hall and Cockrum 1953:398; Hall and Kelson 1959:720.
Phenacomys ungava mackenzii, R. M. Anderson 1947:151.

Distribution
Known only from the southern part of the Yukon (Map 26).

Measurements
Two males from Lapie River, Canol Road, Mi. 132, measured respectively 135, 137; 28, 30; 18, 19. A female from Haeckel Hill, 8 mi. NW Whitehorse, measured 129; 30; 19; and weighed 26.9 g. Cranial measurements of 2 males from Lapie River, Canol Road, Mi. 132, and a female from Haeckel Hill, 8 mi. NW Whitehorse, are respectively: condylobasal length, 25.2, 25.0, 24.6; length of nasals, 7.8, 7.7, 7.5; zygomatic breath, 13.2, 13.9, 13.9; least interorbital breadth, 3.0, 3.0, 3.2; lambdoidal breadth, 11.0, 11.6, 11.3; incisive foramen, 4.4, 4.5, 4.3; alveolar length of maxillary tooth-row, 6.1, 6.0, 5.9.



Map 26
Distribution of *Phenacomys intermedius mackenzii*

Remarks
Adult specimens from the Yukon closely resemble specimens from Fort Smith, District of Mackenzie, on which the name *mackenzii* was based.

Rand (1945*a*) reported two specimens from Lapie River, Canol Road, Mi. 132, and one from Lapie Lakes, but there are no specimens or records of specimens from the latter locality in the National Museums of Canada. There are, however, two specimens collected by Rand's party but not reported by him, from Sheldon Lake, Canol Road, Mi. 222.

This boreal, Nearctic species apparently reaches the northwestern extremes of its distribution in the southwestern Yukon, although it should be looked for in southeastern Alaska. Heather voles have been collected in mixed spruce-fir forest and at the edge of spruce forest and grassland (Rand 1945*a*:41). Near Whitehorse, on 6 June 1963, a female in winter pelage with 7 embryos was collected at 4,800 ft in stunted fir, lodgepole pine, and juniper.

Records of occurrence
Specimens examined, 8: Sheldon Lake, Canol Road, Mi. 222, 2; Lapie River, Canol Road, Mi. 132, 2; Christmas Bay, Kluane Lake, 1 (CU); Haeckel Hill, 8 mi. NW Whitehorse, 1; SW end Dezadeash Lake, 1 (KU); *5 mi. SE Dalton Post*, 1.

Microtus pennsylvanicus – Meadow vole

***Microtus pennsylvanicus drummondii* (Audubon and Bachman)**

Arvicola drummondii, Audubon and Bachman 1846:166; holotype from "Valleys of the Rocky Mountains" probably in the vicinity of Jasper House, Alta.
Microtus pennsylvanicus drummondii, Hollister 1912:23; Osgood 1909*b*:55, 79; Rand 1944*a*:119, 1945*a*:42; R. M. Anderson 1947:155; Baker 1951:108, (part); Cameron 1952:182; Hall and Cockrum 1953:408 (part); Hall and Kelson 1959:724 (part); Youngman 1964:3, 1968:78.
Microtus drummondi, Bailey 1900:23.
Microtus pennsylvanicus alcorni, Baker 1951:105.

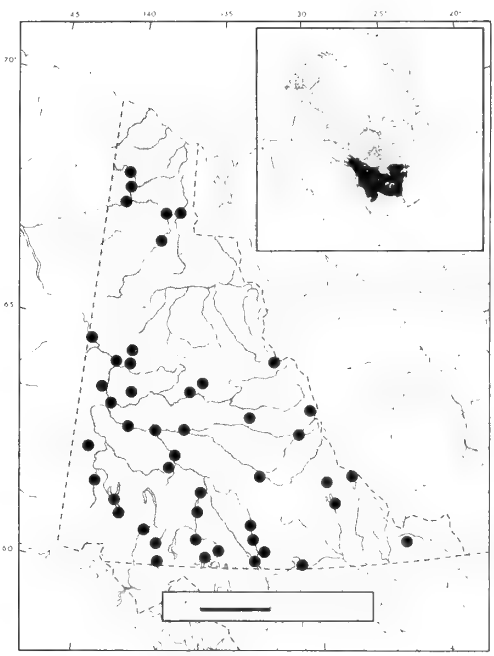
Distribution
Occurs throughout most of the Yukon (Map 27).

Measurements
Average (and extreme) measurements of 24 males and 6 females from the south-eastern Yukon (Little Hyland River) are 152 (140–168); 38 (31–44); 20 (18–22). Twenty-four males from the same locality averaged 34.4 (26.8–39.5) g. For cranial measurements see Table 18.

Remarks
Ellerman (1941:593) considered *Microtus pennsylvanicus* to "represent" the Palearctic *M. agrestis* in North America, and others (Ellerman and Morrison-Scott 1951:702; Klimkiewicz 1970:662) suggested that the two species are conspecific. However, the karyotypes of the two species differ markedly. *Microtus pennsylvanicus* has 46 normal chromosomes while *M. agrestis* has 50 chromosomes, including giant sex chromosomes (Matthey 1952:114). Johnson (1968:26) has also shown serological differences. Frank (1959:92) made several unsuccessful attempts to cross the two species and also noted ethological differences. Most authors admit to the possibility of common origin.

A revision of the meadow vole is long overdue. My examination of a large number of specimens from Manitoba, Saskatchewan, Alberta, British Columbia, the Northwest Territories, Alaska, and the Yukon leads me to agree with Rand (1944*a*:120) that *Microtus pennsylvanicus drummondii* is variable in colour and, to a lesser degree, in cranial characters, throughout its range. However, little can be gained from nominal recognition of these demes.

The name *Microtus pennsylvanicus alcorni* was given by Baker (1951:105) to specimens from the southwestern Yukon and Alaska as far south as Haines because, compared *with M. p. drummondii*, they averaged larger in all measurements except lengths of tail and hind foot. The upper parts were slightly paler and greyer; the underparts were paler, and the zygomatic arches heavier, shorter, and rounder. The skull of *M. p. alcorni* was more massive, and the maxillary teeth were heavier and lower crowned. I agree that some specimens from the Kluane Lake region are slightly paler



Map 27
Distribution of *Microtus pennsylvanicus drummondii*

Table 18
Cranial measurements of *Microtus pennsylvanicus drummondii*

Number of specimens averaged, and sex	Condylobasal length	Zygomatic breadth	Nasal length	Nasal width	Least interorbital constriction	Lambdoidal breadth	Prelambdoidal breadth	Alveolar length of maxillary tooth-row
			Lapierre House region					
Average 10 (7 ♂, 3 ♀)	26.2	14.7	6.7	3.1	3.2	11.7	8.9	6.4
Max.	26.8	15.1	7.3	3.3	3.4	12.2	9.3	6.7
Min.	25.2	14.2	6.5	3.0	2.8	11.2	8.3	6.0
SD	0.50	0.37	0.24	0.10	0.18	0.32	0.30	0.20
SE	0.16	0.12	0.07	0.03	0.06	0.10	0.10	0.06
			Old Crow region					
Average 10 (8 ♂, 2 ♀)	26.3	14.6	7.0^{9}	3.2^{9}	3.3^{9}	11.7^{9}	8.9^{9}	6.6
Max.	26.9	15.0	7.4	3.4	3.6	12.2	9.3	6.8
Min.	25.2	14.0	6.6	2.9	3.0	11.2	8.6	6.2
SD	0.53	0.38	0.28	0.16	0.20	0.33	0.23	0.19
SE	0.19	0.13	0.09	0.05	0.06	0.11	0.08	0.06
			Dawson region					
Average 20 (10 ♂, 10 ♀)	26.1^{19}	14.7^{18}	7.2	3.1	3.3^{18}	11.9^{17}	9.2^{18}	6.4
Max.	27.1	15.7	7.7	3.4	3.6	12.5	9.7	6.7
Min.	25.3	13.6	6.4	2.7	3.0	11.1	8.6	6.3
SD	0.59	0.57	0.31	0.19	0.14	0.43	0.27	0.13
SE	0.13	0.13	0.07	0.04	0.03	0.10	0.06	0.03
			Carmacks region					
Average 18 (8 ♂, 10 ♀)	26.1^{17}	14.5	7.1^{17}	3.1^{17}	3.3	11.8^{17}	9.0	6.3
Max.	27.1	15.2	7.9	3.6	3.6	12.3	9.5	6.7
Min.	25.0	14.0	6.6	2.8	3.2	11.4	8.2	6.0
SD	0.58	0.31	0.36	0.20	0.10	0.30	0.39	0.23
SE	0.14	0.07	0.09	0.05	0.02	0.07	0.09	0.05

Number of specimens averaged, and sex	Condylobasal length	Zygomatic breadth	Nasal length	Nasal width	Least interorbital constriction	Lambdoidal breadth	Prelambdoidal breadth	Alveolar length of maxillary tooth-row
Kluane Lake region								
Average 13 (6 ♂, 7 ♀)	26.5^{12}	15.0^{11}	7.3	3.1	3.3	11.9^{12}	8.9^{12}	6.5
Max.	27.5	15.8	8.0	3.3	3.7	12.7	9.7	7.0
Min.	25.6	14.5	6.6	2.8	2.9	11.3	8.1	6.2
SD	0.54	0.39	0.48	0.16	0.21	0.45	0.46	0.22
SE	0.16	0.11	0.13	0.05	0.06	0.13	0.13	0.06
Carcross–Marsh Lake region								
Average 11 (10 ♂, 1 ♀)	25.2^{6}	14.2^{9}	6.8^{10}	2.9^{10}	3.3^{10}	11.5^{8}	8.8^{8}	6.2
Max.	25.8	14.9	7.2	3.3	3.5	12.1	9.2	6.4
Min.	24.4	13.6	6.5	2.7	3.1	11.1	8.5	5.8
SD	0.52	0.39	0.21	0.20	0.16	0.36	0.24	0.21
SE	0.21	0.13	0.06	0.06	0.05	0.13	0.08	0.06
Little Hyland River								
Average 30 (24 ♂, 6 ♀)	25.8^{27}	14.3^{28}	6.8	3.0	3.5^{28}	11.6^{27}	9.2^{28}	6.2
Max.	27.1	15.2	7.5	3.2	3.7	12.4	9.9	6.6
Min.	24.8	13.8	6.2	2.6	3.1	10.9	8.4	5.9
SD	0.59	0.37	0.29	0.15	0.15	0.34	0.31	0.19
SE	0.11	0.07	0.05	0.03	0.03	0.06	0.06	0.04

dorsally (but not ventrally) than many specimens of *M. p. drummondii* from various parts of its range, but other specimens are indistinguishable from specimens from Jasper, Alta. Specimens from the Kluane Lake region average slightly, but not significantly, larger than series of *M. p. drummondii* from the type locality and other areas in the Yukon, in total length, zygomatic breadth, nasal length, and length of maxillary tooth-row. The measurement showing the greatest difference from topotypes and near topotypes of *M. p. drummondii* is zygomatic breadth, and in this measurement there is considerably less than 75 per cent joint non-overlap. Specimens from Haines, Alaska, assigned by Baker (1951) to *M. p. alcorni*, are darker than *M. p. drummondii* and may represent a valid subspecies. The specimens from the southwestern Yukon represent a slightly distinguishable deme, but considering the overall variability of the species it seems unwise to afford it nominal recognition.

In general, athough the specimens from the Yukon here assigned to *Microtus pennsylvanicus drummondii* have a slightly more grizzled appearance than a series of specimens from the type locality, the similarities are strong. Some specimens of *Microtus pennsylvanicus drummondii* from the vicinity of Dawson are slightly darker than specimens from elsewhere in the Yukon, perhaps indicating intergradation with the dark *M. p. tananaensis* to the west in Alaska. Some specimens from Carcross and Marsh Lake are slightly reddish, possibly indicating intergradation with *M. p. rubidus* to the south in British Columbia.

Both the meadow vole and the northern vole (*Microtus oeconomus*) occur in wet areas. Often they are taken in the same runways, especially in wet grassy meadows, and in dwarf willow, dwarf birch, and alder, near the edges of lakes and streams.

Pregnant females were found between mid-May and mid-August. The frequency of pregnant females was greatest between July 15 and August 15. Seventy-six recorded pregnancies had a mean of 5.3 (2–10) embryos.

Records of occurrence

Specimens examined, 742: Old Crow River, at Timber Creek, 5 (NMNH); Old Crow River, 19 mi. N Old Crow, 1 mi. N mouth Johnson Creek, 11; Old Crow, 24; *½ mi. E Old Crow*, 1; *Porcupine River, 16 mi. SW Old Crow*, 7; 11 mi. NE Lapierre House, 5; *Bell River, 10 mi. NE Lapierre House*, 8; *Lapierre House*, 13; *1 mi. SW Lapierre House*, 9; *Bell River, 1 mi. SW Lapierre House*, 3; Porcupine River, mouth Berry Creek, 4; *4 mi. S mouth Berry Creek*, 1; 12 mi. S Johnson Creek, Porcupine River, 66°41′/137°59′, 1; Yukon–Alaska boundary, Yukon River, 4 (NMNH); *Forty Mile, mouth Coal Creek*, 1 (NMNH); 18 mi. S Chapman Lake, 6; *20 mi. S Chapman Lake*, 1; Bonnet Plume Lake, 22; Yukon River, Chandindu River, 1 (NMNH); *Dawson*, 48 (1 NMNH); *Dempster Highway, Mi. 4.8*, 1 (AHRC); Benson Creek, 28 mi. ENE Dawson, 5; *14 mi. E Dawson*, 26; *16 mi. E Dawson*, 2; Klondike Keno [= 1 mi. S Wernecke], 3; 10.8 mi. N Mayo, 2; *6 mi. N Mayo*, 4; *4½ mi. N Mayo*, 7; *1 mi. SE Mayo*, 12; Dominion Creek, head Indian River, 1 (NMNH); Sixty Mile Creek [= Sixty Mile River], 1 (NMNH); Keele Lake, 56; Stewart River settlement, 17; Russell Mountains [= Russell Range], near forks Macmillan River, 3 (NMNH); south fork Macmillan River, Canol Road, Mi. 249, 6; *Sheldon Lake, Canol Road, Mi. 222*, 12; Macmillan River, 3 (NMNH); Fort Selkirk, 3 (NMNH); Yukon River, 50 mi. below Fort Selkirk, 1 (NMNH); Snag, 1; Yukon Crossing, 3; *Rink Rapid*, 6 (NMNH); *7 mi. NNE Carmacks*, 1; *5½ mi. NW Carmacks*, 9; *4¾ mi. NW Carmacks*, 2; *3½ mi. NW Carmacks*, 7; *2¼ mi. NW Carmacks*, 1; *Nordenskiold River, 1 mi. NW Carmacks*, 41; *½ mi. NW Carmacks*, 11; *¼ mi. NW Carmacks*, 1; 11 mi. WSW Carmacks, 6; *6 mi. WSW Carmacks*, 1; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 5; *Little Hyland River, 128 mi. N Watson Lake*, 29; Lapie River, Canol Road, Mi. 132, 16; Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 16 (AMNH); Donjek River [at Alaska Highway], 3 (1 CU); Yukon River, Thirty Mile River, 3 (NMNH); Rose River, Canol Road, Mi. 95, 13; Burwash Landing, 1; *2 mi. S Burwash Landing*, 1; *Kluane Lake*, 23 (20 CU); *Cultus Bay, Kluane Lake*, 6 (CU); ¾ mi. N Frances Lake, 1; Lake Laberge, 5 (NMNH); Christmas Bay, Kluane Lake, 3 (CU); *Silver Creek, 61°02′/138°24′*, 1 (CU); *Alaska Highway, Mi. 1054*, 17 (CU); *6 mi. SW Kluane*, 15 (KU); *E side Kluane Lake*, 9 (CU); Nisutlin River, Canol Road, Mi. 40, 10; Haines Road Junction, 2; Fifty Mile River [= Yukon River], 6 (NMNH); *6¾ mi.*

SW Whitehorse, 3; mountains, 40 mi. NE Teslin Lake, 1; Dezadeash Lake, 2; *SW end Deazdeash Lake,* 3 (KU); *SW end Dezadeash Lake, Haines Road, Mi. 124,* 1; Marsh Lake, 22 (NMNH); *12 mi. E Tagish,* 3; *Tagish River, 13 mi. SW Jakes Corner,* 1; North Toobally Lake, 47; Teslin Lake, 1; *near Teslin Lake,* 3; *Teslin Post, near Teslin Lake,* 7; Caribou Crossing [= Carcross], 16 (NMNH); *1 mi. S Carcross,* 5; 5 mi. SE Dalton Post, 8; *1½ mi. S and 3 mi. E Dalton Post,* 3 (KU); 88 E Teslin [= Alaska Highway, 88 mi. E Teslin], Upper Rancheria, 1.

Microtus oeconomus – Northern vole

Microtus oeconomus macfarlani **Merriam**
Microtus macfarlani Merriam, 1900*a*:24; holotype from Fort Anderson, Anderson River, District of Mackenzie.
M[*icrotus*]. *oec*[*onomus*]. *macfarlani,* K. Zimmermann 1942:187.
Microtus operarius endoecus, Osgood 1909*b*:55.
Microtus operarius macfarlani, Rand 1945*a*:42; R. M. Anderson 1947:157; Cameron 1952:183.
Microtus oeconomus macfarlani, Baker 1951:110; Hall and Cockrum 1953:425; Hall and Kelson 1959:735; Paradiso and Manville 1961:81; Youngman 1968:78.

Distribution
Probably occurs throughout all but the extreme southeastern part of the Yukon (Map 28).

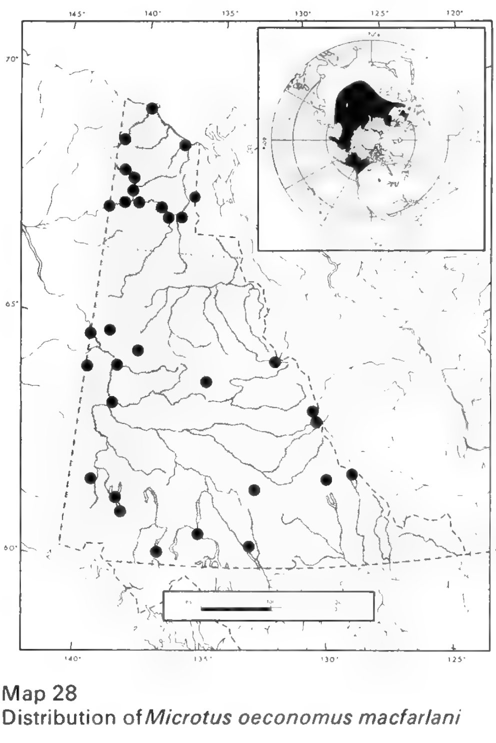
Measurements
Average (and extreme) measurements of 32 males and 17 females from the Old Crow region are respectively 150 (130–171), 158 (137–173); 36 (29–43), 39 (33–47); 19 (16–20), 19 (16–21). Sixteen males averaged 39.4 (34.5–51.7) g. Nine females averaged 40.5 (29.7–59.4) g. For cranial measurements see Table 19.

Remarks
Specimens of *Microtus oeconomus* from the Yukon are quite uniform in external and cranial measurements, and in colour (fresh summer pelage averaging Dark Reddish Brown, 5YR 3/2). Specimens from the Yukon are smaller than specimens from Bettles, Alaska (Paradiso and Manville 1961:81), and Umiat, Alaska (Bee and Hall 1956:126).

Northern voles occur mostly in wet sedge meadows, but were also collected in mossy muskeg, in a floating bog; and in *Sphagnum* in moist soil polygons. Often *Microtus oeconomus* and *M. pennsylvanicus* occurred together utilizing the same runways.

Sixteen pregnant females taken in July averaged 6.1 embryos, and 24 females taken in August averaged 5.2 embryos.

Records of occurrence
Specimens examined, 481: Herschel Island, Pauline Cove, 26; *Firth River,* 6; *mouth Firth River,* 9 (MCZ); 4 mi. WSW mouth Blow River, 17; Firth River, 15 mi. S mouth Joe Creek, 49; Old Crow River, 15 mi. above Timber Creek, 3 (NMNH); *Old Crow River, 65 mi. above Timber Creek,* 3 (NMNH) Old



Map 28
Distribution of *Microtus oeconomus macfarlani*

Table 19

Cranial measurements of *Microtus oeconomus macfarlani*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Nasal length	Least interorbital breadth	Mastoidal breadth	Length of diastema	Alveolar length of maxillary tooth-row
			Firth River				
Average 9 ♂	27.5^{8}	15.4	7.7	3.6	12.3^{8}	8.2	6.5
Max.	28.9	16.2	8.1	3.7	12.5	8.6	6.8
Min.	26.3	14.7	7.5	3.4	11.9	7.8	6.2
SD	0.81	0.42	0.20	0.10	0.18	0.29	0.20
SE	0.28	0.14	0.06	0.03	0.06	0.09	0.07
Average 7 ♀	26.4^{6}	14.8	7.3	3.6	11.7^{6}	7.8	6.4
Max.	27.2	15.2	7.9	3.7	11.9	8.3	6.7
Min.	25.9	14.0	6.8	3.4	11.4	7.2	6.2
SD	0.50	0.39	0.39	0.12	0.21	0.33	0.21
SE	0.21	0.15	0.15	0.05	0.08	0.12	0.08
			Old Crow region				
Average 33 ♂	27.0^{31}	14.9^{26}	7.3	3.6^{32}	11.9^{28}	8.2^{31}	6.4
Max.	28.5	15.9	8.2	4.4	13.0	8.9	6.8
Min.	26.1	13.9	6.6	3.2	11.2	7.7	6.0
SD	0.68	0.65	0.39	0.24	0.38	0.27	0.24
SE	0.12	0.13	0.07	0.42	0.07	0.05	0.04
Average 14 ♀	26.8^{12}	14.9^{13}	7.4	3.6	11.8^{13}	8.4	6.4
Max.	28.3	15.7	7.7	3.9	12.5	9.2	6.9
Min.	25.8	14.1	6.9	3.3	11.5	8.1	6.0
SD	0.85	0.43	0.24	0.17	0.30	0.31	0.25
SE	0.24	0.12	0.06	0.04	0.08	0.08	0.06

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Nasal length	Least interorbital breadth	Mastoidal breadth	Length of diastema	Alveolar length of maxillary tooth-row
			Dawson region				
Average 15 ♂	27.4	15.4^{14}	7.7^{14}	3.6^{14}	12.2^{14}	8.5	6.2
Max.	29.0	16.5	8.3	3.8	12.7	9.0	6.6
Min.	26.3	14.6	7.0	3.4	11.8	8.0	5.8
SD	0.93	0.59	0.38	0.10	0.34	0.29	0.23
SE	0.24	0.16	0.10	0.02	0.09	0.07	0.06
Average 17 ♀	26.6	15.0	7.5^{16}	3.7^{16}	11.8^{16}	8.4	6.2
Max.	27.3	15.9	7.9	3.9	12.2	8.7	6.6
Min.	25.6	14.3	7.0	3.5	11.3	8.0	5.9
SD	0.47	0.43	0.30	0.10	0.27	0.22	0.19
SE	0.11	0.10	0.07	0.03	0.10	0.05	0.05
			Rose River, Canol Road				
Average 6 ♂	27.5	15.4	7.6	3.6	12.0^{4}	8.3	6.5
Max.	28.5	16.1	8.3	3.9	12.3	8.7	7.0
Min.	26.5	14.4	7.3	3.2	11.8	8.1	6.1
SD	0.73	0.58	0.41	0.25	0.21	0.38	0.31
SE	0.30	0.23	0.17	0.10	0.10	0.15	0.12
17886 ♀	25.8	15.5	7.5	3.8	12.0	8.0	6.4
17887 ♀	26.2	14.4	6.8	3.7	11.4	7.9	6.1

Crow River, Timber Creek, 4 (NMNH); *Old Crow River, Black Fox Creek,* 2 (NMNH); Old Crow River, 19 mi. N Old Crow, 1 mi. N mouth Johnson Creek, 12; *Old Crow River, Johnson Creek, 67°50′/139°46′,* 6 (NMNH); *Old Crow River, 50 mi. below Black Fox Creek,* 1 (NMNH); *18 mi. above mouth Old Crow River,* 1 (NMNH); *Old Crow* 43 (6 AHRC); Summit Lake, 67°43′/136°29′, 4; Driftwood Creek [= Driftwood River], 60 mi. NE Old Crow, 1 (AHRC); Porcupine River, 20 mi. NE Old Crow, 1 (AHRC); Porcupine River, 16 mi. SW Old Crow, 6; Porcupine River, mouth Berry Creek, 8; *4 mi. S Berry Creek,* 1; Rampart House, 26; Lapierre House, 5; *1 mi. SW Lapierre House,* 2; head Cold Creek [= head Coal Creek, 67°47′/139°54′], 13 (NMNH); Yukon River, Alaska–Yukon boundary, 1 (NMNH); 13 mi. S Chapman Lake, 1; *Ogilvie Mountains, 52 mi. NE Dawson, 14 mi. S Lomond Lake,* 1; *18 mi. S Chapman Lake,* 2; *20 mi. S Chapman Lake,* 54; *North Fork Pass, Ogilvie Mountains,* 2; *North Fork Crossing, Mi. 43 Aklavik Road* [= *North Fork Crossing, Dempster Highway, Mi. 43*], *Ogilvie Mountains,* 23; Bonnet Plume Lake, 3; 1 mi. from Canadian Customs, Taylor Highway, 1; Dawson City, 2 (AHRC); Keno Hill Summit, 20; Keele Lake, 27; Stewart River settlement, 2; Macmillan Pass, Canol Road, Mi. 282, 8; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 13; *Little Hyland River, 128 mi. N Watson Lake,* 3; Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 20 (AMNH); junction Grafe and Edith creeks, 1 (KU); *Donjek bridge [on Alaska Highway],* 2; Lapie Lake, Canol Road, Mi. 105, 1; *Rose River, Canol Road, Mi. 95,* 16; Burwash Landing, 1; *2 mi. S Burwash Landing,* 1; *Kluane Lake,* 6 (1 NMNH); *Cultus Creek, head Cultus Bay, Kluane Lake,* 1 (CU); W end Sheep Mountain, E Sheep Creek, Alaska Highway, Mi. 1061, 1; *Christmas Bay, Kluane Lake,* 1 (CU); *head Kluane Lake,* 2; *Alaska High-*

Table 20
Cranial measurements of *Microtus longicaudus vellerosus*

Number of specimens averaged or catalogue number, and sex	Condylo-basal length	Zygomatic breadth	Nasal length	Least inter-orbital breadth	Mastoidal breadth	Alveolar length of maxillary tooth-row
			Richardson Mountains, 13 mi. NE Lapierre House			
33950 ♀	26.8	14.5	8.0	3.9	11.7	6.7
			Benson Creek, 28 mi. ENE Dawson			
29640 ♀	26.9	15.6	7.7	3.7	12.3	6.6
			Sheldon Lake, Mi. 222, Canol Road			
18019 ♂	27.1	15.0	8.3	3.8	12.6	6.6
18039 ♂	27.8	15.8	8.4	3.8	12.6	6.5
			Little Hyland River, 128 mi. N Watson Lake			
Average 8 ♂	26.7	15.1	7.7[4]	3.7	12.4	6.4
Max.	28.2	15.6	8.3	3.9	13.0	6.7
Min.	25.7	14.8	7.2	3.6	12.1	6.2
SD	0.80	0.31	0.48	0.11	0.36	0.16
SE	0.28	0.11	0.24	0.04	0.14	0.06
Average 7 ♀	27.0	15.1	7.5	3.8	12.2	6.5
Max.	27.5	15.4	8.0	3.9	12.6	6.7
Min.	26.5	14.8	7.3	3.6	11.7	6.4
SD	0.31	0.21	0.23	0.11	0.32	0.97
SE	0.12	0.08	0.09	0.04	0.13	0.04

way, Mi. 1055, S end Kluane Lake, 1; *Alaska Highway, Mi. 1054,* 3 (CU); *6 mi. SW Kluane,* 2 (KU); *Kluane Range 25 mi. SSE Destruction Bay,* 3; Haeckel Hill, 8 mi. NW Whitehorse, 1; Canol Road, Mi. 11, 1; *Camp 9–W* [= *Canol Road, Mi. 9*], 1 (MVZ); SW end Dezadeash Lake, 1 (KU); *5 mi. SE Dalton Post,* 3.

Microtus longicaudus – Long-tailed vole

***Microtus longicaudus vellerosus* J. A. Allen**
Microtus vellerosus J. A. Allen, 1899*a*:7; holotype from upper Liard River, British Columbia.
Microtus longicaudus vellerosus, Anderson and Rand 1944:20; Rand 1945*a*:44, 1945*b*:66; R. M. Anderson 1947:159; Baker 1951:109; Youngman 1964:3, 1968:77.
Microtus mordax, Osgood 1900:35.

Distribution
Known from all but the Coastal Plain (Map 29).

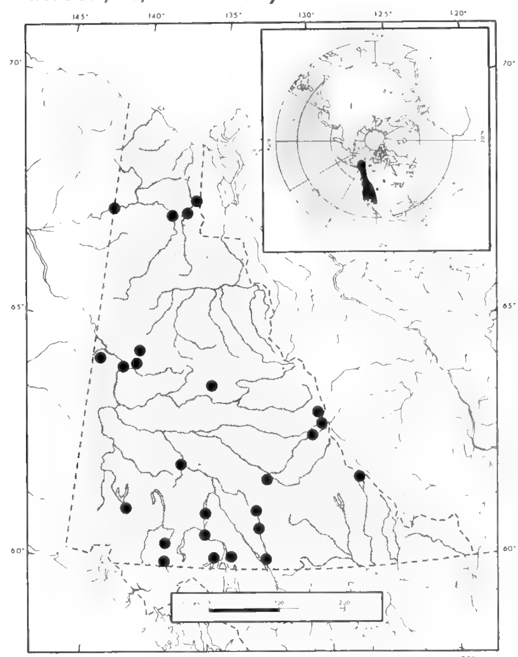
Measurements
Average (and extreme) measurements of 22 females and 14 males from Dalton Post and SW end Dezadeash Lake are respectively 180 (160–198), 63 (49–77), 21 (18–23); 171 (160–190), 60 (51–73), 20 (19–21). Average (and extreme) measurements of 8 females and 8 males from 138 mi. N Watson Lake and 5 mi. E Little Hyland River are 176 (167–185), 59 (54–64), 22 (20–23); 176 (168–189), 57 (51–63), 21 (19–22). Average (and extreme) weights for 4 non-parous females and 8 males from the same locality are respectively 37.1 (38.3–41.8) g, 38.0 (30.4–47.6) g. For cranial measurements see Table 20.

Remarks
Microtus longicaudus is remarkably uniform in colour and cranial measurements throughout its range in the Yukon.

Matthey (1955:178) and S. Anderson (1960:202) have pointed to the many similarities, including chromosome number, between *Microtus longicaudus* and the Old World species *M. nivalis,* and *M. roberti.* I am especially impressed by the similarity between *M. nivalis* and *M. longicaudus,* although the location of the centromeres is different in the two species (Matthey 1955).

Long-tailed voles are found in a wide range of habitats, from low, wet, spruce woodland to high mountains, but they are most commonly found in rocky situations on mountainsides. Pregnant females have been collected in June, July, and August. Nine pregnant females had an average of 3.7 (2–5) embryos. One female had 7 recent embryo scars.

Records of occurrence
Specimens examined, 235: Summit Lake, 67°43′/136°29′, 2; *Richardson Mountains, 14 mi. NE Lapierre House,* 1; *Richardson Mountains, 13 mi. NE Lapierre House,* 1; 4 mi. S mouth Berry Creek, 1; Rampart House, 2; 1 mi. SW Lapierre House, 1; North Fork Pass, Ogilvie Mountains, 1; *North Fork Crossing, Aklavik Road* [= *Dempster Highway*] *Mi. 42.7,* 4; Swede Dome, 34 mi. W Dawson, 4; *2 mi. beyond Canadian Cus-*



Map 29
Distribution of *Microtus longicaudus vellerosus*

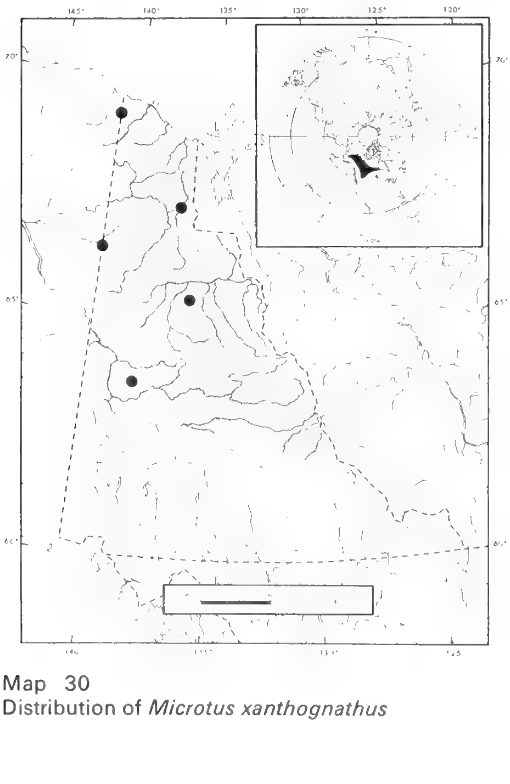
toms, Taylor Highway, 2; Benson Creek, 28 mi. ENE Dawson, 1; Dawson, 4; Keno Hill Summit, 1; *Klondike Keno* [= *1 mi. S Wernecke*], 13; Keele Lake, 25; Macmillan Pass, Canol Road, Mi. 282, 3; Sheldon Lake, Canol Road, Mi. 222, 5; Rink Rapid, 1 (NMNH); *Nordenskiold River, 1 mi. NW Carmacks,* 3; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 6; *Little Hyland River, 128 mi. N Watson Lake,* 13; Lapie River, Canol Road, Mi. 132, 3; Rose River, Canol Road, Mi. 95, 1; Kluane Lake, 3 (CU); *Christmas Bay, Kluane Lake,* 2 (CU); *Alaska Highway, Mi. 1054,* 5 (CU); *6 mi. SW Kluane,* 2 (KU); *E side Kluane Lake,* 1 (CU); Lake Laberge, 2 (NMNH); Nisutlin River, Canol Road, Mi. 40, 1; Haeckel Hill, 1; *McIntyre Creek, 3 mi. NW Whitehorse,* 11 (KU); Dezadeash Lake, 2; *SW end Dezadeash Lake,* 59 (KU); Lake Marsh, 1 (NMNH); *Little Atlin Lake, 6 mi. SSE Jakes Corner,* 2; Teslin Lake, 1; *near Teslin Lake,* 8; *Teslin Post, near Teslin Lake,* 2; 1 mi. S Carcross, 5; *1½ mi. S Carcross,* 2; 5 mi. SE Dalton Post, 3; *6 mi. SE Dalton Post,* 5; *1½ mi. S and 3 mi. E Dalton Post,* 19 (KU).

Microtus xanthognathus – Chestnut-cheeked vole

***Microtus xanthognathus* (Leach)**
Arvicola xanthognathus Leach, 1815:60; holotype from Hudson Bay; Coues and Allen 1877:197.
M[icrotus]. xanthognathus, Miller 1896:66.
Microtus xanthognathus, Bailey 1900:57; Williams 1925:71; Hall and Cockrum 1953:434; Hall and Kelson 1959:741.

Distribution
Known at present from the northern half of the Yukon (Map 30).

Measurements
Average (and extreme) measurements of 30 adults (7 males, 23 females) from Hungry Lake are 194 (183–209); 43 (38–50); 24 (23–27). Average (and extreme) weights of 6 males and 13 nonparous females are respectively 87.0 (83.2–92.4) g; 87.2 (78.5–96.7) g. One pregnant female weighed 119.5 g. For cranial measurements see Table 21.



Map 30
Distribution of *Microtus xanthognathus*

Remarks
Hall and Kelson (1959:741) commented on the possibility that *Microtus xanthognathus* and *M. chrotorrhinus* might be conspecific, but the two species differ considerably cytogenetically (Youngman MS), morphologically, ecologically, and ethologically.

The only fossils of *Microtus xanthognathus* from the Beringian region are an undated mummy from Chicken Creek, Mayers Fork, Forty Mile region, Alaska (AMNH 180252), a single tooth dated at about 6,800 years from central Alaska (Repenning, Hopkins, and Rubin 1964:195), and a single tooth from a postglacial deposit also in central Alaska (Guthrie 1968*b*:233). Specimens of *Microtus xanthognathus* from the Pleistocene age have been found in Virginia and Pennsylvania (Guilday and Bender 1960).

The present distribution pattern of *Microtus xanthognathus* suggested a Beringian origin to Guthrie (1968*b*:239) but without an Asian counterpart (also noted by Guthrie), and without definite Wisconsin fossils except in southern regions. It appears

Table 21
Cranial measurements of *Microtus xanthognathus*

Number of specimens averaged and sex.	Condylobasal length	Zygomatic breadth	Nasal length	Nasal width	Least interorbital breadth	Lambdoidal breadth	Prelambdoidal breadth	Alveolar length of maxillary tooth-row
				Hungry Lake (adults)				
Average 30 (7 ♂, 23 ♀)	32.3[28]	18.3	9.3[29]	3.6[28]	3.5	14.3[29]	10.2[28]	7.6
Max.	33.4	19.8	10.1	4.0	3.9	15.3	10.9	8.1
Min.	31.4	17.3	8.7	2.9	2.9	13.9	9.7	7.3
SD	0.55	0.55	0.35	0.21	0.19	0.33	0.27	0.18
SE	0.10	0.10	0.06	0.04	0.03	0.06	0.05	0.03

to me that this species may have had a southern origin, and closely followed the retreating glaciers northward.

During the summer of 1964, I described this vole to a number of residents of the village of Old Crow, some of whom suggested that they irrupted every twenty years or so, ruining muskrat "sets". Others commented that at times they became so numerous that dogs became ill from eating them. Mr. Peter Lord had seen them in early spring at Little Crow Flats and at Cadzow Lake where they "swam like little muskrats" (also see Lensink 1954:259). The last irruption that Mr. Lord recalled was in 1945. It is not known positively that these reports concerned *Microtus xanthognathus* since none were collected.

On 25 March 1965, Mr. Abraham Peter of Old Crow captured and prepared a study specimen of an adult *Microtus xanthognathus* at Hungry Lake (65°39′45″/135°59′). The specimen was sent with a letter urging me to visit the locality as soon as possible since there were so many voles that he did not know how long the high numbers would last.

On 30 June 1965, G. D. Tessier, N. A. Olsen and I flew to Hungry Lake. The area surrounding our camp at the lake edge was riddled with old burrows and runways, but there were no signs of recent activity. The following day we saw and heard chestnut-cheeked voles on mineral soil in a hilly, previously heavy-wooded area that had been burned an estimated 20 years before. The charred spruce trunks were still standing and there was a light overstory of young spruce. A small fast-running stream ran through the area and dense *Sphagnum* covered much of the adjacent moist ground. Other plant cover included the following species: *Cladina arbuscula* (Wallr.) Hale and Culb., *Alectoria* sp., *Equisetum sylvaticum* L., *Larix laricina* (Du Roi) Koch, *Picea glauca* (Moench), *Picea mariana* (Mill.) B.S.P., *Calamagrostis canadensis* Michx., *Carex canescens* L., *Carex lugens* Holm, *Eriophorum vaginatum* L., *Salix planifolia* Pursh, *Betula glandulosa* Michx., *Betula papyrifera* Marsh., *Rumex arcticus* Trautv., *Rumex occidentalis* Wats., *Stellaria calycantha* (Ledeb.) Bong., *Ranunculus lapponicus* L., *Rosa acicularis* Lindl., *Rubus Chamaemorus* L., *Spiraea Beaverdiana* Schneid., *Empetrum nigum* L., *Epilobium angustifolium* L., *Epilobium palustre* L., *Chamaedaphne calyculata* (L.) Moench., *Ledum groenlandicum* Oed., *Oxycoccus microcarpus* Turcz., *Vaccinium uliginosum* L., *Vaccinium Vitis-Idaea* L., *Pedicularis labradorica* Wirsing, *Petasites hyperboreus* Rydb.

Chestnut-cheeked voles were most numerous in the wet riparian habitat where surface runways and burrows abounded in the thick *Sphagnum*. Burrow entrances ranged from 50 to 70 mm in diameter; runways measured approximately 50 mm across. In several areas, large mounds of earth had been thrown up around burrows. Three mounds that we excavated had a network of underground passages and a nest-chamber with a nest of dried sedge. One mound, heaped around the base of a tree, measured 139 cm in diameter. Older mounds were covered by plants such as fireweed (*Epilobium angustifolium*).

Chestnut-cheeked voles are colonial like the singing vole (*Microtus miurus*) and, like that species, are quite vocal, often facing the source of a disturbance and emitting high pulsating squeaks. Chestnut-cheeked voles were active day and night and could often be seen darting along runways.

Plants found in the mouths, or stored in the nests, of voles and assumed to be food species include *Sphagnum* sp., *Calamogrostis canadensis* (Michx.) Beauv., *Salix planifolia* Pursh, *Rubus Chamaemorus* L., *Epilobium angustifolium* L., *Petasites hyperboreus* Rydb., and the berries of *Vaccinium Vitis-Idaea* L., and *Vaccinium uliginosum* L.

A second colony of *Microtus xanthognathus* was found on a small island in Hungry Lake. Here, mounds occurred along the shoreline, and food plants included the berries of *Arctostaphylos rubra* (Rehd. & Wils.) Fern. and *Viburnum edule* (Michx.) Raf., and the mushrooms, *Lactarius* cf. *aurantiacus* Fries., *Russula* cf. *turci* Bres. and *Hebloma sordidlilum* (Pk.) Sacc.

The only other small mammals known to inhabit the area and use the same runways were *Clethrionomys rutilus, Sorex cinereus, Synaptomys borealis*, and *Lemmus sibiricus.* The only predator seen was a Hawk Owl (*Surnia ulula* Linnaeus).

Specimens collected between July 2 and 7 were either adults that had overwintered, or young less than a month old. A second collection made between August 20 and 24 produced mostly two-to-three-month-old subadults of the year.

Data from a captive colony indicate a gestation period of 21 days, predictable almost to the hour.

Bailey (1900) reported the occurrence of flank glands on male chestnut-cheeked voles, and Quay (1968:439) recorded that they were difficult to detect externally. However, flank glands are easily demonstrable on all adults of both sexes collected at Hungry Lake. Sexually active males were observed to scratch the flank glands with their hind feet. Sexually active females sniff the males' flank glands quite often, whereas males seem more interested in the genital area of the female. The chase prior to copulation is accompanied by considerable vocalization by both sexes. The male gives a low-pitched, chirping call while following the female.

Eleven pregnant females collected in early July averaged 8 (7–10) embryos. None of the young voles collected in late August were pregnant. This may support data from the laboratory showing that young females of the year do not breed. Twenty-eight young averaged 3.5 g (2.7–4.2) at birth, and measured: total length, 50 (45–53); tail, 7 (6–9); hind foot, 6 (6–7). The average daily weight gain was .80 g for the first 28 days. The eyes opened at 14 days (12–17) and the post-juvenile molt was nearly complete at about one month, by which time the young were usually weaned.

Two male chestnut-cheeked voles collected on August 21 were infested by botfly larvae (*Cuterebra* cf. *grisea* Coquillett). This is the fourth report of parasitism by botflys on the genus *Microtus* (Maurer and Skaley 1968:773). Fleas collected from voles were *Amphipsylla sibirica pollionis* (Roths.), *Amalarous penicilliger* cf.. *dissimilis* (Jord.), *Megabothris groenlandicus* (Wahlgr.), and *Megabothris calcifer gregsoni* Holland. These are the first fleas reported from chestnut-cheeked voles.

After summarizing some of the published information on the habitat of *Microtus xanthognathus,* Guilday, Martin, and McCrady (1964:165) concluded that the species shows wide adaptability to various habitats in the boreal forest. However, certain similarities among published and unpublished habitat descriptions make it advisable to reexamine the record, which I summarize below:

[1] "young mixed woods bordering a marsh . . . burrows . . . in dry ground in the woods or shrubbery . . . runways . . . only rarely reaching wet or even damp ground".

[2] "Contrary to their usual habit, the individuals of this colony had extended their runways into a wet sphagnum swamp".

[3] "deep mixed woods on the summit of the hill".

[4] "At the foot of a limestone cliff at Crooked Rapid".

[5] "A cabin near the foot of Boiler Rapid".

[6] "on the bank of the River"

[7] "poplar woods"

[8] "on the Athabaska . . . heavily wooded area". [Preble 1908]

[9] "swampy region sparsely covered by cut-over spruce". [Dice 1921:24]

[10] "On a little stream . . . occupying an old log jam, part of which had become embed-

ded in a matrix of sand and mud and overgrown with weeds". [Osgood 1900:36]
[11] "thin boreal forest, mostly of black spruce with a few scattered larch" [Lensink 1954; 259]
All of these habitat descriptions suggest sites in the boreal forest region displaying wide ecological amplitude, in almost all cases recently disturbed and close to mineral soil. This is supported by inferred habitats at many localities where only a locality name is known. Richardson (1829:123) said that this species "shews no disposition to enter the houses of the traders", thus implying that the chestnut-cheeked voles were found in the immediate disturbed vicinity of such places as Fort Franklin. The same can probably be said for Lapierre House, where the surrounding area had been logged off for building materials and firewood (Youngman MS), and for Fort Smith (Preble 1908), Fort Good Hope, Nelson River, Fort Churchill, Fort Resolution, Fort Liard, Fort McPherson, and Fort Anderson (Coues and Allen 1877:201). Early gold-mining activities stripped the woods at Dominion Creek, Yukon Territory (NMNH 10327–28).

A study of the ecological requirements of *Microtus xanthognathus* suggests that fire and glacial movement, by altering forest succession, may have greatly determined the distribution of this species.

The population explosion at Hungry Lake must have occupied a large area at its maximum. Although in 1965 some voles were found on dry hillsides, it was obvious that the last stand of the species was along the *Sphagnum*-covered edge of the stream. Many of the previously mentioned locality records suggest a riparian habitat.

Records of occurrence
Specimens examined, 81: Yukon–Alaska boundary at 69°20′, 2 (NMNH); Lapierre House, 2 (NMNH); near Bern Creek, international boundary and Arctic Circle, 1; Hungry Lake, 65°39′45″/135°59′, 74; Dominion Creek, head Indian River, 2 (NMNH).

Microtus miurus – Singing vole

Microtus miurus cantator **Anderson**
Microtus cantator Anderson, 1947:161; holotype from near Tepee Lake, 61°35′/140°22′, N slope St. Elias Range, Yukon Territory.
Microtus miurus cantator, Hall and Cockrum 1952:312, 1953:442; Hall and Kelson 1959:745.
Microtus miurus, Youngman 1964:4.

Distribution
Extreme southwestern portion of the Yukon (Map 31).

Measurements
External measurements of 2 males and 2 females from the southwestern Yukon are 152, 149, 150, 149; 29, 28, 29, 25; 21, 19, 18, 18. For cranial measurements see Table 22.

Remarks
For a comparison of this subspecies with *Microtus miurus muriei,* see account of that subspecies. Rausch (1964:348) indicated that *M. m. cantator* intergrades with *M. m. oreas* and *M. m. miurus* in southeastern Alaska, but the relationship of these subspecies with *M. m. muriei* is not well understood at present.

Porsild (1966) suggested that numerous arctic and alpine plants survived in unglaciated mountain refugia in the southwestern Yukon during later phases of the Pleistocene (Fig. 5). It is probable that these small refugia within the Beringian complex were the centres of speciation of *Microtus miurus cantator.*

Ognev (1950) considered *Microtus miurus* to be conspecific with *M. gregalis,* but Rausch (1953) disagreed. Later, in a more detailed study, Rausch (1964) concurred with Ognev. But Fedyk (1970) showed that *Microtus gregalis major* from Siberia have a diploid number of chromosomes of 54 compared to 72 for *M. miurus* (Rausch 1964).

Records of occurrence
Specimens examined, 33: Tepee Lake, 2; Steele–Surge Glacier [= Steele Glacier], 4 (CU); Kluane Lake, 2 (CU); *Sheep Mountain, Mi. 1061, Alaska Highway,* 5; *Sheep Creek, Mi. 1061, Alaska Highway,* 3; *head Kluane Lake,* 2; *Kluane Range, 25 mi. SSE Destruction Bay,* 15.

Microtus miurus muriei Nelson

Microtus muriei Nelson, 1931:311; holotype from Kutuk River, Endicott Mountains, Alaska.
Microtus miurus muriei, Hall and Cockrum 1952:311.
Microtus miurus, Youngman 1964:4.

Distribution

Probably occurs in suitable habitat in mountainous areas in the northern half of the Yukon. Known at present only from the Ogilvie and British Mountains (Map 31).

Measurements

Average external measurements and weights of 9 males and 9 females from the Firth River are respectively 148 (135–156), 142 (134–147); 24 (22–27), 22 (15–26); 19 (14–22), 19 (18–20); 41.2 (33.4–44.7) g, 36.3 (30.7–39.9) g. For cranial measurements see Table 22.

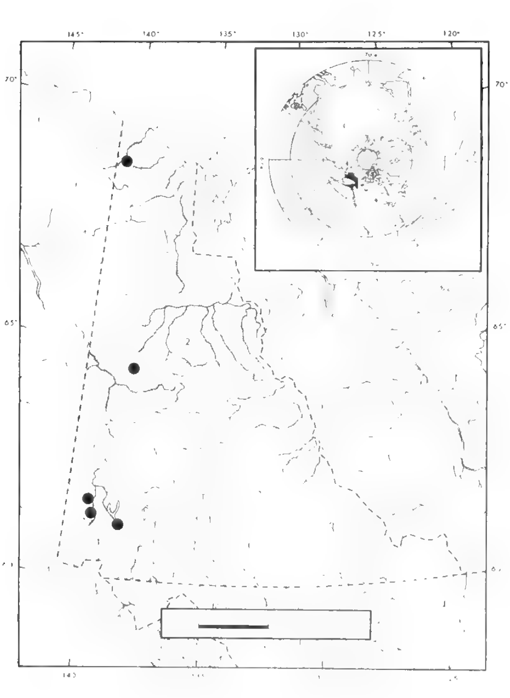
Remarks

This subspecies differs from *Microtus miurus cantator* in being Very Pale Brown (10YR 7/4) ventrally rather than Light Grey (10YR 7/2), with less of the grey basal portion of the fur showing, and in being paler and more yellow red dorsally (less grey), especially noticeable in the facial region, sides, base of tail, and, in males, in the bright patch of fur covering the flank glands.

The skull of this subspecies differs from *M. m. cantator* in being less depressed in the interorbital region when viewed laterally, in having a lower, wider, more flattened cranium, especially when viewed posteriorly, in having greater development of the sagittal crest, and in having the zygomatic arches more flattened, less curving ventrally, especially noticeable when viewed anteriorly.

As Bee and Hall (1956:137) showed, there is an east-west cline in intensity of brown (yellowish red) in *Microtus miurus muriei* in Alaska. The Yukon specimens of this subspecies are at the less intense, eastern end of this cline.

Microtus miurus andersoni Rand from District of Mackenzie, N.W.T., is represented in the National Museums of Canada collection by 4 specimens of the original series and by 12 specimens collected at the type locality in 1968. Considering overall geographical variation within *Microtus miurus* these specimens are barely recognizable as a local deme. Cranially, and in pelage colour, these specimens should be assigned to *M. m. muriei.*



Map 31
Distribution of *Microtus miurus*
1 *M. m. cantator*
2 *M. m. muriei*

Microtus miurus muriei was the predominant species on the Firth River in the northern Yukon, and was found in association with *Microtus oeconomus, Clethrionomys rutilus,* and *Sorex tundrensis.* Singing voles were found several hundred feet from the Firth River on a well-drained knoll in otherwise moist habitat. Burrow entrances were among lichen-covered rocks. Food plants included *Equisetum* sp., and *Oxytropus* sp. Hay piles were first noted on August 6 (Figure 6).

At 20 mi. S Chapman Lake, *Microtus miurus* occurred from 3,000 to 6,500 ft, but were most numerous on the lower slopes. The habitat was well-drained and near running water. The colonial nature of the burrow system was especially noticeable. The population of voles in 1961 was dense and

Table 22
Cranial measurements of *Microtus miurus*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Least interorbital breadth	Length of nasals	Palatilar length	Mastoidal breadth	Alveolar length of maxillary tooth-row
			Microtus miurus muriei Northern Yukon (Firth River and British Mountains combined)				
Average 9 ♂	27.4	15.2	3.3	7.4	13.3	12.4[8]	6.4
Max.	28.4	15.7	3.5	8.3	14.1	12.7	6.5
Min.	26.5	14.1	3.2	6.9	12.3	11.9	6.0
SD	0.67	0.50	0.11	0.47	0.59	0.27	0.19
SE	0.22	0.17	0.04	0.15	0.20	0.09	0.06
Average 9 ♀	26.6	14.0[8]	3.2	6.9	12.9	11.7	6.2
Max.	27.2	14.2	3.5	7.7	13.2	12.2	6.4
Min.	25.3	13.5	3.0	5.9	12.4	11.1	6.0
SD	0.79	0.22	0.17	0.58	0.43	0.40	0.11
SE	0.26	0.08	0.06	0.19	0.14	0.13	0.04
			Chapman Lake Region				
29647 ♂	26.4	13.9	3.1	6.7	12.6		6.1
29663 ♂	27.2	15.0	3.3	7.0	13.5	12.5	6.3
29677 ♂	27.7	14.5	3.2	6.8	13.3	12.0	6.0
29682 ♂	28.2	15.3	3.5	7.0	13.8	12.4	6.2
			Microtus miurus cantator Southwestern Yukon				
Average 4 ♂	28.1[3]	14.1	3.0	7.7	13.9[2]	11.6	6.4
Max.	29.0	14.6	3.2	8.1	14.3	11.8	6.6
Min.	27.3	13.8	2.9	7.3	13.5	11.4	6.2
Average 6 ♀	27.6	14.3	3.0	7.3	13.2	11.7[5]	6.4
Max.	28.9	15.1	3.2	8.0	13.9	12.1	7.0
Min.	26.2	13.4	2.8	7.0	12.5	11.4	6.0
SD	10.0	0.59	0.19	0.36	0.56	0.32	0.36
SE	0.41	0.23	0.08	0.14	0.23	0.14	0.15

Figure 6
Hay pile (*Hedysarum* sp.) of *Microtus miurus*, Firth River, 15 mi. S mouth of Joe Creek, 68°49'30"/140°33', 6 August 1962.

burrow entrances were close to one another. Any intruder near the colony caused the voles to emit their usual high-pitched pulsating squeaks, which followed the intruder as it made its way through the colony. It is possible that in this way a colony of singing voles can keep track of the movements of a wolverine, bear, or any other alien as it moves through. The high-pitched, pulsating nature of the calls suggests echolocation.

Hay piles were first noticed on 30 July and 16 August 1961. The bulk of these piles was composed of *Hedysarum alpinum* L., with some *H. Mackenzii* Richards and *Draba sibirica* (Pall.) present.

The odour of the flank glands is similar to that of *Lemmus sibiricus* and *Microtus xanthognathus*, but stronger, and reminiscent of Friars Balsam. Sexually excited males scratch these glands with their hind feet when the glands become hypertrophied during the breeding season. Males appear to determine the breeding condition of females by smelling the perineal region, whereas females appear to make the same determination by smelling the flank glands of the male.

Observations of a captive colony in Ottawa indicated a gestation period of 21 days. Postpartum estrus occurred often.

Seventeen young averaged 2.29 (1.65–3.0) g at birth. The young gained .86 g per day of the first 18 days, .60 g per day between 36 and 60 days. The eyes opened at approximately 12 days. One male was sexually active at 24 days and several were active by the age of 34 days. One female was sexually active at 41 days. No females were known to have given birth before 6 months of age.

Circadian rhythm was noted in the use of exercise wheels, with the greatest activity centred around midnight, and with a lesser peak of activity at noon.

Locomotion and posture in this species is pika-like, as is the construction of hay piles and, to a lesser degree, the manner of vocalization.

Records of occurrence

Specimens examined, 145: Firth River, 15 mi. S mouth Joe Creek, 79; *British Mountains, 20 mi. SE mouth Joe Creek,* 14; 14 mi. S Chapman Lake, 3; *13 mi. S Chapman Lake,* 22; *Ogilvie Mountains, 52 mi. NE Dawson, 14 mi. S Lomond Lake,* 1; *20 mi. S Chapman Lake,* 26.

Ondatra zibethicus – Muskrat

Ondatra zibethicus spatulatus (Osgood)

Fiber spatulatus Osgood, 1900:36; holotype from Marsh Lake, Yukon Territory.
Ondatra zibethica spatulata, Miller 1912:231, Osgood 1909*b*:56, 79; Rand 1945*a*:44; R. M. Anderson 1947:165.
Fiber zibethicus spatulatus, Hollister 1911*a*:23.

Distribution

Probably occurs throughout the Yukon (Map 32).

Measurements

Average (and extreme) external measurements of 4 males and 2 females from the Old Crow region are 516 (503–545); 224 (210–241); 74 (71–75). Weights of 3 males from Old Crow are 854.8 g, 896.3 g, 1,121.0 g. A male and 2 females from the vicinity of Chapman Lake measured respectively 507, 554, 551; 240, 254, 230; 73, 74, 75. Average (and extreme) measurements of 2 males and 4 females from the extreme southern Yukon are 540 (517–560); 251 (240–265);

Table 23
Cranial measurements of *Ondatra zibethicus spatulatus*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Mastoidal breadth	Breadth of rostrum	Least interorbital breadth	Length of nasals	Alveolar length of maxillary tooth-row
Old Crow							
Average 6 (4 ♂, 2 ♀)	60.8	37.6[4]	25.4[5]	12.9[5]	5.9	21.0	14.3
Max.	61.7	38.7	25.7	13.1	6.2	22.2	14.1
Min.	60.0	37.2	25.0	12.6	5.5	20.4	13.4
SD	0.71	0.43	0.30	0.19	0.29	0.63	0.53
SE	0.29	0.22	0.13	0.07	0.12	0.26	0.22
Chapman Lake region							
29638 ♂	62.1		28.4	13.6	6.0	22.3	14.0
29637 ♀	62.6	37.9	25.9	13.1	5.8	22.4	14.4
29639 ♀	63.5	37.9	27.3	13.3	6.2	22.3	14.2
Stewart River settlement region							
Average 5	63.3	40.2	27.5	13.6	6.1	22.1[4]	15.1
Max.	64.0	41.2	28.5	14.3	6.3	22.9	15.2
Min.	61.5	39.0	26.6	13.1	5.9	22.0	15.0
SD	1.03	0.92	0.86	0.51	0.20	0.78	0.07
SE	0.46	0.41	0.38	0.23	0.1	0.39	0.03
Southern Yukon							
Average 17 (14 ♂, 3 ♀)	63.0[16]	39.5	26.7	13.6[16]	5.9	21.5[16]	15.1
Max.	65.8	40.9	29.5	14.7	6.5	22.4	15.8
Min.	60.4	38.3	25.3	12.5	4.4	20.0	14.4
SD	1.38	1.28	0.96	0.65	0.47	0.73	0.43
SE	0.34	0.31	0.23	0.16	0.11	0.18	0.10

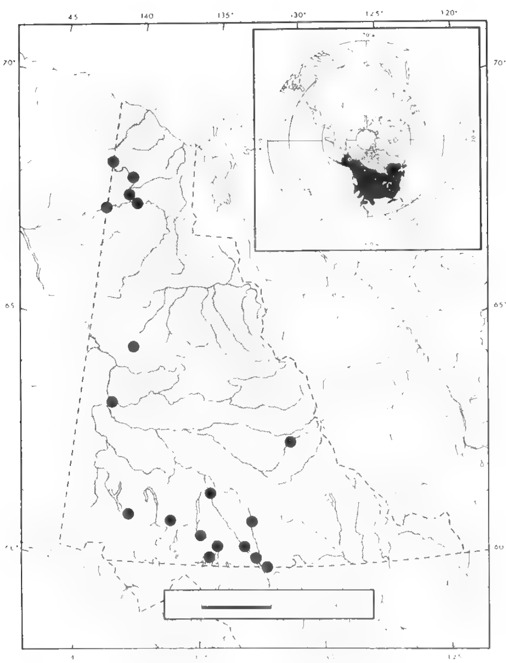
73 (72–75). A male from Tagish weighed 1,067.5 g. For cranial measurements see Table 23.

Remarks

I tentatively follow Hollister (1911*a*:23) in assigning muskrats from the Yukon to *Ondatra zibethicus spatulatus.* The taxonomy of this species is in obvious need of revision.

There is some evidence that a north-south cline in size exists in the Yukon (Table 23), since the specimens from the southern part of the Territory average larger than those from the northern part. Although there is no large series of specimens from the northern Yukon, 18 specimens from the Mackenzie River Delta, Northwest Territories, agree closely with the specimens from Old Crow in size.

Muskrats have been collected between 750 and 6,000 ft altitude in the Yukon. A female from 14 mi. S Chapman Lake, collected 27 July 1961 had 5 embryos.



Map 32
Distribution of *Ondatra zibethicus spatulatus*

Records of occurrence

Specimens examined, 93; Old Crow Flats, International Boundary, 65 mi. N Porcupine River, 1 (NMNH); 30 mi. SE Crow Base [Crow Base = 68°13′/141°00′], 1 (NMNH); *Old Crow River, near Timber Creek,* 4 (NMNH); *38 mi. SE Crow Base,* 1 (NMNH); *Old Crow River, near Black Fox Creek,* 1 (NMNH); Johnson Creek, 5 mi. from mouth, 19 mi. NNE Old Crow, 2; *Old Crow River, 19 mi. N Old Crow, 1 mi. N mouth Johnson Creek,* 2, *Old Crow,* 3 (1 AHRC); Porcupine River, 20 mi. NE Old Crow, 3; Rampart House, 1; 8 mi. S Chapman Lake, 1; *14 mi. S Chapman Lake,* 1; *13 mi. S Chapman Lake,* 1; Stewart River settlement region, 6; Sheldon Lake, Canol Road, Mi. 222, 5; Rose River, Canol Road, Mi. 98, 5; Lower Hoot River [= Lower Teslin River], near Teslin Lake, 2; Hutshi Lake, 50 mi. NW Whitehorse, 1; Kloo Lake, 1 (MCZ); Lower Whitehorse, 1; Hootalinqua River [= Teslin River], near Teslin Lake, 11; *Hoot River* [= *Teslin River*], *near Teslin Lake,* 2; *Upper Hoot River* [= *Upper Teslin River*], *near Teslin Lake,* 2; Lake Marsh, 2 (NMNH); *Little Atlin Lake, 8 mi. SSE Jakes Corner,* 6; Tagish Creek, 1; Carcross, 1; Teslin Lake, 5; *near Teslin Lake,* 3; *Beaver Creek, near Teslin Lake,* 10; *Nisultin River, near Teslin Lake,* 5; *Nisultin Bay, near Teslin Lake,* 1; 30 mi. S Teslin Lake, 1.

Additional records

Near Tent Island (R. M. Anderson 1913*b*: 513); Lapierre House, 25 July 1964 (seen, G. D. Tessier, MS); Bonnet Plume Lake, 23 July 1966 (seen, N. A. Olsen, MS); Keele Lake, 16 August 1966 (old dens seen, W. H. Butler, MS); Little Hyland River, 128 mi. N Watson Lake, 24 June 1963 (seen, G. D. Tessier, MS); North Toobally Lake (seen by R. Chambers, P. M. Youngman, MS, 14 July 1961).

Lemmus sibiricus – Siberian lemming

Lemmus sibiricus helvolus **(Richardson)**
Arvicola (Lemmus) helvolus Richardson, 1828:517; holotype from near headwaters of the southern tributaries of Peace River, or between there and the Jasper House region, Alta. (Preble 1908:82).
Lemmus sibiricus helvolus, Rausch 1953:127; Youngman 1968:76.
Lemmus yukonensis, Osgood 1900:37.
Lemmus helvolus yukonensis, Osgood 1909*b*:80.
Lemmus trimucronatus helvolus, Davis 1944:22; Rand 1945*b*:59 (part); R. M. Anderson 1947:147; Hall and Cockrum 1953:473; Bee and Hall 1956:113; Hall and Kelson 1959:760.
Lemmus trimucronatus alascensis, Hall and Cockrum 1953:473 (part).
Lemmus trimucronatus trimucronatus, Hall and Kelson 1959:760 (part).

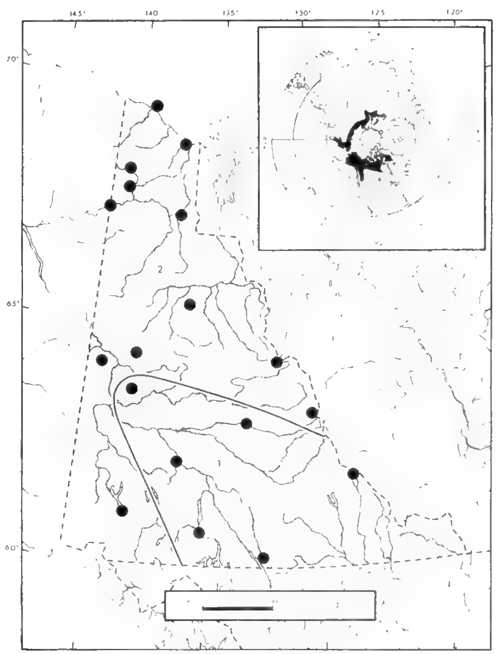
Distribution
The southeastern portion of the Yukon (Map 33).

Measurements
Average (and extreme) measurements of 22 males and 11 females from the Little Hyland River region are respectively 136 (127–152), 133 (124–151); 14 (8–17), 16 (11–21); 19 (18–22), 19 (18–20); 53.6 (42.4–59.8) g, 2 nonparous females weighed 66.1 and 43.0 g. For cranial measurements see Table 24.

Remarks
This is a well-marked subspecies in a species that has few strong subspecies. *Lemmus sibiricus helvolus* differs from *L. s. trimucronatus* in averaging much brighter and paler (sides Yellowish Red, 5YR 5/8 to Reddish Yellow, 5YR 6/8, rump Red, 2.5YR 4/6), with more yellow.

The four specimens from the vicinity of Teslin Lake are old and worn. The colour on parts of these specimens is unlike that found on any recently collected specimens, perhaps owing to the effect of a chemical preservative used on the skins. Nevertheless, I assign these specimens to *L. s. helvolus* on the basis of the general brightness of the pelage colour. Specimens from Tantalus, Rink Rapid, and Dominion Creek, head Indian River, are old, poorly prepared specimens, and may show some intergradation with *L. s. trimucronatus* (as perhaps does the well-prepared specimen from forks Macmillan River). However, these specimens show much of the brightness of pelage, especially on the flanks, that is characteristic of this subspecies.

Rausch (1963*b*:35) considered that *Lemmus sibiricus* was confined to Beringia during Wisconsin time, but Macpherson (1965: 169) suggested a southern origin for *L. s. helvolus.* Considering the pattern of distribution, and divergence of this subspecies, I agree with Macpherson.



Map 33
Distribution of *Lemmus sibiricus*
1 *L. s. helvolus*
2 *L. s. trimucronatus*

Table 24
Cranial measurements of *Lemmus sibiricus*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Length of nasals	Palato-frontal depth	Least interorbital breadth	Mastoidal breadth	Length of diastema	Alveolar length of molar row
			Lemmus sibiricus helvolus Little Hyland River region					
Average 22 ♂	29.1[21]	19.0[20]	8.6	9.1[18]	3.7[20]	14.7[21]	9.1	8.2
Max.	30.1	19.6	9.0	9.6	4.1	15.5	9.6	8.5
Min.	27.5	18.1	7.7	8.7	3.2	14.0	8.5	7.8
SD	0.69	0.49	0.34	0.30	0.28	0.42	0.32	0.21
SE	0.15	0.11	0.07	0.07	0.06	0.09	0.07	0.04
Average 11 ♀	28.0	18.9[10]	8.4	9.1[5]	3.8	14.4	8.6	8.1
Max.	28.6	19.4	8.7	9.4	4.1	14.8	9.2	8.3
Min.	27.1	18.2	8.0	8.6	3.4	13.7	8.3	8.0
SD	0.46	0.41	0.22	0.30	0.23	0.34	0.29	0.12
SE	0.14	0.13	0.07	0.14	0.07	0.10	0.09	0.03
			Lemmus sibiricus trimucronatus Old Crow region					
246842 NMNH, ♂	31.4	20.6	9.4	9.5	3.8	15.5	10.0	8.9
246838 NMNH, ♂	31.0	20.2	9.6	9.6	3.5	15.8	9.5	9.1
246839 NMNH, ♀	28.0	18.8	8.5	9.1	3.9	13.9	8.7	8.3
246841 NMNH, ♀	29.4	20.9	9.3	10.1	4.0	14.7	9.2	8.3
			Hungry Lake					
34834 ♂	34.0	22.0		10.4	3.8	17.3	10.7	9.3
34838 ♂	30.3	19.0	9.1	9.2	4.2	16.0	9.4	8.5
34833 ♀	30.0	20.0	9.3	9.5	4.3	15.5	9.7	8.5
34836 ♀	30.0	20.6	9.9	10.5	4.1	16.0	9.7	8.3
34837 ♀	30.7	19.5	9.7	9.8	3.9	15.2	9.6	9.5

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Length of nasals	Palato-frontal depth	Least interorbital breadth	Mastoidal breadth	Length of diastema	Alveolar length of molar row
Chapman Lake region								
29523 ♂	31.0	20.8	9.6	9.8	3.7	15.1	9.6	8.7
29524 ♂	30.4	19.8	9.4	9.5	3.6	15.0	9.1	8.1
29541 ♂	31.1	20.3	9.6	9.3	3.7	14.6	9.7	8.3
29542 ♂	30.0	20.2	8.8	9.5	3.8	15.3	9.0	8.3
29538 ♀	28.6	18.6	8.0	9.0	4.0	14.5	8.6	8.1
29540 ♀	28.8	18.5	8.1	8.9	3.6	14.8	9.0	8.1
29527 ♀	31.0	21.6	9.9	10.2	3.5	16.4	9.4	8.8
Keele Lake								
34552 ♂	30.5	20.7	9.5	9.8	3.8	15.6	9.6	8.1
35435 ♂	30.6	20.8	10.1	9.8	3.8	15.3	10.1	8.0
35444 ♀	29.2	19.5	9.2	9.6	3.9	14.9	9.3	8.6
35439 ♀	28.6	19.6	8.9	9.3	3.8	14.5	9.2	8.1
35456 ♀	28.3	18.2	8.7	8.8	3.7	14.1	8.8	7.9
Kluane Lake region								
CU, ♂	30.6	19.1	8.8	9.6	4.1	15.4	9.2	7.9
CU, ♂	28.9	19.8	9.4	9.3	3.5	14.8	8.6	8.5

Records of occurrence

Specimens examined, 49: Dominion Creek, head Indian River, 3 (NMNH); forks Macmillan River, 1 (NMNH); Rink Rapid, 5 (NMNH); *Tantalus,* 1; 138 mi. N Watson Lake, 5 mi. E Little Hyland River, 1; *Little Hyland River, 128 mi. N Watson Lake,* 33; Haeckel Hill, 8 mi. NW Whitehorse, 1; Nisutlin Mountains, near Teslin Lake, 1; *near Teslin Lake,* 1; *NE Teslin Lake,* 1; *Eagle Bay, near Teslin Lake,* 1.

Lemmus sibiricus trimucronatus (Richardson)

Arvicola trimucronata Richardson, *in* Parry 1825:309; holotype from Point Lake, District of Mackenzie, N.W.T.
Lemmus sibiricus trimucronatus, Rausch 1953:126.
Lemmus trimucronatus alascensis, R. M. Anderson 1937:110; Rand 1945*b*:59 (part); R. M. Anderson 1947:147 (part); Hall and Cockrum 1953:472 (part); Porsild 1945:15.

Distribution

The northern and southwestern portion of the Yukon (Map 33).

Measurements

Average (and extreme) measurements of 6 specimens (2 males, 4 females) from Hungry Lake area 152 (140–167); 16 (13–18); 21 (20–22). Two males weighed 92.4 and 55.7 g, and a female with 6 embryos (20 mm) weighed 94.2 g. For cranial measurements see Table 24.

Remarks

For a comparison of this subspecies with *Lemmus sibiricus helvolus,* see the account of the latter subspecies. The specimens from Keele Lake, and some specimens from 13 mi. S Chapman Lake, are slightly brighter than other specimens of *L. s. trimucronatus,* perhaps indicating intergradation with *L. s. helvolus.*

North American mammalogists have been reluctant to recognize that Nearctic and Asian lemmings are conspecific (except True 1885; Rausch 1953), although von Middendorff (1853), Hinton (1926:193), Ellerman (1949:893), Ellerman and Morrison-Scott (1951:655), and Sidorowicz (1960:72) implied such a relationship. Also, Ognev (1948:408) and Sidorowicz (1964: 223) came to the more positive conclusion that the Siberian and North American lemmings are conspecific. The latter author concluded also that these two forms are conspecific with the Norwegian lemming, *Lemmus lemmus.* Krivosheev and Rossolimo (1966) agreed that the Siberian and North American lemmings are conspecific, but rejected the poorly substantiated theory that *Lemmus sibiricus* and *Lemmus lemmus* are conspecific. I agree with the latter authors. Although I concur with Sidorowicz (1964) that *Lemmus lemmus* and *Lemmus sibiricus* are indistinguishable cranially, and that they may be conspecific, I do not think that Sidorowicz has made a convincing argument.

Geographical variation in the Siberian lemming in North America is not well understood. A brief history of the taxonomy of *Lemmus sibiricus* from the mainland of North America will show some of the problems that have arisen. The first name for the lemming in North America was *Arvicola trimucronata* Richardson, 1825, from central Mackenzie District. The next-named form, *Arvicola* (*Lemmus*) *helvolus* Richardson, 1828, was based on a specimen from the Rocky Mountains, probably in British Columbia. Using colour as the main indicator of geographical variation, there is no doubt that these names represent two distinct subspecies. The next identifiable names, *Lemmus alascensis* Merriam, 1900, and *Lemmus yukonensis* Merriam, 1900, were applied to specimens from northern coastal Alaska (Point Barrow), and inland Alaska (Charlie Creek) respectively. Finally, *Lemmus minisculus* Osgood, 1904, was based on immature specimens from the base of the Alaska Peninsula.

The validity of *Lemmus yukonensis* was first questioned by R. M. Anderson (1937: 110) who pointed out that the described differences between *L. yukonensis* and *L. alascensis* resulted from comparing specimens in different pelages. In a concise revision of *Lemmus* in North America, W. B. Davis (1944:21) concurred with Anderson and relegated *L. yukonensis* to the synonymy of *L. t. alascensis.* Bee and Hall (1956:109) described *L. t. subarcticus* from the Brooks Range and part of the adjacent coastal plain of northern Alaska, compared the new subspecies with both *L. t. alascensis* and *L. t. yukonensis* without commenting on the conclusions of Anderson and Davis, and implied that *L. t. alascensis* was larger than *L. t. yukonensis*. Among other characters, mainly cranial in nature, *L. t. subarcticus* was described as being 6 per cent smaller than *L. t. alascensis* and 4 per cent smaller than *L. t. yukonensis*.

Hall and Kelson (1959) omitted mention of the conclusions of Anderson and Davis, and also omitted the well-documented occurrence of *Lemmus* on Banks Island, Victoria Island, Prince of Wales Island, King William Island and Bylot Island, N.W.T.

It has been shown that some small mammals, notably Soricidae and Microtinae, vary in body weight and skull size seasonally (Dehnel 1949: Borowski and Dehnel 1952; Schwartz et al. 1964; and Manning 1956). Others have shown that, in addition, "cyclic" microtines exhibit a phase polymorphism in which adults develop to larger size during peak populations (Chitty and Chitty 1962; Kalela 1958; Krebs 1963; K. Zimmermann 1955; Krebs 1964). In some instances, the differences between means of many measurements of described subspecies of *Lemmus sibiricus* are remarkably close to the differences between means of adults from the low and peak stages of the lemming cycle (Bee and Hall 1956, Krebs 1964).

Sidorowicz (1960) and Krivosheev and Rossolimo (1966) noted a slight reduction in size of body and skull in a continuous clinal nature from north to south in the Palearctic, not in accordance with variation in colour. As more material becomes available, this may be found to hold true in North America, especially in the western arctic.

Colour is a good taxonomic character in *Lemmus sibiricus,* but its use is somewhat confounded by the presence of from 6 to 11 pelages (Bee and Hall 1956:102, 103). It is not surprising that specimens in different pelages have been compared in the descriptions of new taxa.

There is a slight colour difference between specimens of *L. s. alascensis* from Point Barrow (paler) and *L. s. trimucronatus* (darker) from the eastern arctic, but the cline in this character is so gradual and continuous that it is impossible to define the limits of the two demes.

Considering all continental populations of *Lemmus sibiricus* in North America, *L. s. trimucronatus* and *L. s. helvolus* are the best defined, and perhaps the only valid subspecies. However, Sidorowicz (1964), after examining specimens only from Point Barrow, Alaska, concluded that *all Lemmus* from the Nearctic are consubspecific.

An interesting zoogeographical corollary is that Krivosheev and Rossolimo (1966) recognized only the nominate subspecies and *L. s. chrysogaster* in the Palearctic. My comparison of a few specimens of *L. s. chrysogaster* from eastern Siberia with specimens from northern Alaska shows the possibility that the two populations may be consubspecific.

Records of occurrence

Specimens examined, 128: Herschel Island, Pauline Cove, 23; *Herschel Island,* 12 (3 AMNH, 8 MZ); 4 mi. WSW mouth Blow River, 2; Old Crow River, 65 mi. above Timber Creek, 1 (NMNH); *Old Crow River, Timber Creek,* 2 (NMNH); Old Crow River, Johnson Creek, 67°50′/139°46′, 3 (NMNH); *Old Crow Mountains,* 2 (1 AHRC); Rampart House, 1; 2½ mi. SW Lapierre House, 1; Hungry Lake, 65°39′45″/135°59′, 6; 13 mi. S Chapman Lake, 13; *18 mi. S Chapman Lake,* 6; *20 mi. S Chapman Lake,* 5; *North Fork Crossing, Mi. 43, Aklavik Road* [= *North Fork Crossing, Dempster Highway, Mi. 43*], *Ogilvie Mountains,* 1; Bonnet Plume Lake, 3; Swede Dome, 34 mi W Dawson, 1; Keele Lake, 43; Christmas Bay, Kluane Lake, 2 (CU); *S end Kluane Lake, Alaska Highway, Mi. 1055,* 1 (CU).

Synaptomys borealis – Northern bog lemming

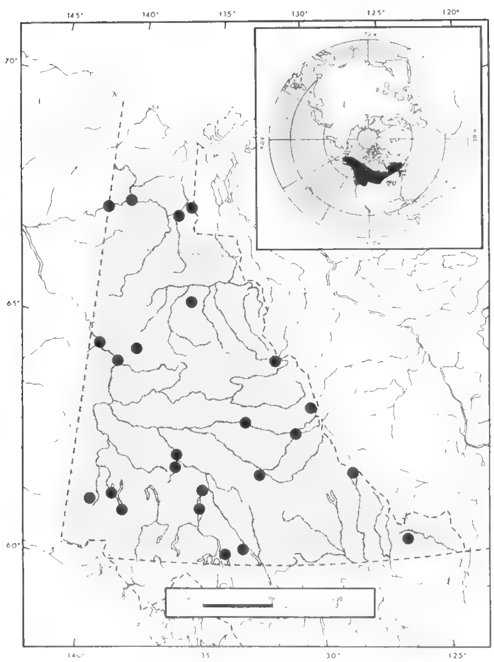
Synaptomys borealis borealis **Richardson**
Arvicola borealis Richardson, 1828:515; holotype from Fort Franklin, District of Mackenzie, N.W.T.
Synaptomys borealis, Osgood 1907:49.
Synaptomys borealis dalli, A. B. Howell 1927:9; Osgood 1909*b*:56, 79; Rand 1945*a*:40, 1945*b*:59; R. M. Anderson 1947:145; Baker 1951:103; Hall and Cockrum 1953:478; Hall and Kelson 1959:764; Youngman 1964:4, 1968:76.
Synaptomys dalli, Osgood 1900:37.

Distribution

Probably occurs throughout the wooded part of the Yukon (Map 34).

Measurements

Average (and extreme) measurements of 18 males and 6 females from the southeastern Yukon are: 123 (112–133), 127 (110–130); 20 (17–23), 19 (17–22); 19 (17–19), 19 (17–20). Four males from near Carmacks weighed 28.4, 32.7, 32.4, 34.1 g. Two non-parous females from the same locality weighed 28.8 and 26.9 g. For cranial measurements see Table 25.



Map 34
Distribution of *Synaptomys borealis borealis*

Remarks

A. B. Howell (1927:25) referred specimens from Alaska, northern British Columbia, and the Yukon to *Synaptomys borealis dalli* since he considered them to be paler than specimens of *S. borealis* with "slightly longer rostra, wider brain cases, wider incisive foramina, and shorter pterygoid fossae", but he also remarked, "there is little average cranial difference." I agree that specimens from these areas are slightly paler than topotypes and near topotypes of *S. b. borealis,* but this colour difference is very slight, and not of equal weight with the colour differences separating most subspecies of *S. cooperi.* A comparison of cranial measurements of four topotypes of *S. b. borealis* (NMNH) and other specimens from various localities in the Northwest Territories (NMNH, AMNH, NMC) with numerous specimens from Alaska and the Yukon (NMNH, AHRC, AMNH, NMC) shows no significant cranial differences in either the measurements mentioned by Howell or in any other measurements.

There is no fossil record of *Synaptomys borealis* in the Alaska–Yukon region. Guthrie (1968*b*:239) could not derive a clear indication of the Pleistocene zoogeography of *Synaptomys borealis* from the present distribution pattern, but thought that the separation of the genus into northern (*S. borealis*) and southern (*S. cooperi*) suggested that *S. borealis* speciated in a northern refugium. However, he also cautioned that since *Synaptomys* has no Eurasian counterpart it could be argued that it is a postglacial immigrant. Wetzel's (1955:1) review of the fossil record of the genus suggests that *Synaptomys borealis* may have had a western, but not necessarily a Beringian origin. The lack of a well-differentiated northwestern subspecies leads me to suspect that *Synaptomys borealis* speciated in a south-

Table 25
Cranial measurements of *Synaptomys borealis borealis*

Number of specimens averaged or catalogue number, and sex	Condylo-basilar length	Zygomatic breadth	Rostral length	Rostral breadth	Least interorbital breadth	Lambdoidal breadth	Length of incisive foramin	Alveolar length of maxillary tooth-row
Old Crow								
33754 ♂	23.9	15.5	6.0	4.9	2.9	11.4	4.9	7.1
33755 ♂	23.5	15.0	6.2	4.8	2.9	11.4	5.0	7.0
North Fork Crossing; Ogilvie Mountains								
30669 ♂	23.2	14.9	6.3	4.8	3.3	11.9	4.9	7.0
30671 ♂	23.8	15.2	6.3	4.7	3.2	11.8	5.4	7.0
Carmacks region								
34831 ♂	25.0	15.9	6.2	4.8	3.0	12.2	5.0	7.1
34820 ♂	25.2	16.0	6.3	5.0	3.1	12.1	5.3	7.5
34821 ♂	25.6	16.2	6.6	5.2	3.2	12.4	5.2	7.7
34829 ♀	23.1	14.8	5.6	4.5	3.0	11.7	4.8	7.0
34822 ♀	24.3	15.1	5.7	5.1	3.1	11.9	4.8	7.2
34825 ♀	23.9	15.1	5.8	5.1	3.3	12.0	4.9	7.1
Southeastern Yukon (several localities)								
Average 18 ♂	24.7^{15}	15.5	6.2^{17}	4.9^{17}	3.1^{16}	11.9^{16}	5.1	7.3
Max.	25.4	16.1	6.9	4.1	3.3	12.4	5.6	7.6
Min.	23.4	14.6	5.7	4.7	3.0	11.3	4.8	7.0
SD	0.51	0.38	0.34	0.14	0.10	0.31	0.24	0.17
SE	0.13	0.09	0.08	0.03	0.02	0.08	0.06	0.04
Average 5 ♀	24.7^{4}	15.6	6.2	4.8	3.1	11.9^{4}	5.1	7.5
Max.	24.9	16.1	6.6	4.9	3.1	12.1	5.4	7.6
Min.	24.5	15.1	6.0	4.6	3.0	11.5	4.7	7.4
SD	0.17	0.36	0.30	0.11	0.05	0.29	0.28	0.08
SE	0.08	0.16	0.14	0.05	0.02	0.14	0.12	0.04

western refugium, and is a postglacial immigrant to the northwest.

Northern bog lemmings have been collected in the Yukon between 800 and 6,000 ft mostly in bogs and marshes. Ten pregnant females averaged 4.4 (3–6) embryos.

Records of occurrence
Specimens examined, 105: Summit Lake, 67°43′/136°29′, 1; Old Crow, 4; Rampart House, 1; Bell River, 3; ½ mi. SW Lapierre House, 2; *Bell River, 2 mi. SW Lapierre House,* 4; Hungry Lake, 65°39′45″/135°59′, 1; mouth Coal Creek, 64°29′/140°26′, 1 (NMNH); *Forty Mile,* 1 (NMNH); North Fork Crossing, Aklavik Road, Mi. 43 [= North Fork Crossing, Dempster Highway, Mi. 43], Ogilvie Mountains, 4; Bonnet Plume Lake, 9; Chandindu River, 1 (NMNH); *Dempster Highway, Mi. 4.8,* 3 (AHRC); Keele Lake, 1; forks Macmillan River, 5 (NMNH); south fork Macmillan River, Canol Road, Mi. 249, 8; *Sheldon Lake, Canol Road, Mi. 222;* 12; Rink Rapid, 1 (NMNH); *5½ mi. NW Carmacks,* 6; *½ mi. NW Carmacks,* 1; 11 mi. WSW Carmacks, 6; 138 mi. N Watson Lake, 5 mi E Little Hyland River, 1; *Little Hyland River, 128 mi. N Watson Lake,* 1; Lapie River, Canol Road, Mi. 132, 7; Thirty Mile River [= Yukon River], 1 (NMNH); Burwash Landing, 1; Steele Glacier, 1 (CU); Lake Laberge, 2 (NMNH); Alaska Highway, Mi. 1056, 1 (CU); Squanga Lake, 1; North Toobally Lake, 15; Little Atlin Lake, 11 mi. E Tagish, 13 mi. S Jakes Corner, 2.

Dicrostonyx torquatus – Varying lemming

Dicrostonyx torquatus kilangmiutak Anderson and Rand

Dicrostonyx groenlandicus kilangmiutak Anderson and Rand, 1945:305; holotype from De Haven Point, Victoria Island, N.W.T.
Dicrostonyx torquatus kilangmiutak, Rausch 1953:128.
Dicrostonyx rubricatus, G. M. Allen 1919:518 (part).
Dicrostonyx groenlandicus rubricatus, Anderson and Rand 1945*a*:305 (part); Hall and Cockrum 1953:484 (part); Miller and Kellogg 1955:560 (part); Hall and Kelson 1959:767 (part); Manning and Macpherson 1958:23.

Distribution
Probably restricted to the Richardson Mountains, the Coastal Plain, and the British Mountains (Map 35).

Measurements
A subadult male from the British Mountains, 20 mi. SE mouth Joe Creek, measured 123; 13; 18; and weighed 41.1 g. Cranial measurements of this individual and an unsexed specimen from Herschel Island are respectively: condylobasilar length, 25.6, 27.4; nasal length, 7.8, 8.4; nasal breadth, 3.5, 3.6; zygomatic breadth, 16.8, 19.5; lambdoidal breadth, 13.0, 14.5; least interorbital breadth, 3.7, —; alveolar length of maxillary tooth-row, 6.5, 8.8.

Dicrostonyx torquatus kilangmiutak differs from *Dicrostonyx torquatus rubricatus* in having the anterior upper parts pale red rather than dark red, and in having a pale-grey rump rather than a dark-grey or brownish rump. Specimens from the northern Yukon are obviously intergrades between *Dicrostonyx torquatus rubricatus* and *D. t. kilangmiutak.*

Remarks
A revision of *Dicrostonyx* in North America is badly needed. At least four species of varying lemming may exist in North America —*Dicrostonyx torquatus, D. unalascensis, D. richardsoni* and *D. hudsonius.* In cross-breeding experiments Rausch and Rausch (1972) failed to breed the F1 progeny of crosses of *D. unalascensis* (Umnak Island) × *D. t. exsul* (St. Lawrence Island), *D. unalascensis* × *D. torquatus nelsoni* (Seward Peninsula), *D. unalascensis* × *D. richardsoni* (near Churchill, Man.), and *D. unalascensis* × *D. t. rubricatus* (Point Barrow, Alaska), whereas the F1 progeny of *D. t. nelsoni* × *D. t. exsul* were fertile. They found the diploid chromosome number varied from 30 to 35 in *D. t. exsul, D. t. nelsoni, D. t. rubricatus,* and *D. unalascensis,* while the diploid number for *D. richardsoni* was 44 and 42. The breeding experiments seem to show that *D. unalascensis* is a good species, while the diploid number of *D. richardsoni* seems to confirm its specific distinctness.

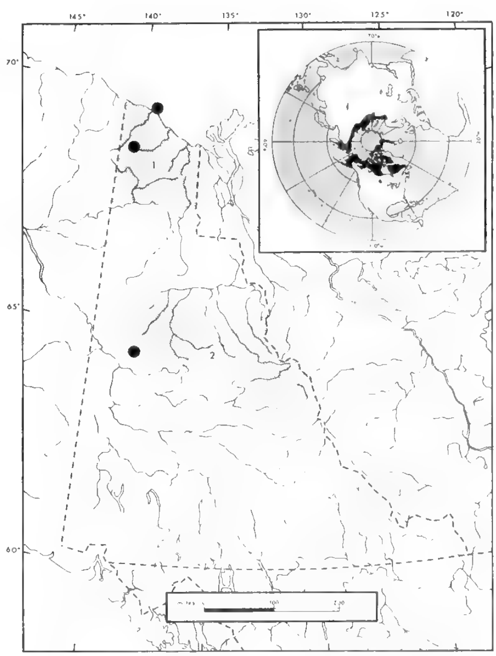
Rausch and Rausch's assignment of varying lemmings from the Seward Peninsula to

Dicrostonyx torquatus nelsoni may be incorrect. Specimens from the Seward Peninsula are greyer, less buff in colour than topotypes of *D. t. nelsoni,* and probably represent an undescribed subspecies.

In my opinion, *Dicrostonyx unalascensis* Merriam (holotype from Unalaska Island) and *D. unalascensis stevensoni* Nelson are consubspecific. *D. t. nelsoni* Merriam (holotype from St. Michael, Alaska) and *D. t. peninsulae* Handley (holotype from Urilla Bay, Unimak Island, Alaska) appear to be well-defined subspecies, but more specimens from both populations are needed. Specimens of *D. t. exsul* G. M. Allen (holotype from St. Lawrence Island, Alaska), when compared with *D. t. nelsoni* and *D. t. rubricatus* (Richardson), are pale and show cranial differences. Varying lemmings from the Seward Peninsula are a uniform dull-grey lacking the grizzled black and dark-red colouring found on the anterior upper parts of specimens of *D. t. rubricatus,* a population that extends at least from Cape Sabine, Alaska, on the Arctic coast, east almost to the Canadian border. *D. t. rubricatus* and *D. t. kilangmiutak* Anderson and Rand (holotype from Victoria Island, N.W.T.) intergrade over a narrow zone in the northern Yukon. *D. t. nunatakensis* Youngman (holotype from Ogilvie Mountains, Yukon Territory) lacks the reddish coloration of *D. t. kilangmiutak. D. t. groenlandicus* (Traill) (holotype from Jameson Land, Greenland) is a distinctive bright grey. I consider *D. t. clarus* Handley (holotype from Mould Bay, N.W.T.) to be consubspecific with *D. t. groenlandicus.* I believe *D. t. lentus* Handley (holotype from Lake Harbour, Baffin Island), a dull-grey subspecies, occurs over entire inhabitable Baffin Island, Southampton Island, and into northeastern District of Keewatin as far as King William Island and Adelaide Peninsula in the north, and Baker Lake in the south. Although intergradation between *D. t. kilangmiutak* and *D. t. lentus* occurs over a narrow zone, there are no obvious intergrades between these two subspecies and the brownish *D. richardsoni* Merriam (holotype from Churchill, Man.). The nominal species *D. hudsonius* differs from the other species in that the first and second upper cheek-teeth lack the accessory fold at the posterointernal corner. However, 13 specimens of *D. richardsoni* from 18 mi. S of Eskimo Point, Keewatin District, N.W.T., show slightly similar characteristics.

The cyclic nature of varying lemming populations was well demonstrated in 1964 when G. D. Tessier and I examined a small segment of the Yukon Coastal Plain on the Beaufort Sea. No lemmings were seen or trapped, but there was evidence that a large population had occupied the area during the previous year (Figure 1). Arctic-fox scats and owl pellets contained nothing but the remains of varying lemmings, and abandoned runways and burrows were numerous.

In Alaska, the Yukon Territory, and the Northwest Territories, varying lemmings have been collected in two radically different tundra biotypes—either in high alpine tundra, or in valley bottoms and coastal tundra (also see Guthrie 1968*b*:236). At any one locality, varying lemmings may be found in one of these biotypes, but they have not been found in both simultaneously. On the Coastal Plain, varying lemmings occur in tundra a few feet above the sea level (Figure 1). In the British Mountains of the northwestern Yukon, they occurred in a sparsely vegetated dry heath at 2,700 ft on a



Map 35
Distribution of *Dicrostonyx torquatus*
1 *D. t. kilangmiutak*
2 *D. t. nunatakensis*

barren, rock-strewn mountainside (Figure 2), but not in the adjacent low tundra. At Horn Lake, N.W.T., in the Richardson Mountains, near the Yukon border, they were found at 1,000 ft in low, poorly drained, *Eriophorum* meadows and not in the adjacent alpine tundra. In the Ogilvie Mountains, north of Dawson, *Dicrostonyx torquatus nunatakensis* was found at 5,500 ft, in a rocky heath at the edge of a glacial cirque (Figure 3).

It is tempting to hypothesize interspecific competitive dominance as the reason for this species' occupancy of two different ecotypes. In the Ogilvie and the British mountains—both areas where *Dicrostonyx* was confined to alpine heath—*Microtus miurus* was the dominant species occupying the low hillsides. In the spring of 1972 *Microtus miurus* was not found in the valleys in the Ogilvie Mountains. However, a single specimen of *Dicrostonyx t. nunatakensis* was collected in a valley and there was evidence that a large population of *Dicrostonyx* had occupied the valley bottoms the previous fall.

Records of occurrence
Specimens examined, 38: Herschel Island, Pauline Cove, 21; *Flanders Point, Herschel Island,* 1 (AMNH); *Herschel Island,* 9 (7 AMNH); British Mountains, 20 mi. SE mouth Joe Creek, 7.

Dicrostonyx torquatus nunatakensis Youngman

Dicrostonyx torquatus nunatakensis Youngman, 1967:31, holotype from Ogilvie Mountains, 20 mi. S Chapman Lake (64°35′/138°13′), 5,500 ft.
Dicrostonyx torquatus, Youngman 1964:4.

Distribution
Known only from the type locality and an adjacent peak in the Ogilvie Mountains of north-central Yukon Territory, but probably occurs in the Wernecke and Selwyn mountains (Map 35).

Measurements
External measurements of the holotype, followed by those of a young adult male are 129, 128; 12, 11; 16, 17. Cranial measurements of the same specimens are: condylobasilar length, 25.3, —; nasal length, 6.6, 7.8; nasal breadth, 3.2, 3.5; zygomatic breadth, 16.6, 17.9; lambdoidal breadth, 12.4, —; least interorbital breadth, 3.7, —; alveolar length of maxillary tooth-row, 6.5, 6.8.

Remarks
This subspecies differs markedly from *Dicrostonyx torquatus rubricatus* and *D. t. kilangmiutak* in being overall pale grey-brown dorsally rather than having the upper parts washed with dark red anteriorly, with a grey rump, and paler underparts. Specimens in immature pelage are greyer and less yellow than comparable specimens of *D. t rubricatus* and *D. t. kilangmiutak.*

Dicrostonyx torquatus nunatakensis occurs in rocky alpine tundra at the base of a glacial cirque, at 5,500 ft, and in adjacent valleys in the rugged southern Ogilvie Range of the Ogilvie Mountains, approximately 250 miles from the nearest records of *Dicrostonyx* from Fort Yukon, Alaska (G. M. Allen 1919) and the Richardson Mountains, N.W.T. A subfossil from Sixty Mile River, mouth of Miller Creek, Yukon Territory, is provisionally assigned to this subspecies.

Records of occurrence
Specimens examined, 11: Ogilvie Mountains, 52 mi. NE Dawson, 2; 20 mi. S Chapman Lake, 9.

Mus musculus – House mouse

***Mus musculus* ssp.**
Mus musculus Linnaeus, 1758:62; type locality Upsala, Sweden.
Mus musculus, Baker 1951:111.

Distribution
Known only from the vicinities of Whitehorse and Dawson.

Measurements
Average (and extreme) measurements of 5 females from Dawson are 180 (175–186); 90 (88–94); 17 (17–18); 16 (14–19). The weights of 3 nonparous females are 22.2, 20.4, 20.3 g. Average (and extreme) cranial measurements of 5 females from Dawson are: condylobasal length, 20.7 (20.0–21.4); zygomatic breadth, 11.2 (11.0–11.5); interorbital breadth, 3.7 (3.7–3.8); nasal length, 8.0 (7.7–8.6); incisive foramen, 5.1 (5.0–5.4); maxillary tooth-row, 3.6 (3.5–3.8).

Remarks
In the Yukon, this introduced mammal has been collected under a deserted building, at a city dump (Baker 1951:111), and in the food cupboards of a house.

Records of occurrence
Specimens examined, 20: Dawson, 17; McIntyre Creek, 3 mi. NW Whitehorse, 2 (KU); 2 mi. NNW Whitehorse, 1 (KU).

Family **Zapodidae** – Jumping mice
Zapus hudsonius – Meadow jumping mouse

***Zapus hudsonius hudsonius* (Zimmermann)**
Dipus hudsonius Zimmermann, 1780:358; type locality, Hudson Bay, Canada.
Zapus hudsonius, Coues 1875:253.
Zapus hudsonius hudsonius, Baker 1951:111; Krutzsch 1954:443 (part); Hall and Kelson 1959:773 (part); Youngman 1964:5, 1968:79.
Zapus hudsonius alascensis, Rand 1945*b*:69; Krutzsch 1954:436 (part); Hall and Kelson 1959:773 (part).

Distribution
Occurs in the southern half of the Yukon (Map 36).

Measurements
A male from North Toobally Lake measured 270; 125; 30. Five females from Dezadeash Lake averaged 223 (216–232); 136 (132–138); 30 (29–32). A male from Carmacks weighed 20.2 g. A nonparous female from Mayo weighed 21.0 g. For cranial measurements see Table 26.

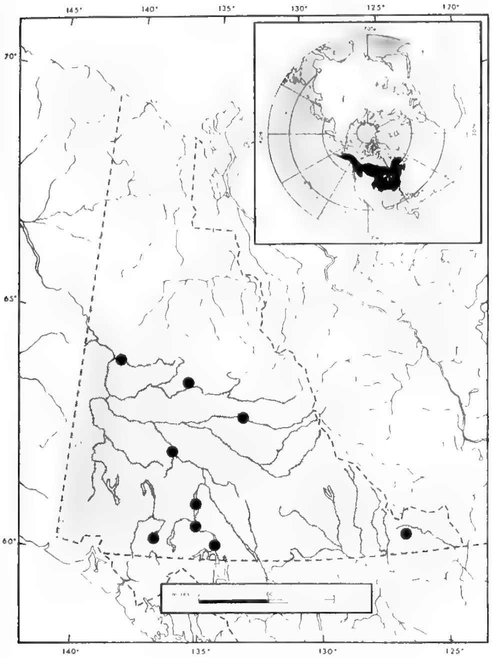
Remarks
No adequate series of specimens exist, for statistical analysis, from any single location in the Yukon.

Krutzsch (1954) considered two specimens from the southwest end of Dezadeash Lake to be intergrades between *Zapus hudsonius hudsonius* and *Z. h. alascensis,* and assigned them to the latter subspecies. He noted that they resemble *Z. h. hudsonius* in the shape of their auditory bullae, but indicated that otherwise they more closely resemble *Z. h. alascensis.* A comparison of these and four additional specimens from the same locality with topotypes of *Z. h. alascensis* and near topotypes of *Z. h. hudsonius,* shows that they most closely resemble *Z. h. hudsonius* cranially and in colour.

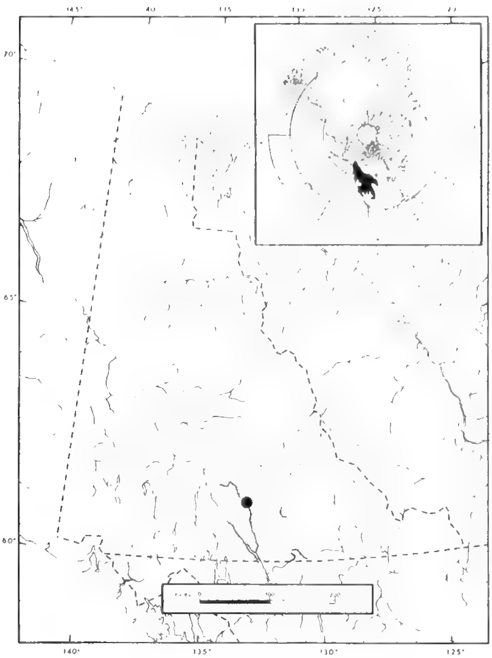
Records of occurrence
Specimens examined, 28: 14 mi. E Dawson 5; 4½ mi. N Mayo, 1; *1 mi. SE Mayo,* 1; forks Macmillan River, 1 (NMNH); 7 mi. NNW Carmacks, 1; *3½ mi. NW Carmacks,* 1; *Nordenskiold River, 1 mi. NW Carmacks,* 2; *Carmacks,* 1; Lake Laberge, 3 (NMNH); McIntyre Creek, 3 mi. NW Whitehorse, 3 (KU); SW end Dezadeash Lake, 3 (KU); *SW end Dezadeash Lake, Haines Road, Mi. 124,* 3; North Toobally Lake, 2; Tagish River, 13 mi. SW Jakes Corner, 1.

Table 26
Cranial measurements of two species of *Zapus*

Catalogue number, and sex of specimens	Occipito-nasal length	Condylobasal length	Zygomatic breadth	Interorbital breadth	Mastoidal breadth	Palatal breadth at M3	Palatal length	Length of incisive foramina	Length of maxillary tooth-row
				Zapus hudsonius hudsonius 14 mi. E Dawson					
30797 ♂	22.6	20.3	10.9	4.1	10.4	2.3	10.0	4.2	3.8
30793 ♀	22.5	20.3	11.0	3.9	10.0	2.9	10.0	4.2	3.7
30796 ♀	22.7	19.9	10.9	4.1	10.4	2.6	9.9	4.0	3.6
				1 mi. SE Mayo					
31726 ♀	23.2	20.9	11.6	4.2	10.9	2.5	9.9	4.5	3.5
				Carmacks region					
35128 ♂	23.1	20.3	10.7	4.3	10.3	2.7	9.8	4.3	3.8
35127 ♀	23.3	20.7	11.2	4.2	10.5	2.7	9.8	4.2	3.7
35129 ♀	22.2	20.5	11.2	3.8	10.3	2.5	9.5	4.0	3.3
				McIntyre Creek, 3 mi. NW Whitehorse					
21654 KU, ♂	21.5	19.3	10.6	4.2	10.1	2.5	9.5		3.6
21656 KU, ♂	21.0	19.4	10.5	4.3	9.9	2.5	9.4		3.6
				SW end Dezadeash Lake					
29080 KU, ♀	23.8	21.3	11.3	4.5	10.7	2.8	10.4	4.5	3.9
43129 KU, ♀	23.1	20.8	11.2	4.4	10.5	2.6	10.2	4.2	3.9
36140 ♀	22.6	19.8	11.4	4.4	10.6	2.4	9.9	4.5	4.2
36141 ♀	22.6	20.1	11.4	4.4	10.5	2.7	9.6	4.4	3.9
				North Toobally Lake					
29826 ♂	21.6	19.7	10.9	4.1	9.9	2.5	9.4	4.2	3.9
				Zapus princeps saltator Rose River, Canol Road, Mi. 95					
17844 ♂	23.5	22.0	11.2	4.4		2.5	10.4	5.4	4.3
17858 ♂			12.2	4.2		2.6	10.8	5.5	4.3



Map 36
Distribution of *Zapus hudsonius hudsonius*



Map 37
Distribution of *Zapus princeps saltator*

Zapus princeps – Western jumping mouse

***Zapus princeps saltator* J. A. Allen**
Zapus saltator J. A. Allen, 1899*b*:13; holotype from Telegraph Creek, B.C.
Zapus princeps saltator, Hall 1931:10; Rand 1945*a*:45, 1945*b*:70; R. M. Anderson 1947:170; Krutzsch 1954:418; Hall and Kelson 1959:776.

Distribution
Southern Yukon (Map 37).

Measurements
Two males from Rose River, Canol Road, Mi. 95, measured respectively 232, 237; 143, 146; 32, 33. For cranial measurements see Table 26.

Remarks
The only 2 specimens from the Yukon are those collected by Rand on the Canol Road.

Records of occurrence
Specimens examined, 2; Rose River Canol Road, Mi. 95, 2.

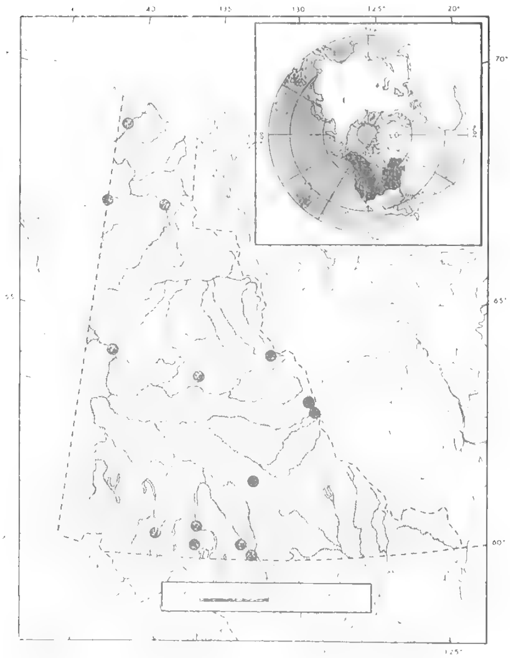
Family **Erethizontidae** – Porcupines
Erethizon dorsatum – Porcupine

Erethizon dorsatum myops Merriam

Erethizon epixanthus myops Merriam, 1900*a*:27; holotype from Portage Bay, Alaska Peninsula, Alaska.
Erethizon dorsatum myops, Anderson and Rand 1943:302; Rand 1945*a*:45, 1945*b*:70; R. M. Anderson 1947:173; Baker 1951:112.

Distribution
All of the Yukon (Map 38).

Measurements
Three males from the southeastern Yukon measured respectively 890, 860, 735; 260, 260, 190; 120, 126, 95. Average (and extreme) measurements of 5 females from the same region are 711 (705–745); 191 (170–222); 99 (88–107). A pregnant female (1 foetus) from Rampart House weighed 13 lb 8 oz. A male from Bonnet Plume Lake weighed 23 lb. For cranial measurements see Table 27.



Map 38
Distribution of *Erethizon dorsatum myops*

Remarks
This subspecies is generally paler, with more yellow hairs than *Erethizon dorsatum dorsatum,* from which it also differs in cranial characters (Anderson and Rand 1943). *Erethizon dorsatum myops* and *E. d. nigrescens* seem to form a western subspecies group that can be distinguished from the eastern subspecies primarily by the long nasal bones.

Rand (1945*a*:45) found some porcupines on the Canol Road in 1944 and reported evidence indicating that many porcupines had frozen to death during the cold winter of 1942–43. It is well known among residents of the southern Yukon that porcupines became scarce in the mid to late 1940s. Louis Pospisil, at Liard Crossing, reported that there had been many deaths and an emigration of porcupines in 1947. Porcupines were still scarce in 1965.

Records of occurrence
Specimens examined, 35: Joe River [= Joe Creek, 69°05′/140°26′], 2 (NMNH); Salmon Cache, 75 mi. up Porcupine River from Old Crow, 1; Rampart House, 1; Bonnet Plume Lake, 3; Chandindu River, 1 (NMNH); head Parent Creek, Duncan district, 1; Keele Lake, 1; Macmillan Pass, Canol Road, Mi. 282, 1; Lapie Lake, Canol Road, Mi.105, 1; *Rose River, Canol Road, Mi. 95,* 6; Whitehorse, 2; Hootalinqua River [= Teslin River], near Teslin Lake, 1; *Surprise Lake,* 1; *2 mi. W Teslin River, 16 mi. S and 56 mi. E Whitehorse,* 1 (KU); Dezadeash Lake, 1; 16 mi. SW Robinson, 1 (NMNH); Teslin Lake, 5; *near Teslin Lake,* 2; *Nisutlin River, near Teslin Lake,* 1; *Fat Creek, Teslin Lake,* 1; *Teslin Bay, Teslin Lake,* 1.

Additional records
Firth River [near Herschel Island] (Anderson *in* Stefannson 1913:514); Richardson Mountains, 16 mi. NE Lapierre House, 27 July 1964 (old work seen, P. M. Youngman, MS); 5 mi. SE Dalton Post, 17 May 1963 (old barking seen, P. M. Youngman, MS).

Table 27
Cranial measurements of *Erethizon dorsatum myops*

Catalogue number and sex of specimens	Basal length	Zygomatic breadth	Length of nasals	Least inter-orbital breadth	Width of rostrum	Alveolar length of maxillary tooth-row
		Bonnet Plume Lake				
35864 ♂	98.2	72.2	41.5	27.4	21.1	27.8
		Keele Lake				
35867 ♀	94.0	71.2	40.1	27.8	21.1	26.6
		Southern Yukon (Canol Road; Teslin Lake)				
17793 ♂		74.3	40.7	33.4	25.9	25.9
17794 ♂	108.0	73.5	43.0	28.9	25.7	27.9
17842 ♂	96.0	73.7	36.8	28.9	21.7	25.3
1979 ♂	96.5		42.3		23.0	28.2
1967 ♂	98.2	71.5	37.9		23.0	23.8
17800 ♀	97.2	71.4	36.1	31.3	24.2	28.1
17801 ♀	95.6	64.3	38.2	30.6	24.6	24.1
18121 ♀	94.0	67.7	36.2	27.9	22.1	26.1
17663 ♀	94.0	69.0	38.4	31.5	25.3	26.9

Order CETACEA – Whales

Key to Yukon Cetaceans

1 Cleft of mouth not curved. Teeth always present in the lower jaw and often in upper; no baleen; rami of lower jaw united by bony denticulations on symphyseal surfaces; blowhole single 2

1′ Cleft of mouth curved. Teeth absent after birth; upper jaws furnished with plates of baleen; rami of lower jaw united by only fibrous tissues and not by bony denticulations; blowhole double 5

2 Dorsal fin absent. Teeth usually fewer than 10 3

2′ Dorsal fin present. Teeth usually more than 10 4

3 Colour everywhere white; back with a hump. Males and females without spirally twisted tusk . . . . *Delphinapterus leucas*, p. 122

3′ Colour above dark grey, below white, sides and back mottled with grey; back without a hump. Males with spirally twisted tusk (occasionally 2) projected anteriorly; females usually not showing tusks externally. (Not recorded from the coastal Yukon.) . . . . *Monodon monoceros*, p. 175

4 Dorsal fin more than 250 mm in height; total length of males more than 8 (20–30) ft; black of sides contrasting with white of belly, white extending up on sides posteriorly; no dark line from corner of mouth to pectoral flipper. Teeth 10 to 13. (Not definitely recorded from coastal Yukon.) . . *Orcinus orca*, p. 175

4′ Dorsal fin less than 250 mm in height; total length of adults less than 8 (4–6) ft; black of back not contrasted with white of belly; dark line from corner of mouth to flipper. Teeth 16 to 26. (Not recorded from coastal Yukon.) . . . . *Phocoena phocoena*, p. 175

5 Head less than 1/3 length of animal; 2 to 4 longitudinal folds on throat; pectoral fin enclosing 4 fingers; annual mottled grey (sometimes blackish). Baleen coarsely fringed, 14 to 18 in. long; cervical vertebrae free. Spouts quick and low. (Not recorded from coastal Yukon.) . . . . *Eschrichtius gibbosus*, p. 175

5′ Head more than 1/3 length of animal; no longitudinal folds on throat; pectoral fin enclosing 5 fingers; annual uniformly black or greyish brown. Baleen finely fringed, about 30 in. long; cervical vertebrae united. Spouts long and high . . . . *Balaena mysticetus*, p. 123

Family **Monodontidae** – Monodontids
Delphinapterus leucas – White whale

***Delphinapterus leucas* (Pallas)**
Delphinus leucas Pallas, 1771:85; type locality, mouth of Obi [Obl] River, northeastern Siberia, U.S.S.R.
D[elphinapterus]. leucas, Cuvier 1812:13.
Delphinapterus leucas, R. M. Anderson 1937:101; Rand 1945*b*:89.

Distribution
Coastal waters.

Measurements
No measurements, external or cranial, are available from the Yukon.

Remarks
R. M. Anderson (1937:101) refers to Whitefish Station, between Tent Island and Escape Reef as a well-known hunting area for white whales, with as many as 200 taken in a good summer.

Shingle Point is the only area on the Yukon coast where any whaling is done today.

Records of occurrence
Specimens examined, 1: Herschel Island, Pauline Cove, 1.

Additional records
30 mi. W Herschel Island, 15 August 1909 (seen, R. M. Anderson, MS); Herschel Island (Porsild 1929:30); Niakonak [near Shingle Point] (Stefannson 1913:35); Whitefish Station, between Tent Island and Escape Reef (R. M. Anderson 1937:101).

Family **Balaenidae** – Right whales
Balaena mysticetus – Bowhead whale

***Balaena mysticetus* Linnaeus**
[*Balaena*] *mysticetus* Linnaeus, 1758:75; type locality, Greenland seas.

Distribution
Waters of the Beaufort Sea.

Measurements
No measurements are known from specimens from the Yukon.

Remarks
Formerly, Eskimos, in skin-covered umiaks, used hand lances to hunt the bowhead whale along the Yukon coast. Every part of the animal was utilized. The flesh was eaten by the men and dogs. The skin, or muktuk, was a delicacy; the blubber was eaten and used for fuel; the bones were used for sledge runners, house frames, net sinkers, and other implements.

In 1888, the first commercial American whaler to travel east of Point Barrow arrived at Herschel Island, Yukon Territory. Other ships followed in later years, and during the peak years of 1893–1895 fifteen whalers, with about 800 men, wintered at Herschel Island.

During the early years of western arctic whaling, both the oil and whalebone were utilized, but during later years the whales were hunted chiefly for the whalebone or baleen, which might bring $10,000 per whale. After 1907 the whaling industry declined. By 1912 the last major whalers left the waters (largely after R. M. Anderson 1937).

In addition to increased trade, whaling brought many changes to the Yukon Eskimos, including venereal disease and other epidemics. Now, except for an occasional fishing camp, the old whaling centres are deserted. For further information on this interesting subject the reader is referred to Hinton and Godsell (1954:113–31), and to R. M. Anderson (1937:100).

Records of occurrence
Specimens examined, 1: Herschel Island, Pauline Cove, 1.

Additional records
Herschel Island (Preble 1908:127, Porsild 1945:21); near King Point, 27 August 1909 (sightings, R. M. Anderson, MS); off Sabine Point, 31 August 1912 (specimens, R. M. Anderson, MS); between Shingle Point and King Point, 10 September 1914 (seen, R. M. Anderson, MS).

Order CARNIVORA – Carnivores

Key to Yukon Carnivores

1	Digitigrade; longitudinal septa in tympanic bullae	2
1′	Plantigrade or subplantigrade; no longitudinal septa in tympanic bullae	7
2	Four digits on forefoot; entepicondylar foramen of humerus lacking; 3 lower molars	3
2′	Five digits on forefoot; entepicondylar foramen of humerus present; 1 or 2 lower molars	6
3	Postorbital processes thickened and convex dorsally; upper incisors prominently lobed; condylobasal length usually more than 170 mm	4
3′	Postorbital processes thin and concave dorsally; upper incisors usually not prominently lobed; condylobasal length usually less than 161 mm	5
4	Nose pad 1 in. or less in diameter; heel pad less than 1¼ in. in diameter; relatively large brain case, slender rostrum, and small narrow teeth; maximum width of brain case in region of parieto-temporal suture; frontal shield not tilted up; distance from outer border of M1 to base of paracone less than distance from this point to inner margin of tooth . . . . *Canis latrans*, p.	125
4′	Nose pad more than 1 in. in diameter; heel pad more than 1¼ in. in diameter; relatively small brain case; massive rostrum, and large teeth; maximum width of brain case usually at the roots of the zygoma; frontal shield tilted up; distance from outer border of M1 to base of paracone greater than distance from this point to inner margin of tooth . . . . *Canis lupus*, p.	128
5	Ears short and rounded; rostrum measured at a point opposite cone of P2 more than 18 per cent of condylobasal length; teeth of rami relatively closely spaced . . . . *Vulpes lagopus*, p.	129
5′	Ears long and pointed; rostrum measured at a point opposite cone of P2 less than 18 per cent of condylobasal length; teeth of rami relatively widely spaced . . . . *Vulpes vulpes*, p.	132
6	Tail more than ½ length of body; premolars 3/2 . . . . *Felis concolor*, p.	153
6′	Tail less than ½ length of body; premolars 2/2 . . . . *Felis canadensis*, p.	154
7	Alisphenoid canal present; 3 lower molars; entepicondylar foramen in humerus absent; length of head and body more than 41 in. in adults; length of tail vertebrae less than 14 per cent of total length	8
7′	Alisphenoid canal absent; 2 lower premolars; entepicondylar foramen in humerus present; length of head and body less than 41 in. in adults; length of tail vertebrae more than 14 per cent of total length	10
8	Always entirely white; combined length of M1 and M2 less than palatal width . . . . *Ursus maritimus*, p.	139
8′	Never entirely white; combined length of M1 and M2 never less than palatal width	9
9	Front claws approximately same length as hind claws; m1 with broad open cuspless valley medially between metaconid and entoconid; p4 without medial accessory cusps or anteroposterior sulcus on posterior part; M2 broadest at a point approximately halfway between anterior and posterior margins . . . . *Ursus americanus*, p.	133
9′	Front claws longer than hind claws; m1 with one or more cusplets medially in valley between metaconid and entoconid; p4 with median accessory cusps and a median anteroposterior sulcus on posterior part; M2 broadest at anterior end . . . . *Ursus arctos*, p.	136

10 Premolars 4/4		11
10′ Premolars fewer than 4/4		12
11 Tail more than 290 mm; outside length of P4 more than 9.5 mm; length of m1 more than 11 mm	*Martes pennanti,* p.	142
11′ Tail less than 290 mm; outside length of P4 less than 9.5 mm; length of m1 less than 11 mm	*Martes americana,* p.	140
12 Fleshy part of tail so thickened at base that tail merges gradually with body; toes of 4 feet webbed at least as far as terminal phalanx of each toe; infraorbital canal large and visible in ventral view; P2 almost as wide as long, M1 rectangular, both adapted for crushing	*Lontra canadensis,* p.	152
12′ Fleshy part of tail not so thickened at base as to cause tail to merge gradually with body; toes of 4 feet not webbed so far distally as terminal phalanx of each toe; infraorbital canal small and not visible in ventral view; P2 much longer than wide, M1 short and wide, both adapted more for shearing		13
13 Premolars 4/3	*Gulo gulo,* p.	150
13′ Premolars 3/3		14
14 Length of upper tooth-row less than 17 mm		15
14′ Length of upper tooth-row more than 20 mm	*Mustela vison,* p.	147
15 Tail without black tip, barely extends beyond outstretched hind feet	*Mustela nivalis,* p.	146
15′ Tail with black tip, extends considerably beyond outstretched hind feet	*Mustela erminea,* p.	142

Family **Canidae** – Canids
Canis latrans – Coyote

***Canis latrans latrans* Say**
Canis latrans latrans Say, *in* James 1823:168; type locality, Engineer Cantonment (=approximately 2 mi. E Fort Calhoun), Washington County, Nebr.
Canis latrans incolatus, Hall 1934:369; Rand 1945*a*:33, 1945*b*:35; Baker 1951:112; Jackson 1951:266; Cameron 1952:179; Hall and Kelson 1959:844.

Distribution
Probably occurs throughout the Yukon (Map 39).

Measurements
No external measurements are available for specimens from the Yukon. For cranial measurements see Table 28.

Remarks
The characteristics purported to separate *Canis latrans incolatus* from *C. l. latrans* and *C. l. lestes* have primarily to do with the dorsal outline of the frontal region being more "dished", the relatively short rostrum, and relatively little black on the forelegs. All of these characters are highly variable and subjective. From an examination of several hundred specimens from western Canada, I conclude that a panmictic population exists.

Rand (1945*a*:33, 1945*b*:36) cited evidence showing there were no coyotes in the Yukon prior to 1912; Armstrong (1937:209) alleged that there were no coyotes in the Yukon a few years prior to 1925. Cairnes (1909:31), however, reported the presence of coyotes in the southern Yukon in 1908, and Clarke (1944) said, "So far as could be ascertained the coyote is an ancient inhabitant of the parkland of southwestern Yukon." In the northern Yukon, where coyotes have occurred sporadically, there is a word for coyote in the Vanta Kutchin vocabulary (*zotsil,* little wolf), and some of the older Indians in Old Crow recall hearing stories about coyotes from their parents.

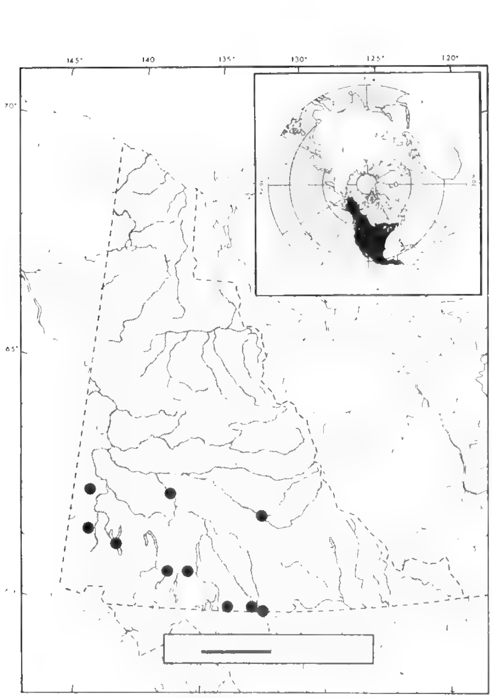
To my knowledge there are no valid

Pleistocene records of *Canis latrans* from Alaska or the Yukon. This may indicate that this species is a postglacial migrant to this region.

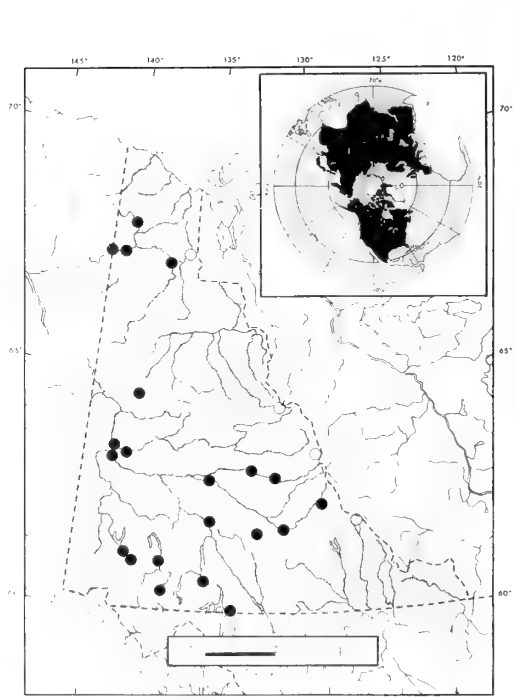
Records of occurrence
Specimens examined, 24: Snag, 1; Yukon Crossing, 1; lower Ross River, Canol Road, 1; near Tepee Lake, 1; Kluane Lake, 2; 25 mi. NW Whitehorse, 1 (KU); Alsek River, Champagne Landing [= Champagne], 1 (AMNH); Teslin Lake, 1 (MVZ); *Grouse Creek [between Atlin and Teslin]*, 1 (MVZ); Atlin Lake, 38 mi. SE Tagish, 1; Yukon–British Columbia boundary at 132°, Teslin Lake, 1 (MVZ).

Localities not plotted
Yukon River, 4 (3 ROM, 1 MVZ); White River, 8 (7 ROM, 1 MVZ).

Additional records
Old Crow (seen by C. P. Charlie, P.M. Youngman, MS, 2 July 1964); Sixty Mile Creek [= Sixty Mile River] (Rand 1945*b*: 36); near Russell Creek (Armstrong 1937: 209); White River, near Yukon–Alaska boundary (Cameron 1952:179); North Toobally Lake (Youngman 1968:79).



Map 39
Distribution of *Canis latrans latrans*



Map 40
Distribution of *Canis lupus*

Table 28
Cranial measurements of *Canis lupus* and *Canis latrans*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Palatal length	Postpalatal length	Zygomatic breadth	Palatal breadth outside first upper molars	Palatal breadth inside second upper premolars	Breadth between postglenoid formina	Interorbital breadth	Least breadth of braincase	Aveolar length of upper carnassial	Crown length of upper first molar
Canis latrans Southwestern Yukon (Kluane Lake; Tepee Lake; Atlin Lake)											
31071 ♂	199	100.5	84.2	113.0	63.9	24.0	50.5	38.2	34.9	22.3	13.1
31072 ♂	191	95.0	81.8	98.4	59.7	21.3	48.6	32.5	35.0	20.5	15.0
17340	194	98.1	81.4	103.8	58.7	22.4	48.1	35.3	36.4	19.2	14.2
31728 ♂	182	94.1	75.5	99.3	56.9	20.7	46.5	32.8	35.3	20.2	13.1
Canis lupus Northern Yukon (mouth Bell River)											
36162 ♂	244	120.6	104.7	144.4	81.7	34.4	64.0	49.8	43.8	23.6	16.5
Central Yukon (Stewart River region)											
31759 ♂	251	125.6	105.8	144.1	78.5	34.5	64.9	52.9	46.1	26.8	17.2
30925 ♂	239	122.2	98.9	139.5	78.0	35.0	65.1	46.8	43.8	23.8	16.3
33453 ♂	258	130.0	107.8	148.0	85.1	40.7	63.2	56.2	49.9	26.3	18.7
14106 ♂	263	130.3	111.9	157.0	83.5	37.0	71.7	55.9	48.7	26.4	19.5
Average 6 ♀	237	118.7	99.6	140.8	79.7	33.2	63.5	44.7	42.3	23.9	17.2
Max.	241	121.8	103.5	152.2	82.1	37.8	66.1	48.2	45.5	24.3	18.0
Min.	230	115.8	95.3	135.0	76.7	30.2	60.8	40.5	39.6	23.5	16.4
SD	4.17	2.42	2.97	6.25	1.89	2.78	1.87	2.91	2.48	0.31	0.65
SE	1.70	0.99	1.21	2.55	0.77	1.13	0.76	1.19	1.01	0.13	0.27

Canis lupus – Wolf

Canis lupus ssp.
Canis lupus Linnaeus, 1758:39; holotype from Sweden; Youngman 1968:79.
Canis lupus pambisileus, R. M. Anderson 1943*a*:391 (part); Goldman 1944:422 (part); R. M. Anderson 1947:57 (part); Hall and Kelson 1959:851 (part).
Canis lupus occidentalis, Goldman 1944:427 (part); Hall and Kelson 1959:851 (part).
Canis lupus columbianus, Rand 1945*a*:34 (part); Hall and Kelson 1959:847 (part).

Distribution
Occurs throughout the Yukon (Map 40).

Measurements
A female from 11 mi. S Chapman Lake measured 1,610; 463; 275. For cranial measurements see Table 28.

Remarks
Jolicoeur (1959) studied geographical variation in wolves in northwestern Canada, and concluded that variation in Nearctic wolves suggests an incompletely panmictic population rather than subspecies. Rossolimo and Dolgov (1965) came to much the same conclusion for wolves in the U.S.S.R. Since a more comprehensive study of geographical variation is needed for all of North America, it makes little sense to attempt to apply the many available names.

Most of the wolves I have seen in the Yukon were grey-black or near black, even in the north.

Many persons in the Yukon hunt wolves with some fervour, either as a method of predator control or to obtain the handsome large hides for trophies. Since there is a $25.00 bounty on wolves in the Yukon, many animals are shot from cars or actively sought after by professional trappers. For some time, the Yukon Game Commission has conducted a wintertime control campaign against wolves, largely in the name of conserving the dwindling caribou herds, by dropping strychnine baits from airplanes onto the frozen surfaces of lakes. As a result, many non-target species are killed, including Bald Eagles, Ravens, foxes, lynx, ermine, coyotes, marten, and wolverine. It is questionable whether these measures save as many caribou as are illegally killed by hunters.

Most residents of the Yukon do not fear confrontation with wolves except in the winter, when prey may be scarce.

Records of occurrence
Specimens examined, 57: 40 mi. SE Crow Base [Crow Base = 68°13′/141°00′], 3 (NMNH); 6 mi. N Rampart House, 1 (NMNH); mouth Bluefish River, 11 mi. WSW Old Crow, 1; mouth Bell River, 1; 11 mi. S Chapman Lake, 1; Yukon River, mouth Rosebute Creek, 4 mi. S mouth Sixty Mile River, 1; *Henderson Creek*, 4; *Stewart River settlement region*, 3; *mouth Stewart River,* 2; mouth White River, 2; *8 mi. S mouth White River*, 1; Stewart River, mouth Barker Creek, 2; north fork Macmillan River, 2 (NMNH); Riddell River, Pelly–Macmillan country, 1 (NMNH); Pelly River, mouth Tummel River, 1 (NMNH); Pelly Lakes, 6 (NMNH); vicinity Big Salmon, 4; Hoole Canyon, 1 (NMNH); *Hoole River,* 1 (NMNH); Lapie River, Canol Road, Mi. 105, 1; Kluane Lake, 1 (MCZ); *Kluane,* 2 (MCZ); 17 mi. N Canon [= 17 mi. N Canyon], E side Aishihik River, 1 (KU); *Marshall Creek, 3 mi. N Dezadeash River,* 1 (KU) Hungry Lake, near Kluane, 1 (MCZ); near Whitehorse, 1; SW end Dezadeash Lake, 1 (KU); W side Atlin Lake, 2.

Localities not plotted
White River, 8 (6 ROM, 2 MVZ).

Additional records
Bell River, 10 mi. NE Lapierre House, 27 July 1964 (sign seen, P.M. Youngman, MS); *Richardson Mountains, 13 mi. NE Lapierre House,* 27 July 1964 (scats seen, I. Stirling, MS); Bonnet Plume Lake, 12 July 1966 (sign seen, W. H. Butler, MS); Keele Lake, 14 August 1966 (sighting reported, W. H. Butler, MS); 138 mi. N Watson Lake, 5 mi. E Little Hyland River (sighting reported, P. M. Youngman, MS, 14 June 1963).

Vulpes lagopus – Arctic fox

***Vulpes lagopus lagopus* (Linnaeus)**
Canis lagopus Linnaeus, 1758:40; type locality, Lapland.
Vulpes lagopus, Bogdanov 1873:247.
Alopex lagopus innuitus, R. M. Anderson 1947:51.

Distribution.
Mainly coastal. Travels occasionally as far south as the Porcupine River (Map 41).

Measurements
No specimens with external measurements are available from the Yukon. For cranial measurements see Table 29.

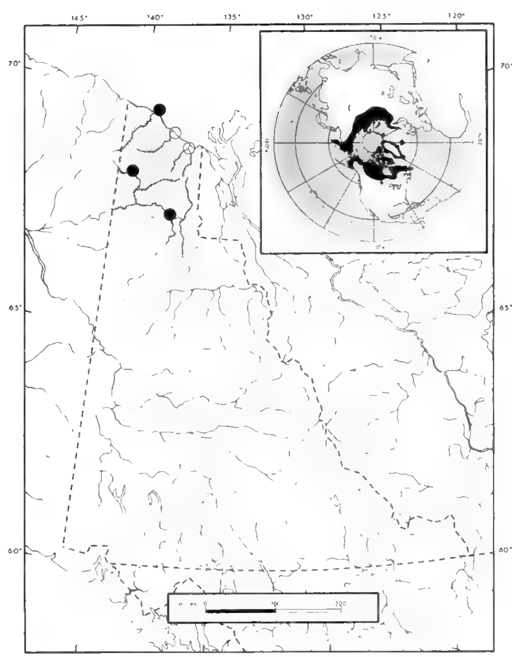
Remarks
The taxonomy of arctic foxes is in obvious need of revision. Five nominal subspecies have been recognized for the Nearctic. Tsalkin (1944) recognized only the nominate subspecies of arctic fox in the continental Palearctic. My examination of several hundred skulls of North American and Eurasian specimens leads me to conclude that the continental Holarctic region is occupied by a panmictic population. The several insular subspecies are not considered here.

The characters used by Merriam (1902: 170), to distinguish *V. l. innuitus* from *V. l. lagopus*—"braincase broader and more pyriform, and tapering much more abruptly behind broadest part; nasals much broader" —are variable in both Nearctic and Palearctic specimens, and direct comparison does not substantiate *V. l. innuitus* as a valid subspecies.

The arctic fox has been placed in the genus *Alopex* by most North American mammalogists, but Bobrinskii, Kuznetsov, and Kuziakin (1965:127) considered *Alopex* a subgenus of *Vulpes*. Hildebrand (1954: 452) emphasized the similarities between *Alopex* and *Vulpes* and implied that they were identical, saying, "These foxes are so strikingly different in distribution, habits, and external appearance that it is convenient to assign them to different genera, but their skulls are similar, and the postcranial skeleton of *Alopex* is more like that of *Vulpes fulva* than is the skeleton of *Vulpes macrotis;* the arctic fox skeleton also resembles that of the red fox more closely than the skeletons of the two species of gray fox resemble each other."

Records of occurrence
Specimens examined, 7: Herschel Island, Pauline Cove, 3; Old Crow River, at Timber Creek, 1 (NMNH); *Old Crow Flats,* 1; Porcupine River, mouth Berry Creek, 2.

Additional records
Warren Point [= King Point] (Russell 1898: 244); 4 mi. WSW mouth Blow River, 5 August 1964 (scats seen, G. D. Tessier, MS).



Map 41
Distribution of *Vulpes lagopus lagopus*

Table 29
Cranial measurements of *Vulpes vulpes* and *Vulpes lagopus*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Palatal length	Postpalatal length	Zygomatic breadth	Palatal breadth outside first upper molars	Palatal breadth inside PM2	Breadth between postglenoid foramina	Interorbital breadth	Least breadth of braincase	Aveolar length of upper carnassial	Crown length of M1
Vulpes vulpes alascensis Old Crow region											
Average 7 ♂	150.2[6]	75.2	64.5[6]	81.5	43.5	17.1	41.4	30.1	22.8	14.1	10.2
Max.	153.0	77.2	67.5	86.6	44.8	18.0	43.1	31.9	24.6	15.0	10.7
Min.	148.0	72.3	61.2	78.5	42.8	15.7	39.8	28.0	20.9	13.4	9.8
SD	2.23	1.79	2.61	2.94	0.79	0.91	1.25	1.26	1.37	0.48	0.27
SE	0.91	0.68	1.07	1.11	0.30	0.34	0.47	0.48	0.52	0.18	0.10
Average 7 ♀	138.8	69.2	60.0	76.5[5]	41.8	16.2	40.0	27.7	23.5	13.1	9.8
Max.	142.6	70.8	62.8	81.1	45.2	17.8	41.7	29.5	26.4	14.2	10.8
Min.	136.0	66.0	57.7	72.6	38.8	14.8	38.5	25.8	21.4	12.1	9.2
SD	2.20	1.64	1.96	4.07	2.08	0.97	0.99	1.30	2.15	0.80	0.62
SE	0.83	0.62	0.74	1.82	0.79	0.37	0.37	0.49	0.81	0.30	0.23
Stewart River region											
Average 22 ♂	151.6	76.0	65.8[21]	80.5[21]	43.2	16.5	41.3	29.6	23.4[21]	14.0	10.1
Max.	160.8	80.9	70.4	85.7	47.3	18.5	44.4	34.0	26.1	15.5	11.1
Min.	146.0	73.0	62.8	77.2	41.6	14.6	39.6	26.1	21.5	12.5	9.3
SD	3.58	2.07	1.94	2.28	1.51	1.15	1.18	1.67	1.51	0.72	0.45
SE	0.76	0.44	0.42	0.50	0.32	0.25	0.25	0.36	0.33	0.15	0.10
Average 8 ♀	142.3	70.6	63.0[7]	76.5	41.9	16.3	40.1[7]	28.7	23.7[7]	13.5	9.7
Max.	147.2	73.0	64.5	80.6	44.2	17.5	41.6	29.8	25.5	14.3	10.4
Min.	139.1	69.3	62.0	73.6	40.4	15.1	39.1	27.2	22.7	12.6	9.3
SD	2.62	1.60	1.33	2.39	1.34	0.75	0.81	0.98	0.99	0.64	0.40
SE	0.93	0.57	0.50	0.85	0.47	0.27	0.31	0.35	0.37	0.22	0.14

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Palatal length	Postpalatal length	Zygomatic breadth	Palatal breadth outside first upper molars	Palatal breadth inside PM2	Breadth between postglenoid formina	Interorbital breadth	Least breadth of braincase	Alveolar length of upper carnassial	Crown length of M1
Vulpes lagopus lagopus Old Crow Flats											
31196 ♀	120.1	57.8	53.5	66.6	37.4	15.6	34.0	25.3	21.3	11.2	8.4
Porcupine River; mouth Berry Creek											
34106	125.9	60.2	56.0	73.4	39.5	16.1	34.2	26.5	23.8	11.4	7.8
34107	117.8	57.8	51.7	67.3	36.5	16.7	34.0	27.9	23.9	9.4	7.3

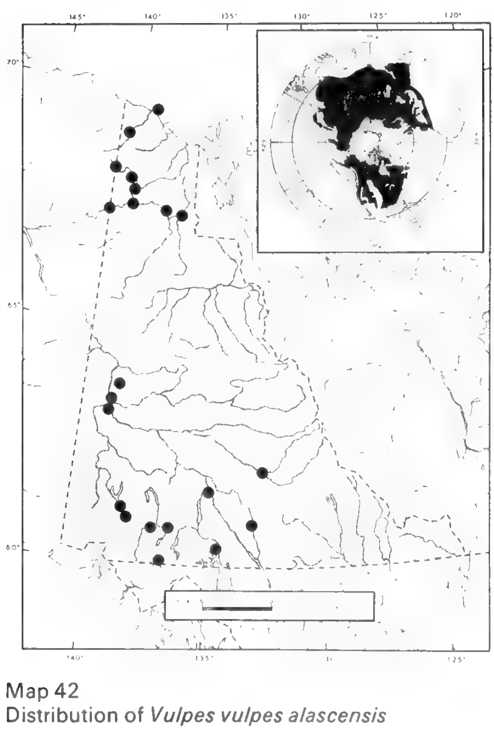
Vulpes vulpes – Red fox

Vulpes vulpes alascensis Merriam
Vulpes alascensis Merriam, 1900*b*:668, holotype from Andreafski, about 70 mi. above delta of Yukon River, Alaska.
Vulpes vulpes alascensis, Rausch 1953:107.
Vulpes fulva alascensis, Rand 1945*a*:33; Hall and Kelson 1959:856 (part).
Vulpes fulva abietorum, Baker 1951:113; Hall and Kelson 1959:855 (part).

Distribution
Occurs throughout the Yukon (Map 42)

Measurements
No external measurements are available from the Yukon. For cranial measurements see Table 29.

Remarks
The differences between *Vulpes vulpes abietorum* and *Vulpes vulpes alascensis* emphasized by Merriam in the original description were that the former possessed a longer skull, a longer and narrower rostrum, slightly larger bullae and carnassials, and a more slender M1.



Map 42
Distribution of *Vulpes vulpes alascensis*

Since a comparison of the skulls of 14 topotypes of *V. v. abietorum* with 18 topotypes and near topotypes of *V. v. alascensis* fails to reveal these or any other significant differences, I consider *V. v. abietorum* to be a synonym of *V. v. alascensis.*

Churcher (1959:516) compared red foxes from Alaska and Eurasia and found differences in size of the skulls, the basioccipital, the bullae, the postorbital constriction and the dentition. Therefore, I infer that subspecies differences exist in red foxes on either side of the Bering Strait. No recent taxonomic study of the red fox has been made in North America, but Churcher (1959) has shown that Alaskan red foxes differ from eastern North American foxes in that "they are larger, have heavier rostra, some inflation of the frontal region above the orbit, a more developed frontal saggittal sulcus, a more prominent infraorbital foramen, larger teeth, and larger and more inflated bullae."

Records of occurrence
Specimens examined, 103: Herschel Island, Pauline Cove, 2; Firth River, 15 mi. S mouth Joe Creek, 1; Crow Base, 68°13′/141°00′, 3 (NMNH); Old Crow River, at Timber Creek, 1 (NMNH); *40 mi. SE Crow Base,* 1 (NMNH); *Old Crow Flats,* 1; 60 mi. SE Crow Base, 11 (NMNH); *Johnson Creek, 5 mi. from mouth, 19 mi. NNE Old Crow,* 1; Old Crow, 2; *5 mi. S Old Crow,* 1; Salmon Cache, 75 mi. up Porcupine River from Old Crow, 4; Rampart House, 3 (2 NMNH); Lapierre House, 4 (NMNH); Ruby Creek, 63°46′/139°16′, 3 (MCZ); 14 mi. N mouth Stewart River, 1; *6 mi. N mouth Stewart River,* 1; *5 mi. N mouth Stewart River,* 1; *4 mi. up Henderson Creek,* 1; *Henderson Creek,* 6; *Stewart River settlement region,* 7; *vicinity Stewart River,* 5; *mouth Stewart River,* 1; *Stewart River settlement,* 4; *5 mi. W mouth Stewart River,* 1; *4 mi. W mouth Stewart River,* 1; *2 mi. W mouth Stewart*

River, 1; *10 mi. W on White River*, 1; *8 mi. S mouth Stewart River*, 2; 1 mi. W mouth White River, 1; *mouth White River*, 4; *8 mi. S mouth White River*, 1; Pelly River, Canol Road, 1; *Ross Post, Canol Road, Mi. 141*, 2; Hootalinqua, 1 (NMNH); Rose River, Canol Road, Mi. 95, 2; Kluane Lake, 5 (4 MCZ); *S end Kluane Lake, Alaska Highway, Mi. 1054*, 1; *6 mi. SW Kluane*, 1 (KU); Slims River, 1 (MCZ); *Hungry Lake [near Kluane]*, 1 (MCZ); Marshall Creek, 3 mi. N Dezadeash River, 6 (KU); Champagne, N side Dezadeash River, 3 (KU); 5 mi. W Tagish, 1; 1½ mi. E Tatshenshini River, 1½ mi. S and 3 mi. E Dalton Post, 1 (KU).

Additional records
Kay Point, 18 August 1914 (seen by Chipman, R. M. Anderson, MS); 10 mi. N Watson Lake, 1 July 1963 (seen, G. D. Tessier, MS); Alaska Highway, Mi. 685, 9 June 1963 (seen, P. M. Youngman, MS); Carcross, 1 and 3 September 1966 (sign and tracks seen, W. H. Butler, MS).

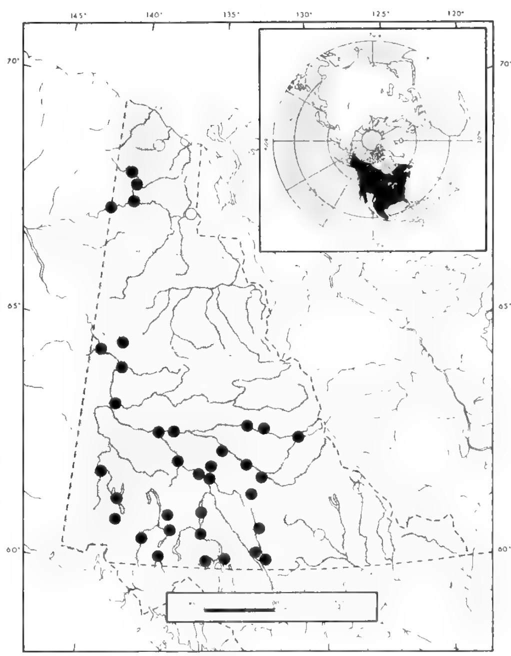
Family **Ursidae** – Bears
Ursus americanus – Black bear

Ursus americanus americanus **Pallas**
Ursus americanus Pallas, 1780:5; type locality, eastern North America; Osgood 1900:41, 1909*b*:81; Rand 1945*b*:16.
Euarctos randi Anderson, 1945:19; R. M. Anderson 1947:38 (part).
Euarctos americanus randi, Miller and Kellogg 1955:693 (part).
Ursus americanus randi, Hall and Kelson 1959:869 (part).
Euarctos hunteri Anderson, 1945:22 (part); R. M. Anderson 1947:38; Miller and Kellogg 1955:695 (part).
Ursus americanus hunteri, Hall and Kelson 1959:868 (part).
Ursus americanus emmonsi, R. M. Anderson 1945:29 (part); Hall and Kelson 1959:868 (part).

Distribution
Occurs throughout the Yukon (Map 43).

Measurements
R. M. Anderson (1945:24) gives the measurements of a male from Nisutlin River, Canol Road, 24 mi. from Johnsons Crossing as 1,390; 80; 235. For cranial measurements see Table 30.

Remarks
Euarctos randi was described as being the smallest Canadian black bear with especially small molariform teeth, whereas *Euarctos hunteri* was described as being one of the largest American black bears, with large molariform teeth. When 27 skulls of *Ursus americanus* from the Yukon and Nahanni region of the District of Mackenzie are arranged according to age by Rausch's method (1961:86), the holotype of *E. randi* falls within Rausch's class VII (seventh or eighth summer), the holotype of *E. hunteri* falls within class IX (twelfth to twentieth summer), and four specimens assigned to *hunteri* by Anderson fall within either class IX or X (twentieth to thirtieth summer). The cranial measurements also reflect these age



Map 43
Distribution of *Ursus americanus americanus*

Table 30
Cranial measurements of *Ursus americanus americanus*

Catalogue number and sex	Rausch's age class	Condylobasal length	Zygomatic breadth
	Old Crow River		
34109 ♀	VIII	241	152
	Klondike Region		
15004	IX	247	
	Stewart River settlement		
31765	VII	258	
	Base Mount Selous, 1 mi. N of South Macmillan River		
30874 ♂	VII		148
30875 ♂	V		139
30877 ♂	VI	252	142
	Mount Sheldon, Canol Road, Mi. 222		
17958 ♂	VII	258	149
17959 ♂	VIII	252	157
17970 ♂	VII	262	154
	Pelly River, Canol Road, Mi. 139		
17790	IX	247	152
	Upper end Hootalinqua		
1842 ♂	VII	256	148
	Haines Road, 12 mi. N Dalton Post		
19598 ♂	IX	260	166
	Nisutlin River, Canol Road, 24 mi. from Johnsons Crossing		
17953 ♂	IX	271	178
	Northeast side Teslin Lake		
1826 ♂	VI	252	154
1834 ♀	VIII	235	147
1836 ♂	VIII	260	160
1841 ♀	IX	249	152
1844 ♂	X	281	185
	Mountains off Bennett Lake, 10 mi. from B.C.		
1905	X		173

classes (Table 30). Thus the name *E. randi* was applied to young animals, while the name *E. hunteri* was applied to considerably older animals.

The single specimen from mountains back of Bennett Lake, 10 mi. N British Columbia boundary (NMC 1905) referred to *Ursus americanus emmonsi* by R. M. Anderson (1945:29) is Dark Reddish Brown (5 YR 2.5/2) with some Light Yellowish Brown (2.5 Y 6/4) hairs on the back and rump, giving the animal a silver-tipped appearance. Cranially, this specimen does not differ from other black bears from the Yukon. Hall (1928:234) pointed out the vast individual variation in colour in black bears, including blue, white, and brown. He concluded that *U. a. emmonsi* was not distinguishable by colour alone, but that the name *emmonsi* also applied to subspecies of bears occupying the mainland of southern Alaska. These subspecies are characterized by a long anteriorly inflated rostrum, small upper molars, and wide mastoidal and zygomatic breadths. Since the specimen in question does not show any of these characters, I conclude that it should be referred to *U. a. americanus.* This brown "silver-tip" coloration of the black bear is fairly common in parts of the Yukon and is responsible for the myth that black and grizzly bears interbreed.

Records of occurrence

Specimens examined, 126: Old Crow River at 140°00′, 1 (NMNH); Old Crow River, 15 mi. below Black Fox Creek, 1 (NMNH); *Old Crow River, 19 mi. N Old Crow, 3 mi. N mouth Johnson Creek,* 1; 55 mi. E Rampart House, 1 (NMNH); Rampart House, 1 (NMNH); Ogilvie Range, 1 (NMNH); Fortymile River, Forty Mile region, 1 (MVZ); *Fortymile Creek* [= *Fortymile River*], *upper Yukon,* 4 (NMNH); Fort Reliance, 2 (NMNH); *Klondike region,* 1; Stewart River settlement, 2; forks Macmillan River, 1 (NMNH); 1 mi. N South Macmillan River, base Mount Selous, 4; lower Pelly River, 2 (NMNH); 150–175 mi. up Macmillan River, 1 (NMNH); *Sheldon Lake, Canol Road, Mi. 222,* 1; *upper Ross River,* 1 (NMNH); *Mount Sheldon, Canol Road, Mi. 222,* 3; Selkirk, 2 (NMNH); Jay River [= Tay River], Pelly River, 1 (NMNH); *Glenlyon Range,* 12 (NMNH); Pelly River, 50 mi. below Ross River, 1 (NMNH); Five Fingers [= Five Finger Rapid], 1 (NMNH); *Nordenskiold River,* 1 (NMNH); Little Salmon Lake, 1 (NMNH); Little Salmon River, 4 (NMNH); Lapp River [= Lapie River], 4 (NMNH); *Ross River,* 2 (NMNH); *Pelly River, Canol Road, Mi. 139,* 1; *mouth Ross River,* 3 (NMNH); *Lapie River, Canol Road, Mi. 136,* 1; *Rose Mountains, upper Pelly River,* 5 (NMNH); Big Salmon River, 1 (NMNH); *near Big Salmon* 1 (NMNH); Kluane River, 1 (NMNH); Army Road [= Canol Road], vicinity Mi. post 112W, 1 (MVZ); *5 mi. SW Camp 108 W* [= *5 mi. SW Canol Road, Mi. 108*], 1 (MVZ); Little Arm [= Brooks Arm], Kluane Lake, 3 (NMNH); *Gladstone Creek,* 1 (NMNH) *Kluane Lake,* 2 (NMNH); Lake Laberge, upper Yukon, 1 (NMNH); Hooche [= Hutshi], 1 (NMNH); head Nisutlin River, 1 (NMNH); *Nisutlin River, Canol Road, Mi. 40,* 1; Duke River, Duke Glacier, 1 (NMNH); Takhini River, 2 (NMNH); *Whitehorse,* 13 (NMNH); *near Whitehorse,* 1 (NMNH); *E Whitehorse,* 2 (NMNH); Champagne, 2 (NMNH); *Champagne Landing,* 1 (NMNH); *50 mi. W Whitehorse, near Champagne Landing,* 1 (NMNH); Jarvis River, 1 (MCZ); Nisutlin River, Canol Road, Mi. 24, 24 mi. from Johnsons Crossing, 1; *25 mi. up Nisutlin River,* 3; *upper end Hootalinqua River* [= *upper end Teslin River*], 1; mountains back Teslin Lake, 1; *mountains back Teslin Post,* 3; *15 mi. NE Teslin Lake,* 1; *Teslin Lake region,* 1; Haines Road, 12 mi. N Dalton Post, 1; 5 mi. NE Tagish Lake, 1 (ANSP); mountains off Lake Bennett, 10 mi. from British Columbia boundary, 1.

Localities not plotted

Pelly River, 1 (NMNH); White River, 1 (NMNH); upper Yukon River, 1 (NMNH); Yukon Territory, 2 (NMNH).

Additional records

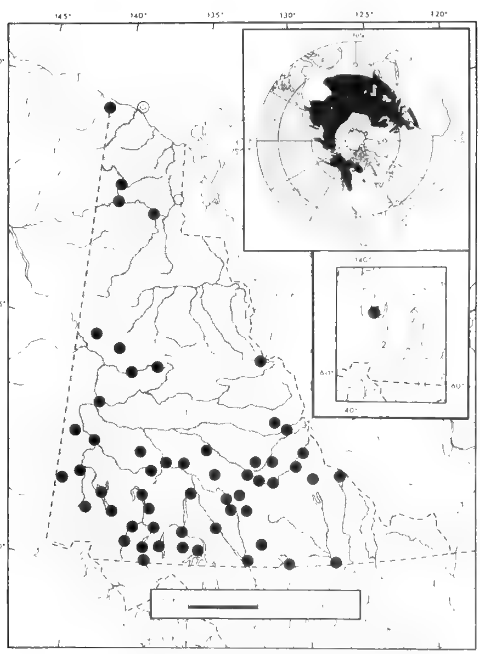
Shingle Point (Harrison 1908:151); Trout Lake, 68°49′/138°44′, 1963 (sightings reported, P. M. Youngman, MS, 9 August 1964); Richardson Mountains, 13 mi. NE Lapierre House, 27 July 1964 (seen, i. Stirling, MS); 138 mi. N Watson Lake, 5 mi. E Little Hyland River (seen by drivers, P. M. Youngman, MS, 14 June 1963); 118 mi. N Watson Lake, 15 June 1963 (seen, P. M. Youngman, MS); Black River (Williams 1925:72).

Ursus arctos – Brown or grizzly bear

***Ursus arctos horribilis* Ord**
Ursus horribilis Ord, 1894:291; type locality, Missouri River, a little above mouth of Poplar River, northeastern Montana.
U[rsus]. arctos horribilis Rausch, 1953:105.
Ursus internationalis Merriam, 1914:177.
Ursus kluane Merriam, 1916:141.
Ursus pallasi Merriam, 1916:149.
Ursus rungiusi sagittalis Merriam, 1918:50.
Ursus pulchellus Merriam, 1918:55.
Ursus oribasus Merriam, 1918:56.
Ursus pellyensis Merriam, 1918:82.
Ursus crassus Merriam, 1918:90.
Ursus horribilis, Rand 1945*a*:27, 1945*b*:18 (part).
Ursus arctos, Youngman 1968:80.

Distribution
All of the Yukon (Map 44).

Measurements
A male and female from the Ogilvie Mountains measured respectively 1,675, 1,422; 75, 110; 203, —. A female from Little Hyland River measured 1,530; 150; 260. For cranial measurements see Table 31.



Map 44
Distribution of *Ursus arctos*
1 *U. a. horribilis*
2 *U. a. middendorffi*

Remarks
The above synonymy includes only citations of original descriptions and a few pertinent recent usages. The author of most of the names that have been applied to North American brown bears obviously had a different concept of the species than that now held by most biologists.

I tentatively follow Rausch (1963*a*:33) in applying the name *Ursus arctos horribilis* to all brown bears from the Yukon, except for a few very large individuals that wander into the southwestern part of the Territory from the coast (see account of *U. a. middendorffi*).

Since there are no pre-Wisconsin fossil grizzlies from North America (Erdbrink 1953; E. Anderson 1968), the present distribution is thought to be a result of postglacial expansion of range from Beringia (Kurtén 1968).

In my opinion, grizzly bears should receive more protection in the Yukon than they do at present. A number of factors, not least their popularity as a trophy, point to early extinction for this species unless strong conservation measures are taken.

Female grizzlies probably do not mature sexually until they are at least 6 or 7 years old. In the Yukon, their litters rarely exceed 2 cubs, and there is apparently a 3-year pause between litters. Thus a female may produce 6 young, or less, during her lifetime of 15 to 20 years.

Records of occurrence
Specimens examined, 213: Alaska–Yukon boundary at 69°30′, 1; Old Crow River, 15 mi. below Black Fox Creek, 1 (NMNH); Old Crow, 1; Salmon Cache, 75 mi. up Porcu-

Table 31
Cranial measurements of *Ursus arctos*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Interorbital width	Length M2
	Ursus arctos horribilis Northern Yukon			
1763 ♂	293	203	78	36.2
36172	333	227	81	34.5
36170 ♂	315	173	70	38.3
36171 ♂	325	205	78	37.6
	Central Yukon			
30237 ♂	311	189	69	38.2
29830 ♀	288	175	63	36.2
35868			66	34.7
	Southern Yukon			
Average 40, (20 ♂, 10 ♀, 10 ?)	291[37]	177	74[39]	35.9[38]
Max.	354	233	88	44.7
Min.	238	134	61	29.1
SD	22.9	20.6	7.4	2.7
SE	3.8	3.3	1.2	0.4
	Ursus arctos middendorffi Donjek River region; Kluane Lake			
19205 ANSP	(382)	240		

pine River from Old Crow, 2; head Coal Creek, 64°47′/139°54′, 2 (NMNH); *Ogilvie Range,* 1 (NMNH); 25½ mi. S Chapman Lake, 1; *44 mi. NE Dawson,* 1; Bonnet Plume Lake, 2; Ogilvie Range, headwaters Klondike River, 1 (NMNH); 50 mi. E Dawson, south fork Hydroelectric Power Canal, 1; Stewart River, 1 (NMNH); head North Macmillan River, 5 (NMNH); Macmillan River, between north and south forks, about 75 mi. E forks, 1 (NMNH); 150–175 mi. up Macmillan River, 4 (NMNH); Donjek River, 4 (NMNH); *Divide, White Glacier and Tanana River,* 1 (NMNH); Glenlyon Range, Pelly River, 1 (NMNH); *Glenlyon Range,* 1 (NMNH); Pelly River, near head, 1 (NMNH); *upper Pelly River, near head,* 1 (NMNH); *upper Pelly River,* 3 (NMNH); Nisling River, 1 (NMNH); Dawson Range, approximately 50 mi. NW Carmacks, 1; Tay Lake area, 1; *upper Pelly River, head Orchay River,* 2 (NMNH); Ross River, Canol Road, Mi. 177, 2; upper Little Salmon River, 1 (NMNH); *Little Salmon River,* 4 (NMNH); Nordenskiold River, 3 (NMNH); *Carmacks,* 3 (NMNH); *Yukon River, 10 mi. below mouth Little Salmon River,* 1 (NMNH); upper Pelly River, near Ross Lakes [Pelly Lakes ?], 1 (NMNH); Lapie River, 1 (NMNH); *upper Pelly River, Ross River,* 2 (NMNH); *Ross River,* 4 (NMNH); *Lapie River, Canol Road Mi. 132,* 1; *upper Pelly River, Ketza River,* 1 (NMNH); *Ross Mountains,* 1 (NMNH); headwaters Nisling River, 2 (NMNH); between Ross River and Little Salmon River, 1 (NMNH); Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 2 (1 AMNH); Kluane River, Donjek River, 12 (NMNH); *St. Claire Creek,* 3 (NMNH); Little Hyland River, 128 mi. N Watson Lake, 1; White River, 30 mi. E Mount Natazhat, 2 (NMNH); *head White River,* 1 (NMNH); *Jenerk River* (= *Generc River*), 1 (NMNH); Pelly River, near Hoole Canyon, 4 (NMNH); *Pelly River above*

Hoole Canyon, 2 (NMNH); *Ketza Divide, Pelly Mountains,* 1 (NMNH); Pelly Banks (= Pelly River, 31 mi. above Hoole Canyon), 1 (NMNH); Mi. Post 112W (= Canol Road, Mi. 112), 1 (MVZ); *Lapie River, Canol Road, Mi. 105,* 1; *Pelly Mountains,* 4 (NMNH); *Pelly Mountains, between Pelly River and Nisutlin River,* 1 (NMNH); Hootalinqua, 1 (NMNH); *Lower Laberge,* 1 (NMNH); Big Salmon River, near Pelly divide, 4 (NMNH); Little Arm [= Brooks Arm], Kluane Lake, 3 (NMNH); Long Arm [= Talbot Arm], Kluane Lake, 4 (NMNH); *Kluane River, Duke River,* 4 (NMNH); *Donjek River region, Kluane Lake,* 4 (ANSP); *Kluane Lake,* 4 (NMNH); Aishiak [= Aishihik] Lake, 2 (NMNH); Big Salmon Lake, 1 (FMNH); *Quiet Lake,* 1 (NMNH); McConnell River, 3 (NMNH); Bighorn Creek, 1 (NMNH); Hoochi [= Hutshi], 1 (NMNH); *E side Aishihik River, 17 mi. N Canyon,* 1 (KU); Fourth of July Creek, 2 (MCZ); *head Kluane Lake,* 1; *Kluane,* 5 (NMNH); Hootalinqua River [= Teslin River], 1 (NMNH); Tahkeena (= Takhini), 1 (NMNH); *Whitehorse,* 1 (NMNH); *near Whitehorse,* 1 (NMNH); *E Whitehorse,* 6 (NMNH); Dezadeash River, 1 (NMNH); *Haines Junction,* 1 (UBC); Champagne, 6 (NMNH); *Champagne Landing,* 5 (NMNH); *Whitehorse, near Champagne Landing,* 1 (NMNH); Wolf River, 50 mi. NE Teslin Lake, 1 (FMNH); *Wolf Lake, Teslin Lake region, 60°38'/131° 40',* 1; *Wolf Lake, 50 mi. NE Teslin, 60°38'/ 131°40',* 1; Alsek River, 6 (1 MCZ, 5 NMNH); W Haines Road, Dezadeash Lake, 1; *Dezadeash Lake,* 1 (NMNH); *Kluk Shoo* [= *Klukshu*], 1 (NMNH); Marsh Lake, 1 (NMNH); *Watson River,* 1 (NMNH); 8 mi. W Robinson, 1 (NMNH); Lake Arkell [= Kusawa Lake], 2 (NMNH); Nisutlin River, 3 (NMNH); *Teslin Lake, British Columbia boundary,* 4 (NMNH); between Klukwan [= Klukshu] and Dalton Post, 1 (NMNH); *Unahini* [= *Klukshu*] *River, 5 mi. N and 1 mi. E Dalton Post,* 1 (KU); *Unahini* [= *Klukshu*] *River, 5 mi. N and 1 mi. E Dalton Post,* 1 (KU); Unahini [= *Klukshu*] *River, 3 mi. N and 1 mi. E Dalton Post,* 2 (KU); *Dalton House* [= *Dalton Post*], 5 (NMNH); *Klukshu River,* 1 (NMNH); Canyon River [= Canyon Creek], 1 (NMNH); upper Liard River, near British Columbia boundary, 1 (NMNH).

Localities not plotted
Pelly River, 1 (NMNH); White River, 2 (NMNH).

Additional records
North shore Herschel Island, 69°37'/138° 58', 16 July 1969 (seen, D. Campbell, MS); Summit Lake, 67°43'/136°29', 16 August 1968 (seen, D. A. Gill, MS).

Ursus arctos middendorffi Merriam

Ursus middendorffi Merriam, 1896*a*:67; holotype from Kodiak Island, Alaska; Rand 1945*b*:21.

Distribution
Occasional wanderers, from the coast, in the southwestern Yukon (Map 44).

Measurements
A specimen from junction of Kaskawulsh and Dezadeash rivers, "skin length 3,048 mm (10 ft); length of skull 457 mm (18 in)" (Rand 1945*b*).

Remarks
I tentatively follow Rand (1945*b*:21) in assigning the name *Ursus arctos middendorffi* to the brown bears from coastal Alaska. The great size of some specimens collected in the southwestern Yukon leads me to agree with Rand that these are wanderers from Alaska.

Records of occurrence
Specimens examined, 1: Donjek River region, Kluane Lake, 1 (ANSP).

Additional records
Junction Kaskawulsh and Dezadeash rivers (Rand 1945*b*:21).

Ursus maritimus – Polar bear

Ursus maritimus **Phipps**
Ursus maritimus Phipps, 1774:185; type locality, Spitzbergen, Norway.

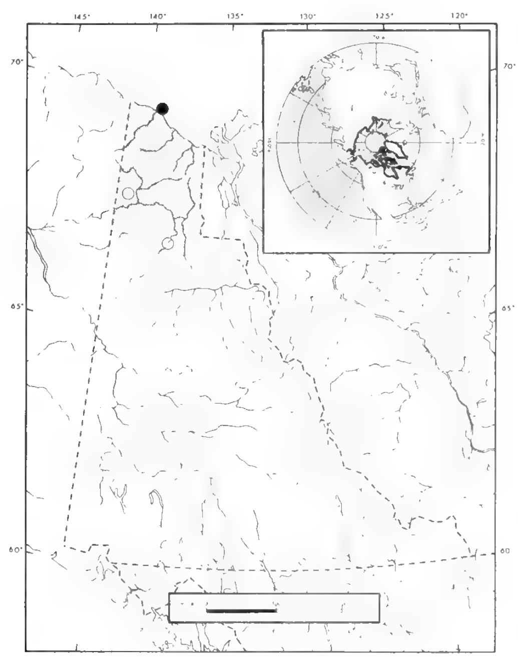
Distribution
Coastal; wandering south occasionally in winter (Map 45).

Measurements
No specimens with external or cranial measurements are available from the Yukon.

Remarks
There are several records of polar bears having been seen south of the Coastal Plain, but none are as interesting as the account given by Charlie Peter Charlie of Old Crow. While returning from the Old Crow Flats with his family by dog team, in early spring, Mr. Charlie saw two "white bears" rapidly approaching. Up until this time he had no first-hand knowledge of polar bears and thought that these might be white (albino) grizzlies, and as such he had no great fear of them. In the next few moments it became obvious that the bears would attack, so Mr. Charlie sent his family ahead with the team and he waited for the bears. Mr. Charlie's rifle was not in good condition and he only had a few shells in his pocket, so he waited until the lead bear was within 100 feet before he shot it. The second bear continued towards him and although shot at fifty feet, it did not collapse until it was almost on top of him. Mr. Charlie, an excellent hunter, was still not especially bothered by the incident. It was only a month later, while talking to an Eskimo, that he learned how much the Eskimos fear polar bears. Only then did he feel shaken by the ordeal.

Records of occurrence
Specimens examined, 2; Herschel Island, 1; *Herschel Island, Pauline Cove,* 1.

Additional records
Old Crow Flats, 67°55'/140°15' (seen by C. P. Charlie, P. M. Youngman, MS, 2 July 1964); *Old Crow Hills* [= *Old Crow Range*] (Leechman 1954:10); headwaters Porcupine River (Leechman 1954:10); *Johnson Village, near confluence Little Porcupine River and Porcupine River,* about 1946 (killed by C. P. Charlie's father, C. R. Harington, MS, 7 November 1968).



Map 45
Distribution of *Ursus maritimus maritimus*

Family **Mustelidae** – Mustelids
Martes americana – Marten

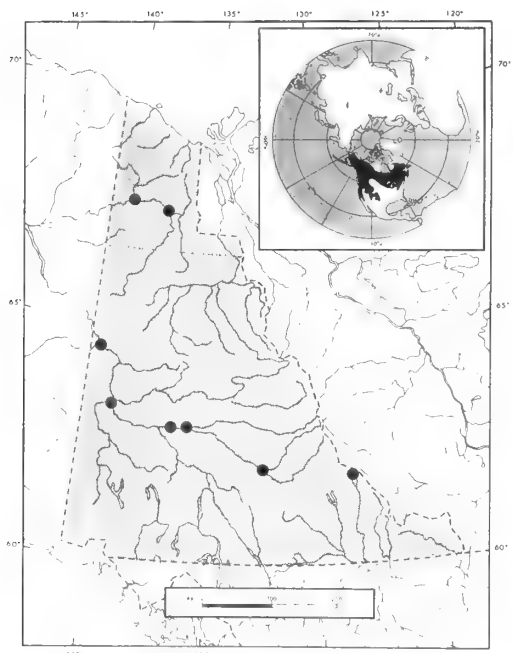
Martes americana actuosa (Osgood)

Mustela americana actuosa Osgood, 1900:43; holotype from Fort Yukon, Alaska; Osgood 1909*b*:83.
Martes americana actuosa, Miller 1912:93; Youngman 1968:80.

Distribution
North, almost to tree-line (Map 46).

Measurements
No specimens are available from the Yukon with external measurements. For cranial measurements see Table 32.

Remarks
Hagmeier (1961:133) asserted there was little reason to apply the subspecies concept to marten because of discordant and clinal variation. However, he also stated (1958:7), "If a single character, size (and possibly a second, colour) is used as a criterion however, a fair fit to variation as described by subspecies results". Dillon (1961), using five characters from Hagmeier's (1958) data, studied the present distribution of each character with relation to Wisconsin and post-Wisconsin events and concluded that four, and perhaps five, of the seven named members of the *americana* group of subspecies, including *M. a. actuosa,* are valid subspecies. I follow Dillon in this decision.



Map 46
Distribution of *Martes americana actuosa*

Brandt (1855), Coues (1877), Baird (1857), and J. A. Allen (1876) could find no external differences between Asian and North American martens or sables. Rhoads (1902) considered Gray's (1865) separation of the Old and New World martens, based on differences in the shape of M1, to be warranted. Rhoads also indicated that *Martes martes* and *M. zibellina* resemble *M. americana* more closely than they resemble *M. foina.* He found that specimens from Kamchatka, U.S.S.R., were slightly larger than specimens from Alaska and the District of Mackenzie, but he noted, "In both size and proportions . . . these crania of *zibellina* are remarkably like *actuosa* of Alaska and *brumalis* of Labrador. But when the dental characters are examined there is a distinct separation between them, based . . . on the great size and peculiar asymmetric saddle shape of the upper posterior grinder of *zibellina* as contrasted with the rectangular, transversely elongate shape of that tooth in *americana.* The . . . relative size and the inner tuberculation of the lower sectorial . . . is also a decided feature."

On the other hand, Hagmeier (1958, 1961) suggested that *M. americana* may be conspecific with *Martes zibellina,* which may be conspecific with *Martes martes* since intergradation between the two forms occurs in the Ural Mountains (Pavlinin 1963). Rausch (1963*b*:39) excluded *M. zibellina* from this relationship, "since it differs significantly from the other two in the form of the penile bone (Novikov 1956)." However, my comparison of several bacula of *Martes americana* from Alaska

Table 32
Cranial measurements of *Martes americana actuosa*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Canine width	Rostral width	Lingual length of M1	Bulla length
		Northern Yukon			
34112 ♂	82.9	16.0	16.5	5.2	19.2
36097 ♂	85.2	16.6	17.3	4.8	17.5
36098 ♂	83.8	16.1	16.5	4.8	18.8
31199 ♂	83.8	15.8	16.9	5.1	17.5
36099 ♀	77.0	15.2	15.9	4.5	17.3
	Central Yukon (vicinity of Stewart River settlement)				
Average 27 ♂	83.5[25]	16.0	16.8	4.8	17.1
Max.	88.1	16.9	17.7	5.3	18.4
Min.	81.2	15.3	16.0	4.1	15.8
SD	1.48	0.45	0.47	0.31	0.56
SE	0.29	0.09	0.09	0.06	0.11
Average 19 ♀	75.7	14.2[18]	14.9	4.1	16.1
Max.	77.7	15.0	15.9	4.6	17.1
Min.	74.0	13.6	14.1	3.8	15.2
SD	1.09	0.41	0.55	0.22	0.42
SE	0.25	0.10	0.13	0.05	0.10

and the Yukon, with bacula of *Martes zibellina* from Kamchatka and the middle Urals shows no fundamental difference.

Hagmeier (1961:129) said, "there is greater similarity between crania of *M. martes, M. zibellina,* and *M. melampus* and the *caurina* section of *M. americana* than there is between the crania of the *caurina* and the *americana* group." This is true to some extent, but specimens of *M. zibellina* from Kamchatka resemble *M. americana* from Alaska and the Yukon more closely cranially than they resemble the *caurina* group in all characters except the shape of M1, which is more like the *caurina* group.

Considering the apparent hybridization of *Martes zibellina* and *M. martes* (subspecies groups *zibellina* and *martes*?) and the intergradation of the North American subspecies groups *caurina* and *americana,* as well as the many similarities between *M. zibellina* and *M. americana*, there is a possibility that the latter two forms may be conspecific. However, considering that the two populations have presumably been separated for a comparatively long geological time (since the Bering Land Bridge was forested), and in the absence of a more detailed study, I use the conservative nomenclature here.

Records of occurrence

Specimens examined, 169; 1 mi. N Old Crow, 1; *Old Crow,* 3; *Gordie Creek, near Old Crow,* 2; *5 mi. S Old Crow,* 1; *13½ mi. SE Old Crow,* 2; Porcupine River, mouth Berry Creek, 1; *Salmon Cache, 75 mi. up Porcupine River from Old Crow,* 2; Forty Mile, 7 (3 CAS, 4 MVZ); 4 mi. N mouth Stewart River, 1; *4 mi. W mouth Stewart River,* 1; *Stewart River,* 1; *Stewart River settlement region,* 36; *mouth Stewart River,* 1; *vicinity Stewart River,* 3; *3 mi. W mouth Stewart River,* 4; *10 mi. W mouth White River,* 1; *10 mi. S mouth Stewart River,* 1; *mouth White River,* 5; Macmillan River, 48 (NMNH); Pelly River, 30 mi. above Selkirk, 7 (NMNH); mouth Ross River, 10 (NMNH); Little Hyland River, 128 mi. N. Watson Lake, 6.

Localities not plotted
Porcupine River, 8 (UBC); Pelly River, 3 (NMNH); Ross Lakes, 14 (NMNH).

Martes pennanti – Fisher

Martes pennanti pennanti (Erxleben)

[*Mustela*] *pennanti* Erxleben, 1777:470; type locality, eastern Canada [=Quebec].
Martes pennanti columbiana, Youngman 1968:80.

Distribution
Southeastern Yukon (Map 47).

Measurements
No specimens with external measurements are available from the Yukon. The cranial measurements of a male from Morley Lake are: condylobasal length, 115.9; zygomatic width, 72.3; upper tooth row, 42.2; mastoidal width, 55.5; palatal length, 62.1; rostral width, 23.1; upper molar width, 11.4.

Remarks
A number of investigators (Grinnell, Dixon, and Linsdale 1937; Rand 1945*a*; Hagmeier 1959) have indicated that geographical variation in fishers is slight. Hagmeier (1959) found that the nominal subspecies of fisher differ in some cranial characters from each other, but these differences were slight compared to the Coefficient of Variation of each population. Also, most differences varied in an east-west cline, and therefore Hagmeier concluded that there was little value in recognizing subspecies of fisher.

I agree that *Martes pennanti columbiana* should not be recognized since northwestern fisher differ from eastern fisher mainly in their slightly larger size, and this size difference is clinal. Even if the presence of the cline is ignored, the Coefficient of Difference between eastern and northwestern populations is well below the conventional level of subspecific difference.

The present distribution and ecology of the fisher suggests that it is a postglacial immigrant to the Yukon.

Records of occurrence
Specimens examined, 4: 35 mi. NW Liard Crossing, 1; 36 mi. W Watson Lake, 1; N end Morley Lake, 1; *Morley Lake, 25 mi. SE Teslin,* 1.

Mustela erminea – Ermine

Mustela erminea arctica (Merriam)

Putorius arcticus Merriam, 1896*b*:15; holotype from Point Barrow, Alaska; Osgood 1909*b*:57.
Mustela erminea arctica, Ognev 1935:31; Rand 1945*b*:26; Hall 1951:102 (part); Hall and Kelson 1959:906 (part).
Mustela erminea, Ross 1862*a*:138.

Distribution
Approximately the northern half of the Yukon (Map 48).

Measurements
An adult male from Benson Creek, 28 mi. ENE Dawson, and an adult female from Kamarkak (= Komakuk Beach) measured respectively 337, 282; 91, 73; 49, 41. For cranial measurements see Table 33.

Remarks
This subspecies may be distinguished from *Mustela erminea richardsonii* by the following characters (Hall 1951*b*): Interorbital breadth greater than distance between glenoid fossa and posterior border of external auditory meatus; skull larger in all dimensions except tympanic bullae; length of tooth-rows more than length of tympanic bulla; zygomatic breadth greater than distance between last upper molar and jugular foramen; breadth of rostrum more than 30 per cent of basilar length; proximal two-thirds of underside of tail coloured the same as underparts (summer pelage).

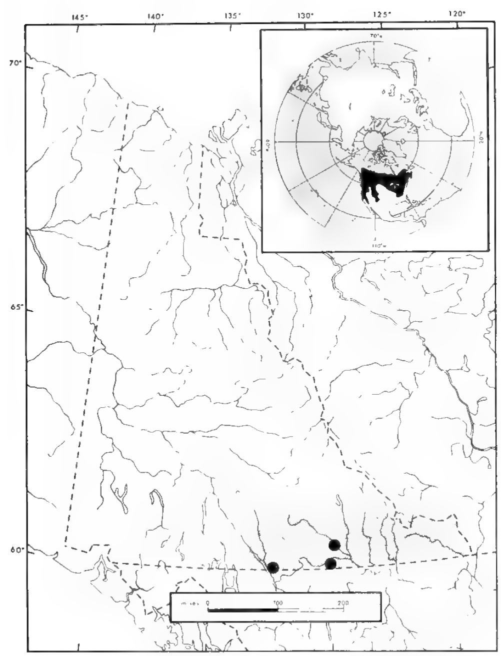
Ermine from the southern half of the Yukon are intergrades between *Mustela erminea arctica* and *M. e. richardsonii.* Specimens were assigned to *M. e. arctica* if they showed more than half of the above-mentioned characters.

Macpherson (1965:164) has suggested a Beringian origin for *Mustela erminea arctica,* and a southern origin for *M. e. richardsonii.* The distribution and degree of divergence between the two subspecies leads me to agree.

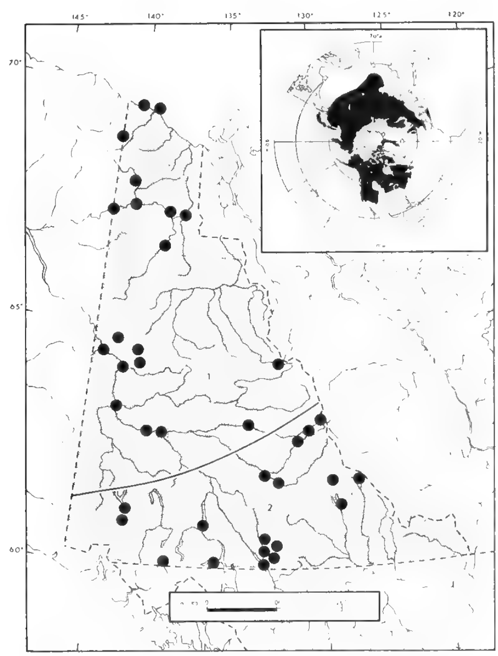
Records of occurrence

Specimens examined, 88: Kamarkak [= Komakuk Beach], 1; Herschel Island, 2 (1 MCZ, 1 AMNH); 69°00′/141°00′, 1 (NMNH); Old Crow Flats, 4; 1 mi. S Old Crow, 2; *13½ mi. SE Old Crow,* 1; Salmon Cache, 75 mi. up Porcupine River from Old Crow, 1; Rampart House, 4 (1 NMNH); Lapierre House, 2 (NMNH); Schaeffer Lake, 2; head Coal Creek, 64°47′/139°54′, 1 (NMNH); 13 mi. S Chapman Lake, 2; Forty Mile, 12 (6 MVZ, 6 CAS); Bonnet Plume Lake, 2; 28 mi. ENE Dawson, 1; Fort Reliance, 1 (NMNH); 6 mi. N mouth Stewart River, 2; *3 mi. N mouth Stewart River,* 1; *Stewart River settlement region,* 33; *vicinity Stewart River settlement,* 1; *5 mi. W mouth Stewart River,* 1; *2 mi. W mouth Stewart River,* 1; *mouth Stewart River,* 2; *9 mi. W mouth White River,* 1; *mouth White River,* 2; forks Macmillan River, 1 (NMNH); Yukon River, 20 mi. W Fort Selkirk, 1 (NMNH); Selkirk settlement [= Selkirk], 2 (NMNH).

Localities not plotted
Alaska–Yukon boundary, 1 (NMNH).



Map 47
Distribution of *Martes pennanti columbiana*



Map 48
Distribution of *Mustela erminea*
1 *M. e. arctica*
2 *M. e. richardsonii*

Mustela erminea richardsonii (Bonaparte)

Mustela Richardsonii Bonaparte, 1838:38; type locality, possibly Fort Franklin, N.W.T.
Mustela erminea richardsonii, Hall 1945:77; Rand 1945*a*:30, 1945*b*:26; Hall 1951*b*:118 (part); Cameron 1952:179; Hall and Kelson 1959:907; Youngman 1968:80.
Putorius Richardsonii, Ross 1862*a*:138; Ross 1862*b*:273.
Putorius arcticus, Osgood 1909*b*:82 (part).

Distribution
Approximately the southern half of the Yukon (Map 48).

Measurements
Two males from Lapie River, Canol Road, and Sheldon Lake, Canol Road, measured respectively 331, 321; 91, 81; 47, 48. A female from 1 mi. S Carcross weighed 77.1 g. For cranial measurements see Table 33.

Remarks
The characters used to separate *M. erminea richardsonii* from *M. e. arctica* are given under the account of *M. e. arctica.* Hall (1951*b*:102) assigned specimens from Slims River near Kluane and from head of Lake Laberge to *M. e. arctica.* Additional specimens from the southwestern Yukon show proportionally more characters of *M. e. richardsonii,* but Hall was essentially correct

Table 33
Cranial measurements of *Mustela erminea* and *Mustela nivalis*

Number of specimens averaged or catalogue number, and sex	Basilar length	Length of tooth-rows	Breadth of rostrum	Inter-orbital breadth	Mastoidal breadth	Zygomatic breadth
Mustela erminea arctica Northern Yukon (Rampart House; Old Crow; Old Crow Flats; Herschel Island)						
Average 9 ♂	42.5	15.4	14.7	11.7	22.7	26.4
Max.	44.2	15.9	15.5	12.5	24.3	28.0
Min.	40.7	14.7	13.6	10.6	21.8	24.6
SD	1.34	0.42	0.58	0.69	0.78	1.05
SE	0.45	0.14	0.19	0.23	0.26	0.40
Stewart River settlement region						
Average 29 ♂	42.0	15.0	14.0	11.4	22.6	25.9
Max.	44.0	16.1	15.6	12.5	24.2	28.4
Min.	38.2	13.0	11.9	9.3	19.5	22.8
SD	1.24	0.66	0.68	0.66	0.93	1.78
SE	0.23	0.12	0.13	0.12	0.17	0.33
34603 ♀	33.4	11.7	11.0	8.5	17.8	20.0
30937 ♀	34.3	21.1	10.5	8.4	17.6	18.9
30939 ♀	35.0	12.3	10.9	9.1	18.4	20.1
Mustela erminea richardsonii Southeastern Yukon (Little Hyland River; Canol Road)						
31733 ♂	41.2	14.7	13.1	11.7	22.2	25.6
18021 ♂	40.8	14.0	12.4	9.9	20.6	23.5
31734 ♂	40.7	14.2	12.3	9.8	21.2	23.6

in that this is an area of nearly complete intergradation between the two subspecies. The specimen from head of Lake Laberge is too fragmentary for certain subspecific assignment but I include it in *M. e. richardsonii* on geographical grounds.

Records of occurrence

Specimens examined, 48; Macmillan Pass, Canol Road, Mi. 282, 1; south fork Macmillan River, Canol Road, Mi. 249, 1; Sheldon Lake, Canol Road, Mi. 222, 1; Lapie River, Canol Road, Mi. 132, 1; Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 1 (AMNH); Little Hyland River, 128 mi. N Watson Lake, 1; Pelly River, Hoole Canyon, 1 (NMNH); Frances Lake, 2; Kluane Lake, 2; *head Kluane Lake,* 3; Slims River, near Kluane, 1 (MCZ); head Lake Laberge, 1 (NMNH); Nisutlin River, Canol Road, Mi. 40, 2; *30 mi. NE Teslin Lake,* 1; Wolf Lake, near Teslin Lake, 60°38′/131° 40′, 6; Thirty Mile River [= Thirty Mile Creek], near Teslin Lake, 1; *30 mi. N Teslin Lake,* 1; *Nisutlin Flats, near Teslin Lake,* 2; Nisutlin Mountains, near Teslin Lake, 3; *Wolf River, near Teslin Lake,* 1; Teslin Lake, 2; *near Teslin Lake,* 1; *Nisutlin River, near Teslin Lake,* 1; *Eagle Bay, Teslin Lake,* 1; *Teslin Post, near Teslin Lake,* 2; *Morley Bay, Teslin Lake,* 2; Haines Road, Mi. 113, 4; 1 mi. S Carcross, 1.

Localities not plotted
Pelly River, 1 (NMNH).

Number of specimens averaged or catalogue number, and sex	Basilar length	Length of tooth-rows	Breadth of rostrum	Inter-orbital breadth	Mastoidal breadth	Zygomatic breadth
		Vicinity Kluane Lake				
31074 ♂	40.2	14.7	12.9	11.1	22.0	26.3
31075 ♀	35.9	12.5	10.8	8.8	18.3	20.9
20259 ♀	35.3	12.8	10.8	8.6	18.5	
34172 MCZ, ♀	37.3	12.8	11.6	9.4	22.0	22.1
		Carcross				
35872 ♀	32.1	11.3	10.1	7.9	16.3	18.0
		Vicinity Teslin Lake				
2040 ♂	42.0	14.6	13.0	11.4	22.8	26.0
2123 ♂	40.6	14.3	12.1	9.9	21.4	
2086 ♂	40.5	14.1	12.9	10.6	21.3	
		Mustela nivalis eskimo Firth River, 15 mi. S mouth Joe Creek				
30622 ♂	27.1	9.1	7.9	6.7	14.0	16.3
		Old Crow				
34111 ♀	26.2	8.5	6.6	5.6	12.2	
		Porcupine River; mouth Berry Creek				
34110 ♂	26.8	9.3	7.8	6.2	14.9	14.6

Mustela nivalis – Least weasel

***Mustela nivalis eskimo* (Stone)**
Putorius rixosus eskimo Stone, 1900:44; holotype from Point Barrow, Alaska.
Mustela nivalis eskimo Reichstein, 1958:169; Hall and Kelson 1959:1082 (addenda).
Mustela rixosa rixosa, Rand 1945*a*:30, 1945*b*:25.
Mustela rixosa eskimo, Hall 1951*b*:181.

Distribution
Probably occurs in all but the southeast corner of the Yukon (Map 49).

Measurements
An adult male from Firth River, 15 mi. S mouth Joe Creek, measured 159; 14; 23; and weighed 51.3 g. For cranial measurements see Table 33.

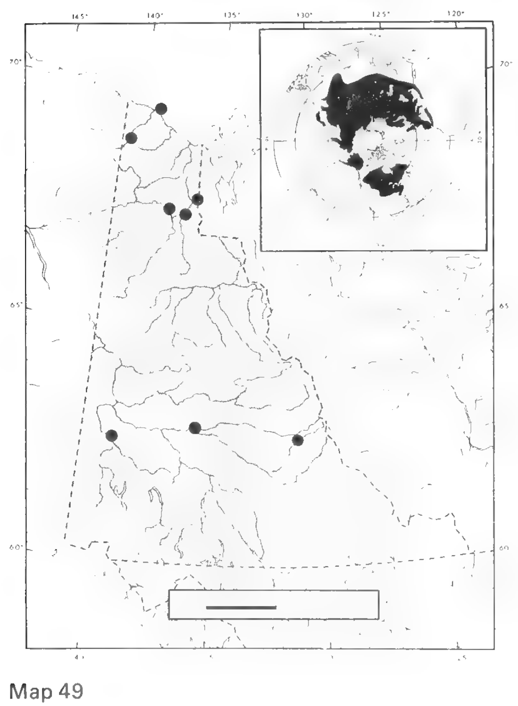
Remarks
The taxonomy of the small, short-tailed weasels of Europe, Asia, and North America has fluctuated for some time. G. M. Allen (1933), Hall (1951*b*) Siivonen (1968), and Kurtén (1968) thought that *Mustela rixosa* occurred allopatrically with *M. nivalis* in North America as well as in Europe and Asia. However, Ognev (1935); Ellerman and Morrison-Scott (1951); and Bobrinskii, Kuznetsov, and Kuziakin (1965) regarded *M. rixosa* as probably conspecific with *M. nivalis.* After studying geographical variation, primarily in Europe, Reichstein (1958) concluded that *M. rixosa* was conspecific with *M. nivalis.* Hall and Kelson (1959) tentatively followed this arrangement.

Mustela nivalis eskimo has been characterized by Hall (1951*b*) as being large in size, light in colour, and as having a broad skull and short tail. Some specimens from the Arctic Slope of Alaska are indeed large (Hall 1951*b*:183), perhaps indicating geographical variation, whereas specimens from the Brooks Range (Rausch 1953:113) and more southern localities in Alaska are not especially large, nor do they have a large, broad skull. There are too few specimens from the Yukon and northern Mackenzie District to adequately establish the average size of specimens from this region, but an adult male from Peel River, 26 mi. S Aklavik, N.W.T. (NMC 15432) approaches the Alaskan specimens in size.

Specimens of *Mustela nivalis eskimo* examined in this study have 11 caudal vertebrae and a short tail not extending beyond the outstretched hind feet in study skins. Specimens of *M. n. rixosa* and other subspecies have 14 to 16 caudal vertebrae, resulting in a longer tail extending beyond the outstretched hind feet in study skins.

A specimen (CAS 7445) from 15 mi. E Atlin, B.C., referred by Hall (1951*b*: 186) to *rixosa* has a short tail, which I consider to be a strongly diagnostic feature, and therefore I refer it to *M. n. eskimo.*

Only further collecting can show whether the hiatus between the southernmost specimens of *Mustela nivalis eskimo* and the northernmost specimens of *M. n. rixosa*



Map 49
Distribution of *Mustela nivalis eskimo*

actually exists. It is probable that *M. n. eskimo* and its very close (perhaps consubspecific) Palearctic relative, *M. n. pygmea* Allen, occupied Beringia during the Wisconsin, and it is possible that in North America, the Beringian and southern periglacial populations have not yet occupied the intervening previously glaciated area. If the Beringian populations intergrade with *M. nivalis* in the Palearctic, but not in the Nearactic, then perhaps the short-tailed Beringian forms occupying Alaska, the northwestern Northwest Territories, the Yukon, and extreme southwestern British Columbia should be referred to as *M. nivalis,* while the long-tailed southern periglacial forms occupying much of the remainder of North America should retain the name *Mustela rixosa.*

Several of the specimens from the Yukon were trapped in "Museum Special" mousetraps placed in the runways of voles near holes. Several specimens were taken in tundra, and two were taken in taiga near cabins. A specimen from Old Crow, captured 19 August 1964, was lactating.

Records of occurrence
Specimens examined, 10: Herschel Island, Pauline Cove, 1; *Firth River,* 1; Firth River, 15 mi. S mouth Joe Creek, 1; Summit Lake, 67°43′/136°29′, 1; mouth Berry Creek, 1; Old Crow, 1; Lapierre House, 1 (NMNH); Little Kalzas Lake, 1; Ross River, near Sheldon Lake, 1; Klotassin River, 1 (NMNH).

Mustela vison – Mink

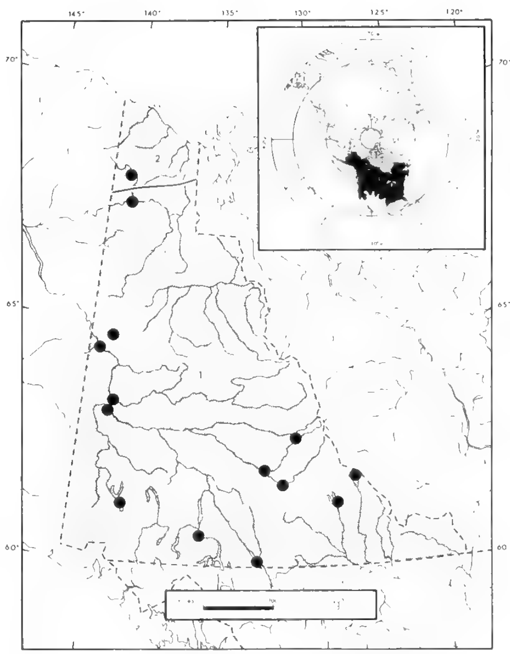
***Mustela vison energumenos* (Bangs)**
Putorius vison energumenos Bangs, 1896:5; holotype from Sumas, B.C.
Mustela vison energumenos, Miller 1912:101; Rand 1945*b*:28; Baker 1951:115; Hall and Kelson 1959:618 (part); Youngman 1968:80.

Distribution
North, approximately to the Porcupine River (Map 50).

Measurements
A young adult male from Louise Lake, and a female from Sheldon Lake measured respectively 515, 485; 196, 155; 68, 59. The male weighed 1,052.3 g. For cranial measurements see Table 34.

Remarks
A comparison of measurements of *Mustela vison aniakensis* Burns and *M. v. melampeplus* (Elliot), both from Alaska, with *M. v. energumenos* from the Yukon and British Columbia, leads me to tentatively conclude that they are consubspecific.

Mustela vison energumenos differs from *M. v. ingens* in averaging significantly smaller in condylobasal length (83 per cent joint non-overlap), zygomatic breadth (90 per cent n.o.), breadth of rostrum (87 per cent n.o.), and interorbital breadth (87 per cent n.o.). Specimens of *M. v. energumenos* seldom have as well-developed sagittal crests as do specimens of *M. v. ingens.* In addition, *M. v. energumenos* is smaller in external measurements and has paler and shorter fur, as well as less dense underfur.



Map 50
Distribution of *Mustela vison*
1 *M. v. energumenos*
2 *M. v. ingens*

There is some indication that *M. v. energumenos* may have a smaller baculum.

Records of occurrence
Specimens examined, 51: 5 mi. S Old Crow 1; *10 mi. S Old Crow*, 2; *13½ mi. SE Old Crow*, 1; head Coal Creek, 64°47′/139°54′, 5 (NMNH); Forty Mile, 6 (MVZ); 8 mi. N mouth Stewart River, 1; *7 mi. N mouth Stewart River*, 1; *5 mi. N mouth Stewart River*, 1; *3 mi. N mouth Stewart River*, 2; *3 mi. down Yukon River from Stewart River*, 1; *Stewart River settlement*, 6; *Stewart River settlement region*, 1; *Yukon River, vicinity Stewart River*, 2; *mouth Stewart River*, 2; *2 mi. S on Stewart River*, 1; *2 mi. S mouth Stewart River*, 1; 6 mi. W mouth White River, 1; *3 mi. S mouth White River*, 1; Sheldon Lake, Canol Road, Mi. 222, 2; Ross Post, Canol Road, Mi. 141, 1; Little Hyland River, 128 mi. N Watson Lake, 2; Hoole River, 1 (NMNH); Frances Lake, 2 mi. up East Arm, 1; Kluane Lake, 3; Louise. Lake, 7½ mi. W Whitehorse, 1; Nisutlin River, near Teslin Lake, 3; *Fat Creek, near Teslin Lake*, 1.

Table 34
Cranial measurements of *Mustela vison*

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Mastoidal breadth	Length of tooth-rows	Breadth of rostrum	Length of bulla	Interorbital breadth	Length of M1	Breadth of M1	Length of P4
				Mustela vison energumenos 5 mi. S Old Crow						
33431 ♂	65.5	39.8	34.6	23.1	18.5	17.1	14.6	3.8	5.7	7.4
				10 mi. S Old Crow						
33553 ♂	66.5	38.3	33.8	23.7	18.1	16.8	14.9	3.8	6.1	7.4
				Stewart River region						
Average 19 ♂	68.3	39.6[18]	34.9	24.2	18.9[17]	17.2	15.0[18]	4.2	6.4[18]	7.6
Max.	70.0	40.8	36.3	26.7	20.5	18.6	16.2	5.0	7.5	8.7
Min.	66.3	37.5	32.6	22.7	17.7	16.2	14.2	3.6	5.8	7.1
SD	1.37	0.88	0.98	0.84	0.74	0.73	0.54	0.33	0.41	0.33
SE	0.31	0.21	0.22	0.19	0.17	0.17	0.13	0.08	0.09	0.08
31042 ♀	59.6	34.9	29.8	21.3	16.8	16.6	13.5	3.5	5.4	6.7
31037 ♀	59.9	34.5	29.7	21.5	16.3	15.8	13.2	3.7	5.6	6.6
31038 ♀	61.1	35.3	31.2	21.8	17.1	15.4	13.8	3.7	5.9	6.9
34671 ♀	60.2	34.5	30.8	21.6	16.7	15.0	13.1	3.4	5.8	7.3
				Frances Lake						
21954 ♂	69.2	39.9	35.4	25.3	20.5	17.4	16.0	4.5	6.6	7.5

Mustela vison ingens (Osgood)

Lutreola vison ingens Osgood, 1900:42; holotype from Fort Yukon, Alaska.
Mustela vison ingens, Miller 1912:101.

Distribution

Extreme northern Yukon (Map 50).

Measurements

No specimens with external measurements are available from the Yukon. Average (and extreme) measurements of 10 males and 10 females from Fort Yukon and Beaver, Alaska, are respectively 620 (570–661), 560 (524–612); 192 (167–203), 180 (163–201); 69 (64–73), 63 (58–70). For cranial measurements see Table 34.

Remarks

For comparison with *Mustela vison energumenos,* see account of that subspecies.

Mustela vison ingens is the largest subspecies of living mink in North America. The difference in size and the lack of clear intergrades between it and *M. v. energumenos* make me suspect that there may be reduced fertility between the two forms. *M. v. energumenos* occurs north at least to Old Crow, while *M. v. ingens* occurs on Old Crow Flats, only some 30 to 50 miles away.

Number of specimens averaged or catalogue number, and sex	Condylobasal length	Zygomatic breadth	Mastoidal breadth	Length of tooth-rows	Breadth of rostrum	Length of bulla	Interorbital breadth	Length of M1	Breadth of M1	Length of P4
					Kluane Lake					
31076 ♂	68.9	42.0	37.1	24.1	19.0	18.2	15.5	4.4	6.6	7.9
31078 ♂	65.6	42.2	34.7	23.3	19.6	17.0	15.0	4.1	6.3	7.7
					Mustela vison ingens Old Crow Flats					
Average 5 ♂	74.0	44.4	38.7	26.0	20.9	18.1	16.5	4.7	7.0	8.2
Max.	76.2	47.0	39.9	26.6	21.7	19.2	17.4	5.2	7.5	8.5
Min.	72.1	42.3	37.0	25.5	20.1	17.2	15.7	4.4	6.6	7.9
33433 ♀	66.2	39.7	33.4	24.0	19.4	17.1	14.9	4.0	6.3	7.5
33558 ♀	67.7	40.0	35.4	23.2	19.7	16.9	16.0	3.3	5.8	7.1
					Fort Yukon and Beaver, Alaska					
Average 11 ♂	72.2	43.6[4]	38.2	25.6	20.8	18.2	16.7	4.3	6.7	7.9
Max.	74.9	45.6	39.9	26.9	22.4	19.3	18.2	4.8	7.0	8.2
Min.	67.1	41.6	35.3	23.6	19.1	16.7	15.4	4.1	6.1	7.4
SD	2.54	1.50	1.48	0.92	0.93	0.80	0.96	0.22	0.30	0.25
SE	0.77	0.50	0.44	0.28	0.28	0.24	0.29	0.07	0.09	0.08
Average 11 ♀	65.9	38.5	34.8	23.3[10]	18.8	16.8	14.8	3.7	6.0	7.0
Max.	68.2	40.5	39.0	24.0	19.3	17.5	15.7	4.0	6.4	7.3
Min.	63.9	35.4	33.2	22.4	18.4	16.1	14.1	3.3	5.7	6.8
SD	1.62	1.41	1.62	0.58	0.52	0.44	0.51	0.21	0.21	0.19
SE	0.49	0.43	0.49	0.18	0.16	0.13	0.15	0.06	0.06	0.06

To my knowledge there is no dated fossil record of *Mustela vison* for Beringia, and as *Mustela vison* does not now occur in the Palearctic, there is little evidence of a Beringian origin for *M. v. ingens.* The divergence between *M. v. ingens* and the other North American mink, as well as the lack of intergradation, suggest, however, that *M. v. ingens* owes its origin to isolation in Beringia or other nearby refugia.

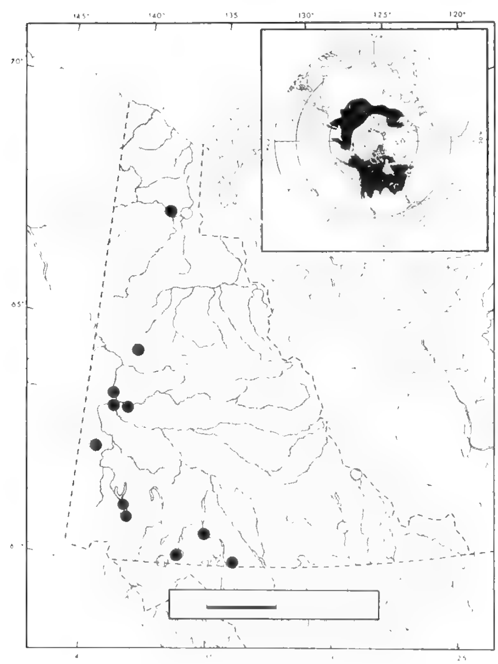
Records of occurrence
Specimens examined, 9: 40 mi. SE Crow Base 68°13′/141°00′, 1 (NMNH); *Old Crow Flats,* 8.

Gulo gulo – Wolverine

***Gulo gulo luscus* (Linnaeus)**
[*Ursus*] *luscus* Linnaeus, 1758:47; type locality, Hudson Bay.
Gulo gulo luscus, Degerbøl 1935:2.
Gulo luscus, Osgood 1900:44, 1909*b*:83; Swarth 1926:147; Banfield 1961*a*:30.
Gulo luscus luscus, Rand 1945*a*:32, 1945*b*:29; Cameron 1952:179.

Distribution
Probably occurs throughout the Yukon (Map 51).

Measurements
A subadult male and subadult female from 20 mi. S Chapman Lake measured respectively 940, 840; 210, 173; 170, 160. For cranial measurements see Table 35.



Map 51
Distribution of *Gulo gulo luscus*

On several occasions, I have called wolverines to within 50 ft of me by "squeaking" on the back of my hand.

Two wolverines collected in the Ogilvie Mountains had fur and the entire palmar and plantar pads from hoary marmots in their stomachs. On this occasion, 19 August 1961, three subadult wolverines, probably littermates, were travelling together.

At several localities in alpine tundra I found what must have been temporary feeding dens of a wolverine. These dens, usually among rocks, were all in exposed sites that afforded an excellent view of the surrounding countryside. All contained the splintered skeletal remains of such prey as sheep, caribou, and marmots.

Records of occurrence
Specimens examined, 41: Salmon Cache, 75 mi. up Porcupine River from Old Crow, 1; 20 mi. S Chapman Lake, 2; 25 mi. N mouth Stewart River, 1; *12 mi. N mouth Stewart River,* 1; *5½ mi. N mouth Stewart River,* 1; Henderson Creek, 1; *3 mi. N mouth Stewart River,* 2; *Stewart River settlement,* 8; *vicinity Stewart River settlement,* 3; *5 mi. W mouth Stewart River,* 1; *3 mi. W mouth Stewart River,* 1; *mouth Stewart River,* 1 (NMNH); *7 mi. S mouth Stewart River,* 1; *5 mi. W mouth White River,* 1; *mouth White River,* 1; *2 mi. S mouth White River,* 1; 10 mi. up Stewart River from mouth, 1; *Stewart River, mouth Maisy May Creek,* 1; Snag, 1; Kluane Lake, 1; *Sheep Mountain, Alaska Highway, Mi. 1061,* 1; Slims River, 1; *Hungry Lake 60°59′/138°10′* 1 (MCZ); Whitehorse, 1

Table 35
Cranial measurements of *Gulo gulo* and *Lontra canadensis*

Number of specimens averaged or catalogue number, and sex	Condylo-basal length	Zygomatic breadth	Inter-orbital breadth	Mastoidal breadth	Length of maxillary tooth-row
		Gulo gulo luscus			
		Salmon Cache, 75 mi. up Porcupine River from Old Crow			
33692 ♂	147.1	107.3	39.0	90.0	53.7
		Stewart River region			
Average 14 ♂	146	102	41	90	52
Max.	150	107	44	93	53.8
Min.	140	98	39	84	50.2
SD	2.66	3.04	1.50	2.67	1.10
SE	0.71	0.81	0.40	0.71	0.29
31056 ♀	134	90	37	47	47.5
31774 ♀	138	103	39	84	48.9
31775 ♀	136	92	35	81	47.4
31778 ♀	135	91	37	84	48.8
		Atlin Lake			
35180 ♂	144	101	40	84	50.4
		Slims River			
20335 ♀	145	100	41		50.6
		Lontra canadensis pacifica			
		13½ mi. SE Old Crow			
33411 ♂	115	71	24	67	38.0
		20 mi. N mouth Stewart River			
31060 ♀	112	78	27	68	36.8
		Thistle Creek, 8 mi. above mouth White River			
31814 ♂	113.5	76.7	23.4	68.8	36.9
		6¾ mi. SW Whitehorse			
31744 ♂	107.1	71.3	23.4	65.7	36.5
		Hungry Lake (60°59′/138°10′)			
34164 MCZ, ♀	112.2	73.6			36.2
		Beaver Creek, Teslin Lake			
1969 ♂	115.3	79.5	27.3	69.9	37.1

(UBC); 60 mi. W Carcross, 1 (MVZ); N end Atlin Lake, 1.

Localities not plotted
Pelly River, 2 (NMNH); Yukon Territory, 1 (MCZ); Thirty Mile River, Teslin Bay, 1.

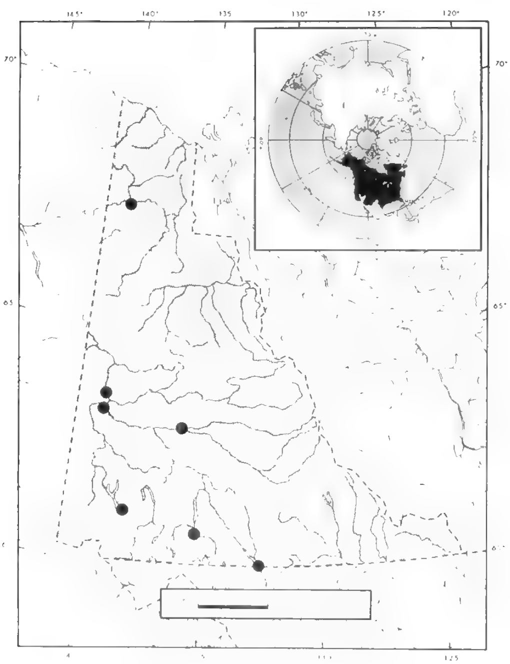
Additional records
Lapierre House, 25 July 1964 (sign, G. D. Tessier, MS); 138 mi. N. Watson Lake, 5 mi. E. Little Hyland River, 13 June 1963 (seen, P. M. Youngman, MS); Cantung [= Canadian–Tungsten] Road, Mi. 61 (seen by D. Christie, P. M. Youngman, MS); Blanchard River (Cameron 1952:179).

Lontra canadensis – River otter

Lontra canadensis pacifica **(Rhoads)**
Lutra hudsonica pacifica Rhoads, 1898:429, holotype from Lake Keechelus, 3,000 ft, Kittitas County, Wash.
Lontra c.[anadensis] pacifica, van Zyll de Jong 1972:81.
Lutra canadensis yukonensis, Goldman 1935:180 (part); Rand 1945*b*:31; R. M. Anderson 1947:71; Hall and Kelson 1959:946 (part).

Distribution
Occurs throughout most of the Yukon (Map 52).

Measurements
No external measurements are available from specimens from the Yukon. For cranial measurements see Table 35.



Map 52
Distribution of *Lontra canadensis pacifica*

Remarks
I concur with van Zyll de Jong that neither *Lontra canadensis preblei,* Goldman (type locality, near McTavish Bay, Great Bear Lake, District of Mackenzie) nor *Lontra canadensis yukonensis* Goldman (type locality, Unalakleet, Norton Sound, Alaska) are valid subspecies.

Specimens from the Yukon have been difficult to obtain. The dried carcasses left by trappers are valuable. They should be shipped, with as much data as possible to: Curator of Mammals, National Museum of Natural Sciences, Ottawa.

Records of occurrence
Specimens examined, 11: 13½ mi. SE Old Crow, 1; 20 mi. N mouth Stewart River, 1; 2 mi. up White River from mouth, 1; *Thistle Creek, 8 mi. above mouth White River,* 1; Pelly River, mouth Macmillan River, 1 (NMNH); Hungry Lake, 60°59′/138°10′, 3 (MCZ); 6¾ mi. SW Whitehorse; 2; Beaver Creek, Teslin Lake, Yukon–British Columbia boundary, 1.

Family **Felidae** – Cats
Felis concolor – Cougar

Felis concolor ssp.

Felis concolor Linnaeus, 1771:552; type locality, Cayenne region, French Guiana; Youngman 1968:81.

Distribution
Irregular occurrence in the southern half of the Yukon (Map 53).

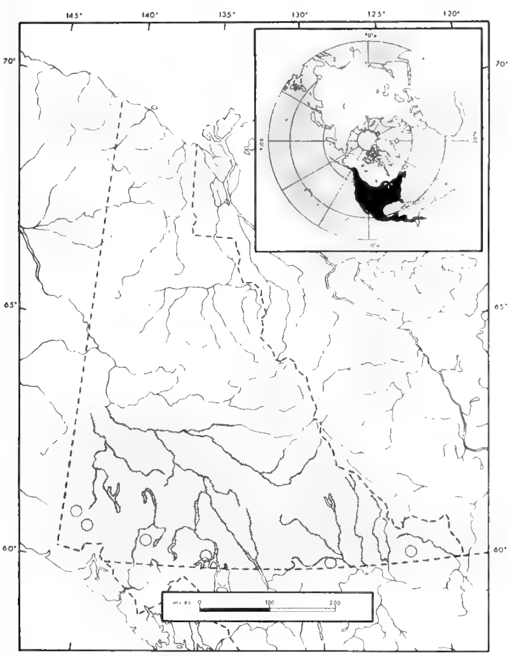
Measurements
No specimens are available from the Yukon.

Remarks
Youngman (1968:81) recorded a sight record of a cougar from the Alaska Highway, 36½ mi. W Watson Lake. There are also numerous other, poorly documented, sight records for the Yukon. Most of these records included the phrases "big cat" and "long tail". Many, if not most, of these records are probably legitimate. On one occasion, two sightings along the Dawson Road came within a day or two of each other, indicating that the same animal was making northerly progress.

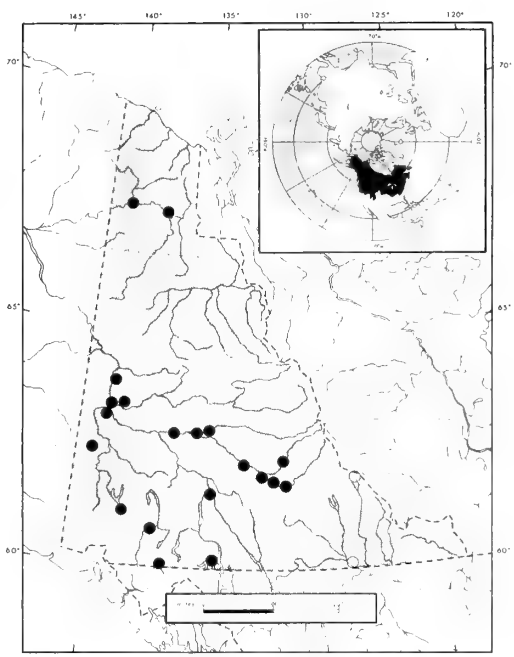
The few cougar in the southern Yukon probably prey on mule deer and an occasional caribou.

Records of occurrence
Specimens examined, none.

Additional records
70 mi. W Alaska Highway, Mi. 1054, early June, 1964 (seen, P. Upton, MS, 9 May 1968); near highest point Kaskawulsh–Donjek divide (Wood 1967: 36); Kathleen Lake, 18 July 1955 (seen by F. Mikusch, T. Kjar, MS, 30 April 1956); Tobally [= Toobally] Lake (Rand 1944*b*:40); 3 mi. N Carcross, 27 July 1955 (seen by G. Rose, T. Kjar, MS, 30 April 1956); 36½ mi. W Watson Lake (Youngman 1968:81).



Map 53
Distribution of *Felis concolor*



Map 54
Distribution of *Felis canadensis canadensis*

Felis canadensis – Lynx

***Felis canadensis canadensis* (Kerr)**
Lynx canadensis Kerr, 1792:157; type locality, eastern Canada [=Quebec]; Rand 1945*a*:35; R. M. Anderson 1947:75; Baker 1951:116.
Felis canadensis, Youngman 1968:81.

Distribution
The entire Yukon (Map 54).

Measurements
A female from 37 mi. NE Selkirk, and a female from Takhanne River, 5 mi. ESE Dalton Post, measured respectively 880, 850; 115 —; 267, 240. For cranial measurements see Table 36.

Remarks
Various authors (Bobrinskii, Kuznetsov, and Kuziakin 1965; Ellerman and Morrison-Scott 1951; Rausch 1953; Kurtén and Rausch 1959) considered *Felis canadensis* to be conspecific with *Felis lynx.* However, the last-named authors compared Fennoscandian lynx with Alaskan lynx, and despite their tentative conclusion that the two forms are conspecific they admitted that specific differentiation could not be finally settled on the basis of the material available to them. Also Kurtén (1968:83) reversed his earlier conclusions and considered them related species.

A 12-pound adult female lynx collected 37 mi. NE Selkirk, 11 July 1965, had in its stomach 2 masked shrews, 6 meadow voles, one long-tailed vole, and a Savannah Sparrow.

Felis canadensis is known from the Pleistocene fossil assemblage from Alaska (Repenning 1967:306), but so far as I know is not definitely known as a fossil from the southern periglacial region. Its present distribution may have resulted from postglacial immigration from Beringia.

Records of occurrence
Specimens examined, 329: Old Crow, 4; Salmon Cache, 75 mi. up Porcupine River from Old Crow, 1; Ruby Creek, 63°46'/139°16', 2 (MCZ); *30 mi. N mouth Stewart River,* 1; *25 mi. N mouth Stewart River,* 1; 15 mi. N mouth Stewart River, 1; *10½ mi. up Henderson Creek,* 1; *11 mi. up Henderson Creek,* 1; *12 mi. up Henderson Creek,* 2; *14 mi. up Henderson Creek,* 1; *10 mi. up Henderson Creek,* 1; *10 mi. N mouth Stewart River,* 2; *9½ mi. N mouth Stewart River,* 1; *9½ mi. up Henderson Creek,* 2; *9 mi. N mouth Stewart River,* 3; *8 mi. N mouth Stewart River,* 8; *8 mi. N Stewart River,* 1; *7½ mi. N mouth Stewart River,* 2; *7 mi. N mouth Stewart River,* 2; *7 mi. N Stewart River,* 1; *7½ mi. up Henderson Creek,* 1; *7 mi. up Henderson Creek,* 1; *6½ mi. N mouth Stewart River,* 1; *6 mi. N mouth Stewart River,* 5; *8 mi. NW mouth Stewart River,* 1; *6 mi. up Henderson Creek,* 2; *5 mi. N mouth Stewart River,* 7; *Yukon River, 5 mi. W mouth Stewart River,* 1; *5 mi. N Stewart River,* 2; *5 mi. up Henderson Creek,* 1; *4 mi. up Henderson Creek,* 1; *Henderson Creek,* 32; *4 mi. N mouth Stewart River,* 1; *2 mi, N mouth Stewart River,* 6; *1 mi. N mouth Stewart River,* 1; *Stewart River settlement,* 2; *Stewart River settlement region,* 7; *vicinity Stewart River,* 16; *vicinity Stewart River settlement,* 1; *Karison Creek, vicinity Stewart River,* 1; *9 mi. W mouth Stewart River,* 1; *7 mi. W mouth Stewart River,* 1; *6 mi. W mouth Stewart River,* 1; *5 mi. W mouth Stewart River,* 1; *4 mi. W mouth Stewart River,* 3; *3 mi. W mouth Stewart River,* 2; *2 mi. W mouth Stewart River,* 2; *Stewart River,* 5; *mouth Stewart River,* 3; *2 mi. E mouth Stewart River,* 1; *2½ mi. E Stewart River,* 1; *3 mi. E Stewart River,* 2; *4 mi. E mouth Stewart River,* 1; *5 mi. E mouth Stewart River,* 1; *2½ mi. S mouth Stewart River,* 1; *3 mi. S mouth Stewart River,* 2; *4 mi. N mouth White River,* 1; *5 mi. S mouth Stewart River,* 2; *6 mi. S mouth Stewart River,* 1; *7 mi. S mouth Stewart River,* 2; *7 mi. below mouth Stewart River,* 1; *9 mi. S mouth Stewart River,* 1; *12 mi. E mouth Stewart River,* 1; 18 mi. up Henderson Creek, 2; *16 mi. up Henderson Creek,* 2; *17 mi. up Henderson Creek,* 1; 5 mi. W mouth White River, 1; *mouth White River,* 11; *3 mi. S mouth White River,* 1; *5 mi. S mouth White River,* 1; *8 mi. SE mouth White River,* 1; *8 mi. SW mouth White River,* 1; *6 mi. S mouth White River,* 1; *10 mi. SW mouth White River,* 1; *7 mi. S mouth White River,* 4; *9 mi. S mouth White River,* 1; Macmillan River at 62°55'/135°, 2

Table 36
Cranial measurements of *Felis canadensis canadensis*

Number of specimens averaged or catalogue number, and sex	Basal length	Mastoidal breadth	Zygomatic breadth	Interorbital breadth	Breadth across postorbital processes	Postorbital constriction	Tooth-row
Stewart River settlement region							
Average 75 ♂	131	56	91	29	58[73]	40[74]	41
Max.	137	59	98	32	65	44	44
Min.	121	51	87	26	52	36	39
SD	3.18	1.51	2.24	1.18	2.65	1.79	1.08
SE	0.37	0.17	0.26	0.14	0.31	0.21	0.13
Average 33 ♀	125	54	89	28[32]	56[30]	39	39
Max.	130	57	93	30	59	42	41
Min.	121	52	85	26	54	37	38
SD	2.37	1.17	1.87	1.15	1.45	1.43	0.92
SE	0.41	0.20	0.33	0.20	0.27	0.25	0.16

(NMNH); Pelly River, Kalzas Creek [= Kalzas River], 48 (NMNH); 37 mi. NE Fort Selkirk, 1; Snag, 1; Pelly River, 230 mi. from mouth, 8 (NMNH); 50 mi. up Ross River, 1 (NMNH); Pelly River, Lapie River, 7 (NMNH); *Pelly River, Canol Road,* 1; *Lapie River, Canol Road, Mi. 132,* 1; Pelly River Ketza River, 1 (NMNH); *Pelly River, Hoole Canyon,* 7 (NMNH); Pelly River, Starr Creek, 1 (NMNH); Pelly River, Hoole River, 2 (NMNH); Hootalinqua, 6 (NMNH); Kluane Lake, 4; *Kluane Lake, Cultus Creek,* 1 (CU); *Kluane,* 1 (MCZ); Marshall Creek, 3, mi. N Dezadeash River, 1 (KU); 1 mi. S Carcross, 1; Takhanne River, 5 mi. ESE Dalton Post, 1.

Localities not plotted
Pelly River, 30 (NMNH); Pelly River, below "Rives"? River, 3 (NMNH); Pelly River, Steamboat Island, 1 (NMNH); Pelly River, mouth Indian Creek, 6 (NMNH).

Additional records
138 mi. N Watson Lake, 5 mi. E Little Hyland River (seen by drivers, P. M. Youngman, MS, 14 June 1963); Watson Lake area, 1 July 1963 (seen, G. D. Tessier, MS).

Order PINNIPEDIA – Seals and walrus

Key to Yukon Pinnipeds

1	Hind limbs capable of rotating forward; alisphenoid canals present	2
1′	Hind limbs incapable of rotating forward; alisphenoid canals absent	3
2	Pinnae absent; upper canines enlarged forming tusks; postorbital processes absent .... *Rosmarus rosmarus*, p.	156
2′	Pinnae present, small; upper canines not enlarged; postorbital processes present .... *Callorhinus ursinus*, p.	156
3	First and second digits of manus longer than third; jugal bone long, narrow (depth of jugal less than half its length); mammae 2	4
3′	Third digit of manus longer than first two; jugal bone short, deep (depth of jugal not less than half its length); mammae 4 .... *Erignathus barbatus*, p.	158
4	Cheek-teeth large, length of P2 6.8 mm or more; colour usually of dark spots on paler background .... *Phoca vitulina*, p.	157
4′	Cheek-teeth small, length of P2 less than 6.8 mm; colour usually of whitish spots with dark centres .... *Phoca hispida*, p.	157

Family **Otariidae** – Eared seals
Callorhinus ursinus – Northern fur seal

***Callorhinus ursinus* (Linnaeus)**
Siren cynocephala Walbaum, *in* Artedi 1792:560; type locality, North Pacific Ocean, south of Alaska Peninsula, at approximately 53° N, 155° W (Stejneger 1936:278) (Based on the sea ape of Steller; see Stejneger 1936:285).
Callorhinus ursina cynocephala, Hall 1940:76.
Callorhinus ursinus, McEwen 1954:44; Scheffer 1958:83, Radvanyi 1960:277.

Distribution
Rare, along the coast.

Measurements
A male from Tent Lake measured: total length, 46½ in; tail, 2 in; ear, 1¼ in; weight, 54 lb. No cranial measurements are available from the Yukon.

Remarks
Specimens of the northern fur seal have been reported from Point Barrow, Alaska; Barter Island, Alaska; Letty Harbour, N.W.T. (69°50′/124°24′) (Radvanyi1960:277);and from Tent Lake, Yukon Territory (McEwen 1954:444). These wandering individuals may be more common than is generally supposed.

Records of occurrence
Specimens examined, 1; Tent Lake, 68°48′/136°42′, 1.

Family **Rosmaridae** – Walrus
Rosmarus rosmarus – Walrus

***Rosmarus rosmarus* ssp.**
Rosmarus rosmarus Linnaeus, 1758:38; type locality, Arctic regions.

Distribution
Coastal waters.

Measurements
"14 ft., 2,200 lbs., tusk 14 in." (Harington 1966:508). No cranial measurements are available.

Remarks
Sightings of walrus from coastal Yukon Territory have been summarized by Harington (1966). These and records from Alaska and the Northwest Territories indicate that walrus probably occur in Yukon waters fairly regularly, but not in large numbers.

Since no specimens have been collected from the coastal Yukon, subspecific determination cannot be made.

Records of occurrence
Specimens examined, 1: Herschel Island, off Avadlek Spit, 1.

Additional records
West shore Herschel Island (Harington 1966:508); Herschel Island (R. M. Anderson 1937:102, Porsild 1945:14); off Stokes Point (Harington 1966:509); between Stokes Point and Kay Point (Harington 1966:509); King Point (R. M. Anderson 1937:102).

Family **Phocidae** – Earless seals
Phoca vitulina – Harbour seal

Phoca vitulina **ssp.**
[*Phoca*] *vitulina* Linnaeus, 1758:38; type locality, European seas.
Phoca vitulina richardii, Porsild 1945:13; R. M. Anderson 1947:78; Dunbar 1949:9; Scheffer 1958:92.

Distribution
Coastal waters.

Measurements
None available from the Yukon.

Remarks
The occurrence of this seal in the Yukon waters rests on the undoubtedly correct identification of A. E. Porsild, who saw several that had been taken at Herschel Island in the fall of 1927.

Records of occurrence
Specimens examined, none.

Additional records
Herschel Island (Porsild 1945:13).

Phoca hispida – Ringed seal

Phoca hispida hispida **Schreber**
Phoca hispida Schreber, 1775; type locality, coasts of Greenland and Labrador.
Phoca hispida beaufortiana, R. M. Anderson 1943*b*:25.

Distribution
Coastal waters.

Measurements
A male and female from Herschel Island measured respectively 1,308, 1,187; 107, 114; 241, 279. Average (and extreme) cranial measurements (followed by the Standard Error of the mean) of 21 specimens (12 ♂, 9 ♀) are: condylobasal length, 159 ± 2.74 (139.1—177.3); mastoidal breadth, 98 ± 1.03 (88.8–106.5); least interorbital breadth, 5.6 ± 0.20 (3.8–7.7); palatal length, 65.4 ± 1.36 (53.6–76.4); nasal length, 35.2 ± 0.95 (28.5–44.9); nasal width, 10.9 ± 0.18 (9.5–12.2); occipital condyles, 52.8 ± 0.62 (49.5–56.9); post-canine series, 33.9 ± 0.45 (29.7–37.5); zygomatic breadth, 93.6 ± 1.61 (80.0–105.4).

Remarks
R. M. Anderson (1943*b*:25, 26), on the basis of 15 specimens, described *Phoca hispida beaufortiana* (type locality, Cockburn Point, Dolphin and Union Strait, N.W.T.) as differing from *P. h. hispida* by the following cranial characters: braincase not so rectangular, dorsal surface of braincase more flattened, heavier interorbital bridge, nasals less spreading anteriorly, distance between lateral edges of occipital condyles greater, palate slightly longer, palate more deeply and acutely notched, bullae larger, more pointed anteriorly and less rounded ventrally, mastoid portion of bullae longer and more massive, parietal ridges more distinct, size averaging larger.

My comparison of 39 specimens from Alaska, the Yukon Territory, and the extreme western Northwest Territories, with

22 specimens from the eastern Arctic, reveals a difference in only one of these characters. The braincase of *P. h. beaufortiana* does appear to be less rectangular than that of *P. h. hispida*. Also, in *P. h. beaufortiana,* the angle between the interorbital septem and posterior margin of the temporal foramin is more rounded than in *P. h. hispida.* A number of measurements were compared by scatter diagrams and other conventional statistical methods, but no significant differences could be found.

I conclude that there is considerable individual variation in *Phoca hispida* and that there are no trenchant characters that separate the eastern and western Arctic population at the subspecific level.

Harington (1966:511) pointed out that the eastern Arctic and western Arctic are separated throughout the year by solid ice in M'Clure Strait, Viscount Melville Sound, M'Clintock Channel, Victoria Strait and Queen Maud Gulf. The slight differences between the eastern and western demes of *Phoca hispida* are of the magnitude that might be expected in a panmictic population, with a slight restriction of gene flow caused by the pack ice.

Records of occurrence
Specimens examined, 90: Herschel Island, 29 (6 UBC); *Herschel Island, Pauline Cove,* 61.

Erignathus barbatus – Bearded seal

***Erignathus barbatus barbatus* (Erxleben)**
[*Phoca*] *barbata* Erxleben, 1777:590; type locality, coasts of Scotland, or southern Greenland or Iceland.
Erignathus barbatus, Gill 1866:12.

Distribution
Coastal waters.

Measurements
A male from Herschel Island measured 78 in; 4¾ in; 15 in. The cranial measurements (in mm), of the same specimen are: condylobasal length, 216; mastoidal breadth, 143; least interorbital breadth, 25.5; palatal length, 100; nasal length, 58.2; nasal width, 22.8; maxillary tooth-row, 57.7.

Remarks
R. M. Anderson (1930:99) considered the western subspecies *Erignathus barbatus nauticus* (Pallas) to be synonymous with *E. b. barbatus*, but Manning and Macpherson (1958:64) indicated that western specimens are more brachycephalic than eastern specimens. I have compared a series of eastern and western skulls and agree that some differences exist, but pending a revision of the species I consider these differences to be below the subspecific level.

Records of occurrence
Specimens examined, 2: Herschel Island, 1; *Herschel Island, Pauline Cove,* 1.

Order ARTIODACTYLA – Artiodactyls

Key to Yukon Artiodactyls

1	Frontal appendages (horns) not deciduous, present in both sexes; lacrimal articulating with nasal	2
1′	Frontal appendages (antlers) deciduous, absent in females of some species; lacrimal not articulating with nasal	5
2	Total length more than 2,000 mm; length of skull more than 350 mm; length of maxillary tooth-row more than 120 mm	3
2′	Total length less than 2,000 mm; length of skull less than 350 mm; length of maxillary tooth-row less than 120 mm	4
3	Horns smooth, conical; accessory column on inner side of molars not reduced; paroccipital processes widely separated from condyles . . . *Bison bison*, p.	167
3′	Horns rugose, flattened at base; accessory column on inner side of molars reduced; paroccipital processes not widely separated from condyles . . . *Ovibos moschatus*, p.	169
4	Tail longer than 150 mm; lacrimal pits absent; horns less than 150 mm in circumference at base . . . *Oreamnos americanus*, p.	168
4′	Tail shorter than 150; lacrimal pits present; horns more than 150 mm in circumference at base . . . *Ovis nivicola*, p.	170
5	Antlers more or less palmate	6
5′	Antlers not palmate	7
6	Antlers strongly palmate; length of skull more than 500 mm . . . *Alces alces*, p.	161
6′	Antlers slightly palmate; length of skull less than 500 mm . . *Rangifer tarandus*, p.	163
7	Posterior narial cavity divided by vomer . . . *Odocoileus hemionus*, p.	160
7′	Posterior narial cavity not completely divided by vomer . . . *Cervus elaphus*, p.	159

Family **Cervidae** – Cervids
Cervus elaphus – Red deer or wapiti

Cervus elaphus canadensis Erxleben

[*Cervus elaphus*] canadensis Erxleben, 1777;305; type locality, Quebec.

Distribution
Takhini River valley and vicinity of Hutshi Lakes in the southwestern Yukon.

Measurements
No measurements of the introduced herd are available.

Remarks
In 1951, 19 red deer were introduced (from Elk Island Park, Alberta) in the vicinity of Braeburn Lake, and in 1954, 30 more were released. The herds spread and reproduced in the subsequent years, but overall production has been poor. In 1967, there were only an estimated 43 animals in the Takhini River valley and in the vicinity of Hutshi Lake (A. M. Pearson 1967).

Records of occurrence
Specimens examined, none.

Additional records
Nordenskiold Valley, Hutshi Lakes area, 17 December 1963 (35 animals seen, A. M. Pearson, MS, 20 April 1965), 4 March 1965 (34 animals seen, A. M. Pearson, MS, 20 April 1965), 27 January 1966 (34 animals seen, A. M. Pearson, MS, 22 April 1966), 2 March 1966 (16 animals seen, A. M. Pearson, MS, 22 April 1966), 18 April 1966 (41 animals seen, A. M. Pearson, MS, 22 April 1966), 14 April 1967 (27 animals seen, A. M. Pearson, MS, 1967); Takhini River, Ibex River area, 26 January 1963 (5 animals seen, A. M. Pearson, MS, 20 April 1965), 4 March 1965 (12 animals seen,

A. M. Pearson, MS, 20 April 1965), 11 September 1965 (8 animals seen by hunter, A. M. Pearson, MS, 22 April 1966), 27 January 1966 (16 animals seen, A. M. Pearson, MS, 22 April 1966), 30 November 1966 (9 animals seen, A. M. Pearson, MS, 1967).

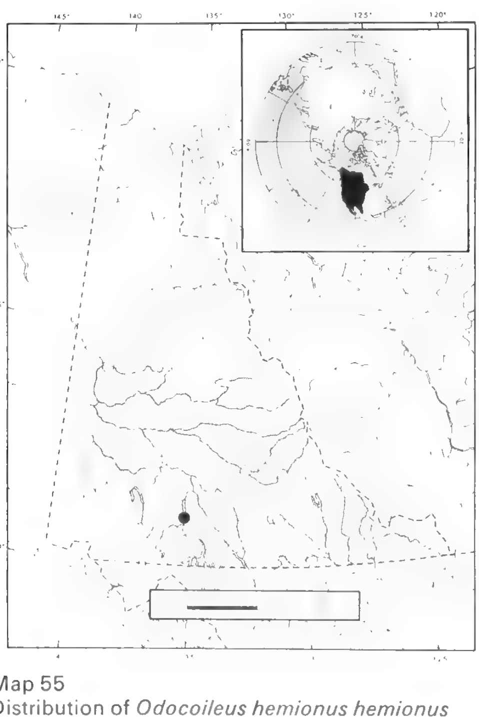
Odocoileus hemionus – Mule deer

Odocoileus hemionus hemionus **(Rafinesque)**

Cervus hemionus Rafinesque, 1817:436; type locality, mouth of Big Sioux River, S. Dak.
Odocoileus hemionus hemionus, Youngman 1964:5, 1968:81.
Odocoileus hemionus sitkensis, Rand 1945*b*:76; R. M. Anderson 1947:176; Miller and Kellogg 1955:799.
Dama hemionus sitkensis, Hall and Kelson 1959:1007.

Distribution
Southern half of the Yukon (Map 55)

Measurements
There are no specimens with external measurements available from the Yukon. Cranial mastoidal breadth, 86; maxillary tooth-row, hofen Island, Lake Laberge (Youngman 1964:5) are: basilar length, 262; length of nasals, 36; greatest width of nasals, 36; zygomatic breadth, 114; orbital width, 80; mastoidal breadth, 86; maxillary tooth-row, 88; palatal breadth, 50; greatest and least widths of anterior process of jugal below lacrimal, 20 and 10.



Map 55
Distribution of *Odocoileus hemionus hemionus*

Remarks
Adney (1900:445) recorded having seen deer tracks at Miles Canyon near Lake Laberge, and near Big Salmon in the fall of 1897. He reported that 10 years prior to that time deer were thought not to occur east of the coastal mountains.

Clarke (1944) recorded secondhand reports of sightings "in the Teslin and Little Atlin regions of southern Yukon Territory, as far north as Nisutlin River". He also stated, "I consider it certain that Mule Deer have occurred in the Yukon territory, in the Beaver, Smith, and perhaps Coal River Valleys, and that they will continue their present spread and increase."

Youngman (1964, 1968) reported the first known specimen from the Yukon and listed additional sight records.

There are reliable sightings of mule deer as far north as Dawson, but most of the records are from the southern Yukon,where they occur in the greatest numbers.

According to Youngman (1968), mule deer build up in numbers during favourable years, but wolves seriously deplete the herds during severe winters.

Records of occurrence
Specimens examined, 1: Richthofen Island, Lake Laberge, 1.

Additional records
Hunker Creek, 1950 (seen by C. Henderson, P. M. Youngman, MS, 30 June 1964); between Jackfish Lake and Ketza River, 1961 (reported sighting, T. O. Connolly, MS, 20 March 1962); Carmacks, 1964 (sighting reported, P. M. Youngman, MS, 18 June

1964); 15 mi. downstream from Ross River (Youngman 1964:5); Pelly Plateau (Youngman 1968:81); McPherson Lake (Youngman 1968:81); headwaters Frances River (Youngman 1968:81); 120 mi. up Liard River from Liard Crossing (Youngman 1968:81); Takhini River area, near Whitehorse (sighting reported, J. B. Fitzgerald, MS, 12 April 1962); about 2 mi. N Johnsons Crossing (Youngman 1964:5); Alaska Highway, S Atlin cutoff (sighting reported, J. B. Fitzgerald, MS, 12 April 1962); 45 mi. W Watson Lake (Youngman 1968:81); Tarfu Lake area, just E Atlin Road (Youngman 1964:5); *Atlin Lake, 33 mi. SE Tagish,* 1963 (tracks seen by Indians, P. M. Youngman, MS, 27 May 1963); *Atlin Road, immediately N British Columbia* border (sighting reported, J. B. Fitzgerald, MS, 12 April 1962).

Alces alces – Moose

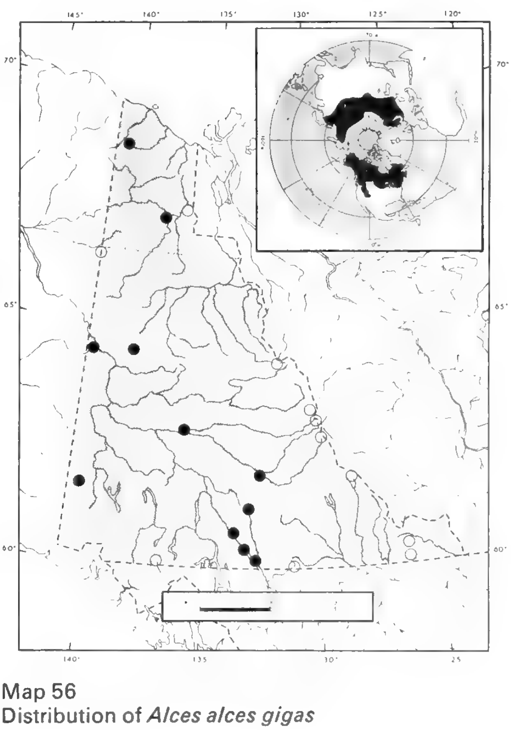
***Alces alces gigas* Miller**
Alces gigas Miller, 1899:57; holotype from N side Tustumena Lake, Kenai Peninsula, Alaska.
Alces alces gigas, Lydekker 1913–16:237; Peterson 1952:21 (part).
Alces americanus gigas, Osgood 1909*b*:72; Rand 1945*a*:49; R. M. Anderson 1947:177.
Alces americana andersoni, Peterson 1950:1 (part).
Alces alces, Youngman 1968:81.

Distribution
Found throughout the Yukon (Map 56).

Measurements
A male from British Mountains, 20 mi. SE Joe Creek, and a female from 13 mi. S Chapman Lake, measured respectively 2,680, 2,805; 100, 150; 830, 820; 260, 270. For cranial measurements see Table 37.

Remarks
Prior to 1950, three subspecies of moose were generally recognized in North America, *Alces americana americana* (Clinton) in the eastern range of the species as far west as northeastern British Columbia and District of Mackenzie, the larger *Alces a. gigas* in Alaska and Yukon Territory, and *Alces a. shirasi* Nelson in the Rocky Mountains of Wyoming, Idaho, Montana, and southeastern British Columbia.

Peterson (1950:1) gave the name *Alces a. andersoni* to the population occupying the area from northern Minnesota, Michigan, and western Ontario, westward to northwestern British Columbia and eastern Yukon Territory. Peterson (1955:14) theorized that these four nominal subspecies represented populations that had been restricted to four different refugia during the Wisconsin glaciation. I agree that *Alces alces gigas* was isolated in Beringia while the remaining populations were pushed south, but it is my opinion that *A. a. andersoni* is an intergrade population. The majority of features given by Peterson to separate *A. a. andersoni* from the adjacent subspecies are ratios of various cranial measurements, many of which vary in an east-west clinal pattern.



Map 56
Distribution of *Alces alces gigas*

Table 37
Cranial measurements of *Alces alces gigas*

Catalogue number, and sex of specimens	Greatest length	Basal length	Zygomatic breadth	Mastoidal breadth	Upper tooth-row crowns	Least width of palate between tooth-rows	Orbital breadth
Northern Yukon (British Mountains; Porcupine River)							
34113 ♂	605	538	247	177	144	69	246
30623 ♂	623	553	222	169	147	65	239
Central Yukon (Chapman Lake region)							
29839 ♂	665	602	225	187	147	69	240
29837 ♀	625	556	200	155	147	61	213
Southern Yukon (Teslin Lake area)							
2240 ♂	596	530	214	170	152	63	231
1829 ♂	632	555	215	171	145	63	227
1871 ♂	607	542	218	164	142	65	240
2244 ♂	582	524	202	144	158	51	206
2242 ♀	588	538	201	151	148	63	214
2251 ♀	591	532	213	160	145	61	220

Records of occurrence
Specimens examined, 53: British Mountains, 20 mi. SE mouth Joe Creek, 1; Porcupine River, 8 mi. N mouth Bell River, 1; *mouth Bell River,* 2; 6 mi. S Chapman Lake, 1; *13 mi. S Chapman Lake,* 2; *15 mi. S Chapman Lake,* 1; Fortymile Creek [= Fortymile River], 10 mi. above station, 8 (MVZ); Macmillan River, 3 (NMNH); Ross River, Canol Road, 1; *Lapie River, Canol Road, Mi. 120,* 1; Harris Creek, head White River, 1 (NMNH); Rose River, Canol Road, Mi. 95, 1; 30 mi. down Hootalinqua River [= 30 mi. down Teslin River], 1; 20 mi. N Teslin Lake, 1; *6 mi. down Hootalinqua River* [= *6 mi. down Teslin River*], 1; Teslin Lake, 2; *Teslin district,* 19; *Teslin Lake, 20 mi. from N end,* 3.

Localities not plotted
Sheep Mountains, E Atlin Lake, 1 (FMNH); Yukon Territory, 2.

Additional records
Richardson Mountains, 13 mi. NE Lapierre House, 28 July 1964 (sign seen, I. Stirling, MS); Bern Creek (Williams 1925:71); Bonnet Plume Lake, 14 July 1966 (seen, W. H. Butler, MS); Keele Lake, 8 August 1966 (seen by hunters, W. H. Butler, MS); Macmillan Pass, [Canol Road,] Mi. 282 (Rand 1945*a*:50); valleys Pelly River and its tributaries, Mackenzie Mountains (Keele 1910:24); Yukon–Northwest Territories boundary, Canadian–Tungsten Road, 11 June 1963 (seen, P.M. Youngman, MS); North Toobally Lake, 11 July 1961 (trails seen, P.M. Youngman, MS); Smith River inlet to South Toobally Lake (Youngman 1968:82); 5 mi. SE Dalton Post, 17 May 1963 (tracks seen, P. M. Youngman, MS); Swift River, summer 1944 (seen, C.H.D. Clarke, MS).

Rangifer tarandus – Caribou

***Rangifer tarandus caribou* (Gmelin)**
[*Cervus tarandus*] *caribou* Gmelin, *in* Linnaeus 1788:177; type locality, eastern Canada [=Quebec City].
Rangifer tarandus caribou, True 1885:592; Banfield 1961*b*:88 (part).
Rangifer montanus osborni, Osgood 1909*b*:74.
Rangifer ogilvyensis Millais, 1915:263.
Rangifer mcquirei Figgins, 1919:1.
Rangifer arcticus osborni, Murie 1935:81; Rand 1945*a*:50; R. M. Anderson 1947:179 (part); Hall and Kelson 1959:1020 (part).
Rangifer arcticus stonei, Murie 1935:76; R. M. Anderson 1947:179 (part).
Rangifer montanus selousi Barclay, 1935:306.

Distribution
Southern part of the Yukon intergrading, at times, with *R. t. groenlandicus* in the central Yukon (Map 57).

Measurements
A female from Rose River, Canol Road, Mi. 95, measured 1,870;—; 575. Figgins (1919) gives measurements of a male from Kletsan Creek as 2,472; 224; 659. For cranial measurements see Table 38.

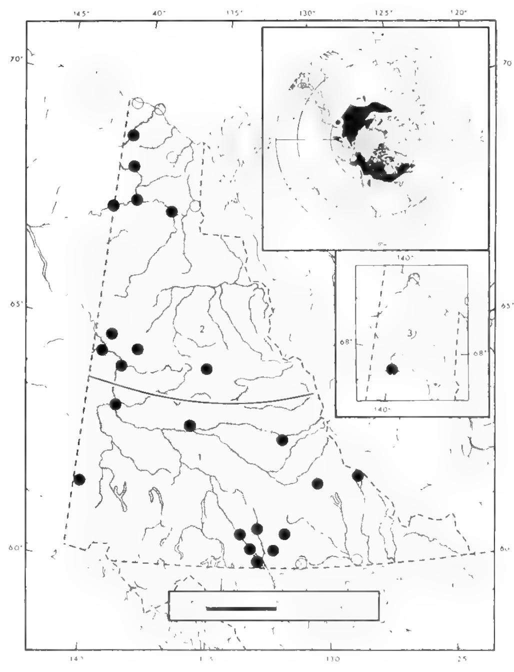
Remarks
Rangifer tarandus caribou differs from *R. t. groenlandicus* in having longer nasals; longer tooth-rows; longer, more gently tapering rostrum; less protruding orbits, with resulting shallower preorbital pits; longer lachrymal vacuities; antlers shorter and heavy, rather than long and rangy; beams flattened and usually brown rather than cylindrical and ivory coloured; large body; rump mirror, socks, and white on belly reduced (Figures 7 and 8, and Banfield 1961*b*: 43, 70).

Not all specimens of *Rangifer tarandus caribou* can be differentiated by any single character from *R. t. groenlandicus*, but most can be separated by an aggregate of external or cranial characters. Some of the characters used by Banfield (1961*b*) to separate *R. t. caribou* from *R. t. granti* (= *R. t. groenlandicus*), notably the measurements of the posterior nares and the arched or flattened condition of the nasal bones, did not prove diacritical in the present study.

Living woodland caribou are large "horsey"-looking animals with a long face, relatively subdued coloration, and short, heavy antlers with flattened beams.

The woodland caribou of Kamchatka, the Okhotsk coast, and Transbaikalia, U.S.S.R., resembles the woodland caribou from northwestern North America (Banfield, 1961*b*: 99), but is apparently a smaller subspecies. Insufficient specimens have been available, however, for adequate comparison.

Banfield (1961*b*) estimated 1,000 woodland caribou in the Yukon. With ever-in-



Map 57
Distribution of *Rangifer tarandus*
1 *R. t. caribou*
2 *R. t. groenlandicus*
3 *R. t. pearyi*

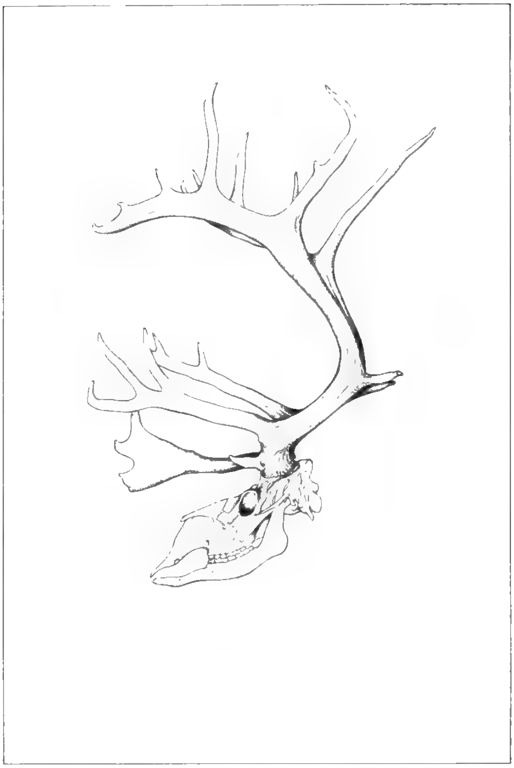


Figure 7
Skull of *Rangifer tarandus caribou,* Teslin District, 1912. No. 2264, ♂ NMC. Reduced to 6.5 per cent of natural size.

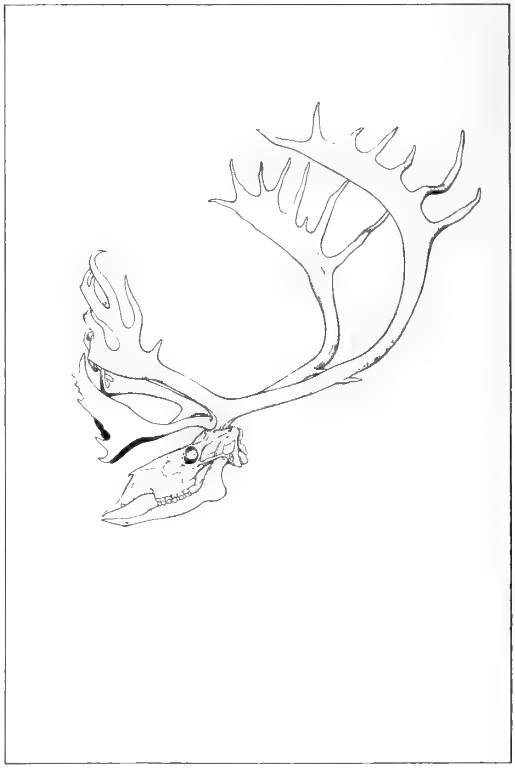


Figure 8
Skull of *Rangifer tarandus groenlandicus,* Old Crow, 1963. No. 35135, ♂ NMC. Reduced to 6.5 per cent of natural size

creasing accessibliity to those herds, their numbers are seriously endangered.

Records of occurrence

Specimens examined, 42; Stewart River, 1 (NMNH); *near mouth White River,* 3 (NMNH); Pelly River, Little Kalzas Lake, 2 (NMNH); *Macmillan River,* 1 (NMNH); fork Riddell Rivers, 2 (NMNH); Little Hyland River, 128 mi. N Watson Lake, 2; McEvoy Lake, 1; St. Clair [= St. Clare] Creek, head White River, 1 (NMNH); *Kletsan Creek, tributary White River, 4 mi. E Alaska–Yukon boundary,* 1 (DMNH); Rose River, Canol Road, Mi. 95, 1; *Rose River, Canol Road, Mi. 78,* 1; Hootalinqua [= Teslin] River, 1 (NMNH); Stoneaxe Lake, 1; *Wolf Lake, NE Teslin Lake,* 1; *Wolf Lake, 100* [?] *mi. E Teslin Lake,* 2; (FMNH); upper Hootalinqua [= upper Teslin] River, 1; English Creek, Wolf River, N Teslin, 1; Teslin district, 18; *Pike Lake, 75 mi. SE Whitehorse,* 1.

Additional records
Mountains between forks Macmillan River (Barclay 1935:306); *Mountains S south fork Macmillan River* (Barclay 1935:306); Watson Lake (signs seen, Clarke 1944); Swift River (signs seen, Clarke 1944).

Table 38
Cranial measurements of *Rangifer tarandus*

Number of specimens averaged or catalogue number, and sex	Basal length	Greatest orbital breadth	Nasal length	Length of maxillary tooth-row	Diastema
		Rangifer tarandus groenlandicus Old Crow region			
Average 5 ♂	346[5]	167	115	90	130
Max.	348	174	135	95	131
Min.	344	159	102	85	129
SD	2.2	6.3	12.7	3.9	1.0
SE	0.6	2.8	5.2	1.6	0.4
36090 ♀	297	148	105	81	113
36091 ♀	306	157	106	89	112
36092 ♀	306	155	99	91	113
		Dawson region			
22778 ♂	362	170	104	90	141
Average 5 ♀	331	159	106	88	125
Max.	339	167	117	93	131
Min.	325	155	97	84	118
SD	5.2	5.9	9.6	4.0	5.9
SE	2.3	2.7	4.3	1.8	2.6
		Rangifer tarandus pearyi Old Crow			
33435 ♀	272	140	93	92	94
		Rangifer tarandus caribou Southern Yukon			
Average 5 ♂	382	173	131	96	146
Max.	417	188	160	107	166
Min.	358	163	103	91	132
SD	22.5	1.0	21.7	6.5	16.6
SE	11.4	4.5	9.7	2.9	7.4
17816 ♀	332		110	95	128
146360 NMNH, ♀	347	174	105	93	135

Rangifer tarandus groenlandicus (Borowski)

Cervus gröenlandicus Borowski, 1784:72; type locality, Greenland.
Rangifer tarandus gröenlandicus, Lydekker 1898*b*:47.
Rangifer arcticus, Osgood 1909*b*:49.
Rangifer arcticus stonei, Murie 1935:79 (part).
Rangifer tarandus granti, Banfield 1961*b*:59.

Distribution
West-central and northern part of the Yukon (Map 57).

Measurements
A male from Porcupine River, 11 mi. N mouth Bell River, measured 1,930; 164; 558; 138; 250 lb. A female from 20 mi. S Chapman Lake, 64°35′/138°13′, measured 1,760; 165; 550. Osgood (1909*b*) gave measurements for a male from Coal Creek: 1,830; 140; 565. For cranial measurements see Table 38.

Remarks
For comparisons with *Rangifer tarandus caribou* and *R. t. pearyi* see Figures 7 and 8, and accounts of those subspecies.

I agree with Banfield (1961*b*:59) that the definition of the taxonomic status of the caribou from the Alaska Peninsula northward in Alaska and the northern Yukon is a difficult problem. There are relatively few specimens extant. The amount of intergradation with domestic Siberian reindeer in southern Alaska is problematical (Banfield 1961*b*) as is the amount of intergradation with woodland caribou. Banfield (1961*b*) assigned Alaskan and Yukon barren-ground caribou to *R. t. granti,* stating that "tundra caribou of the Alaska Peninsula and the Brooks Range of northern Alaska resemble each other closely. Although *granti* is generally slightly larger the differences are not statistically significant." However, he also said, "Subsequent statistical analysis indicated that the Brooks Range population could not be separated adequately from *groenlandicus,* and the southern groups could not be separated from *granti.* . . . caribou populations in Alaska and Yukon Territory indicate a broad belt of intergradation between the woodland caribou, *caribou,* and the tundra reindeer, *groenlandicus.*

Since the only statistically valid Alaskan race is *granti* of the Alaskan peninsula, one is faced with the possible choice of referring to all central and northern Alaskan populations as *granti* intergrades."

My interpretation of these statements is that, although Alaskan and Yukon barren-ground caribou show some evidence of intergradation with woodland caribou, they are statistically inseparable from *R. t. groenlandicus.* However, Banfield chose to regard these populations as intergrades between *R. t. caribou* and *R. t. groenlandicus,* to which he applied the name *R. t. granti* (although he referred to the specimens that he examined as "Intergrades between *granti, groenlandicus,* and *caribou*").

I compared cranial measurements of specimens from the northern Yukon with Banfield's measurements (1961*b*:128–129) of *Rangifer tarandus groenlandicus* and found the difference well below the conventional level of subspecific difference (C.D. less than 75 per cent n.o. in two measurements; less than 58 per cent n.o. in three measurements).

Records of occurrence
Specimens examined, 52: Firth River, 15 mi. S mouth Joe Creek, 1; Old Crow River, 40 mi. above Timber Creek, 1 (NMNH); Old Crow, 10; Porcupine River, Rampart House, 2 (NMNH); Porcupine River, 11 mi. N mouth Bell River, 1; head Coal Creek, 64°47′/139°54′, 2 (NMNH); 20 mi. S Chapman Lake, 1; Forty Mile, 3 (2 MVZ, 1 KSU); *Fortymile River,* 16 (15 MVZ, 1 KSU); *Dawson, Clinton Road, Mi. 5,* 1; *Fortymile Creek* [= *Fortymile River*], *10 mi. above station,* 5 (MVZ); *Dawson, Forty Mile Road, Mi. 42,* 3; *Dawson, Forty Mile Road, Mi. 40,* 2; *Dawson, Forty Mile Road, Mi. 35,* 1; McQuesten Lake, 1; Dawson, Forty Mile Road, Mi. 15, 1.

Localities not plotted
Yukon–Alaska boundary, 1 (NMNH).

Additional records
30 mi. W Herschel Island, 14 August 1909 (seen, R. M. Anderson, MS); shoal water, S Herschel Island (Russell 1898:226); SE Fitton Mountain, 3 August 1964 (herd seen, P. M. Youngman, MS); Summit Lake,

67°43′/136°29′, 16 August 1968 (droppings, tracks, shed antlers seen, D.A. Gill, MS); *Richardson Mountains, 13 mi. NE Lapierre House,* 27 July, 1964 (tracks seen, I. Stirling, MS).

Rangifer tarandus pearyi J. A. Allen

Rangifer tarandus pearyi J. A. Allen, 1902:409; holotype from Ellesmere Island, 79° N, N.W.T.

Distribution
Occasionally migrates at least as far south as Old Crow (Map 57).

Measurements
None available for specimens from the Yukon. For cranial measurements see Table 38.

Remarks
Rangifer tarandus pearyi can be distinguished from *R. t. groenlandicus* by its small size, near-white winter pelage, and slate-coloured summer pelage.

Banfield (1961*b*:63) commented on a specimen collected at Cape Dalhousie, N.W.T., from a herd that crossed Amundsen Gulf during the winter of 1951–52. Peary's caribou were also sighted during that same winter at Baillie Island, N.W.T., and on the mainland near Herschel Island, Yukon Territory (Manning and Macpherson 1958:67).

An adult female from Old Crow (NMC 33435) collected by Richard Nukon during the winter of 1963–64 is referred to *R. t. pearyi* on the basis of its small cranial measurements. When the measurements of this specimen are compared to measurements of *R. t. groenlandicus and R. t. pearyi* by the "t" test method of comparing a single specimen with a sample (Simpson, Roe, and Lewontin 1960:182), the Old Crow specimen shows a closer similarity to *R. t. pearyi* in four out of five measurements, and a closer similarity to the Dolphin and Union herd of intergrade *pearyi* and *arcticus* [= groenlandicus] (Manning 1960) in the remaining measurement (length of nasals).

Hunters from Old Crow have often commented on the occasional occurrence of small caribou, mixed with herds of larger animals (personal communications).

Records of occurrence
Specimens examined, 1: Old Crow, 1.

Additional records
Mainland near Herschel Island (Manning and Macpherson 1958:67).

Family **Bovidae** – Bovids
Bison bison – Bison

Bison bison bison (Linnaeus)

[*Bos*] bison Linnaeus, 1758:72; type locality, ancient "Quivera", central Kansas.
B[*ison*]. bison, Jordan 1888:337.

Distribution
Last seen in the Nisling River Valley. Probably extirpated.

Measurements
No measurements from the introduced herd are available.

Remarks
A number of Pleistocene species of bison formerly occupied the Yukon (Skinner and Kaisen 1947) perhaps including the woodland bison (*Bison bison athabascae* Rhoads).

In 1951 the Canadian Wildlife Service released five bison (*Bison bison bison*)—three cows and two bulls—in the Braeburn Lake area of the Yukon (gift of the United States Government, introduced from Alaska, originally from Montana). One of the bulls was shot illegally in 1958. Since their release, the bison have wandered widely, remaining for some time in the Nisling River Valley. So far as I can determine, no bison have been seen since 1963. There is inconclusive evidence that the herd may have bred.

Records of occurrence
Specimens examined, none.

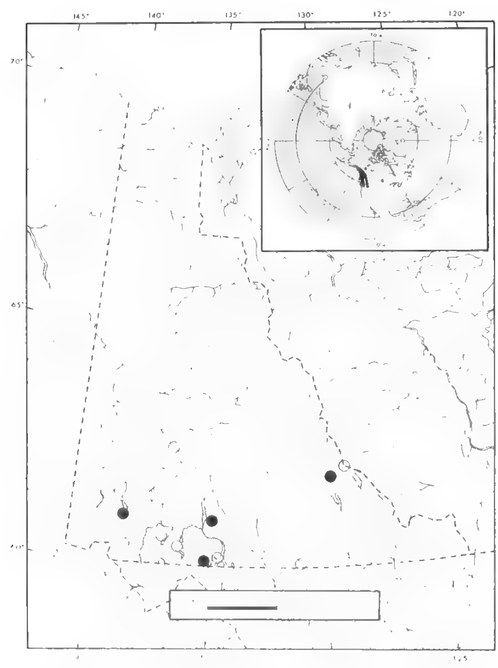
Additional records
Nisling River valley area, autumn 1953—7 animals seen; July 1955—5 animals seen; winter 1961—4 animals seen; 31 May 1963—4 animals seen (A. M. Pearson, MS, 20 April 1965).

Oreamnos americanus – Mountain goat

***Oreamnos americanus* (Blainville)**
Oreamnos americanus americanus (Blainville), 1816:80; type locality, Cascade Range near Columbia River, Oregon or Washington.
Oreamnos americanus columbiae, Rand 1945*b*:86; R. M. Anderson 1947:186; Hall and Kelson 1959:1027.
Aploceras montanus, Ross 1861:442.
Oreamnos americanus, Youngman 1968:82.

Distribution
Southern Yukon (some unconfirmed sightings from the Ogilvie Mountains) (Map 58).

Measurements
No external measurements are available from Yukon specimens. Cranial measurements of a male from the southern Yukon are: greatest length, 301; zygomatic breadth, 106; greatest orbital breadth, 125; nasal length, 107; alveolar length of maxillary tooth-row, 74; length of diastema, 86; palatal breadth at M3, 49.



Map 58
Distribution of *Oreamnos americanus columbiae*

Remarks
Cowan and McCrory (1970) have shown that the northern population of mountain goats differs from the two southern populations more than the latter differ from each other. These authors postulate a Beringian refugial origin for the northern population to explain the divergence. There is little evidence to support this thesis (see Hoffman and Taber 1967), but *Oreamnos* may have been an early migrant to Beringia.

The distribution of mountain goats in some of the rugged mountains of the southern Yukon is well documented, but only sight records exist for more northern areas in the Yukon. Sight records for Carmacks are probably correct. Records for the Ogilvie Mountains, NE of Dawson, are open to suspicion, since the area has been hunted for some time without producing a specimen. Nevertheless one of the observers was an experienced game guide.

MacNeish (1959) found bones of *Oreamnos* in a postglacial archaeological site (est. 4000 B.P.) in the extreme northern Yukon. Whether *Oreamnos* has occurred in the northern Yukon within historical times is open to question.

Various authors have uncritically accepted Ross's record (1861:442) of three specimens from Lapierre House. These specimens are not known to be still in existence, but admitting that they once existed is not sufficient to document a recent northern Richardson Mountain distribution for *Oreamnos,* since the specimens could have been obtained by trade from Indians far to the south. Lapierre House is very near mountain sheep range and it is quite possible that the specimens were fragmentary remains of sheep.

Records of occurrence
Specimens examined, 6: Ida Lake [= McPherson Lake], 60 mi. W Glacier Lake, N.W.T., 1; Teslin Mountains, 1 (NMNH); Bullion Creek, Slims River, 1; mountains off Lake Bennett, 10 mi. from British Columbia border, 3.

Additional records
Williams Creek, 62°23′/136°37′, 1939 (killed by J. Brown, P. M. Youngman, MS, 21 July 1961); *Yukon valley [near Carmacks]*, 1928 (killed by H. LePage, P. M. Youngman, MS, 21 July 1961); *between Carmacks and Selkirk* (two sighted by S. Bates, P. M. Youngman, MS, 21 July 1961); head Nahanni, Hyland, and Pelly rivers (NMC 1821–1823, not found); Dezadeash Mountains, 30 July 1943 (seen, Clarke 1944); *mountains near Lake Kathleen and Dezadeash Lake* (Lake 1945:29); Lake Arkell [= Kusawa Lake] (NMC 1507, not found); around glaciers, Saint Elias Range, draining towards Alsek [River] ("patches of abundance," Clarke 1944); Little Windy Arm, Lake Tagish (Rand 1945*b*:86); Swift River area (seen by C. S. Lord, Clarke 1944).

Additional records not plotted
Hills around the [McDougall] Pass (Ogilvie 1890:66); Lapierre House (Ross 1861:442); near Sheep Mountain (Ogilvie 1890:53); 11 mi. S Chapman Lake (seen by H. Truman, P. M. Youngman, MS, 23 July 1961); near Tombstone Mountain, 13 July 1964 (seen, D. R. Harrison, MS, 14 July 1964); near Tombstone Mountain and Wolf Creek (seen by T. Worbets, P. M. Youngman, MS, 18 August 1961); lower Bonanza [Creek], 1949 (seen by C. Henderson, P. M. Youngman, MS, 30 June 1964); near Wolf Lake (Rand 1945*b*:86).

Ovibos moschatus – Musk-ox

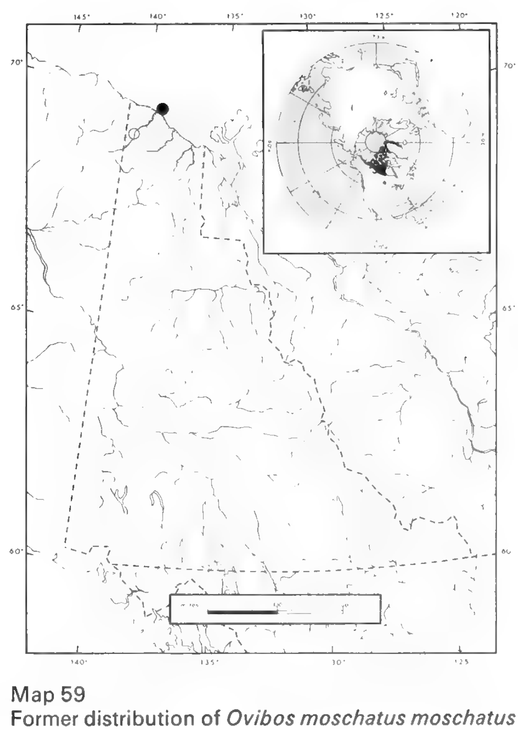
Ovibos moschatus moschatus (Zimmermann)
Bos moschatus Zimmermann, 1778:86; type locality, between Seal and Churchill rivers, Man.
Ovibos moschatus, Desmarest 1822:492; Hone 1934:7; Rand 1945*b*:83.

Distribution
Extinct in the Yukon. Possibility of wanderers from Alaskan herd. Probably formerly occurred along the entire coast (Map 59).

Measurements
None available for specimens from the Yukon.

Remarks
The recent occurrences of musk-oxen in the Yukon has been based on reports of a skull found on Herschel Island in 1908 (Stefannson 1912; R. M. Anderson 1913*a*). Richardson (1829:276) learned from Indians that musk-oxen inhabited the barren grounds west of the Mackenzie River, and Russell (1898) commented on the former range between the Mackenzie River and Bering Strait as evidenced by skeletal remains.

On 22 July 1969, David A. Gill and Peter Goenard flew from Herschel Island to Inuvik, N.W.T., in a Cessna 185 piloted by Leon Goenard. At 8:30 p.m. all were astonished at sighting two musk-oxen on the Yukon coast, four miles west of King Point. Some time after the sighting, Eskimos were report-



Map 59
Former distribution of *Ovibos moschatus moschatus*

ed to have killed both animals, a sad ending for what might have been the nucleus of a Yukon herd. Both animals evidently came from the Arctic Slope of Alaska opposite Barter Island, some 150 miles away, where 52 animals were introduced from Nunivak Island, Alaska, on 11 April 1969.

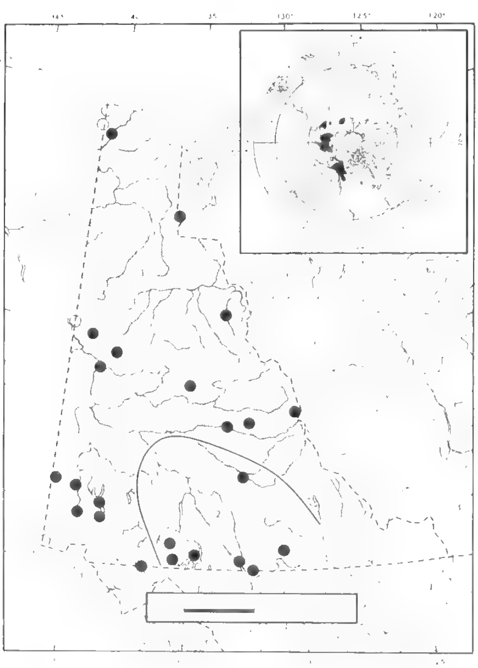
Records of occurrence
Specimens examined, 1: Herschel Island, Pauline Cove, 1.

Additional records
Joe Creek, Firth River (MacNeish 1959:51).

Ovis nivicola – Mountain sheep

Ovis nivicola dalli **Nelson**
Ovis montana dalli, Nelson 1884:13; holotype from mountains S of Fort Yukon on west bank of Yukon River, Alaska.
Ovis n (ivicola). dalli, Nasonov 1923:124.
Ovis dalli, Osgood 1909*b*:51.
Ovis dalli dalli, Cowan 1940:525 (part); Rand 1945*b*:84 (part); Hall and Kelson 1959:1034 (part); Youngman 1968:82.
Ovis dalli stonei, Cowan 1940:532 (part), Hall and Kelson 1959:1035 (part).

Distribution
The northern, southwestern and southeastern parts of the Yukon (Map 60).



Map 60
Distribution of *Ovis nivicola*
1 *O. n. dalli*
2 *O. n. stonei*

Measurements
A male from 20 mi. S Chapman Lake, measured 1,375; 97; 410. Two males from the Yukon–N.W.T. boundary, 19 mi. SW Horn Lake, measured respectively 1,370, 1,410; 119, 122; 102, 96. For cranial measurements see Table 39.

Remarks
This subspecies differs from *Ovis nivicola stonei* in being almost pure white, (as opposed to near black) and in averaging smaller in a number of cranial measurements (Cowan 1940:526). The range of *O. n. dalli* as shown in Map 60 has been drawn at a theoretical halfway zone between the broadly intergrading ranges of *O. n. dalli* and *O. n. stonei.* Thus some dark sheep are found in the region allocated to *O. n dalli* and some nearly pure-white sheep are found within the indicated range of *O. n. stonei* (for further discussion of intergradation see Sheldon 1911:299–322; and Cowan 1940:527).

Varying opinions have been expressed on the systematic status of North American and Siberian sheep (Chernyavskii 1962). Most North American authors (J. A. Allen 1912; Seton 1927; Cowan 1940; R. M. Anderson 1947; Miller and Kellogg 1955; Hall and Kelson 1959) have considered that there are two species of sheep in North America (*Ovis dalli* and *O. canadensis*), neither being conspecific with Asian sheep. However, Rausch (1963*b*:31) considered *O. nivicola* and *O. dalli* as probably conspecific. Many Old World authors (Lydekker 1898*a*; Tsalkin

1951; Pfeffer 1967; Ellerman and Morrison-Scott 1951; Heptner, Nasimovic, and Bannikov 1966) considered eastern Siberian and North American sheep to be conspecific, the name *Ovis canadensis* having priority. Others (Nasonov 1923) considered *O. nivicola* and *O. dalli* to be conspecific, with *O. canadensis* occurring only in North America. A third group (Severtsov 1873*a*; Chernyavskii 1962) considered *O. nivicola* in eastern Siberia, and *O. dalli* and *O. canadensis* in North America, to be separate species. Chernyavskii (1962) concurred with Cowan (1940) that *Ovis nivicola, Ovis dalli* and *Ovis canadensis* are separate species. However, Chernyavskii thought that *Ovis nivicola* and *Ovis dalli* more closely resemble each other than either resembles *O. canadensis,* although Cowan (1940) thought that *O. nivicola* and *O. dalli* differ from each other as greatly as the latter differs from *O. canadensis.* Cowan (1940:509) considered that the short, wide skull, the small size of the rump patch, and the smoother horns of *Ovis nivicola* are enough to separate it, at the species level, from *O. dalli* and *O. canadensis.* Chernyavskii (1962) compared his own measurements of *O. nivicola* with Cowan's measurements (1940) of *O. dalli* and *O. canadensis.* He pointed out that the length of the nasal bones of *O. canadensis* noticeably exceed those of *O. dalli* and *O. nivicola,* but he agreed with Cowan that the orbital width of *O. nivicola* is significantly greater than in the two North American forms, the ratio of orbital width to basal length averaging 49.2 per cent in *O. nivicola,* and in *O. dalli* and *O. canadensis* only 44.9 and 44.5 per cent. Chernyavskii also showed that the rostrum and occipital regions of the skull in *O. nivicola* are relatively broader than in the North American species, and the white rump patch in *O. nivicola* does not extend onto the back above the base of the tail. However, Chernyavskii disagreed with Cowan's observation that the surface of the horns of *O. nivicola* is smoother than in *O. dalli.* My own observations generally agree with those of Chernyavskii.

My measurements of *O. nivicola,* however, show a wide range in the ratio of orbital width to basilar length. Four males of *O. n. kenaensis* in the National Museum of Natural History, Washington, average 46.6 per cent, and seven males of *O. n. stonei* in the National Museums of Canada average 45.7 per cent. Some individuals of *O. nivicola* from Siberia have ratios as low as 45.7 per cent and some individuals from North America have ratios as high as 48.4 per cent.

Thus the ranges of orbital width–basilar length ratios for Siberian and North American specimens overlap, with the means separated by four or five mm. Also, the Siberian specimens have a slightly smaller rump patch (NMNH 242245). These characters are of the magnitude that could be expected in mammals the size of sheep separated by a relatively short time-span at the Bering Strait, and in my opinion, are at the subspecific level.

Various explanations have been given for the origin of native sheep in North America. Severtsov (1873*a,b*), Nasonov (1923), and Sushkin (1925) argued for a double migration between Asia and North America across the Bering Land Bridge, the ancestors of *Ovis ammon* being early migrants that split into northern *(O. nivicola)* and southern forms (*O. canadensis*). The northern form later crossed the Bering Land Bridge to populate eastern Siberia.

Cowan (1940) suggested that *Ovis canadensis* and *Ovis dalli* were more recent and specialized descendants of *Ovis nivicola.* He proposed a single migration of the ancestors of *Ovis nivicola* to North America in late Pliocene or early Pleistocene, and a separation of the immigrants into northern and southern segments during glacial times, giving rise to *Ovis dalli* in the north and *Ovis canadensis* in the south.

Stokes and Condie (1961:608) believed that the fossil Great Basin sheep (*Ovis catclawensis*) is more closely related to *Ovis ammon* than to *Ovis canadensis.* They believed that it evolved into *O. dalli* in northwestern North America, and *O. canadensis* in western North America, thus substantiating Severtsov's theory rather than Cowan's.

Stock and Stokes (1969), however, reexamined the fossil Great Basin specimens and concluded that they most closely resemble *Ovis canadensis,* rather than *O. ammon,* thus supporting the single migration theory. They mentioned "considerable differences" between *Ovis nivicola,* and *Ovis dalli,* and noted that the subspecies of *O. canadensis* geographically closest to *O. dalli* (*O. c. canadensis*) is the least like *O. dalli,* while the remaining subspecies bear greater resemblance to *O. dalli* and *O. nivicola.* They also noted the resemblance be-

Table 39
Cranial measurements of *Ovis nivicola*

Number of specimens averaged or catalogue number, and sex	Ratio of orbital width to basilar length	Basilar length	Length of rostrum	Nasal length	Nasal width	Orbital width	Zygomatic width	Maxillary width	Mastoidal width	Palatal breadth at M3	Palatal breadth at PM2	Length of upper molar series	Prealveolar length
						Ovis nivicola Eastern Siberia (various localities)							
194254 NMNH, ♂	51.0	250	161	96	48	128	131	91	91	56	34	72	76
22202 NMNH, ♂	50.8	240	157	91	40	122	123	82	93	51	37	68	75
21339 NMNH, ♂					39	118	124	88	89	57	32	74	
22201 NMNH, ♂	49.4	243	156	86	42	120	122	85	97	53	34	74	73
239325 NMNH, ♂	46.5	243	158	89	41	113	120	83	89	56	32	75	75
194204 NMNH, ♂	45.7	242	158	90	37	111	120		87	53		69	
22690 AMNH, ♂	51.3	236		93	42	121	119	84	114	53	31	70	71
18212 AMNH, ♂	47.0	236		82	42	111	118	79	96	50	33	65	72
18211 AMNH, ♂	51.3	230		70	35	118	111	80	95	51	31	75	71
Average 15 ♂ (from Chernyavskii 1962)	49.2	247		92		122				50		72	
Max.	52.6	250		96		128				53		76	
Min.	47.5	242		89		118				46		65	
						Ovis nivicola dalli Alaska; Yukon; Northwest Territories; (corrected from Cowan 1940)							
Average 18 ♂	45.2[8]	249[16]		91[7]	44[7]	112[7]	122[8]	83[17]	89	52[17]	34	76[17]	78[17]
Max.	46.9	256		102	46	116	127	90	96	56	36	82	82
Min.	42.8	235		85	38	108	118	75	84	48	28	72	73
SD	1.49	6.20		7.25	3.25	3.93	3.24	4.05	2.99	2.42	2.22	3.05	2.88
SE	5.29	1.60		2.96	1.35	1.60	1.22	1.01	.72	.60	.53	.76	.72

Number of specimens averaged or catalogue number and sex	Ratio of orbital width to basilar length	Basilar length	Length of rostrum	Nasal length	Nasal width	Orbital width	Zygomatic width	Maxillary width	Mastoidal width	Palatal breadth at M3	Palatal breadth at PM2	Length of upper molar series	Prealveolar length
Ovis nivicola dalli Yukon Territory (various locations)													
131434 NMNH, ♂	48.4	250	173	93	48	121	122	87	89	53	36	74	79
205153 NMNH, ♂			167			121	127	89		54	31	79	76
29841 ♂			166	97	44	115		86		47	36	79	79
134491 NMNH, ♀	43.1	234	162	93	40	101	110	78	80	49	32	69	76
134467 NMNH, ♀	44.0	227		75	34	100	114	74	76	48	30	68	72
Ovis nivicola stonei Southeastern Yukon													
Average 7 ♂	45.7	255^{6}	152^{6}	97^{4}	45^{6}	116	114^{6}	85	85^{6}	53	35	75^{6}	80^{5}
Max.	48.3	260	178	109	52	125	125	89	93	64	38	77	83
Min.	44.0	247	93	89	38	109	89	83	78	45	30	71	76
SD	183.78	5.34	32.47	8.41	4.69	6.04	12.84	3.98	6.49	6.21	3.05	2.76	3.21
SE	75.03	2.18	13.26	4.20	1.92	2.28	5.24	1.50	2.65	2.35	1.15	1.13	1.43

tween the eastern subspecies of *Ovis ammon* and *O. canadensis.*

As I have suggested previously, I do not agree that there are great differences between *Ovis nivicola* and *Ovis dalli.* The cranial and colour differences are minor. If we were dealing with rodent-size animals, even a modern "splitter" would hesitate to rank them as full species.

The present distribution and divergence of Siberian and North American sheep suggest to me a single migration with the subsequent splitting off of Siberian populations (*O. n. nivicola,* etc.), Beringian populations (*O. n. dalli, O. n. kenaensis*), a southern Rocky Mountain isolate (*O. n. stonei*), and southern populations (*O. n. canadensis,* etc.).

At the end of the Wisconsin, as the ice-free corridor opened between the Cordilleran and Keewatin glaciers, the dark-coloured *stonei* moved northward, intergrading with *O. n. dalli* in northern British Columbia and southern Yukon. The region of intergradation is almost entirely within the previously glaciated area immediately to the south of the boundary of unglaciated Beringia. Most of the sheep that occur within the unglaciated region are white.

I tentatively follow Lydekker, and others, in considering Siberian and Northern American sheep to be conspecific.

Records of occurrence
Specimens examined, 48: Firth River, Joe River [= Firth River, Joe Creek], 2 (NMNH); Yukon–Northwest Territories boundary, 19 mi. SW Horn Lake, 2; Ogilvie Range, 2 (UBC); head Eagle Creek, 40 mi. NE Eagle River, Alaska, 1 (NMNH); *head Coal Creek,* 64°47'/139°54', 8 (NMNH); 20 mi. S Chapman Lake, 1; Dawson, 2 (1 AMNH, 1 NMNH); *Dawson City, Northwest Territories* [= Dawson], 1 (BCPM); *Klondike River,* 1 (NMNH); Mayo Lake, upper Stewart River, 1 (NMNH); 275 mi. NNE Whitehorse, Selwyn Range, Keele Peak, 1 (MZ); Macmillan River, opposite Husky Dog Creek, 5 (NMNH); north fork Macmillan River, 1 (NMNH); Yukon–Alaska boundary, White River, 3 (NMNH); Wolverine Creek [head Donjek River], 1 (NMNH); Kluane Lake, 1 (NMNH); *Congdon Creek* [*near Kluane*], 1 (MCZ); *W flank Sheep Mountain, near Sheep Creek* [*near old Alaska Highway*], 1; Donjek Valley, 5 (AMNH); *head Donjek River,* 2 (FMNH); Slims River, 2 (MCZ); Yukon–British Columbia boundary, head Tatshenshini River, Haines Road, 1.

Localities not plotted
Yukon Mountains, 3.

Additional records
British Mountains, 15 mi. from Arctic coast (International Boundary Commission 1918: 281); Joe Creek, latitude 68°56' (International Boundary Commission 1918:281); ranges between Porcupine and Black rivers (International Boundary Commission 1918: 281); near Tatonduk River (International Boundary Commission 1918:280); northern slopes Mount Saint Elias (International Boundary Commission 1918:280).

Ovis nivicola stonei J. A. Allen

Ovis stonei, J. A. Allen, 1897:111; holotype from Che-on-nee Mountains, headwaters Stikine River, B.C.
Ovis n[*ivicola*]. stonei, Nasonov 1923:125.
Ovis dalli stonei, Osgood 1909*b*:77; Cowan 1940:525 (part); Rand 1945*b*:84 (part); Hall and Kelson 1959:1034 (part).

Distribution
The south-central portion of the Yukon (Map 60).

Measurements
No external measurements are available for specimens taken in the Yukon Territory. For cranial measurements see Table 39.

Remarks
For comparison of this subspecies with *O. c. dalli* see account of that subspecies.

Records of occurrence
Specimens examined, 45: Pelly River, Lapie River, 8 (NMNH); *Lapie River, Canol Road, Mi. 132,* 2; 16 mi. W Robinson, 1 (NMNH); Cassiar Mountain region, 6 (NMNH); Twelve Mile River [= Twelve Mile Creek, 60°15'/134°28'], 4 (AMNH); *Carcross,* 2; Tow-we-oh, vicinity Teslin Lake, 1; *Teslin Lake region,* 12; head Watson River, 50 mi. W Robinson, 2 (FMNH); head Morley River, 30 mi. SE Teslin, 7.

These species have not been collected as specimens nor are there satisfactory sight records documenting their occurrence in the Yukon Territory.

Myotis volans (H. Allen)
Swarth (1936:400) recorded the northernmost specimens of the long-legged bat from the south end of Atlin Lake, B.C., approximately 60 miles south of the Yukon–British Columbia boundary.

Eptesicus fuscus (Palisot de Beauvois)
Reeder (1965:332) collected an adult female big brown bat from near the crossing of Shaw Creek and the Richardson Highway, 64°15′/145°50′ in east-central Alaska, approximately 150 miles west of the Alaska–Yukon boundary.

Lepus othus othus Merriam
Bee and Hall (1956:34) listed records of Alaska hares from as far east in Alaska as the Kuparuk River, 149°02′00″/70°16′30″.

Lepus arcticus andersoni Nelson
Howell (1936*b*:328) recorded a specimen from as far west as Fort Anderson, District of Mackenzie. Porsild (1945) reported, "Signs probably of this species were seen in the Richardson Mountains west of Aklavik in July, 1933, and, on gravel ridges in the foothills between the delta and Shingle point." The absence of arctic hares and Alaska hares from the Arctic Slope of the Yukon Territory may reflect different refugial origins for the two forms.

Monodon monoceros Linnaeus
Huey (1952:496) records a specimen of a narwhal from the mouth of the Colville River, Alaska, and Bee and Hall (1956:160) list other records from Point Barrow, Alaska.

Orcinus orca Linnaeus
Bee and Hall (1956:162) listed records from as far east as Point Barrow, Alaska. Hinton and Godsell (1954:116) recorded a killer whale taken off Herschel Island. However, the alleged stomach contents of this specimen are suspiciously close to those reported by Eschricht (1866:159). Killer whales undoubtedly occur in Yukon waters.

Phocoena phocoena (Linnaeus)
Bee and Hall (1956:164) recorded two harbour porpoises collected at Elson Lagoon, 156°20′00″/71°21′30″ and other more western records from the Arctic Slope of Alaska.

Eschrichtius gibbosus (Erxleben)
Bee and Hall (1956:165) recorded grey whales from Point Barrow, Alaska.

Phoca fasciata Zimmermann
Ribbon seals have been reported from Point Barrow, Alaska, by various authors (Bee and Hall 1956:226).

Phoca groenlandica Erxleben
Porsild (1945:13) recorded a harp seal taken at Aklavik, District of Mackenzie, in 1926.

Cystophora cristata (Erxleben)
Porsild (1945:13) recorded the killing of a hooded seal at Herschel Island in 1931. Although Porsild did not see the animal, he believed that there was conclusive evidence backing the identification. Porsild also recorded a hooded seal killed at Tuktoyaktuk, District of Mackenzie, in 1941–42.

The original name combination is followed by the type locality as cited in the original description. Emendations and coordinates, where added, are enclosed in brackets.

Lepus saliens, Caribou Crossing, between Lake Bennett and Lake Tagish, Northwest Territory, Canada [= Carcross, 60°10'/134° 42', Yukon Territory].

Eutamias caniceps, Lake Lebarge, Northwest Territory, Canada [= Lake Laberge, Yukon Territory].

Sciuropterus yukonensis, Camp Davidson, Yukon River, near Alaska–Canada boundary [= 64°40'51"/140°54'31"].

Evotomys dawsoni, Finlayson River, a northern source of Liard River, N.W.T. [= Yukon Territory 61°30'/129°30'; altitude, 3,000 ft]

Microtus pennsylvanicus alcorni, 6 mi. SW Kluane, 2,550 ft elevation, Yukon Territory, Canada [= 61°01'/138°31'].

Microtus cantator, tundra slide above timberline on mountaintop near Tepee Lake on north slope of St. Elias Range. Tepee Lake is at head of Harris Creek, which runs west-northwest into Genero [= Generc] River, which runs north into White River, a tributary of Yukon River; about 21 miles east of Alaska–Yukon International Boundary, about latitude 61°35', longitude 140°22'; about 18 miles southeast of Canyon City (on White River); about 18 miles northeast of Mount Constantine and Klutlan Glacier; and about 45 miles northwest of northwest arm of Kluane Lake.

Fiber spatulatus, Lake Marsh, Northwest Territory, Canada [= Marsh Lake, Yukon Territory].

Dicrostonyx torquatus nunatakensis, Yukon Territory: 20 mi. S Chapman Lake (64°35'/ 138°13'), 5,500 ft.

Euarctos randi, Sheldon Mountain, Canol Road, mile 222, Yukon Territory, Canada; latitude about 62°30' north, longitude 131° west; altitude, about 4,000 ft.

Ursus rungiusi sagittalis, Champagne Landing, southwestern Yukon [= Champagne, 60°47'/136°29'].

Ursus crassus, upper Macmillan River, Yukon.

Ursus internationalis, Alaska–Yukon Boundary about 50 miles south of Arctic Coast (lat. 69°00'30").

Ursus kluane, McConnell River, Yukon Territory

Ursus oribasus, Upper Liard River, Yukon, near British Columbia boundary.

Ursus pallasi, Donjek River, southwestern Yukon Territory.

Ursus pellyensis, Ketza Divide, Pelly Mountains, Yukon.

Ursus pulchellus pulchellus, Ross River, Yukon Territory, Canada.

Rangifer montanus selousi, mountains south of South Fork of Macmillan River, Yukon Territory, 5,000 ft.

Tarandus rangifer ogilvyensis, Ogilvy Mountains, just north of Dawson, Alaska [= Yukon Territory].

Rangifer mcguirei, Kletson [= Kletsan] creek, a tributary of the White river, four miles east of the Alaska–Yukon boundary.

Ovis fannini, Dawson City, N.W.T. [= Dawson, 64°04'/139°25', Yukon Territory].

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