

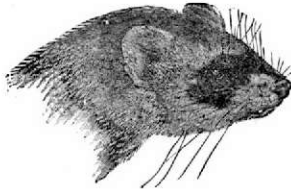
U. S. DEPARTMENT OF AGRICULTURE  
DIVISION OF BIOLOGICAL SURVEY

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# NORTH AMERICAN FAUNA

No. 19

[Actual date of publication, October 6, 1900]



## RESULTS OF A BIOLOGICAL RECONNOISSANCE OF THE YUKON RIVER REGION

**General Account of the Region**

**Annotated List of Mammals**

By WILFRED H. OSGOOD

**Annotated List of Birds**

By LOUIS B. BISHP, M. D.

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Prepared under the direction of

Dr. C. HART MERRIAM

CHIEF OF DIVISION OF BIOLOGICAL SURVEY



WASHINGTON  
GOVERNMENT PRINTING OFFICE

1900

## CONTENTS OF NORTH AMERICAN FAUNA.

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## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
WASHINGTON, D. C., *July 28, 1900.*

SIR: I have the honor to transmit for publication, as No. 19 of North American Fauna, a report entitled 'Results of a Biological Reconnoissance of the Yukon River Region,' by Wilfred H. Osgood and Louis B. Bishop.

Under instructions dated May 11, 1899, Wilfred H. Osgood, an assistant in the Biological Survey, proceeded to Skagway, Alaska, and thence over White Pass to the headwaters of the Yukon and down the entire length of the Yukon River to St. Michael. He was accompanied by Dr. Louis B. Bishop, of New Haven, as volunteer assistant; Dr. Bishop has prepared the report on the birds observed during the trip. These are the first investigations of the kind undertaken on the Upper Yukon, and the results herewith presented will be found to contain many important facts concerning the distribution of mammals, birds, and trees in this region.

Respectfully,

C. HART MERRIAM,  
*Chief, Biological Survey.*

Hon. JAMES WILSON,  
*Secretary of Agriculture.*





# CONTENTS.

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	Page.
General account of the region, by Wilfred H. Osgood.....	7
Itinerary .....	7
Faunal districts .....	8
Lynn Canal district.....	8
White Pass district.....	9
Canadian Yukon district—Lake subdivision.....	10
River subdivision .....	12
Hudsonian Yukon district.....	13
Alaska Tundra district.....	15
Summary of faunal districts.....	16
Previous work .....	18
New species.....	19
Mammals of the Yukon region, by Wilfred H. Osgood.....	21
Introduction .....	21
List of species and subspecies.....	22
Annotated list of species.....	22
Birds of the Yukon region, with notes on other species, by Louis B. Bishop..	47
Introduction .....	47
Classified lists of species.....	51
Annotated list of species.....	57

## ILLUSTRATIONS.

PLATE		Facing page.
I.	Map of Alaska.....	Frontispiece
II.	Fig. 1.—Summit of White Pass.	
	Fig. 2.—Canadian police station at Caribou Crossing .....	10
III.	Fig. 1.—Cliffs on east side of Lake Lebarge.	
	Fig. 2.—Yukon River 50 miles below Fort Selkirke.....	12
IV.	Fig. 1.—Nests of red squirrels in spruce thicket.	
	Fig. 2.—Burrows made by red squirrels in loose scales stripped from spruce cones.....	26
V.	Skulls of <i>Sciurus vancouverensis</i> , <i>Sciurus hudsonicus petulans</i> , <i>Neotoma cinerea drummondi</i> , and <i>Neotoma saxamans</i> .....	34
VI.	Skulls of <i>Lutreola vison energumenos</i> , <i>Lutreola v. ingens</i> , <i>Fiber zibethicus</i> , and <i>Fiber spatulatus</i> .....	42
VII.	Skulls of <i>Mustela americana brumalis</i> , <i>Mustela americana actiuosa</i> , and <i>Mustela americana</i> .....	44

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**RESULTS OF A BIOLOGICAL RECONNOISSANCE OF THE YUKON RIVER REGION.**

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**GENERAL ACCOUNT OF THE REGION.**

By WILFRED H. OSGOOD.

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Nowhere else in North America is such a vast extent of boreal country so easily accessible as along the Yukon. The navigable waters of the river begin at Lake Bennett, only 35 miles from the port of Skagway, on the coast of southeast Alaska, and with but one short interruption, extend northward as far as the Arctic Circle and then westward to Bering Sea; in all, a distance of more than 1,800 miles. The recent developments resulting from the discovery of gold in this region include a modern railroad from Skagway to Bennett and a tram-car service around the dangerous White Horse Rapids. The chief obstacles to ready access to the territory have thus been removed, and an opportunity is afforded for obtaining specimens and information from a region much of which was previously unknown to naturalists. Accordingly, with Dr. Louis B. Bishop as voluntary companion and A. G. Maddren as assistant, I was detailed to make a hasty biological reconnoissance of this region during the summer of 1899.

**ITINERARY.**

After outfitting at Seattle, Wash., we sailed via the Inside Passage direct to Skagway, Alaska, where we arrived on May 30. From Skagway we worked slowly over White Pass and down to Lake Bennett, at the head of navigation on the Yukon. Here we embarked in a small flat-bottomed boat suited to our needs and sailed down the series of lakes that follow one another for nearly 200 miles. From the lakes we passed into Thirty-Mile River, thence into Lewes River, and finally into the Yukon proper, stopping frequently and making collections at favorable points. With the aid of the swift, even cur-



rent we were able to make easy and rapid progress. Thus we continued until an unfortunate capsizing between Fort Yukon and Fort Hamlin prevented further detailed work on the river, and we were obliged to proceed direct to St. Michael, where a month was spent in collecting on the coast and tundra. Finally, late in September, our work was brought to a close by the approach of the long arctic winter. We returned to Seattle on the U. S. revenue cutter *Corwin*, which stopped on her way for a few hours at St. George Island and at Unalaska, at each of which places we collected a few birds.

A relatively large part of our time was spent in the White Pass region and about the headwaters of the Yukon, as this was an absolutely virgin field, whereas part of the lower river had been previously visited by naturalists. We were unable to do any collecting in the mountains which lie back from the river, owing to the great distance to be covered and the shortness of the season. Legions of mosquitoes were attendant upon us almost constantly. At first they seemed positively unbearable and were a real hindrance to the work, but we gradually became accustomed to them, and by the use of gloves, head nets, and canopies to sleep under, managed to exist in comparative comfort. Aside from insect pests, however, outdoor life on the Yukon in June and July is very enjoyable; good camping places are abundant, and the weather is mild and beautiful. During the latter part of August and in September strong winds sweep up the river and frequent rains occur.

#### FAUNAL DISTRICTS.

The country traversed may be divided for convenience into five districts: (1) The Lynn Canal district, (2) the White Pass district, (3) the Canadian Yukon district, (4) the Hudsonian Yukon district, and (5) the Alaska Tundra district. These districts are limited in a general way by their respective life zones, but they are not of equal extent or importance, and the names applied to them are used not to specially designate restricted parts of zones already recognized, but purely as a matter of convenience. They are longitudinal districts—that is, they are very much longer than wide, and each is merely a narrow tract covered by our route through some larger faunal region.

*Lynn Canal district.*—Skagway and the country bordering Lynn Canal are in the northern part of that faunal area which Nelson has called the 'Sitkan district' and which has often been included in the Northwest Coast district. The trees and shrubs are much the same as those at Juneau, Wrangell, and other points farther south, but the vegetation is not quite so dense and luxuriant. The shores of Lynn Canal are steep, rocky, and comparatively sparsely timbered, but in some places, as at Haines, low, swampy ground and heavy saturated forests are found. At Skagway, poplars (*Populus tremuloides* and *Populus*

*balsamifera*) are very common; they share the river bottom with willows and extend well up the steep canyon sides, where they occupy large areas adjacent to the pines, firs, and spruces. Skagway is surrounded by high mountains, and its fauna is limited chiefly by altitude. Glacier Station, 14 miles distant, and about 1,900 feet higher, is near the boundary between the Lynn Canal and White Pass districts. The station is situated on the side of a wooded gulch through which a fork of Skagway River flows. The immediate vicinity is similar to the country about Skagway, but shows the influence of the Hudsonian zone of the White Pass district, which begins only a short distance beyond. On either side of the gulch are glaciated granite cliffs supporting an irregularly distributed vegetation, chiefly groves of poplars and dense thickets of alders, while in the bottom of the gulch conifers are the prevailing trees. The most common trees and shrubs are lodgepole pines (*Pinus murrayana*), alpine firs (*Abies lasiocarpa*), tidewater spruces (*Picea sitchensis*), poplars or aspens (*Populus tremuloides* and *Populus balsamifera*), alders (*Alnus sinuata*), dwarf birches (*Betula glandulosa*), currants (*Ribes laxiflorum*), and huckleberries (*Vaccinium ovalifolium*). The black crowberry (*Empetrum nigrum*) and several other heather-like plants occur in the gulch but are more common higher up. Along the trickling streams are many ferns and mosses, as well as occasional patches of the lichen known as 'reindeer moss.' Among the mammals of this region are the Streater shrew (*Sorex p. streatoris*), the Bangs white-footed mouse (*Peromyscus oreas*), the Dawson red-backed mouse (*Eutamias dawsoni*), the long-tailed vole (*Microtus mordax*), and the red squirrel (*Sciurus h. petulans*). Characteristic birds are the sooty song sparrow (*Melospiza m. rufina*), the Townsend fox sparrow (*Passerella i. townsendi*), the Oregon snowbird (*Junco h. oregonus*), and the varied thrush (*Hesperocichla nevada*).

*White Pass district.*—The summits of the mountains that rise directly east of Skagway are covered with glaciers and perpetual snow, which feed numerous streams that flow down between massive walls of granite. The sides of the wider canyons have been smoothed and scored by glaciation, and the smaller and more recent ones are but jagged rock-bound chasms. These unfavorable conditions cause a rapid change in the character of the plant and animal life, and from Glacier to the summit of White Pass the zones are Hudsonian and Arctic-alpine. A few hundred feet above Glacier the trees become smaller and more scattered, and at Summit only the alpine juniper (*Juniperus nana*), the bearberry (*Arctostaphylos uva-ursi*), and depauperate alpine hemlocks (*Tsuga mertensiana*) occur. Heathers and mosses prevail and large areas of reindeer moss are conspicuous. For some distance on the summit of White Pass (Plate II, fig. 1) the elevation and physiography are much the same; the country is slightly

rolling and consists entirely of granite rock, about which cling many mosses and heathers, while small alpine junipers and hemlocks struggle for existence in favorable places. The breeding birds found with these Hudsonian plants were ptarmigan (*Lagopus rupestris* and *L. leucurus*), pipits (*Anthus pensilvanicus*), rosy finches (*Leucosticte t. littoralis*), and golden-crowned sparrows (*Zonotrichia coronata*). Characteristic mammals noted were pikas (*Ochotona collaris*), hoary marmots (*Arctomys caligatus*), and mountain goats (*Oreamnos montanus*).

*Canadian Yukon district.—Lake subdivision:* On the north side of the divide the hemlocks are soon replaced by pines and spruces, and in the vicinity of Shallow Lake the boundary of the interior fauna and flora is reached. The change is complete at Log Cabin, British Columbia, nine miles from the head of Lake Bennett, where the characteristic features of the Canadian zone are again established and the general aspect of the country is very different. The most abundant tree is the white spruce (*Picea canadensis*), and among shrubs seen for the first time the buffalo berry (*Lepargyrea canadensis*) is very common. Birds marking a change of fauna are the slate-colored junco (*Junco hyemalis*), the Alaska jay (*Perisoreus canadensis fumifrons*), the intermediate sparrow (*Zonotrichia l. gambeli*), and the black-poll warbler (*Dendroica striata*). A new chipmunk (*Eutamias caniceps*) is very conspicuous. At the head of Lake Bennett another change occurs; the country becomes more arid and rocky and there is a tinge of Hudsonian.

Lake Bennett is a long, narrow sheet of water inclosed by high granite cliffs, the sides of which are often so steep as to be unfavorable for plant and animal life, and whose summits are doubtless similar to White Pass in fauna and flora. Cold winds sweep down the lake much of the time, and cool shadows envelop the east side most of the forenoon and the west side most of the afternoon, so that opportunity for warmth by direct sunlight is limited. Hence there is quite a strong Hudsonian element about the lake. Among the plants<sup>1</sup> collected here are the pale dwarf laurel (*Kalmia glauca*), the Greek valerian (*Polemonium humile*), the forget-me-not (*Myosotis sylvatica alpestris*), the alpine juniper (*Juniperus nana*), the bush cranberry (*Viburnum pauciflorum*), the dwarf birch (*Betula glandulosa*), the bearberry (*Arctostaphylos uvaursi*), the buffalo berry (*Lepargyrea canadensis*), the shadbush (*Amelanchier alnifolia*), the Labrador tea (*Ledum groenlandicum*), and the black crowberry (*Empetrum nigrum*). Where trickling streams come down to the lake alder thickets abound, and along terraces of rock clumps of pines and spruces as well as poplars find support. Among Hudsonian mammals were found pikas (*Ochotona collaris*), hoary marmots (*Arctomys caligatus*), and Dall sheep

<sup>1</sup> Identified by F. V. Coville, chief botanist, U. S. Department of Agriculture.



FIG. 1.—SUMMIT OF WHITE PASS.



FIG. 2.—CANADIAN POLICE STATION AT CARIBOU CROSSING.





(*Ovis dalli*). Although the lake widens slightly at its lower end, its outlet is a narrow stream about 2 miles long, called Caribou Crossing (Plate II, fig. 2), on the north side of which is an open, grassy swamp bordered by willow thickets. This low country, though very limited and not extending to the next lake, affords a breeding place for a few mammals and birds not found about Bennett.

Lake Tagish, which receives the waters of Bennett through Caribou Crossing, is like Bennett in character, though not so closely walled, and is characterized by practically the same plants and animals. The surrounding mountains are covered with dense forests, which in many places are almost impenetrable.

Connected with Lake Tagish by a short, narrow stream, known as Six-Mile River, is Lake Marsh, a long shallow lake on each side of which extends low country, with rolling hills farther back. The valley widens here quite appreciably, and the open country is like that at Caribou Crossing. On the east side are sedgy bogs surrounded by willow thickets, and in many places a wide margin of beautiful green sedge meets the edge of the water. Rocky shores are found at some points on the northwest side, but in general the country is low and moist, in marked contrast to that about Bennett and Tagish. The mountain animals of those lakes are of course absent, and the bird life is also somewhat different.

Fifty-Mile River, into which the Yukon waters proceed from Lake Marsh, is rather narrow, and for a short distance at White Horse Rapids very swift. Its banks are chiefly abrupt bluffs of sandy clay (from 50 to 100 feet high) but at Miles Canyon it is confined between walls of basalt. Below the rapids the stream widens somewhat and the high banks become less frequent, often being replaced by low ones thickly grown with willows. The timber is somewhat scattered, and on the rolling hills back from the river bare granite spaces may be frequently seen. At the head of Fifty-Mile River, we first met with birch trees (*Betula papyrifera* ?), and from that time on they were seen daily. They do not grow to large size—trees more than 8 inches in diameter were seldom seen. Several small streams flow into Fifty-Mile River, which favor the growth of thickets of alders along their banks and large clumps of willows about their mouths. The little boreal sagebrush (*Artemisia frigida*) grows abundantly on the warm exposed slopes that occasionally alternate with the sandy bluffs. Lodgepole pines are also abundant and frequently occupy large areas to the exclusion of all other trees. Spruce and poplar, however, are still the strongest elements in the forest.

From Fifty-Mile River we enter Lake Lebarge, the last and largest of the lakes. All about its clear, cold waters are low granite mountains (Plate III, fig. 1). Occasionally patches of heavy spruce forest are found near the water, but in many places cliffs rise abruptly from

the water's edge, and the timber is very sparsely sprinkled over them. The rocks found here and a few in Thirty-Mile River are the last we saw showing signs of glaciation. Lake Lebarge is quite different from Lake Marsh, and is more similar to Lakes Tagish and Bennett, though all the Hudsonian elements of these are not present.

*River subdivision:* This area includes the section from the foot of Lake Lebarge to the mouth of the Pelly River at Fort Selkirk. There is very little variety in the character of the country between these points. Thirty-Mile River, which proceeds from Lake Lebarge, is a swift, narrow stream, and at low water is barely navigable for small steamers. A conspicuous feature of its banks, which are cut abruptly like those of Fifty-Mile River, is a narrow ribbon-like stratum of volcanic ash about 6 inches below the surface that may be seen wherever the bank is exposed. On the mountains a short distance from the river the forest of spruce is heavier and purer than any previously noted. The poplars and willows are more confined to the brink of the river, and the birches are scattered. Thirty-Mile River is simply that portion of the Yukon between Lake Lebarge and the mouth of the Hootalinqua or Teslin River. The stream is greatly augmented by the waters of the Hootalinqua, and from this point on to Fort Selkirk is known as the Lewes River. Below the Hootalinqua it cuts through the Semenow Hills, for the most part abrupt, rocky, and rather barren mountains from 2,000 to 3,000 feet high. Near their bases and at the water's edge are forested areas, but the exposed hillsides are covered with boreal sagebrush (*Artemisia frigida*), with here and there a prostrate juniper or a small clump of spruces. The river now widens rapidly, receiving in succession the waters of the Big Salmon, the Little Salmon, and the Nordenskiöld. The rolling hills are sometimes a mile or several miles from the river bank, with low willow swamps intervening. Islands varying from 1 to 100 acres in extent and covered with luxuriant vegetation are abundant. The distribution of trees on the small, regular-shaped islands is very uniform, the different kinds being grouped in concentric belts. Alders generally form the outer margin; next come the willows; next the poplars, rising somewhat higher; and finally the dark-green spruces, which occupy the central area. The whole effect is quite picturesque. On the larger islands the spruces are larger, and usually predominate to such an extent that almost everything else should be classed as undergrowth (including trees and shrubs belonging to the genera *Alnus*, *Salix*, *Populus*, *Lepargyrea*, *Cornus*, *Viburnum*, *Rosa*, *Ledum*, *Vaccinium*, *Ribes*, and others). Lodgepole pines still occur, though unlike the spruces they nowhere form continuous forest and disappear entirely a short distance beyond Fort Selkirk.

The Canadian Yukon district as a whole is very well marked. Characteristic mammals are the gray-headed chipmunk (*Eutamias caniceps*),

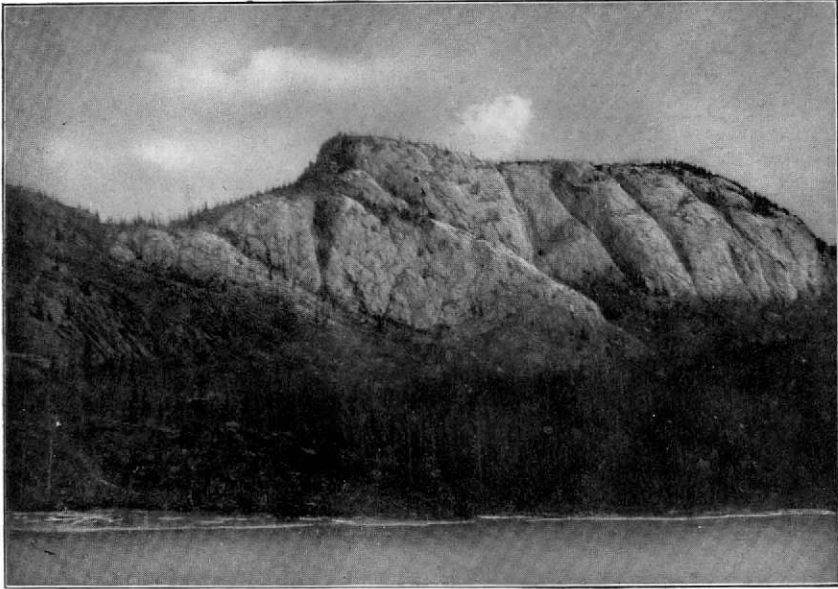


FIG. 1.—CLIFFS ON EAST SIDE OF LAKE LEBARGE.

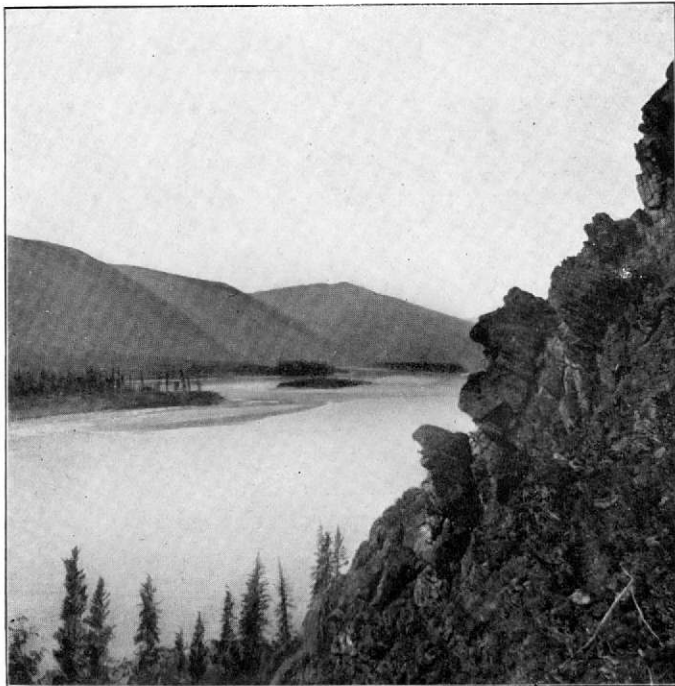


FIG. 2.—YUKON RIVER, 50 MILES BELOW FORT SELKIRK.



the Bennett ground squirrel (*Spermophilus campetru plesius*), the Northern bushy-tailed rat (*Neotoma saxamans*), white-footed mice (*Peromyscus oreus* and *Peromyscus maniculatus arcticus*), and the varying hare (*Lepus salsiens*). All of these species and three of the genera, *Eutamias*, *Neotoma*, and *Peromyscus*, find their northern limits in this district. Among birds that are known from the Yukon only in this district may be mentioned the sparrow hawk (*Falco sparverius*), the screech owl (*Megascops asio kennicotti?*), the night hawk (*Chordeiles virginianus*), the tree swallow (*Tachycineta bicolor*), the Tennessee warbler (*Helminthophila peregrina*), the pilcolated warbler (*Wilsonia pusilla pilcolata*), and the mountain bluebird (*Sialia arctica*). Of these, *Chordeiles* is perhaps the most noteworthy, as it is decidedly a southern genus. It is very common, and was seen nightly from Caribou Crossing to Rink Rapids, but after we had passed that point it disappeared. Its range in this region as observed by us is probably accurate and corresponds with the limits of the district. Among trees, the lodgepole pine (*Pinus murrayana*) is common throughout the district, but does not extend beyond it.

*Hudsonian Yukon district.*—This district, as here considered, includes all of the Yukon region from Fort Selkirk to the limit of trees. The Lewes River is joined at Fort Selkirk by the Pelly, after which the increased volume of water flows on between heavily forested slopes and jutting cliffs (Plate III, fig. 2), which replace the sandy banks of the upper river. From the mouth of the Selwyn northward the topography of the river banks is but slightly different. The number of poplars in the forest is much increased; the spruces are correspondingly decreased not only in number but also in size; while the birches about hold their own, and the pines are not present at all, having disappeared between Fort Selkirk and the mouth of the Selwyn River. As we approach Dawson spruces become dwarfed and entirely subordinate to the poplars, which crowd their bushy tops together for miles and miles. The spruces are in the gulches and in small clumps elsewhere, and a few are scattered about, their dark-green spike tops showing off well against the billowy mass of the lighter foliage of poplar and birch. The undergrowth remains much the same, and deep moss covers the ground and rocks. In damp sandy places along shore and on islands occasionally overflowed a bright-green scouring rush (*Equisetum*) grows so abundantly as to be a characteristic plant. The alpine juniper (*Juniperus nana*) is found occasionally on hill-sides not too thickly grown with poplars, and on the more open hill-sides the landscape is brightened by masses of fireweed (*Chamaenerion angustifolium*), for even here forest fires are not a novelty.

Two more large rivers, the White and the Stewart, empty into the Yukon in this vicinity. About the mouths of these and other tributaries is more or less low country covered with willows. Islands become

still more numerous and larger, and have a forest growth that is more uniform in character than that of the river banks. High cliffs overhanging the river are of frequent occurrence.

From Dawson to the Alaska boundary and thence to Circle the country is about the same. For a long distance in the vicinity of the boundary a range of high mountains is visible to the northward on the right bank of the river. The low, rolling hills which border the upper river do not quite reach Circle, but are replaced by a broad, flat country known as the 'Yukon Flats,' which extends from near Circle to Fort Hamlin, a distance of about 200 miles. Through the 'Flats' the course of the river breaks up into a great many channels, and the islands still further increase in size and number. These are composed of sand and silt, in which poplars thrive better than spruces, though the latter are by no means eliminated. A wild rose (*Rosa cinnamomea?*) is the most abundant shrubby plant, and on the ground below it the *Equisetum* is rampant. The larger islands are identical in character with the mainland, and on them the spruces form quite a heavy forest, with deep moss beneath. At Fort Hamlin the river narrows again and flows between rolling wooded hills, which are similar to many farther up the river. Small streams enter the main river frequently, and the timber is much the same; poplars, alders, and birches cover the hills in dense thickets, through which spruces are sprinkled. Alders are more numerous than before. The hills vary in height from 500 to 3,000 feet, and the highest have a distinct timberline at about 2,000 feet. At the mouth of the Tanana the hills become smaller and the river very much wider. Here, at Fort Gibbon, Dr. Bishop found the larch (*Larix americana*) quite abundant. This was the only point at which it was seen by any of our party.

The Lower Yukon beyond the Tanana is very uniform in character. The banks are low and rolling and overgrown with willows and alders; farther back are higher hills covered with poplars and birch; occasionally the summits of a few hills higher than the rest are devoid of trees. On the sandy islands the willow thickets are impenetrable, and where a cut bank exposes a section of them their slender perpendicular trunks stand so closely as to present a solid front like a thick hedge or canebrake. Thus it continues until the limit of timber is reached at Andraefski, 90 miles above the mouth of the Yukon.

This district as a whole is characterized by absence of southern plants and animals. Among migratory birds a few have their center of abundance farther south, but all the mammals are northern forms, and nearly all belong to genera of circumpolar distribution.<sup>1</sup> Plant life, though quite luxuriant, is made up of only a small number of hardy species. Characteristic mammals are the Fort Yukon ground

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<sup>1</sup>The only exceptions are *Synaptomys*, *Fiber*, and *Erethizon*.

squirrel (*Spermophilus osgoodi*), Dawson red-backed mouse (*Eutamias dawsoni*), yellow-cheeked vole (*Microtus xanthognathus*), Yukon lemming (*Lemmus yukonensis*), Dall varying hare (*Lepus americanus dalli*), and tundra weasel (*Putorius arcticus*). Of the birds, the most characteristic are the duck hawk (*Falco peregrinus anatum*), pigeon hawk (*Falco columbarius*), Alaska longspur (*Calcarius lapponicus alascensis*), hoary redpoll (*Acanthis hornemanni exilipes*), fox sparrow (*Passerella iliaca*), Bohemian waxwing (*Ampelis garrulus*), and wheatear (*Saxicola oenanthe*).

*Alaska Tundra district.*—The Yukon from Andraefski to the coast of Norton Sound is bounded on both sides by typical tundra. The country is low and gently undulating, and its surface a short distance away appears to be thickly carpeted with grass. That this is not the real condition a short walk ashore soon demonstrates; but the delusion is so complete that were it not for the presence of the great river one might fancy himself looking out over the undulating plains at the eastern base of the Rocky Mountains in the western United States.

The flora of the tundra, though devoid of trees deserving of the name, is found on careful examination to be quite varied. Besides the numerous mosses and heathers and many small berry-bearing plants are dwarf willows, birches, and alders. The alders attain the greatest size, but are usually found in isolated clumps in favorable spots, where they often grow from 6 to 8 feet high. The ground is frozen a few inches below the surface, and the heavy, spongelike covering of vegetation is kept constantly saturated. Occasional high bluffs on the coast in exposed situations are bleak and bare, but besides these there is scarcely a spot not covered with low, matted vegetation. Numerous small ponds are irregularly distributed over the tundra, and around them the vegetation is ranker than elsewhere. Broken lava borders the shores of St. Michael Island, and small moss-covered heaps of it, which form practically the only solid footing on the island, are scattered about over the tundra.

Characteristic mammals at St. Michael are the Hall Island fox (*Vulpes hallensis*), Nelson vole (*Microtus operarius*), tundra red-backed mouse (*Eutamias dawsoni alascensis*), Nelson pied lemming (*Dicrostonyx nelsoni*), Alaska lemming (*Lemmus alascensis*), and Alaska Arctic hare (*Lepus othus*). Land birds known to breed are the hoary redpoll (*Acanthis hornemanni exilipes*), common redpoll (*Acanthis linaria*), Alaska longspur (*Calcarius lapponicus alascensis*), western tree sparrow (*Spizella monticola ochracea*), golden-crowned sparrow (*Zonotrichia coronata*), and Siberian yellow wagtail (*Budytes flavus leucostriatus*). Common tundra plants<sup>1</sup> are *Cassiopea tetragona*, *Andromeda polifolia*, *Vaccinium vitis-idaea*, *Mairania alpina*, *Ledum palustre*, *Artemisia*

<sup>1</sup> Nelson, Report upon Natural History Collections in Alaska, 30, 1887.

*arctica*, *Rubus chamaemorus*, *Rubus arcticus*, *Betula nana*, *Alnus sinuata*, *Chamaecistus procumbens*, and *Tussilago frigida*.

#### SUMMARY OF FAUNAL DISTRICTS.

All the country here considered is in the boreal zones, the Tundra district and a small part of the White Pass district belonging to the Arctic subdivision, and the Yukon Valley principally to the Hudsonian, though it has also a well-marked Canadian section. Birds are comparatively rare in all the interior region, and it is difficult to determine the exact range of many species. Some were seen but once or twice; others appeared sporadically at rather long intervals; while still others that are known from the region were not seen at all; so it is hardly safe, in making generalizations, to rely too much on the ranges observed by us. The distribution of trees and shrubby plants and of many of the mammals, however, could be determined with much greater accuracy and constitute reliable guides in fixing the limits of the districts. These districts are in general the same as those recognized by Nelson, but with more definite and somewhat modified limits. Names slightly different from those he used are adopted here in order to agree with the commonly accepted names of the primary zones of North America. Thus the part of his 'Alaskan-Canadian' district here considered is called the 'Hudsonian Yukon' district, since it lies entirely within the transcontinental Hudsonian zone. Owing to fluvial conditions, the boundaries of the Yukon districts doubtless do not agree in latitude with those which might be made away from the rivers.

The zones which we successively traversed in going from Skagway to St. Michael via White Pass and the Yukon are: (1) Canadian; (2) Hudsonian; (3) Arctic-Alpine; (4) Canadian; (5) Hudsonian, and (6) Arctic. The Lynn Canal district is in the Canadian zone, but it has some slight peculiarities such as are to be expected in a coast district. Though it does not have the Hudsonian animals of the northern coast, it lacks several of the typical Canadian forms of the coast farther south.<sup>1</sup> It is really near the northern limit of the Canadian zone on

<sup>1</sup>The coast of Alaska south of the peninsula, or what has been known as the 'Sitka district,' may be easily divided into two districts corresponding to the Canadian and Hudsonian zones. Lynn Canal is situated near the boundary between these districts. Among Canadian mammals which have their center of abundance in the restricted Sitka district on the coast south of Lynn Canal are: *Odocoileus sitkensis*, *Sciurus vancouverensis*, *Peromyscus macrorhinus*, *Eutamias wrangeli*, *Microtus macrurus*, *Synaptomys wrangeli*, *Zapus saltator*, and *Myotis alascensis*. Among the Hudsonian forms found on the coast only north of Lynn Canal are: *Rangifer* sp., *Ovis dalli*, *Sciurus hudsonicus*, *Spermophilus e. plesius*, *Zapus h. alascensis*, *Ochotona collaris*, and *Myotis lucifugus*. Among trees which find their northern limit in the vicinity of Lynn Canal are: *Thuja plicata*, *Abies lasiocarpa*, and *Pinus murrayana*. The northern district from Lynn Canal to Kadiak is so similar to the great interior Hudsonian region that it hardly merits recognition as a distinct district, but it certainly should not be included in the Sitka district.

the Pacific coast. The occurrence at Skagway of mammals of the interior, such as *Microtus mordax*,<sup>1</sup> *Evotomys dawsoni*, and *Peromyscus oreas*, seems to show an approach to the condition farther north where the coast and interior forms are practically the same. The Canadian zone of the Lynn Canal district gives way to the Hudsonian and Arctic-Alpine in the White Pass district. The character of this district is essentially the same as that of other mountain regions in western North America. This is well indicated by the fact that its mammals include the hoary marmot (*Arctomys caligatus*), the Alaska pika (*Ochotona collaris*), and the mountain goat (*Oreamnos montanus*), and its birds the ptarmigan (*Lagopus leucurus* and *L. rupestris*), the pipit (*Anthus pensilvanicus*), and the rosy finch (*Leucosticte t. littoralis*).

The Canadian Yukon district from Bennett to Fort Selkirk merely represents the extent to which our route entered the extreme northern part of the Canadian zone; that is, its limits are those of the section that our route made across the end of a narrow tongue which extends northward from the great areas occupied by the Canadian zone farther south. Owing to its being so near the border of the Hudsonian zone, its character is not purely Canadian, but the presence of such forms as chipmunks (*Eutamias*) and white-footed mice (*Peromyscus*) among mammals, night hawks (*Chordeiles*) among birds, and lodgepole pines (*Pinus murrayana*) among trees, makes it evident that the Canadian element is very strong. The Hudsonian Yukon district represents the complete section which the Yukon River makes through the great northern forest belt of the Hudsonian zone. This belt corresponds to the Alaskan-Canadian district outlined by Nelson. It is bounded on the south by the Canadian zone and the extreme northern limit of southern forms, and on the north by the treeless tundra. On the west it probably reaches and includes the coast from Kadiak to Lynn Canal; on the east its limits are unknown. The Alaska Tundra district defines itself. Its character is the combined result of latitude and rigorous coast climate. Our experience in this treeless district was limited to St. Michael Island and the ninety miles between Andraefski and the mouth of the Yukon. The animals of this region are not all absolutely confined to it, many of them ranging some distance into the forest belt. Small mammals, such as the Nelson vole (*Microtus operarius*), occupy so-called 'islands'—local spots offering what are practically tundra conditions—as far within the forest belt as Circle.

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<sup>1</sup>The case of *Microtus mordax* at the head of Lynn Canal is particularly interesting, since a closely related form, *M. macrurus*, has been found at Glacier Bay on the north side of the mouth of the canal and also at Juneau on the south side, and would therefore be expected at Skagway, which is halfway between. Assuming that *macrurus* has been dispersed from the south northward on the coast, it seems that it did not reach Glacier Bay by way of the present mainland, otherwise it would be found at Skagway. *M. mordax* doubtless reached Skagway from the interior.

The fauna of the Yukon basin as a whole is composed of two principal elements, one containing absolutely circumpolar forms, evidently derived from the north, the other containing forms which have their center of abundance farther south. This is particularly true of the mammals. Among the genera belonging to the north may be mentioned *Rangifer*, *Evotomys*, *Lemmus*, and *Dicrostonyx*, all of which are circumpolar in distribution; those from farther south are *Alces*, *Sciuropterus*, *Eutamias*, *Peromyscus*, *Neotoma*, *Fiber*, and *Synaptomys*. With the exception of alpine species and a few wide-ranging forms, chiefly carnivores, the variations of which are not sufficiently known to be of use in defining faunal regions, no species of mammals are common to the Yukon region and the Sitkan coast district. From this it seems that all the southern forms which reach the Yukon region have been derived from the interior rather than from the coast. This is also true of the trees and to a great degree of the birds. But, on the other hand, some species of land birds are common to the lower Yukon and the Sitkan district while a large intervening area in the interior is uninhabited by them.<sup>1</sup> *Seelasphorus rufus*, *Dendroica townsendi*, and *Hyllocichla aonalaschkae* were found on both sides of White Pass, but only rarely and for a very short distance on the interior side.

#### PREVIOUS WORK.

Our knowledge of the natural history of the Yukon region has been derived chiefly from two sources—the members of the Russo-American Telegraph Expedition and the Signal Service officers formerly stationed at St. Michael. The first information was gathered by the scientific corps of the Telegraph Expedition of 1865 to 1868. Prominent among the members of this corps were Robert Kennicott, William H. Dall, and J. T. Rothrock, all of whom secured valuable specimens and information. The notes of Kennicott were not published, owing to his untimely death at Nulato, May 13, 1866, but numerous specimens, particularly from the vicinity of Fort Yukon, are now in the National Museum, a monument to his faithful pioneer work. Among the numerous papers on various subjects relating to Alaska published by Dall are lists of birds and mammals.<sup>2</sup> A list of plants including some records from Fort Yukon was published by Rothrock.<sup>3</sup>

<sup>1</sup>One of these species is the varied thrush (*Hesperocichla nevya*) which was found in the Lynn Canal district, but not in any numbers in the Yukon Valley above Dawson. Below Dawson it is quite common along the Yukon and undoubtedly breeds there. It is well known to range along the Pacific coast to Kadiak, and thence to the shores of Kotzebue Sound and up the Kowak River. Its absence on the Upper Yukon and its occurrence all along the coast make it extremely probable that in reaching the Yukon its course of migration is up the river from its mouth.

<sup>2</sup>List of Birds of Alaska, by W. H. Dall and H. M. Bannister <Trans. Chicago Academy of Sciences, I, pt. II, 267-310, 1869; also Alaska and its Resources, by W. H. Dall, Boston, Lee & Shepard, 1870.

<sup>3</sup>Sketch of the Flora of Alaska, by J. T. Rothrock <Annual Report Smithsonian Institution, 1867, 433-463.



In 1874, with the establishment of a meteorological station at St. Michael, work was begun by Lucien M. Turner. He collected about St. Michael and secured specimens from the fur traders and natives on the Yukon as far up as Fort Yukon. The results of his work were published in the Arctic Series of the Signal Service.<sup>1</sup>

Turner was relieved in 1877 by E. W. Nelson, who continued to collect specimens until 1881. His work was more extensive than that of Turner, but was carried out along the same lines. He made several trips up and down the coast from St. Michael, and also worked about the Yukon delta and up the river as far as Anvik. L. N. McQuesten, who conducted a trading post at Fort Reliance, furnished him with numerous specimens and much valuable information. The results of Nelson's work were also published in the Arctic Series of the Signal Service<sup>2</sup> and form by far the most valuable contribution to the natural history of Alaska yet made. In 1889 an important report<sup>3</sup> was published by Dr. George M. Dawson, covering the region of the sources of the Yukon and down as far as Fort Selkirk. This report contains detailed descriptions of the physical features of the upper river, notes on natural history, particularly on the distribution of trees, and a list of plants by John Macoun.

#### NEW SPECIES.

Nine new species and subspecies of mammals are described in the present report. They are as follows:

<i>Sciuropterus yukonensis.</i>	<i>Fiber spatulatus.</i>
<i>Sciurus hudsonicus petulans.</i>	<i>Lepus salsiens.</i>
<i>Eutamias caniceps.</i>	<i>Lutreola vison ingens.</i>
<i>Spermophilus empetra plesius.</i>	<i>Mustela americana actiuosa.</i>
<i>Neotoma saxamans.</i>	

In the collection of birds, three new forms were found. These have been described by Dr. Bishop<sup>4</sup> as follows:

<i>Canachites canadensis osgoodi.</i>	<i>Contopus richardsoni saturatus.</i>
<i>Suyornis saya yukonensis.</i>	

<sup>1</sup> Contributions to the Natural History of Alaska, by L. M. Turner, Arctic Series, Signal Service, No. II, Washington, 1886.

<sup>2</sup> Report upon Natural History Collections made in Alaska, by E. W. Nelson, Arctic Series, Signal Service, No. III, Washington, 1887.

<sup>3</sup> Geological and Natural History Survey of Canada, Annual Report, III (1887-88), Pt. I, 6 B-277 B, 1889.

<sup>4</sup> Auk, XVII, 113-120, April, 1900.



Besides the above, several new mammals which come within the scope of the present report have been recently described by Dr. Merriam.<sup>1</sup> These are as follows:

*Spermophilus osgoodi.*

*Lemmus yukonensis.*

*Lemmus alascensis.*

*Dicrostonyx nelsoni.*

*Erethizon epixanthus myops.*

*Lepus americanus dalli.*

*Lepus othus.*

*Vulpes hallensis.*

*Sorex personatus arcticus.*

*Sorex tundrensis.*

In addition to these, three new forms recently described by Witmer Stone<sup>2</sup> should be mentioned:

*Dicrostonyx hudsonius alascensis* (equals *D. nelsoni* Merriam).

*Putorius rixosus eskimo.*

*Lynx canadensis mollipilosus.*

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<sup>1</sup> Proc. Wash. Acad. Sci., II, 13-30, March 14, 1900.

<sup>2</sup> Proc. Acad. Nat. Sci. Phila., March 24, 1900, 33-49.

# MAMMALS OF THE YUKON REGION.

By WILFRED H. OSGOOD.

## INTRODUCTION.

The following list, primarily based on collections made during the past year, includes all the known mammals of the Yukon region. Besides the species which belong strictly to the Yukon, are included those found in the Lynn Canal and White Pass districts and those known to occur at St. Michael. This makes a list containing the majority of the mammals known from Alaska, which is not, however, intended to be comprehensive, but should be considered as supplementary to the list published by Nelson in 1887. As may be seen from the itinerary, our collections were made during a hasty trip from the coast of southeastern Alaska to the head waters of the Yukon and thence down the river to St. Michael. Good series of all the common small mammals were secured, but the larger and rarer species were not often obtained. It was not only difficult to secure specimens of the larger mammals, but it was hard to gain much accurate information in regard to them. Most of the miners we met had been in the country but a short time and their knowledge of animals was limited; natives were seldom met on the upper river and the few that were interviewed seemed disinclined to talk. The fur trade on the Yukon has dwindled to comparatively meager proportions. The Indians still bring a few furs to the traders every year and receive pittance of flour and tea in return; but the trade is apparently very small and were it not for the transportation business which has recently become so important, the large companies would doubtless find it difficult to maintain themselves.

In identifying the recently collected specimens and studying their geographical distribution, it has been necessary to refer constantly to the specimens collected by Kennicott, Dall, Nelson, and Turner. Many of these, which are in the National Museum, were found to be in poor condition and required considerable renovating to make them comparable with modern specimens. For the free use of these specimens I am indebted to Gerrit S. Miller, jr., assistant curator of mammals in the National Museum. I am also indebted to Outram Bangs for the use of specimens, and E. W. Nelson for much valuable information. The identifications of some of the mammals have been verified

by specialists as follows: The species of *Sorex* by Dr. C. Hart Merriam; of *Microtus* by Vernon Bailey, and of *Zapus* by Edward A. Preble. All measurements are in millimeters.

#### LIST OF SPECIES AND SUBSPECIES.

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| 1. <i>Rangifer montanus</i> Seton-Thompson.          | 28. <i>Lemmus alasensis</i> Merriam.               |
| 2. <i>Rangifer arcticus</i> (Richardson).            | 29. <i>Dicrostonyx nelsoni</i> Merriam.            |
| 3. <i>Rangifer tarandus</i> (Linnaeus).              | 30. <i>Zapus hudsonius alasensis</i> Merriam.      |
| 4. <i>Alces gigas</i> Miller.                        | 31. <i>Erethizon epixanthus myops</i> Merriam.     |
| 5. <i>Ovis dalli</i> Nelson.                         | 32. <i>Ochotona collaris</i> (Nelson)              |
| 6. <i>Oreamnos montanus</i> (Ord).                   | 33. <i>Lepus salsiens</i> sp. nov.                 |
| 7. <i>Sciuropterus yukonensis</i> sp. nov.           | 34. <i>Lepus americanus dalli</i> Merriam.         |
| 8. <i>Sciurus hudsonicus</i> Erxleben.               | 35. <i>Lepus othus</i> Merriam.                    |
| 9. <i>Sciurus hudsonicus petulans</i> subsp. nov.    | 36. <i>Lynx canadensis mollipilosus</i> Stone.     |
| 10. <i>Eutamias caniceps</i> sp. nov.                | 37. <i>Canis occidentalis</i> Richardson.          |
| 11. <i>Spermophilus empetra plesius</i> subsp. nov.  | 38. ? <i>Vulpes fulvus</i> (Desmarest).            |
| 12. <i>Spermophilus osgoodi</i> Merriam.             | 39. <i>Vulpes hallensis</i> Merriam.               |
| 13. <i>Arctomys caligatus</i> Eschscholtz.           | 40. <i>Ursus americanus</i> Pallas.                |
| 14. <i>Castor canadensis</i> Kuhl.                   | 41. <i>Ursus horribilis alasensis</i> Merriam.     |
| 15. <i>Mus decumanus</i> Pallas.                     | 42. <i>Lutra canadensis</i> (Schreber).            |
| 16. <i>Peromyscus oreas</i> Bangs.                   | 43. <i>Lutreola vison ingens</i> subsp. nov.       |
| 17. <i>Peromyscus maniculatus arcticus</i> (Mearns). | 44. <i>Putorius arcticus</i> Merriam.              |
| 18. <i>Neotoma saxamans</i> sp. nov.                 | 45. <i>Putorius cicognani alasensis</i> (Merriam.) |
| 19. <i>Erotomys dawsoni</i> Merriam.                 | 46. <i>Putorius rizonos eskimo</i> Stone.          |
| 20. <i>Erotomys dawsoni alasensis</i> (Miller).      | 47. <i>Mustela americana actiosa</i> subsp. nov.   |
| 21. <i>Microtus mordax</i> (Merriam).                | 48. <i>Mustela pennanti</i> Erxleben.              |
| 22. <i>Microtus drummondi</i> (Aud. and Bach.).      | 49. <i>Gulo luscus</i> (Linnaeus).                 |
| 23. <i>Microtus xanthognathus</i> (Leach).           | 50. <i>Sorex personatus streatori</i> Merriam.     |
| 24. <i>Microtus operarius</i> (Nelson).              | 51. <i>Sorex personatus arcticus</i> Merriam.      |
| 25. <i>Fiber spatulatus</i> sp. nov.                 | 52. <i>Sorex obscurus</i> Merriam.                 |
| 26. <i>Synaptomys dalli</i> Merriam.                 | 53. <i>Sorex tundrensis</i> Merriam.               |
| 27. <i>Lemmus yukonensis</i> Merriam.                | 54. <i>Myotis lucifugus</i> (Le Conte).            |

#### ANNOTATED LIST OF SPECIES.

**Rangifer montanus** Seton-Thompson. Mountain Caribou.

*Rangifer montanus* Seton-Thompson, Ottawa Naturalist, XIII, No. 5, 6, Aug. 11, 1899; Allen, Bull. Am. Mus. Nat. Hist., N. Y., XIII, 1-18, April 3, 1900.

This large woodland caribou is reported as quite common in northern British Columbia about the head waters of the Yukon and for an indefinite distance northward. It does not occur on the coast south of Cook Inlet, but is reported from many points immediately beyond the summit of the coast mountains. It prefers the higher ground in summer and is not found along river bottoms like the moose, for which reason few are killed by parties descending the river. Its flesh is smoked and dried by the Indians for winter food, and when so cured is preferred to all other meat of the country. The hides, like those of the moose, serve the natives for various articles of clothing and are utilized especially for sleeping robes.

**Rangifer arcticus** (Richardson). Barren Ground Caribou.

The barren ground caribou ranges over nearly all of extreme northern North America from northwestern Labrador to the Aleutian Islands. It was formerly abundant over this great territory, but is now quite rare. Even at the time of Nelson's work in 1877 it had become comparatively uncommon, though it was once common all about Norton Sound and for some distance up the river. The southern and interior limits of its range are uncertain. During our stay in St. Michael, I saw half a dozen skins which had been secured near Andraefski, 90 miles above the mouth of the Yukon. There are specimens in the National Museum from Nushagak and Unalakleet, Alaska; and from Rampart House and La Pierre House, Northwest Territory.

**Rangifer tarandus** (Linnaeus). Domesticated Reindeer.

During the past few years, as is well known, an effort has been made to introduce domesticated reindeer from Siberia into Alaska. The animals as a rule have been carefully herded, but in a few cases they have had opportunities to stray away and run wild. The herd that had perhaps the best chance to stray was one which was brought from Lapland to Haines in 1898, and driven inland over the Dalton trail. A short time after it started several of the animals were seen in the forest near Haines, and one of them was killed. This was the only instance of the kind brought to my attention, but I have no doubt that reindeer have occasionally wandered from the care of the herders at other times and in other places.

**Alces gigas** Miller. Alaska Moose.

*Alces gigas* Miller, Proc. Biol. Soc. Wash., XIII, 57-59, May 29, 1899.

The Alaska moose, as has frequently been stated, is the largest of the deer family in North America. Its distribution along the Yukon extends from Lakes Atlin and Tagish at least to the mouth of the Tanana and probably somewhat farther. Whymper<sup>1</sup> says that it was 'never known as low as Nulato,' even in the time of its greatest abundance. It is evident, however, from the record of Nelson<sup>2</sup> at the Yukon delta, and that of Richardson<sup>3</sup> at the mouth of the Mackenzie, that it does occasionally leave its favorite woodlands of the interior and wander as far as the Arctic coast. At present it is still quite numerous, but is chiefly confined to the small streams tributary to the Yukon. According to reports which came to me it is abundant in the region about the upper waters of the Stewart, Pelly, and MacMillan rivers. Along the great river itself numbers have been killed during

<sup>1</sup> Travels in Alaska and on the Yukon, 245, 1869.

<sup>2</sup> Report upon Natural History Collections in Alaska, 287, 1887.

<sup>3</sup> Fauna Boreali-Americana, 233, 1829.

the recent influx of prospectors. At the beginning of the Klondike rush, it was not uncommon for a party to secure one or two moose while descending the river, but such is rarely the case at present. Our party failed to see any, though we spent nearly three months in the region; during this time we heard of but two animals being killed, one near the foot of Lake Lebarge and another on upper Charlie Creek, a short distance above Circle; both were secured by Indians. We saw comparatively few fresh tracks.

In winter, moose meat is the staple diet of both Indians and whites and has readily sold in the mining camps at \$1 to \$2 per pound. Such a price, even in this country of high wages, has been a great incentive to hunting, and many a miner has left his claim to pursue the moose. The hides also are a source of profit, particularly to the Indians, who tan them and make them into mittens and moccasins. What the Indians do not need they sell readily to miners and prospectors. It is difficult to estimate the number of animals that have been killed, but it must be very large, for the demand has been steady and a comparatively large population has been supplied with meat. On one hunt, an account of which has been given by Tappan Adney,<sup>1</sup> 44 moose were killed in about one month, and a single party of Indians was credited with a total of 80 moose and 65 caribou in one winter.

#### *Ovis dalli* (Nelson). Dall Mountain Sheep.

Most of the specimens of the Dall sheep which have reached our museums were secured in the vicinity of Cook Inlet, but the animal occurs in nearly all the high mountains of Alaska, and in the north ranges to the Arctic coast. Since we were at a distance from the mountains during the greater part of our trip, I was unable to secure much information in regard to the distribution of the species. Sheep are said to occur about the West Arm of Lake Bennett, and Windy Arm of Lake Tagish. A prospector with whom I talked at Lake Tagish said he had seen and killed them at both of these places. Lake Bennett is not far from the type locality of *O. stonei*, and it is possible that this species occurs there with *O. dalli*. Both white and gray sheep are reported, though all are said to be white in winter. I was told that white sheep were killed some years ago on the cliffs about Lake Lebarge, but I failed to find signs of them there. Prospectors at Fort Selkirk say that sheep are always to be found in the mountains along Pelly River, particularly in the MacMillan Mountains<sup>2</sup> near the mouth

<sup>1</sup> Harper's Magazine, C, 495-507, March, 1900.

<sup>2</sup> The sheep from the MacMillan Mountains are said to be the 'black sheep,' which name could hardly apply to *O. dalli*, but is the name commonly given to *O. stonei*. If *stonei* really does occur in these mountains the record is a very interesting one, and the locality much farther north than any from which the species has been previously recorded.

of MacMillan River, and they were also reported from the head waters of the Stewart and from the Tanana Hills.

**Oreamnos montanus** (Ord). Mountain Goat.

Goats occur on the high granite cliffs which inclose the upper part of Lynn Canal; they are also common on the mountains near White Pass and about the rocky walls of Lake Bennett. I was told that they had been killed recently at the upper end of Little Windy Arm on Lake Tagish, but I could obtain no reliable report of their occurrence in the interior beyond this point. At Lake Lebarge they were very doubtfully reported. Their range is known to extend north to White Pass in the coast mountains at least to Copper River,<sup>1</sup> but does not reach far into the interior. Hunters from the mountains about the upper waters of the Pelly and Stewart rivers asserted positively that none had been heard of in that region.

The station agent at Glacier, near White Pass summit, told me that goats frequently appear on the cliffs within easy view of his house. He also showed me the hide of one that had been killed near there a short time before our arrival. I made one short trip into these mountains, but failed to see any goats. The character of the cliffs is ideal for them, but they had evidently gone farther back to their summer feeding grounds, as the abundant tracks and dung were a few weeks old.

**Sciuropterus yukonensis** sp. nov. Yukon Flying Squirrel.

Type from Camp Davidson, Yukon River, near Alaska-Canada boundary. No. 13322, U. S. Nat. Mus. Collected December 8, 1890, by R. E. Carson.

*Characters.*—Size largest of North American flying squirrels; tail exceedingly long; color rather dark, underparts suffused with fulvous; skull slightly characterized.

*Color.*—Top of head, neck, and upperparts to base of tail pale cinnamon or between the wood brown and cinnamon of Ridgway; underfur bluish black, partially exposed on legs and membranes; underparts dull whitish, irregularly suffused with cinnamon fawn; feet dusky above, lightly edged with creamy white, buffy white below; cheeks and sides of head ashy, lightly mixed with cinnamon; end of nose slightly paler than top of head, not light ashy as in *S. sabrinus*; black eye-ring prominent; tail light fawn below, with a light edging of dusky, becoming broader toward tip; tail above fawn heavily mixed with black, which predominates for terminal fifth.

*Skull.*—Size large, slightly larger than in *S. alpinus*; audital bullæ larger; width at postorbital constriction greater; molars heavier, particularly the mandibular series.

<sup>1</sup>H. T. Allen, Science, VII, 57, 1886.

*Measurements.*—Total length 365; tail 180; hind foot (measured dry) 41. Skull: Occipitonasal length 40; zygomatic breadth 25; postorbital constriction 10.

*Remarks.*—This species is distinguished from both *S. sabrinus* and *S. alpinus* by its large size and very long tail, but it is also very different from either in color. It is evidently a very rare squirrel, as the type and one topotype are the only specimens known. A specimen from Chilkoot Inlet which may possibly be this species has been recorded by Dr. George M. Dawson.<sup>1</sup> Camp Davidson is the northernmost point at which the genus *Sciuropterus* is known to occur. The type and one other specimen were secured by R. E. Carson, who was a member of the boundary survey party of the U. S. Coast and Geodetic Survey under J. E. McGrath, in 1890. Dr. W. W. Kingsbury, also a member of the party, writes me as follows in regard to these specimens:

I send you the following notes taken from my journal regarding two Flying Squirrels which were captured by a member of our party while in Alaska, in 1890; their skins were sent to the National Museum at Washington.

The female was caught Dec. 8th, 1890, and the male Dec. 9th, 1890. Both squirrels were caught in a trap known as the 'dead fall,' which was set by R. E. Carson for marten. The traps were set in the bed of a frozen stream, where it ran through a clump of spruce trees about one-fourth of a mile back from the Yukon river. This clump of trees is about 2½ miles east of the International boundary line, and on the east bank of the Yukon river.

We showed these skins to both McQuesten and Mayo, two traders who had been in that country over twenty years, and who said that they had seen Flying Squirrels along the Yukon river quite a number of times before, and had also seen them at Ft. Reliance and Ft. Yukon; but had not seen any of them for a number of years before this date. We also showed the skins to an Indian, who said these squirrels would attack a man by flying in his face, and the Indians would not eat them because the squirrels ate dirt.

During the winter and spring of that year, I hunted very carefully in the vicinity where these squirrels were captured, but failed to find further trace of them. The stomachs of both of these squirrels were empty. The traps in which they were caught were set for martens, and two or three had been caught, but none were caught in these traps after the squirrels were captured.

### *Sciurus hudsonicus* Erxleben. Hudson Bay Red Squirrel.

All the red squirrels from the Yukon basin and northern Alaska, as far as can be determined at present, are referable to *Sciurus hudsonicus* 'proper,' although those from the Upper Yukon show considerable tendency toward *S. h. streatoris*. Most of the Yukon specimens are in summer pelage, while the few available specimens from eastern Canada and the vicinity of Hudson Bay are in winter pelage, so that close comparison is not possible. Specimens from various points along the Yukon from Bennett to Nulato have been examined. The

<sup>1</sup> Geol. and Nat. Hist. Survey of Canada, Annual Report, III (1887-88), pt. I, 50 A, 1889.





FIG. 1.—NESTS OF RED SQUIRRELS IN SPRUCE THICKET.



FIG. 2.—BURROWS MADE BY RED SQUIRRELS IN LOOSE SCALES STRIPPED FROM SPRUCE CONES.



animal is exceedingly abundant in all the spruce forest, and doubtless ranges northward to the limit of trees.

Evidences of its activity are to be found all through the spruce forest. Its globular nests of grass, moss, bark, and refuse are common (Plate IV, fig. 1), and are usually situated near the trunk of some slender spruce, 10 or 20 feet from the ground. Sometimes several will be found in the same tree, and a half dozen or more are very often to be seen at the same time. Little excavations in the moss show where the chickarees have been digging for roots; and spruce cones tucked away in these and other out-of-the-way places are further evidence of their sagacity. The ground is often strewn for some distance with the scales of spruce cones which they have stripped (Plate IV, fig. 2). Near Lake Marsh I found one such place 20 feet square which was covered 6 inches deep with scales.

***Sciurus hudsonicus petulans* subsp. nov.**

*Type* from Glacier, White Pass, Alaska (altitude 1,870 feet). No. 97457, U. S. Nat. Mus., Biological Survey Collection, ♀ ad. Collected June 4, 1899, by W. H. Osgood. Original No., 370.

*Characters*.—Similar to *S. hudsonicus*, but larger and darker; central portion of tail darker and with slight mixture of black; submarginal black in tail wider; edging of tail much darker; underparts not pure white in summer. Similar to *Sciurus h. streator*, but more reddish; central portion of tail with much less admixture of black; subterminal black in tail much narrower. Somewhat similar to *S. vancouverensis*, but paler and cranially different; lateral stripe much more prominent; submarginal and subterminal black in tail narrower; median dorsal stripe less suffused; median dorsal hairs of tail with much less black.

*Color*.—*Summer pelage*: Upperparts between the raw umber and Prout's brown of Ridgway; top of head slightly darker than back; lateral line prominent, intense black; forelegs and feet russet; underparts lightly washed with fulvous; median dorsal portion of tail hazel, slightly mixed with black-tipped hairs; submarginal and subterminal black in tail rather limited; edging of tail ochraceous; under surface of tail paler than upper, the grayish roots of the hairs showing through.

*Winter pelage*: Similar to the corresponding pelage of *S. hudsonicus*, but considerably darker; median dorsal line more diffuse; tail darker and with greater admixture of black in central portion.

*Skull*.—Similar to that of *hudsonicus* and its other subspecies; nasals longer and posteriorly more compressed than in *S. vancouverensis*; orbital arch with a sharp indentation between lachrymal and postorbital process. (See Plate V, fig. 2.<sup>1</sup>)

*Measurements*.—Average of two specimens from type locality: Total length 303; tail 120; hind foot 50.

<sup>1</sup>Topotype No. 97460, U. S. Nat. Mus. Compare with fig. 1, *S. vancouverensis*, No. 71889, U. S. Nat. Mus., from Goldstream, Vancouver Island.

*Remarks.*—The closest relationship of this red squirrel is evidently with *hudsonicus* of northern Alaska.<sup>1</sup> A single specimen from Yakutat Bay shows a decided tendency toward the northern form, and those from Cook Inlet are clearly referable to it. A more or less imperfect specimen from Inverness, British Columbia, indicates a possible intergradation with *Sciurus h. streatorii*. There is ample material demonstrating by skulls as well as by color that it has no very close relationship to *S. vancouverensis*. My specimens of *petulans* taken early in June are in new summer pelage or in old winter pelage just previous to or in process of change. The latter doubtless does not fairly represent the winter pelage; but in making comparison with eastern specimens, I have chosen those in a similar condition.

About Lynn Canal and on the southwest side of White Pass I found these red squirrels abundant. Several at Glacier had become quite tame, and came every day to the cabin of one of the railroad hands to be fed. They have all the vivacious energy, curiosity, and vocal accomplishments of their Eastern cousins, and fully maintain their reputation for rollicking good nature and fearlessness.

***Eutamias caniceps* sp. nov.** Gray-headed Chipmunk.

*Type* from Lake Lebarge, Northwest Territory, Canada. No. 99200, U. S. Nat. Mus., Biological Survey Collection, ♀ ad. Collected July 13, 1899, by W. H. Osgood. Original No., 603.

*Characters.*—Similar to *E. borealis*, but grayer, particularly the head, tail, and feet; postauricular spots more prominent; underparts pure white.

*Color.*—*Summer or postbreeding pelage:* Sides bright ochraceous, extending from flanks forward and stopping immediately below ears, but interrupted at shoulders by the extension of gray from arm; five black stripes on back very distinct and, except outer ones, entirely unmixed with ochraceous; outer pair of light stripes pure white, prominent, not continuous with postauricular spots; inner light stripes bluish white mixed with ochraceous; top of head brownish gray; postauricular spots bluish white, connected with throat by a continuous light stripe running below ear; light stripes on sides of head prominent, almost pure white; dark stripes rufous mixed with blackish, narrower and darker than in *E. borealis*; underparts pure white; feet yellowish white. *Worn pelage:* General effect of upperparts olive gray relieved by the black and white stripes of the back and faint traces of the fulvous, which has been worn away; feet grayish white; tail above black, grizzled and overlaid with white, below clay color submargined by black and margined by white.

<sup>1</sup>The *hudsonicus* of northern Alaska is here considered the same as that from eastern Canada, but will doubtless prove separable when an abundance of material in all pelages is available.

*Skull*.—Similar to that of *E. borealis*, but with a slightly fuller brain-case and larger audital bullæ.

*Measurements*.—Type (from dry skin): Total length 223; tail vertebrae 103; hind foot 32.

*Remarks*.—The type<sup>1</sup> of *E. borealis* from Fort Liard, British Columbia, is missing, but specimens from Fort Simpson, which is not far from Fort Liard, and other points east of the Rocky Mountains, are available for comparison. These are all much suffused with fulvous, and are very easily distinguished from those of the Upper Yukon. *E. caniceps* is characterized not only by gray head and cheeks, but by gray feet, gray edging to tail, and pure white underparts.

This species is found from the headwaters of the Yukon about Lake Lindeman to the vicinity of Fort Selkirk, where it was last seen by our party. I found it most common in the dry and open rocky country about Lake Bennett and Lake Lebarge, and a few were taken in the thickets of *Lepargyrea* about Lake Marsh and Fifty-Mile River. It is not abundant anywhere in the region, but is remarkably tame and unsuspecting. I seldom saw more than two or three in a half day's tramp, but these would often frisk about within a few feet of me as if entirely oblivious of my presence.

**Spermophilus empetra plesius** subsp. nov. Bennett Ground Squirrel.

*Type* from Bennett City, head of Lake Bennett, British Columbia. No. 98931, U. S. Nat. Mus., Biological Survey Collection, ♀ ad. Collected June 19, 1899, by W. H. Osgood. Original No., 465.

*Characters*.—Similar to *S. empetra* and *S. kadiacensis*, but smaller; general color less fulvous; under side of tail always clear bright cinnamon rufous; molar teeth relatively much larger than in *kadiacensis*; skull small and light and otherwise slightly peculiar.

*Color*.—*Postbreeding pelage*: Above, mottled as in *S. empetra*, but general color less fulvous; upperparts, mixed black, white and yellowish gray extending forward to top of head, becoming narrower and slightly grayer between shoulders; top of head chestnut mixed with black; nose and forehead clear hazel; under side of body cinnamon rufous paling to nearly white around chin and extending to sides of body, neck and cheeks, and both sides of legs; under side of tail somewhat deeper cinnamon rufous margined by yellowish white; subterminal black in tail less extensive than in *empetra* and *kadiacensis*; median part of upper side of tail grizzled black and yellowish, narrow submargin and subterminal zone black, the whole edged and overlaid with yellowish white. The hairs of the back in *S. plesius* are of two kinds, some being of several colors arranged in zones and some pure black for their entire length. The former, which are most abundant, are dark sooty plumbeous at the base followed by a zone of light gray,

<sup>1</sup> See Allen, Bull. Am. Mus. Nat. Hist., N. Y., III, 109, 1890.

then one of black, then yellowish white, and finally a black tip. In *S. empetra*, the arrangement is practically the same, but the upper part of the light gray zone blends into fulvous. As this is the widest zone, it gives a fulvous suffusion to the entire upperparts of the animal. In *plesius* the black submargin of the tail never shows through on the under side. *Worn spring pelage*: Upperparts yellowish gray; top of head, forehead, and nose cinnamon rufous; thighs with faint suggestions of rufous; shoulders and neck hoary; sides and underparts grayish white washed with yellowish and flecked with ochraceous; feet pale buffy ochraceous; tail paler than in postbreeding pelage.

*Skull*.—Similar to that of *S. empetra* from Unalaska, but smaller and lighter; nasals shorter and wider in proportion to their length; postpalatal notch extending farther forward, being almost on a plane with the last molar; molar teeth decidedly larger than those of *kadiacensis*.

*Measurements*.—Type (from dry skin): Total length 345; tail vertebrae 93; hind foot 50. Skull of type: Basal length 45; zygomatic breadth 35; postorbital constriction 13; length of nasals 18; least width of nasals 6; alveolar length of molar series 13.

*Remarks*.—The material representing *Spermophilus empetra* is still very scanty and imperfect. Specimens from the Arctic coast are few in number and poor in quality, while from Hudson Bay one flat skin, unaccompanied by a skull, is all I am able to find. I have considered this (No. 13932, U.S.N.M.) to be typical of *empetra* and have used it in making skin comparisons. Since it agrees fairly well with specimens of the ground squirrel which has been introduced on Unalaska, I have used the skulls of these for skull comparisons. Specimens from Bristol Bay and the Alaska peninsula are apparently intermediate between *empetra* and *plesius*. *S. kadiacensis* is apparently confined to Kadiak Island, as specimens from the mainland immediately opposite the island are cranially and dentally distinct. The southern members of the group, *columbianus* and *erythroglutæus*, also need not be considered, as they are very different from *empetra* and *plesius*.

*S. plesius* was first met with on the south side of White Pass near Glacier, where a small colony was found on a steep rocky slope above the canyon. They were active here in early June while patches of snow still lay on the ground. On the summit of White Pass another small colony was found, and at Lake Bennett they were very abundant. Here their burrows are to be found wherever the conformation of the rocks affords lodgment of sufficient soil. From Bennett on to Fort Selkirk they are exceedingly abundant. We saw them daily about all the lakes, and as we floated down Fifty-Mile and Thirty-Mile rivers, we often saw them bobbing in and out of their burrows or scurrying along their little trails which score the banks.

From sunrise till late in the afternoon, their sharp clicking cries

rang out across the water, so that, if not to be seen, they at least reminded us of their presence nearly all the time. When alarmed, they stand erect on their haunches near their burrows and violently utter their sharp, high-pitched *clickety click* as long as the exciting cause is in sight, always emphasizing each cry by vigorously slapping their short tails against the ground behind them. As a rule they were quite wary, and it was not possible to get within gunshot without some concealment and careful stalking. The limit of the range of the species along the river is near Fort Selkirk. The last specimen secured was caught near Rink Rapids, but I learned that quite a colony of ground squirrels exists on the west bank of the river just below Fort Selkirk.

**Spermophilus osgoodi** Merriam. Fort Yukon Ground Squirrel.

*Spermophilus osgoodi* Merriam, Proc. Wash. Acad. Sci., II, 18, March 14, 1900.

From Fort Selkirk, near the limit of *Spermophilus plesius* in the interior, nearly to Circle, we saw no signs of ground squirrels of any kind. Just before reaching Circle, however, we began to see unmistakable signs of them and were soon attracted to a small colony by their clicking calls which reached our ears as we floated down in midstream. The call is executed in about the same time as that of *S. plesius*, but its pitch is much lower and its effect on the ear is utterly different. It suggests the click of castanets. On going ashore we found their burrows and connecting paths scattered over quite an area on the hillside. The colony occupied the open hillside and a few ledges of loose rock, and even extended down into a thicket of alder and willow at the foot of the hill. The animals were very shy and became much excited at our approach. Their long tails were very noticeable in marked contrast to the short ones of *S. plesius*, which we had been accustomed to seeing. Fifteen specimens were secured.<sup>1</sup> At this time (Aug. 14) they were all very fat and in splendid postbreeding pelage; the entire underparts were rich ferruginous without a trace of any other color; the back was very dark, and the long tail was full and bushy. One specimen was pure glossy black with faint shadowy indications of vermiculation on the back. Among the specimens in the National Museum from Fort Yukon are several in this melanistic condition, showing that it is not uncommon. The range of this species on the Yukon begins about 20 miles above Circle and extends at least to Fort Yukon and probably to the mouth of the Tanana.

**Arctomys caligatus** Eschscholtz. Hoary Marmot.

Six specimens of the hoary marmot were secured in the White Pass region and about Lake Bennett, where it was common. It is confined

<sup>1</sup> This valuable series was unfortunately destroyed.



to rocky, mountainous parts of the Hudsonian zone, and consequently we did not meet with it during the latter part of our trip, and only heard of it through reports from the mountains at the headwaters of the White and Tanana rivers. As elsewhere; it is familiarly known as the 'whistler,' although occasionally rather inappropriately called 'ground hog.' Its long drawn whistle is peculiarly mournful, particularly when it breaks the deathly silence of some rocky canyon. It loves to stretch at full length on top of a large rock and bask in the sun. I frequently found it quietly enjoying itself in this manner.

**Castor canadensis** Kuhl. American Beaver.

It hardly seems possible that half a million or more beaver skins have been secured in the Territory of Alaska. The animal is now almost as rare there as it is in the United States, the inevitable result of continued pursuit by both whites and natives, which has so many parallels that it is useless to emphasize it here. At Fort Selkirk I saw several beaver skins taken on a small tributary of Stewart River, and at St. Michael I found a very few in the warehouses of the trading companies. Beyond this I saw or heard nothing of them.

**Mus decumanus** Pallas. Norway Rat.

Large rats are exceedingly abundant at St. Michael. Their introduction must have been effected very recently, as they were unknown there at the time of Nelson's work. Unalaska has long been their northern limit on the Pacific coast. They find shelter about the wharves and lumber piles at St. Michael and also infest the buildings, particularly food warehouses. Their distribution will undoubtedly soon be extended all along the Yukon by means of the many steamers now plying between St. Michael and Dawson.

**Peromyscus oreas** Bangs. Bangs White-footed Mouse.

*Peromyscus oreas* Bangs, Proc. Biol. Soc. Wash., XII, 84, March 24, 1898.

Long-tailed mice were taken at Skagway, Glacier, Summit, Bennett, Caribou Crossing, Fifty-Mile River, and Rink Rapids. In general they seemed to be more woodland loving than the short-tailed species, though at Bennett a number were taken among bare rocks at the very water's edge. I first noticed them here while walking along the shore at night. They were darting in and out among the rocks, chasing each other as if playing a game of tag, and often four or five were in sight at once. *P. oreas* from the type locality is somewhat intermediate between my specimens and those which come from the coast of Puget Sound and southern British Columbia. Northern specimens are slightly larger, paler, and less ruddy brown than typical *oreas*. They are very similar in color to *canadensis* and increase the prob-

ability that the latter has a transcontinental range. Their skulls are larger and have fuller braincases than those of either *oreas* or *canadensis*.

***Peromyscus maniculatus arcticus* (Mearns).** Arctic White-footed Mouse.

*Hesperomys leucopus arcticus* Mearns, Bull. Am. Mus. Nat. Hist., N. Y., II, 285, Feb., 1890.

A short-tailed white-footed mouse was found to be very common from Lake Marsh to Lake Lebarge. Thirty specimens were secured, most of them about the crevices of low ledges of rock along the lake shores. The name *arcticus* is only tentatively used for these specimens, as its applicability can not be positively known until a series of Labrador specimens is obtained. My specimens do not differ from topotypes of *arcticus*, and these in turn, as stated by Bangs,<sup>1</sup> do not differ in color and size from typical *maniculatus*. The description of the skull of the Great Whale River specimen examined by Bangs, however, does not agree well with the characters of the skulls of *arcticus*, so it seems advisable to recognize *arcticus* as a subspecies of *maniculatus*. It is probable that more material will amply justify this treatment of the western form.

***Neotoma saxamans* sp. nov.** Northern Bushy-tailed Rat.

*Type* from Bennett City, head of Lake Bennett, British Columbia. No. 98923, U. S. Nat. Mus., Biological Survey Collection, ♂ ad. Collected June 19, 1899, by W. H. Osgood. Original No., 462. (See Plate V, fig. 4.)

*Characters*.—Similar to *Neotoma cinerea drummondii*, but somewhat darker; underparts pure white; skull strongly characterized.

*Color*.—(Type:) Above, grayish fawn mixed with black, becoming brighter on sides, where the quantity of black is much diminished; underparts and feet pure white; eyelids intense black with a limited sooty area about them; nose and anterior cheeks ashy; tail slaty above, white below.

*Skull*.—Similar to that of *N. drummondii* (Plate V, fig. 3<sup>3</sup>) but with interorbital space narrower; nasals narrower and more attenuate posteriorly; maxillary arm of zygoma lighter; sphenopalatine vacuities open; ventral surface of occipital with a high trenchant median ridge; front of incisors very pale.

*Measurements*.—Type (from dry skin): Total length 452; tail vertebræ 192; hind foot 46. Skull of type: Basal length 52; zygomatic breadth 29; interorbital width 5; length of nasals 23.

*Remarks*.—*Neotoma saxamans* differs from *N. cinerea*,<sup>2</sup> *N. occiden-*

<sup>1</sup>Am. Naturalist, XXXII, 496, July, 1898.

<sup>2</sup>*Neotoma c. columbiana* Elliot does not differ cranially from *N. cinerea*, and therefore need not be considered in this connection.

<sup>3</sup>No. 75907, U. S. Nat. Mus., from Jasper House, Alberta.

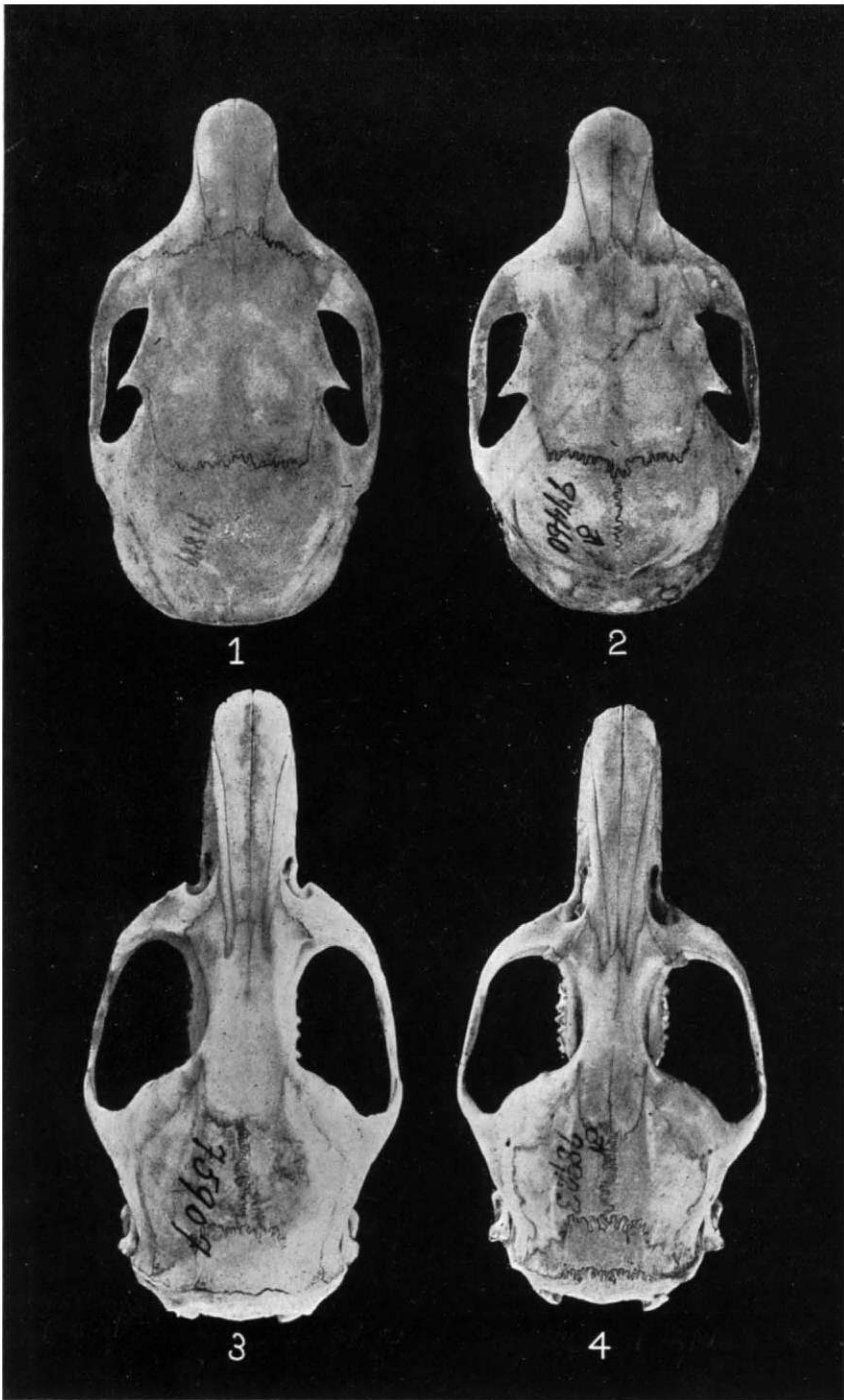
*talis*, and *N. drummondii* chiefly in its long attenuate nasals, open sphenopalatine vacuities, and pale incisors. The only specimens secured were caught in a slide of large granite boulders at the head of Lake Bennett. It was ascertained to occur, however, from White Pass to the Semenow Hills. In the cliffs above Glacier on the coast side of White Pass I found signs of *Neotoma*, and once one peeped out of a crevice at me while I was busily engaged stalking a hoary marmot. It also occurs sparingly in the cliffs about Lake Lebarge and in the Semenow Hills, where the last evidences of its presence were seen. This distribution makes it the northernmost species of the genus.

One night about 10.30, as I was returning to camp at Bennett, I saw one of these rats frisking about in the rocks. It was still quite light, and I immediately stopped and stood motionless while he darted in and out of the rocks. His movements were utterly noiseless and so quick that my eye could scarcely follow them. For some time his little whiskered nose appeared and disappeared at various openings in the rocks about ten feet away. Each time he would look steadily at me for a moment or two and then silently vanish. Gradually his curiosity overcame his caution, and in decreasing circles he came nearer and nearer until he bobbed out right before me and then cautiously approached until he could sniff at the toe of my shoe. A slight grating of my gun barrel against a rock caused him to vanish like a flash, and this time he did not reappear.

***Evotomys dawsoni* Merriam. Dawson Red-backed Mouse.**

Red-backed mice are by far the most abundant mammals in the Yukon region. Although but one specimen was taken at Bennett, and none between there and Fifty-Mile River, in spite of considerable trapping, aside from this they were found all along our route from Skagway to Fort Yukon. The following are the most important localities at which specimens were secured: Skagway, Glacier, Bennett, White Horse Rapids, Lake Lebarge, Rink Rapids, Fort Selkirk, Dawson, Charlie Creek, and Circle. From a study of this series, which numbers over 100 specimens, it appears that all belong to one species, *E. dawsoni*. Its range probably reaches northward almost if not quite to the limit of trees.

Specimens were trapped in all sorts of localities; along cold streams, under logs, in heavy moss, in *Microtus* runways, and among rocks. They abound on the large islands, where they were generally caught in dry, brushy places, in the dead leaves which cover the ground. We occasionally saw them during the day, and often heard them rustling the dead leaves on the ground about us as we lay in our blankets at night. They are the vermin of the miner's larder, and are always to be found about log cabins.



SKULLS OF SCIURUS AND NEOTOMA. (X 1½.)

1. *Sciurus vancoverensis*.
2. *Sciurus hudsonicus petulans*.

3. *Neotoma cinerea drummondii*.
4. *Neotoma saxamans*.



**Evotomys dawsoni alascensis** (Miller). Tundra Red-backed Mouse.

*Evotomys alascensis* Miller, Proc. Acad. Nat. Sci. Phila., 1898, 364-367.

The *Evotomys* found at St. Michael has heretofore been compared only with the Asiatic *E. rutilus*. Its closest relationship is really with *E. dawsoni*, with which its range is doubtless continuous. On comparing the series secured at St. Michael with those in the same condition of pelage from Rink Rapids,<sup>1</sup> Northwest Territory, I am unable to find even the slightest difference in color or size. The skull of *alascensis* is slightly characterized by small, narrow molar series, and by nasals which have their posterior end truncate. The palate and audital bullæ are not peculiar. The tail is often thick and bristly in winter pelage and in immature specimens of both *dawsoni* and *alascensis*. From this it appears that *alascensis* may be only a slightly marked subspecies.

The favorite habitat of these mice about St. Michael is in the heaps of broken lava scattered about over the tundra. They are very rarely taken in the *Microtus* runways. They are common in the warehouses, which they seem to enter more readily than other mice of the tundra.

**Microtus mordax** (Merriam). Long-tailed Vole.

Specimens of this vole were taken at Skagway, Glacier, Bennett, Lake Marsh, Lake Lebarge, Rink Rapids, and near Charlie Village. Specimens from near the coast are almost exactly like those of the interior and all are quite typical of the species. They were found in various environments, but the general habitat of the species was dry places rather than moist. At Glacier and Bennett they were secured on dry, rocky hillsides; at Lake Marsh two specimens were taken in the crevices of some granite rocks; at Lake Lebarge they were taken in the kitchen of a log cabin; at Rink Rapids, in an open, sandy place; and near Charlie Village, on the side of a cut bank, where they had made burrows and runways among the exposed roots of trees. Charlie Village is by far the northernmost locality from which the species has been recorded.

**Microtus drummondi** (Aud. and Bach.). Drummond Vole.

This is the most common meadow vole of the Yukon region. At Caribou Crossing and Lake Marsh its runways form interminable labyrinths in the level, open stretches of sedge at the margin of the water. It occurs in nearly all moist, grassy places from Caribou Crossing to Fort Yukon. From there it undoubtedly ranges farther on, at least to Nulato, where Dall took several specimens. It is most active during the day, as I easily learned by visiting traps night and

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<sup>1</sup>No good series of specimens is available from any point nearer Finlayson River, the type locality of *E. dawsoni*, than Rink Rapids. This series is therefore used to represent the species.

morning. Near Fort Yukon I found its runways on recently deposited silt sparsely grown up to *Equisetum*. Its burrows in this soft material were very numerous, and at the entrance to each a little heap of earth in small globular lumps, as if carried in the mouth, was always to be seen.

***Microtus xanthognathus* (Leach).** Yellow-cheeked Vole.

This fine species was met with only once. A small colony was found on a little stream near Charlie Village, occupying an old log jam, part of which had become embedded in a matrix of sand and mud and overgrown with weeds. Burrows perforated this structure in numerous places, and well-beaten, open runways connected various openings about the protruding logs. The little animals were quite active during the daytime, and as I walked over the logs I occasionally saw one flash from one opening under a log to another and heard sharp little squeaks sounding all about beneath me. A liberal number of traps placed about yielded nine specimens, chiefly immature. The colony was apparently confined to the log jam, as traps set in suitable places but a few yards away secured only *M. drummondii*. Four specimens of this vole collected by Robert Kennicott are in the National Museum, one from the mouth of the Porcupine and three from the Yukon, 200 miles southwest of that point.

***Microtus operarius* (Nelson).** Nelson Vole.

This vole was taken on a small stream about 40 miles above Circle, and a few more were secured between that point and Fort Yukon. It doubtless ranges from there to the coast. Forty-nine specimens were taken at St. Michael. These represent all stages of growth and several phases of color and seem to offer pretty conclusive proof that but one species of *Microtus* occurs at St. Michael. It was found in all moist parts of the tundra, being particularly numerous along the banks of the small ponds in the tall grass and rank, weedy growths.

***Fiber spatulatus*<sup>1</sup> sp. nov.** Northwest Muskrat.

*Type* from Lake Marsh, Northwest Territory, Canada. No. 98567, U. S. Nat. Mus., Biological Survey Collection, ♀ yg. ad. Collected July 3, 1899, by W. H. Osgood. Original No., 552. (See Plate VI, fig. 4.)

*Characters.*—Similar in general to *Fiber zibethicus*; size small; color rather dark; skull small; molar teeth very small; nasals short and much expanded anteriorly.

*Color.*—Similar to *Fiber zibethicus*, but apparently less suffused with fulvous.

*Skull.*—Similar to that of *Fiber zibethicus* (Plate VI, fig. 3<sup>2</sup>), but smaller; jugals more slender, and but slightly produced dorsally; audital bullæ smaller; molar teeth decidedly smaller; nasals much shortened and

<sup>1</sup>*Spatulatus*, spatulate, in allusion to the shape of the nasals.

<sup>2</sup>No. 76259, U. S. Nat. Mus., from Wilmington, Mass.



widely expanded anteriorly, rapidly becoming compressed posteriorly; angular process of mandible short, blunt, and upturned; condyle narrow and somewhat rounded.

*Measurements.*—Type (from dry skin): Total length 495; tail vertebrae 170; hind foot 73. Skull of type: Basal length 57; zygomatic breadth 38; length of nasals 21; alveolar length of molar series 14.

*Remarks.*—Specimens of this species from Ugashik, Fort Kenai, Nushagak, and Nulato, in Alaska, have been examined. Besides these, I find two specimens from Alberta which seem to be referable to it, one from South Edmonton and one from Henry House. These all agree in having very small molar teeth and short, spatulate nasals, characters which are amply sufficient to distinguish the species from all other forms in the genus. The specimens secured by Nelson at St. Michael can not now be found, but they doubtless show the same characters. *Fiber osoyoosensis* has larger teeth and a much longer rostrum than *spatulatus*, so need not be further compared with it. From these facts it appears that *Fiber spatulatus* is the form occupying all of northwest America, and is derived from a form east of the Rocky Mountains rather than from a western one.

Muskrats occur sparingly all along the Yukon, where they find particularly favorable environment about the many small swamp-invested ponds a short distance from the river banks. At St. Michael a few are still found about the open ponds on the tundra.

#### **Synaptomys dalli** Merriam. Dall Lemming Mouse.

Lemming mice were taken at the foot of Lake Lebarge, at Rink Rapids, and near the mouth of the Chandindu River. At Lake Lebarge they were found in the long grass at the edge of a small pond; at other localities in cold, boggy places near small streams. The external characters of *S. dalli* have been unknown up to the present time, but, as was to be expected, they are in accordance with the general type so uniform throughout this genus. The color of the upper parts is chiefly raw umber mixed with black; the lower parts are uniform bluish white, and the feet and tail are dusky. The ears are of medium size and partially hidden by long hairs growing from the anterior base; a conspicuous bluish-white side gland is present in the males. The skull of the type of *dalli* is not fully mature and does not agree in all particulars with my specimens from the Upper Yukon. In these the skull is somewhat larger and heavier and the nasals are a trifle longer and more noticeably constricted posteriorly.

#### **Lemmus yukonensis** Merriam. Yukon Lemming.

*Lemmus yukonensis* Merriam, Proc. Wash. Acad. Sci., II, 27, March 14, 1900.

This lemming was found at only two localities—Rink Rapids, where five specimens were secured, and Charlie Creek, where five more were

taken. Considerable careful trapping was done at various points between these two places, but no other specimens were secured. At Rink Rapids they were caught about old logs and among dry leaves in places usually frequented by red-backed mice. At Charlie Creek one was caught in a *Microtus* runway and several were secured on the side of a cut bank. On one occasion one was seen running about under a brush heap in midday.

**Lemmus alasensis** Merriam. Alaska Lemming.

*Lemmus alasensis* Merriam, Proc. Wash. Acad. Sci., II, 26-27, March 14, 1900.

All efforts to secure this species at St. Michael proved fruitless. I kept large numbers of traps out for more than two weeks and set them in all conceivable locations about the tundra, but failed to catch any lemmings.

**Dicrostonyx nelsoni** Merriam. Nelson Pied Lemming.

*Dicrostonyx nelsoni* Merriam, Proc. Wash. Acad. Sci., II, 25-26, March 14, 1900.

*Dicrostonyx hudsonius alasensis* Stone, Proc. Acad. Nat. Sci. Phila., March 24, 1900, 37-38.

No specimens of this species were taken. Nelson says of it:

Specimens were brought me by the fur traders from above Fort Yukon and from Nulato, Anvik, and Kotlik, along the course of the Yukon, and also from the Kaviak Peninsula and about Kotzebue Sound. A few were taken near St. Michael, but they were not numerous there. They are more plentiful about Bering Straits than any other district visited by me, if the number of their skins among the native children can be taken as a guide.

**Zapus hudsonius alasensis** Merriam. Alaska Jumping Mouse.

Three typical specimens of this jumping mouse were taken in a sedgy swamp near the foot of Lake Lebarge. Similar swamps exist near the Yukon, at least as far as Fort Yukon, but I was unable to do any trapping in them. No specimens were taken elsewhere.

**Erethizon epixanthus myops** Merriam. Alaska Porcupine.

*Erethizon epixanthus myops* Merriam, Proc. Wash. Acad. Sci., II, 27-28, March 14, 1900.

Porcupines are quite common in all the forest region of Alaska. I noticed signs of them at many places along the Yukon. They were abundant about Glacier, in the White Pass region, and I shot one there one evening as it swayed back and forth in the top of a slender alder. It was eating the leaf buds which were just bursting.

**Ochotona collaris** (Nelson). Alaska Pika.

Two specimens of an ashy gray *Ochotona* were taken, one at the summit of White Pass, another at the head of Lake Bennett. The species was apparently quite rare at these localities and it was only with considerable difficulty that these individuals were secured. Both are very pale, ashy gray, with pure white underparts, no traces of

fulvous, and very indistinct collars. They are in the early spring or left-over winter pelage, and agree quite well with specimens in the same pelage collected in the Chigmit Mountains, near Bristol Bay, by C. L. McKay. The type and topotypes of *O. collaris* are in the summer or post-breeding pelage and present quite a different appearance.

The species apparently occurs in the high mountains throughout Alaska. It was reported to me from the MacMillan Mountains, the Upper Stewart River, the Upper White, and the Upper Tanana. Fragments of a skull were found in an owl pellet picked up by Dr. Bishop near Windy Arm, Lake Tagish. The present record from White Pass is the most southern one. There is suitable country for it farther south, and it will be interesting to trace its range in this direction.

**Lepus saliens** sp. nov.

*Type* from Caribou Crossing, between Lake Bennett and Lake Tagish, Northwest Territory, Canada. No. 98956, U. S. Nat. Mus., Biological Survey Collection, ♂ ad. Collected June 26, 1899, by W. H. Osgood. Original No., 504.

*Characters*.—Similar to *Lepus bairdi*, but more yellowish and less ruddy; dorsal hairs with plumbeous roots; feet nearly white in summer; similar to *L. columbiensis*,<sup>1</sup> but with greater amount of black in dorsal region; feet much lighter; skull similar in general to that of *Lepus a. dalli*; audital bullæ very large.

*Color*.—Type in *worn spring pelage*: Upperparts mixed black and yellowish buff, with patches of plumbeous under-fur exposed in places; black hairs predominating on rump and middle of back, forming an ill-defined dorsal stripe; outer edge of thighs, outer side of forelegs and pectoral band buff; ears and head, except sides of nose, buff with black hairs sprinkled through; sides of nose gray; ears margined with white; hairs of fore and hind feet plumbeous at base, rufous in central part, and broadly white at tips; general appearance of feet white, lightly mixed with rufous; underparts, except pectoral band, white.

*Skull*.—Similar to that of *dalli* but somewhat larger; teeth heavier; nasals long, heavy, and very broad anteriorly; audital bullæ very large; palate short; malars rather wide, deeply channeled anteriorly; postorbital and antorbital processes of frontals well developed.

*Measurements*.—Type (measured from dry skin): Total length 395; hind foot 134; ear from crown 74. Skull of type: Occipitonasal length 77; greatest zygomatic breadth 38; length of nasals 33; greatest width of nasals 17; alveolar length of molar series 15.

*Remarks*.—The exact relation in which this species stands to *americanus*, *bairdi*, and *columbiensis* is difficult to determine at present. Its light feet point to relationship with *bairdi*, while its dark under color

<sup>1</sup> Rhoads, Proc. Acad. Nat. Sci. Phila., 1895, 242-243.

and general buffy appearance are more like *columbiensis*. Its skull is quite distinctive, the large audital bullæ and broad nasals being unequaled in the group. It seems probable that it is a northern form of *bairdi* not related to *columbiensis*, which is nearer to *washingtoni*. There are no specimens available to show whether or not it has any connection with *dalli*, which is the form found on the Lower Yukon. But two specimens were secured—the type, which I shot in a *Lepargyrea* thicket at Caribou Crossing, and one very young female which Dr. Bishop took in a willow bog near Bennett City. It seems to have been a decidedly 'off year' for rabbits, for these two were the only ones we saw on our entire trip, though numerous signs of their former abundance were seen daily.

**Lepus americanus dalli** Merriam. Dall Varying Hare.

*Lepus americanus dalli* Merriam, Proc. Wash. Acad. Sci., II, 29–30, March 14, 1900.

This rabbit is doubtless abundant at certain times all along the Lower Yukon, but we heard very little of it. It is subject to epidemics and frequently becomes locally extinct, which probably accounts for its scarcity last year.

**Lepus othus** Merriam. Alaska Arctic Hare.

*Lepus othus* Merriam, Proc. Wash. Acad. Sci., II, 28, March 14, 1900.

Signs of Arctic hares were occasionally noticed about St. Michael, but we did not see any of the animals. The Eskimos were hunting continually, and brought numbers of ducks and geese to the village to sell, but they brought no rabbits during our stay.

**Lynx canadensis mollipilosus** Stone. Arctic Lynx.

*Lynx canadensis mollipilosus* Stone, Proc. Acad. Nat. Sci. Phila., March 24, 1900, 48–49.

The Canada lynx is not as common in the interior of Alaska as might be expected. I saw no signs of it and could obtain only very scanty information as to its occurrence. The police sergeant in charge of the station at the foot of Lake Lebarge told me that the tracks of but one had been seen in that vicinity during the previous winter. Lynx-skin robes are in common use in the country, but the majority of them are imported. This I learned from a trader at Circle, who had several for sale that came from eastern and southern Canada.

Lynx skulls from the following localities are in the National Museum: Tanana River, Russian Mission, Nulato, Andraefski, and mountains near Unalakleet.

**Canis occidentalis** Richardson. Wolf.

The country along the Yukon is not well suited for wolves, and they are seldom seen there. A prospector showed me the skin of a large gray one from the upper waters of the MacMillan river—the only one I saw on the trip.

**Vulpes fulvus** (Desmarest)? Red Fox.

Occasional reports of foxes were received all along our route, but no specimens were secured. Owing to their natural sagacity, foxes are doubtless able to hold their own against trappers better than most other fur-bearing animals. Their skins are quite common among traders and natives.

**Vulpes hallensis** Merriam. Hall Island Fox.

*Vulpes hallensis* Merriam, Proc. Wash. Acad. Sci., II, 15-16, March 14, 1900.

White fox skins are common among the natives and traders at St. Michael, and could be bought at from \$1 to \$4 each, according to quality. During our stay there one of the animals was seen on the island, which indicates that they are still far from extermination.

**Ursus americanus** Pallas. Black Bear.

Black and brown bears are common all along the Yukon. We found them common on the upper river, and Nelson records them as far down as Anvik. We saw tracks very frequently, but owing to the thick forest and underbrush, and the fact that we made no special hunts for them, the animals themselves were rarely observed. A young adult female in glossy black pelage was killed at Glacier by A. G. Maddren, and several others were seen during our stay there. I was told at Lake Lebarge and at White Horse Rapids that brown bears were seen very frequently. At Fort Selkirk I saw skins brought from the Pelly River. Near Charlie Village I saw the skin of a large brown bear that had been killed there shortly before our arrival. One afternoon while sitting in the boat preparing specimens, about 20 miles above Circle, I saw a good-sized black bear walking deliberately across an open space on a hillside a short distance away. We gave chase, but did not see it again. At the mouth of the Tatondu River I saw numerous tracks, and on the border of a stagnant pool found evidences that bruin had been enjoying a mud bath. Moss uprooted by bears in digging for roots was noticed at several places.

**Ursus horribilis alascensis** Merriam. Alaska Grizzly Bear.

Very little accurate information is obtainable in regard to the grizzly in the Yukon region. It doubtless occurs sparingly all along the river, but miners and prospectors report any large bear as a grizzly, and without doubt often mistake the brown bear for it. There are a number of its skulls from Norton Sound in the Biological Survey collection.

**Lutra canadensis** (Schreber). American Otter.

The fate of the otter in Alaska is much the same as that of the beaver. There are doubtless a few on some of the smaller streams of the interior and about the Yukon delta, but they are now quite rare in comparison with their former abundance.

**Lutreola vison ingens** subsp. nov. Alaska Mink.

*Type* (skull) from Fort Yukon, Alaska. No. 6530, U. S. Nat. Mus., ♂ ad., old. Collected by Robert Kennicott. (See Plate VI, fig. 2.)

*Characters*.—Size largest of North American mink; similar to *L. v. energumenos*, but lighter in color and very much larger; skull and teeth very large and heavy.

*Color*.—Similar in general to *Lutreola v. energumenos*, but paler.

*Skull*.—Very large, angular, and ridged; rostrum very wide; brain-case relatively shallow and very wide; zygomatic heavy; audital bullæ large and relatively wide; dentition heavy. (Compare with skull of *Lutreola v. energumenos*, Plate VI, fig. 1.<sup>1</sup>)

*Measurements*.—No. 13880, U. S. National Museum, St. Michael, Alaska (from dry skin): Total length 720; tail vertebræ 180; hind foot 75. Skull of type: Occipitonasal length 69; zygomatic breadth 47; mastoid breadth 41; breadth across postorbital processes 23; length of audital bulla 17. Average of five adults: Occipitonasal length 44.5; mastoid breadth 39.5; breadth across postorbital processes 21; length of audital bulla 17.5.

*Remarks*.—The large size of the Alaska mink has been noted by various authors,<sup>2</sup> but each has dismissed the subject by concluding that it is the natural result of the animal's northern range, and the form has remained unnamed, while less marked forms from other localities have been recognized. The largest mink previously described is *L. v. energumenos*, which is very much smaller than *ingens* and also averages much darker.

The minks of the Yukon region are caught mostly on the tributary streams, and, as stated by Nelson, are very abundant in the area between the deltas of the Yukon and the Kuskokwim. Along the Yukon itself our party did not see any, and very few signs of them were observed. Their skins were seldom seen among the Indians and Eskimos. They were reported, however, from the Porcupine, Koyukuk, Tanana, and various other streams tributary to the Yukon, and without doubt occur in suitable places all over Alaska.

**Putorius arcticus** Merriam. Tundra Weasel.

*Putorius arcticus* Merriam, N. Am. Fauna No. 11, 15, June, 1896.

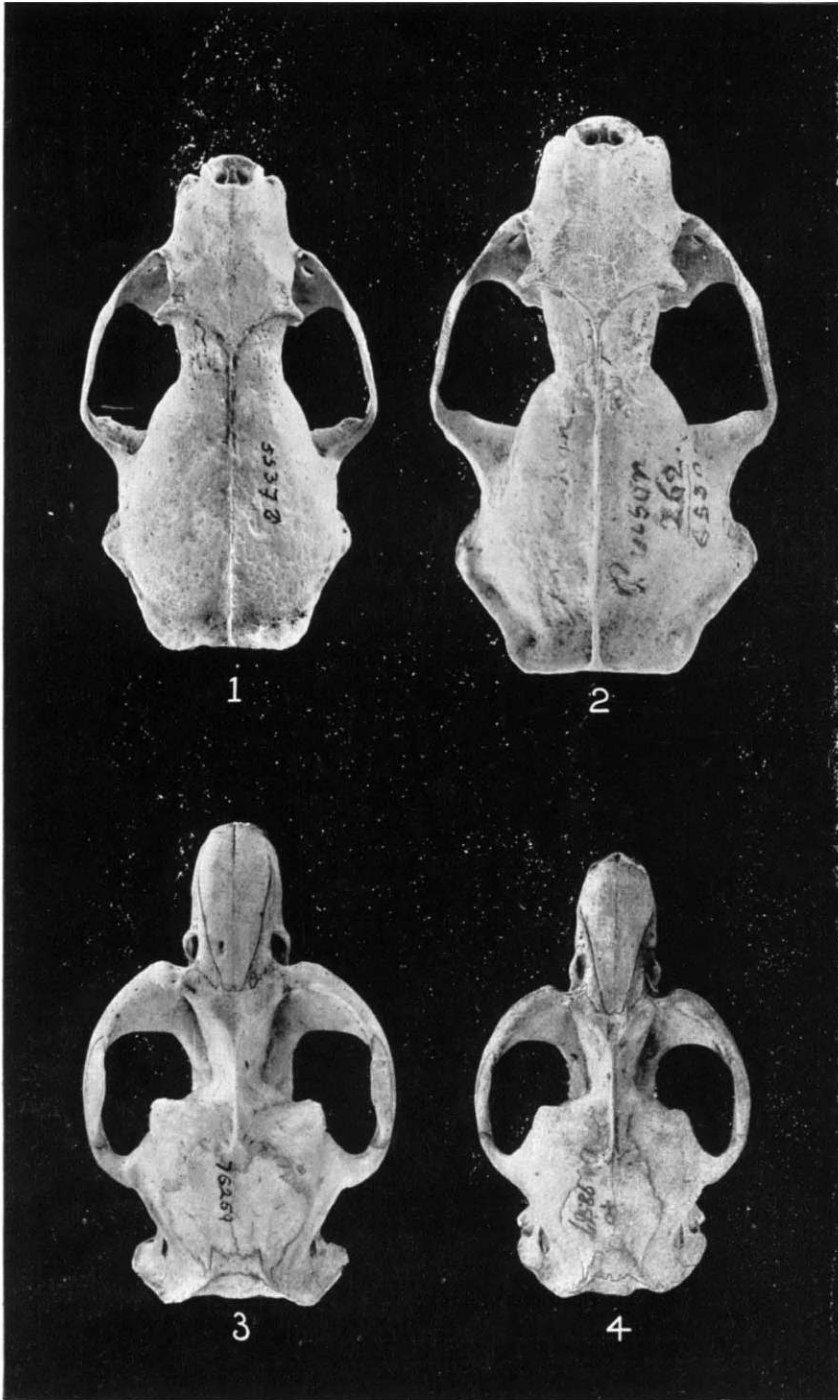
*Putorius cicognani richardsoni* Merriam, *l. c.*, 11-12 (part).

Three immature specimens of this weasel were taken at St. Michael. They were caught in traps baited with sandpipers and set among the lava rocks along the shore. Several specimens which were also secured at St. Michael by Nelson and Turner are in the National Museum. Besides these I find specimens from Nulato, Fort Yukon, and Fort Reliance, which gives the species a more extensive range in the interior than it has been supposed to have. Most of these specimens are

<sup>1</sup> No. 5537, Bangs collection, from Sumas, B. C.

<sup>2</sup> See Allen, Bull. U. S. Geol. and Geog. Survey Terr., II, 327-328, 1876.





SKULLS OF LUTREOLA AND FIBER. (Natural size.)

1. *Lutreola vison energumens.*
2. *Lutreola vison ignis.*

3. *Fiber zibethicus.*
4. *Fiber spatulatus.*





imperfect, but enough skulls are now at hand to show conclusively that all the Yukon specimens heretofore identified as *richardsoni* are really practically identical with *P. arcticus* from Point Barrow.

***Putorius cicognani alascensis* (Merriam). Juneau Weasel.**

A single immature specimen taken 20 miles below Fort Selkirk is referred to this form. Its skull is rather large and indicates a possible intergradation with *P. arcticus*; otherwise it agrees with *alascensis*.

***Putorius rixosus eskimo* Stone. Alaska Least Weasel.**

*Putorius rixosus eskimo* Stone, Proc. Acad. Nat. Sci. Phila., March 24, 1900, 44-45.

No specimens of this rare weasel were obtained. There are three imperfect specimens in the National Museum, two from St. Michael and one from Fort Reliance. Besides these the only ones recorded are the type and four topotypes from Point Barrow, Alaska, and the specimen mentioned by Stone (loc. cit.) from Bethel, Kuskokwim River, Alaska.

***Mustela americana actuosa* subsp. nov. Alaska Marten.**

*Type* (skull) from Fort Yukon, Alaska. No. 6043, U. S. Nat. Mus., ♂ ad., old. Collected by Robert Kennicott. (See Plate VII, fig. 2.)

*Characters*.—Similar to *M. brumalis*, but larger; cranial and dental characters distinctive.

*Color*.—(Topotype, No. 6416, U.S.N.M., ♂ ad.): Posterior half of upperparts pale ochraceous buff, shoulders and anterior part of upperparts gradually becoming grayish; entire upperparts, except head, overlaid with coarse brown hairs; head, including cheeks and throat, pale grayish-white lightly mixed with brown, especially on nose and chin; inside and edges of ears whitish, outside and bases of ears brown; underparts similar to upperparts, but darker and more brownish on chest; an irregular patch of creamy buff mixed with white on chest; legs and feet dark brown, front of legs with mixture of gray hairs; tail brown, somewhat darker at tip, and with a slight mixture of gray hairs.

*Skull*.—Similar to that of *M. brumalis* (Plate VII, fig. 1<sup>1</sup>), but somewhat larger; relatively longer and narrower; interorbital space slightly narrower; audital bullæ very much larger and longer; dentition relatively much weaker; last upper molar decidedly smaller.

*Measurements*.—Average of four adult male topotypes measured in the flesh by the collector: Total length 26.22 inches (665 mm.); tail vertebræ 8.08 inches (223 mm.); hind foot 4.36 inches (109 mm.). Skull of type: Occipitonasal length 85; greatest zygomatic breadth 55; breadth across postorbital processes 24; palatal length 44; length of audital bulke 19.

<sup>1</sup>Type No. 7417, Bangs collection, from Okak, Labrador.

*Remarks.*—This form is the largest of the subspecies of *Mustela americana*. *M. brumalis* is also large, but does not equal *actuosa*, and notwithstanding its smaller size has heavier dentition. The enormous audital bullæ of *actuosa* are not equaled by those of any other member of the group. The skulls of *americana* (Plate VII, fig. 3<sup>1</sup>) and *caurina* are so very much smaller than those of *brumalis* and *actuosa* that they do not need to be closely compared. In a good series of *actuosa* from Fort Yukon and Fort McPherson the characters are very constant. A large number of skins from these localities present very little variation, and nearly all are quite light colored like the one described above. The marten is still the commonest fur-bearing animal of Alaska, notwithstanding the hundreds of thousands that have already been taken. Trappers are always confident of a harvest of martens whether other animals are abundant or not.

***Mustela pennanti* Erxleben. Fisher.**

Dr. Elliott Coues<sup>2</sup> states that he has examined specimens of the fisher from Alaska, but does not give the exact locality. At present no specimens are at hand to corroborate this record, but there is little doubt that the animal occurs along the Upper Yukon, as it is known from similar latitudes to the eastward. It was not met with by our party, and I received no reliable information in regard to it.

***Gulo luscus* (Linnaeus). Wolverine.**

Wolverines seem to be quite common in the Yukon region. They were often reported, and I saw a number of skins among the natives on the lower river. One was said to have been trapped at Tagish in the winter of 1898, and others were seen in the vicinity. They are seen frequently about Lake Lebarge in winter, and trappers from the MacMillan River say they are abundant in that region.

***Sorex personatus streator* Merriam. Streator Shrew.**

Specimens of this shrew were secured as follows: Haines 1, Skagway 6, Glacier 1, Bennett 3, Caribou Crossing 2, Lake Lebarge 1, 50 miles below Fort Selkirk 1, mouth of Chandindu River 1, and 40 miles above Circle 1. Although the conditions along the Yukon seem to be ideal for shrews, I was unable to secure many specimens, and could only conclude that they were not common there, for the same methods of trapping were much more successful in the coast regions.

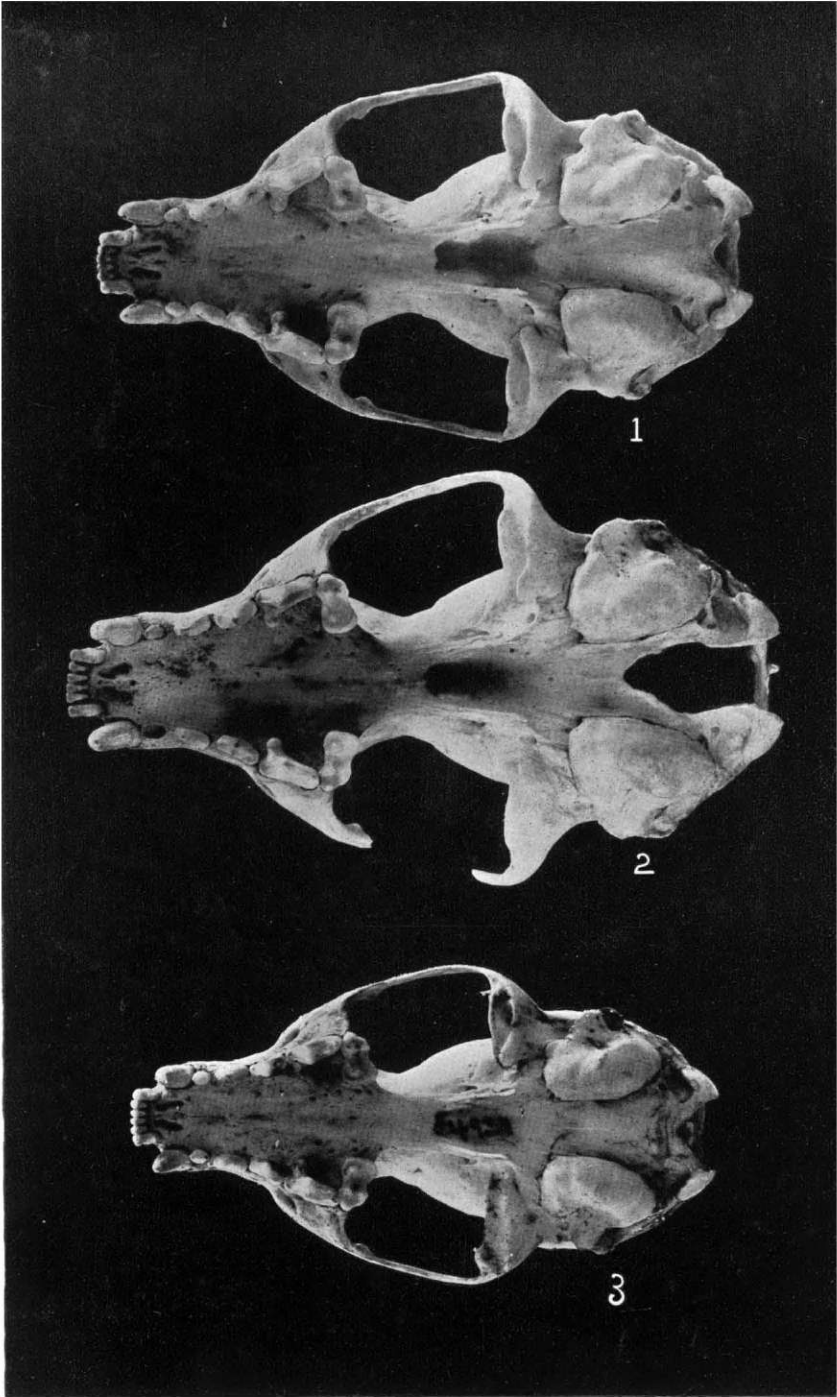
***Sorex personatus arcticus* Merriam. Arctic Shrew.**

*Sorex personatus arcticus* Merriam, Proc. Wash. Acad. Sci., II, 17, Mar. 14, 1900.

Twenty specimens were taken at St. Michael. They occur throughout the tundra in much the same situations as *S. tundrensis*, but were also found in the lava heaps and along high banks near the coast.

<sup>1</sup>No. 4934, Merriam collection, from the Adirondacks, New York.

<sup>2</sup>Fur-bearing Animals, 69, 1877.



SKULLS OF MUSTELA. (Natural size.)

1. *Mustela americana brunalis*.

2. *Mustela americana actiuosa*.

3. *Mustela americana*.



**Sorex obscurus** Merriam. Mountain Shrew.

Two specimens were caught under tufts of grass on a rocky hillside at Bennett. This locality is much farther north than any from which this species has been previously recorded.

**Sorex tundrensis** Merriam. Tundra Shrew.

*Sorex tundrensis* Merriam. Proc. Wash. Acad. Sci., II, 16-17, March 14, 1900.

Eighteen specimens of this pretty shrew were taken at St. Michael. They were found in various parts of the tundra, but seemed to be in small localized colonies. About certain small ponds nearly all the shrews caught were of this species, while but a short distance away all were *arcticus*. A single imperfect specimen collected by Kennicott near Fort Yukon is in the National Museum. In size it does not differ from typical *tundrensis*, but in color it is somewhat darker, thus indicating a possible intergradation with *richardsoni*.

**Myotis lucifugus** (Le Conte). Little Brown Bat.

Bats were first seen at Caribou Crossing, and from that point were occasionally noticed at various places to our camp, 50 miles below Fort Selkirk, where they were last seen. Turner mentions their reported occurrence as far down as Fort Yukon and Nulato. In June and July we generally found them flying from 10 to 11.30 p. m., and sometimes even later. Two specimens only were secured. These are somewhat grayer and less glossy than specimens from the eastern United States.





# BIRDS OF THE YUKON REGION, WITH NOTES ON OTHER SPECIES.

By LOUIS B. BISHOP, M. D.

## INTRODUCTION.

In preparing the ornithological part of this report I have thought it advisable to note as far as possible all species met with from the time we passed Dixon Entrance, northward bound, May 28, until we reached Cape Scott on the return trip, October 12, for the reason that articles on Alaska birds are not yet so numerous as to make such notes worthless. It was of course impossible to obtain specimens of waterfowl seen from the decks of steamers; therefore when specific identification was not positive I have referred genera seen to the species which previous observers—especially E. W. Nelson and William Palmer—have found most common in the waters visited.

Nowhere did we see the vast colonies of water birds which others have met with in Alaskan waters, probably because most of these birds had left their summer homes in Bering Sea when we passed in October; but various migrants were common in the Inside Passage in May, geese and ducks on the Lower Yukon in August, and waterfowl of many species in Akutan Pass in October.

The region from Skagway, at the head of Lynn Canal, to Circle, on the Yukon, was the scene of most of our work; and as very little was known of it ornithologically I have mentioned in my annotated list every occasion of our observation of all except the commonest species. Ornithologists, in referring to the Upper Yukon, include, as a rule, only that part of the river which lies between Dawson and Nulato; hence the avifauna of its head waters was with us largely a matter of conjecture. George G. Cantwell<sup>1</sup> mentions species he saw about the lakes; but his experience was in many ways so different from ours that, while crediting him with the first records for species which we also found, I have omitted others which we did not find and for which he may have mistaken closely allied birds.

The country we traversed between Skagway and Circle divides itself into three quite distinct faunal districts. The coast of Southeast Alaska belongs to the 'Sitkan district' of Nelson, White Pass Summit

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<sup>1</sup>Birds of the Yukon Trail < Osprey, III, 25, Oct., 1898.

and the heights above Glacier belong to the Arctic-Alpine zone, and the Yukon Valley belongs to the Canadian and Hudsonian zones. In the last the Canadian element is most pronounced in the lake region, with a very slight infusion of Sitkan forms, the strictly Hudsonian species increasing and the others decreasing as the Yukon winds north toward Fort Yukon. Beyond this point Hudsonian forms predominate, giving place to Arctic where the Yukon loses its identity in the tundra of the delta. The Upper Yukon Valley may be divided faunally at Fort Selkirk, where the Pelly from the Rocky Mountains and the Lewes from the Coast Range unite to form the Yukon proper, 15 species of land and shore birds occurring above this point which have not been found between there and Fort Yukon, and 12 having been recorded between the Pelly and Fort Yukon which have not been taken above. Of the 128 species and subspecies found between Dixon Entrance and Fort Yukon, 22 per cent were common to the coast of southeast Alaska and the Yukon Valley, 19 per cent confined to the coast, 55 per cent to the Yukon Valley, and 4 per cent found only on White Pass Summit and at similar altitudes.

The avifauna of southeastern Alaska is already fairly well known, and the twelve days spent at Haines, Skagway, and Glacier resulted chiefly in extending the ranges of a few species, though the barn swallow proved to be the subspecies recently reinstated by Mr. Palmer, the myrtle warbler that lately described by Mr. McGregor, and the wood pewee an unrecognized form. Of the 52 species found between Dixon Entrance and Glacier, 2—*Colaptes auratus luteus* and *Merula migratoria*—were eastern, 8 Alaskan, 25 Pacific coast, and 17 common to northern North America. At Haines, which is situated on a narrow and for the most part heavily wooded peninsula, birds, although not common, were more numerous than they were either at Skagway, which is in a narrow cliff-bordered valley at the head of Lynn Canal, or at Glacier, 14 miles from Skagway, 1,870 feet higher, and surrounded by deep spruce woods and alder thickets. We found in the avifauna of Glacier a slight but decided difference from that of the tide-water level of Lynn Canal, *Junco hyemalis connectens* replacing *J. h. oregonus*, and *Wilsonia pusilla pileolata* replacing *Helminthophila celata lutescens*, while *Melospiza melodia rufina* and *Merula migratoria* were absent.

Among the thickets of alpine hemlock growing with moss and heather between the granite rocks of White Pass Summit and the heights above Glacier we found *Zonotrichia coronata* and *Anthus pensilvanicus* common, and *Lagopus rupestris*, *L. leucurus*, *Leucosticte tephrocotis littoralis* and *Sayornis saya yukonensis* in smaller numbers. *Sayornis s. yukonensis* reached the Yukon level at Fort Selkirk, and *Anthus pensilvanicus* at Circle, but the others were not seen again.

To one accustomed to the orchards, fields, and forests of Connecti-

cut, the duck marshes of North Dakota, or even the balsam thickets of northern New England, the Yukon Valley seems wanting in bird life—not the center of abundance of its avifauna, but rather a deposit for the overflow from more favored regions. There are exceptions to this rule, notably wandering flocks of crossbills, the colonies of bank swallows of Fifty-Mile and Thirty-Mile rivers and the Yukon proper, the spotted sandpipers that continually flitted across our bow, the intermediate sparrows and juncos that seldom failed to greet us as we stepped ashore, and the Alma thrushes, whose songs sounded all night, wherever we happened to camp. Bird life is fairly abundant, too, in certain favored places such as Log Cabin, Caribou Crossing, the swampy shores of Lake Marsh, and the ponds and level country at the lower end of Lake Lebarge. Near Miles Canyon I noticed 23 species on July 11, but individuals of each, with the exception of bank swallows, were few. In the entire Upper Yukon Valley breeding colonies of shore and water birds were conspicuously absent. The precipitous shores of the lakes, the comparative absence of islands, the swift current of the Yukon, and its high banks cut by narrow, wooded valleys, are a sufficient explanation of this; and I can not believe that either geese, ducks, or shore birds ever bred abundantly in most of the region visited, though their number has doubtless been reduced in recent years.

In the Yukon flats the condition changes, and no doubt many of these birds find a summer home in the ponds a few miles back from the river, as they do at the foot of Lake Lebarge; but these we had no opportunity of visiting. Our study of the bird life of the Yukon was chiefly confined to what could be seen or heard from our boat or on the banks in the immediate vicinity of camping places. From the lakes to the Alaska boundary snow-capped peaks were absent, and no species were found that did not also occur upon the banks of the river, although we climbed hills, visited deep woods, and ascended small streams for some distance. As we proceeded north, however, several birds were found at lower altitudes than those at which they had been already noted. Away from the river, birds were rarer than immediately upon its banks.

We learned little regarding the Upper Yukon as a migratory highway for species breeding farther north, though we heard that thousands of geese and ducks passed Lower Lebarge in the spring. It was too late for the spring migration, and the southward movement of ducks and geese had hardly begun on August 20, when we left Circle. The fall migration of the *Limicolæ* should have been well under way at this date, but very few of these birds were observed. If they do pass in large numbers they must frequent the ponds back from the river. Several times at Circle, I walked a long distance over the sand flats left bare by the falling Yukon without seeing any

shore birds, or anything on which they could feed. This was very different from the constantly passing flocks I saw on the Yukon Delta August 27-28, and the abundance of *Limicolæ* at St. Michael in September. The smaller land birds we often saw late in July and in August. They were usually in family parties, and most of them seemed to be traveling up the river. At Circle the intermediate sparrow, western tree sparrow, and western savanna sparrow were abundant, and were evidently migrating August 19-20.

Forty-two species of migratory birds, exclusive of those possessing a continental range, certainly occur as summer residents in the Yukon Basin above Fort Yukon. Of these, 13 (31 per cent) have their center of distribution in eastern North America, 14 (33 per cent) near the Pacific coast, and 15 (36 per cent) in western North America not far from the Rocky Mountains. The eastern birds reach the Yukon through the Rocky Mountains. Some of these, such as *Chordeiles virginianus*, were found only above the Tatchun River; others, as *Empidonax t. alnorum*, were absent above the Pelly and common from there to Fort Yukon; others, as *Wilsonia pusilla*, were not found above the Chandindu River; others, as *Helminthophila peregrina* were each found at a single place, while still others, as *Junco hyemalis* and *Merula migratoria*, were regularly distributed along the river. The Pacific coast forms probably all reach the Yukon over the Alaska coast range. These disappear as one goes north, *Hylocichla aonalaschkeæ* extending through Lake Bennett, *Wilsonia p. pileolata* to Lake Marsh, *Dendroica townsendi* to Lake Lebarge, *Myadestes townsendi* to Dawson, and *Tachycineta thalassina* to Circle. Last and most important in number of species, abundance of individuals, and regularity of distribution are birds which breed in the Yukon Valley and spend the winter in the western United States, as *Zonotrichia l. gambeli*, *Spizella s. arizonæ*, and the small *Ammodramus s. alaudinus* of the Yukon lakes, and those which probably enter by the mouth of the Yukon, as the large *Ammodramus s. alaudinus*, found below Alaska boundary, and *Seiurus n. notabilis*, first met near Dawson.

In coloring, Yukon birds, especially in juvenile plumage, show a strong tendency to replace the buff-ochraceous markings of Eastern forms by white, cream color, and gray. *Canachites c. osgoodi*, *Parus h. evura*, and *Hylocichla u. alma* are good examples of this characteristic.

I take this opportunity to express my hearty thanks to Dr. Merriam for the privilege of visiting Alaska as a member of the Biological Survey party, of writing this report, and of using the collection of the Biological Survey in its preparation; also to Mr. Osgood and Mr. Oberholser of the Biological Survey for aid in determining species. I am also greatly indebted to Mr. Robert Ridgway and Dr. Charles W. Richmond for the opportunity of studying the collection of the

United States National Museum and for much valuable assistance; to Dr. J. A. Allen and Mr. F. M. Chapman for the hours which I spent with the birds in the American Museum of Natural History; to Mr. William Brewster for the courtesy of allowing me to compare my specimens with those in his valuable collection, and to Mr. Walter Deane for much help in this study.

### CLASSIFIED LISTS OF SPECIES.

#### NEW SUBSPECIES.

*Canachites canadensis osgoodi.*                      *Contopus richardsoni saturatus.*  
*Sayornis saya yukonensis.*

#### SPECIES NOT HITHERTO RECORDED FROM WESTERN NORTH AMERICA.

##### *Haliaeetus albicilla.*

#### SPECIES NOT HITHERTO RECORDED FROM SOUTHEASTERN ALASKA.

*Æchmophorus occidentalis.*                      *Empidonax hammondi.*  
*Xema sabinii.*                                      *Junco hyemalis connectens.*  
*Lagopus leucurus.*                                *Sitta canadensis.*  
*Picoides americanus alascensis.*              *Merula migratoria.*  
*Contopus richardsoni saturatus.*

#### SPECIES NOT HITHERTO RECORDED FROM UNALASKA.

*Larus philadelphia.*                              *Tringa acuminata.*  
*Tringa maculata.*                                *Loxia curvirostra minor.*

#### SPECIES NOT HITHERTO RECORDED FROM THE PRIBILOF ISLANDS.

*Larus philadelphia.*                              ? *Arenaria melanocephala.*  
*Tringa acuminata.*

#### SPECIES NOT HITHERTO RECORDED FROM ST. MICHAEL.

##### *Calidris arenaria.*

#### SPECIES NOT HITHERTO RECORDED FROM THE YUKON ABOVE FORT YUKON.

*Tringa bairdi.*                                      *Spinus pinus.*  
*Symphemia semipalmata inornata.*              *Spizella socialis arizonæ.*  
*Buteo borealis calurus.*                        *Passerella iliaca.*  
*Falco sparverius.*                                *Helminthophila peregrina.*  
? *Megascops asio kennicotti.*                      *Dendroica townsendi.*  
? *Dryobates villosus hyloscopus.*                *Wilsonia pusilla pileolata.*  
*Contopus borealis.*                                *Sitta canadensis.*  
*Contopus richardsoni saturatus.*                *Hylocichla aonalaschkae.*  
*Empidonax traillii alnorum.*                      *Hylocichla aonalaschkae pallasii.*  
*Empidonax hammondi.*                              *Saxicola cyanthe.*

#### LIST OF SPECIES KNOWN FROM THE YUKON BASIN.

*Colymbus holboëlli.*                              *Gavia lumme.*  
*Colymbus auritus.*                                *Stercorarius pomarinus.*<sup>1</sup>  
*Gavia imber.*                                      *Stercorarius parasiticus.*<sup>1</sup>  
*Gavia arctica.*                                    *Stercorarius longicaudus.*<sup>1</sup>

<sup>1</sup> Known only from Fort Yukon or below.

<i>Rissa tridactyla pollicaris</i> . <sup>1</sup>	<i>Tringa bairdi</i> .
<i>Larus barrovianus</i> . <sup>1</sup>	<i>Tringa minutilla</i> .
<i>Larus argentatus smithsonianus</i> .	<i>Tringa alpina pacifica</i> .
<i>Larus vegæ</i> . <sup>1</sup>	<i>Ereunetes occidentalis</i> . <sup>1</sup>
<i>Larus brachyrhynchus</i> .	<i>Calidris arenaria</i> . <sup>1</sup>
<i>Larus philadelphia</i> .	<i>Limosa lapponica baueri</i> . <sup>1</sup>
<i>Xema sabinii</i> . <sup>1</sup>	<i>Limosa hæmastica</i> . <sup>1</sup>
<i>Sterna caspia</i> . <sup>1</sup>	<i>Totanus flavipes</i> .
<i>Sterna paradisea</i> .	<i>Helodromas solitarius cinnamomeus</i> .
<i>Sterna aleutica</i> . <sup>1</sup>	<i>Heteractitis incanus</i> . <sup>1</sup>
<i>Hydrochelidon nigra surinamensis</i> . <sup>1</sup>	<i>Bartramia longicauda</i> . <sup>1</sup>
<i>Phalacrocorax pelagicus robustus</i> . <sup>1</sup>	<i>Symphemia semipalmata inornata</i> . <sup>2</sup>
<i>Merganser americanus</i> .	<i>Tryngites subruficollis</i> . <sup>1</sup>
<i>Merganser serrator</i> . <sup>1</sup>	<i>Actitis macularia</i> .
<i>Anas boschas</i> .	<i>Numenius hudsonicus</i> .
<i>Mareca americana</i> .	<i>Numenius borealis</i> . <sup>1</sup>
<i>Nettion carolinensis</i> .	<i>Squatarola squatarola</i> .
<i>Querquedula discors</i> . <sup>1</sup>	<i>Charadrius dominicus</i> .
<i>Spatula clypeata</i> .	<i>Charadrius dominicus fulvus</i> . <sup>1</sup>
<i>Dafila acuta</i> .	<i>Ægialitis semipalmata</i> .
<i>Aythya vallisneria</i> . <sup>1</sup>	<i>Arenaria interpres</i> . <sup>1</sup>
<i>Aythya marila</i> .	<i>Arenaria melanocephala</i> . <sup>1</sup>
<i>Aythya affinis</i> .	<i>Canachites canadensis osgoodi</i> .
<i>Clangula clangula americana</i> .	<i>Bonasa umbellus umbelloides</i> .
<i>Clangula islandica</i> .	<i>Lagopus lagopus</i> .
<i>Charitonetta albeola</i> .	<i>Lagopus rupestris</i> .
<i>Harelda hyemalis</i> .	<i>Pediceetes phasianellus columbianus</i> . <sup>1</sup>
<i>Histrionicus histrionicus</i> .	<i>Circus hudsonius</i> .
<i>Arctonetta fischeri</i> . <sup>1</sup>	<i>Accipiter velox</i> .
<i>Somateria v-nigra</i> . <sup>1</sup>	<i>Accipiter atricapillus</i> .
<i>Somateria spectabilis</i> . <sup>1</sup>	<i>Buteo borealis calurus</i> . <sup>2</sup>
<i>Oidemia americana</i> . <sup>1</sup>	<i>Buteo swainsoni</i> . <sup>1</sup>
<i>Oidemia deglandi</i> .	<i>Archibuteo lagopus</i> . <sup>1</sup>
<i>Oidemia perspicillata</i> .	<i>Haliaeetus leucocephalus alascanus</i> .
<i>Chen hyperborea</i> . <sup>1</sup>	<i>Falco rusticolus gyrfalco</i> .
<i>Anser albifrons gambeli</i> . <sup>1</sup>	<i>Falco peregrinus anatum</i> .
<i>Branta canadensis hutchinsi</i> .	<i>Falco columbarius</i> .
<i>Branta canadensis minima</i> .	<i>Falco columbarius richardsoni</i> . <sup>2</sup>
<i>Branta nigricans</i> . <sup>1</sup>	<i>Falco sparverius</i> . <sup>2</sup>
<i>Philacte canagica</i> . <sup>1</sup>	<i>Pandion haliaëtus carolinensis</i> . <sup>1</sup>
<i>Olor columbianus</i> . <sup>1</sup>	<i>Asio accipitrinus</i> . <sup>1</sup>
<i>Olor buccinator</i> . <sup>1</sup>	<i>Scotiaptex cinerea</i> .
<i>Grus canadensis</i> .	<i>Scotiaptex cinerea lapponica</i> . <sup>1</sup>
<i>Fulica americana</i> . <sup>1</sup>	<i>Nyctala tengmalmi richardsoni</i> .
<i>Crymophilus fulcarius</i> . <sup>1</sup>	? <i>Megascops asio kennicotti</i> . <sup>2</sup>
<i>Phalaropus lobatus</i> .	<i>Bubo virginianus pallescens</i> .
<i>Gallinago delicata</i> .	<i>Nyctea nyctea</i> . <sup>1</sup>
<i>Macrorhamphus scolopaceus</i> . <sup>1</sup>	<i>Surnia ulula caparoch</i> .
<i>Tringa canutus</i> . <sup>1</sup>	<i>Ceryle alcyon</i> .
<i>Tringa couesi</i> . <sup>1</sup>	<i>Dryobates villosus leucomelas</i> .
<i>Tringa maculata</i> .	? <i>Dryobates villosus hyloscopis</i> . <sup>2</sup>

<sup>1</sup> Known only from Fort Yukon or below.<sup>2</sup> Known only above Fort Yukon.

<i>Dryobates pubescens nelsoni.</i>	<i>Hirundo erythrogastra unalashkensis.</i>
<i>Picoides arcticus.</i>	<i>Tachycineta bicolor.</i>
<i>Picoides americanus alascensis.</i>	<i>Tachycineta thalassina.</i> <sup>2</sup>
<i>Colaptes auratus luteus.</i>	<i>Clivicola riparia.</i>
<i>Chordeiles virginianus.</i> <sup>2</sup>	<i>Ampelis garrulus.</i>
<i>Selasphorus rufus.</i> <sup>2</sup>	<i>Lanius borealis.</i>
<i>Sayornis saya yukonensis.</i> <sup>2</sup>	<i>Helminthophila celata.</i>
<i>Contopus borealis.</i>	<i>Helminthophila peregrina.</i> <sup>2</sup>
<i>Contopus richardsoni saturatus.</i> <sup>2</sup>	<i>Dendroica aestiva rubiginosa.</i>
<i>Empidonax trailli.</i> <sup>1</sup>	<i>Dendroica coronata hooveri.</i>
<i>Empidonax trailli alnorum.</i> <sup>2</sup>	<i>Dendroica striata.</i>
<i>Empidonax hammondi.</i> <sup>2</sup>	<i>Dendroica townsendi.</i> <sup>2</sup>
<i>Otocoris alpestris leucolæma.</i>	<i>Seiurus aurocapillus.</i> <sup>1</sup>
<i>Pica pica hudsonica.</i>	<i>Seiurus noveboracensis notabilis.</i>
<i>Perisoreus canadensis fumifrons.</i>	<i>Wilsonia pusilla.</i>
<i>Corvus corax principalis.</i>	<i>Wilsonia pusilla pileolata.</i> <sup>2</sup>
<i>Scolecophagus carolinus.</i>	<i>Budytes flavus leucostriatus.</i> <sup>1</sup>
<i>Pinicola enucleator alascensis.</i>	<i>Anthus pensilvanicus.</i>
<i>Pyrrhula cassini.</i> <sup>1</sup>	<i>Cinclus mexicanus.</i>
<i>Loxia leucoptera.</i>	<i>Sitta canadensis.</i> <sup>2</sup>
<i>Acanthis hornemanni exilipes.</i>	<i>Parus atricapillus septentrionalis.</i>
<i>Acanthis linaria.</i>	<i>Parus cinctus alascensis.</i> <sup>1</sup>
<i>Spinus pinus.</i> <sup>2</sup>	<i>Parus hudsonicus evura.</i>
<i>Passerina nivalis.</i>	<i>Phylloscopus borealis.</i> <sup>1</sup>
<i>Calcarius lapponicus alascensis.</i>	<i>Regulus calendula.</i>
<i>Calcarius pictus.</i> <sup>1</sup>	<i>Myadestes townsendi.</i> <sup>2</sup>
<i>Ammodramus sandwichensis alaudinus.</i>	<i>Hylocichla aliciae.</i>
<i>Zonotrichia leucophrys gambeli.</i>	<i>Hylocichla ustulata almæ.</i>
<i>Zonotrichia coronata.</i>	<i>Hylocichla aonalaschkæ.</i> <sup>2</sup>
<i>Spizella monticola ochracea.</i>	<i>Hylocichla aonalaschkæ pallasi.</i> <sup>2</sup>
<i>Spizella socialis arizonæ.</i> <sup>2</sup>	<i>Merula migratoria.</i>
<i>Junco hyemalis.</i>	<i>Hesperocichla nævia.</i>
<i>Melospiza lincolni.</i>	<i>Saxicola cenanthe.</i>
<i>Passerella iliaca.</i>	<i>Sialia arctica.</i> <sup>2</sup>
<i>Petrochelidon lunifrons.</i>	

## SPECIES WHOSE OCCURRENCE ON THE YUKON IS DOUBTFUL.

<i>Chaulelasmus streperus.</i>	<i>Aquila chrysaetos.</i>
<i>Eniconetta stelleri.</i>	<i>Nucifraga columbiana.</i>
<i>Branta canadensis.</i>	<i>Loxia curvirostra minor.</i>
<i>Macrorhamphus griseus.</i>	<i>Motacilla ocularis.</i>

<sup>1</sup> Known only from Fort Yukon or below.<sup>2</sup> Known only above Fort Yukon.



## SPECIES AND SUBSPECIES OCCURRING IN THE YUKON BASIN AND HAVING THEIR CENTER OF ABUNDANCE DURING THE BREEDING SEASON IN ALASKA AND BERING SEA.

<i>Rissa tridactyla pollicaris</i> . <sup>1</sup>	<i>Canachites canadensis osgoodi</i> .
<i>Larus barrovianus</i> . <sup>1</sup>	<i>Halieetus leucocephalus alascanus</i> .
<i>Larus vegge</i> . <sup>1</sup>	? <i>Megascops asio kennicotti</i> .
<i>Larus brachyrhynchus</i> .	<i>Picoides americanus alascensis</i> .
<i>Sterna aleutica</i> . <sup>1</sup>	<i>Sayornis saya yukonensis</i> .
<i>Phalacrocorax pelagicus robustus</i> . <sup>1</sup>	<i>Contopus richardsoni saturatus</i> .
<i>Arctonetta fischeri</i> . <sup>1</sup>	<i>Perisoreus canadensis fumifrons</i> .
<i>Somateria v-nigra</i> . <sup>1</sup>	<i>Pinicola enucleator alascensis</i> .
<i>Chen hyperborea</i> . <sup>2</sup>	<i>Leucosticte tephrocotis littoralis</i> .
<i>Branta canadensis minima</i> .	<i>Calcarius lapponicus alascensis</i> .
<i>Branta nigricans</i> . <sup>2</sup>	<i>Hirundo erythrogastra unalashkensis</i> .
<i>Philacte canagica</i> . <sup>1</sup>	<i>Dendroica aestiva rubiginosa</i> .
<i>Grus canadensis</i> . <sup>2</sup>	<i>Dendroica coronata hooveri</i> .
<i>Macrorhampus scolopaceus</i> .	<i>Parus cinctus alascensis</i> .
<i>Tringa couesi</i> . <sup>2</sup>	<i>Parus hudsonicus evura</i> .
<i>Ereunetes occidentalis</i> .	<i>Hylocichla ustulata almæ</i> .
<i>Heteractitis incanus</i> .	<i>Hesperocichla nævia</i> .
<i>Arenaria melanocephala</i> .	

Of these 35 forms, 1 is a subspecies of an Asiatic bird, 5 are chiefly confined to Bering Sea, 2 range in winter to the western Pacific, 7 are resident subspecies of northern North American birds, and the remaining 20 pass in winter to the western United States or beyond.

## EASTERN NORTH AMERICAN SPECIES FOUND IN THE YUKON BASIN.

<i>Limosa hæmastica</i> .	<i>Helminthophila celata</i> .
<i>Numenius borealis</i> .	<i>Helminthophila peregrina</i> .
<i>Accipiter atricapillus</i> .	<i>Dendroica striata</i> .
<i>Falco sparverius</i> .	<i>Seiurus aurocapillus</i> .
<i>Colaptes auratus luteus</i> .	<i>Wilsonia pusilla</i> .
<i>Chordeiles virginianus</i> .	<i>Hylocichla aliciae</i> .
<i>Empidonax trailli alnorum</i> .	<i>Hylocichla aonalaschkæ pallasii</i> .
<i>Junco hyemalis</i> .	<i>Merula migratoria</i> .
<i>Passerella iliaca</i> .	

## WESTERN NORTH AMERICAN SPECIES FOUND IN THE YUKON BASIN.

<i>Anser albifrons gambeli</i> .	<i>Empidonax hammondi</i> .
<i>Branta canadensis hutchinsi</i> .	<i>Otocoris alpestris leucolaema</i> .
<i>Olor buccinator</i> .	<i>Pica pica hudsonica</i> .
<i>Symphemia semipalmata inornata</i> .	<i>Calcarius pictus</i> .
<i>Bonasa umbellus umbelloides</i> .	<i>Ammodramus sandwichensis alaudinus</i> .
<i>Pediceetes phasianellus columbianus</i> .	<i>Zonotrichia leucophrys gambeli</i> .
<i>Buteo borealis calurus</i> .	<i>Spizella monticola ochracea</i> .
<i>Buteo swainsoni</i> .	<i>Spizella socialis arizonæ</i> .
<i>Falco columbarius richardsoni</i> .	<i>Seiurus noveboracensis notabilis</i> .
<i>Bubo virginianus pallascens</i> .	<i>Cinclus mexicanus</i> .
? <i>Dryobates villosus hyloscopus</i> .	<i>Parus atricapillus septentrionalis</i> .
<i>Picoides americanus alascensis</i> .	<i>Myadestes townsendi</i> .
<i>Selasphorus rufus</i> .	<i>Sialia arctica</i> .
<i>Empidonax trailli</i> .	

<sup>1</sup> Reported only from the Yukon Delta.

<sup>2</sup> Known only as migrants.

## AMERICAN PACIFIC COAST SPECIES FOUND IN THE YUKON BASIN.

Helodromas solitarius cinnamomeus.	Dendroica townsendi.
Tachycineta thalassina.	Wilsonia pusilla pileolata.
Zonotrichia coronata.	Hylocichla aonalaschkæ.

## ASLATIC AND PACIFIC SPECIES FOUND IN THE YUKON BASIN.

Limosa lapponica baueri. <sup>1</sup>	Pyrrhula cassini.
Charadrius dominicus fulvus. <sup>1</sup>	Budytes flavus leucostriatus. <sup>1</sup>
Archibuteo lagopus.	Phyllopeustes borealis. <sup>1</sup>
Scotiaptex cinerea lapponica. <sup>1</sup>	

## MIGRATORY SPECIES NOT COMMON TO NORTHERN NORTH AMERICA FOUND DURING THE BREEDING SEASON IN THE YUKON BASIN ABOVE FORT YUKON.

*Eastern species.*

Accipiter atricapillus.	Helminthophila celata.
Falco sparverius.	Helminthophila peregrina.
Colaptes auratus luteus.	Dendroica striata.
Chordeiles virginianus.	Wilsonia pusilla.
Empidonax trailli alnorum.	Hylocichla aliciae.
Junco hyemalis.	Hylocichla aonalaschkæ pallasii.
? Passerella iliaca.	Merula migratoria.

*Western species.*

Branta canadensis hutchinsi.	Selasphorus rufus.
? Grus canadensis.	Sayornis saya yukonensis.
Symphemia semipalmata inornata.	Empidonax hammondi.
Buteo borealis calurus.	Spizella monticola ochracea.
? Otocoris alpestris leucolæma.	Spizella socialis arizonæ.
Pica pica hudsonica.	Seiurus noveboracensis notabilis.
? Calcarius lapponicus alascensis.	Myadestes townsendi.
Ammodramus sandwichensis alaudinus.	Hylocichla ustulata almæ.
Zonotrichia leucophrys gambeli.	Sialia arctica.
Falco columbarius richardsoni.	

*Pacific coast species.*

Larus brachyrhynchus.	Dendroica æstiva rubiginosa.
Helodromas solitarius cinnamomeus.	Dendroica coronata hooveri.
Leucosticte tephrocotis littoralis.	Dendroica townsendi.
Zonotrichia coronata.	Wilsonia pusilla pileolata.
Hirundo erythrogastra unalaschkensis.	Hylocichla aonalaschkæ.
Tachycineta thalassina.	Hesperocichla nævia.
Contopus richardsoni saturatus.	

## SPECIES OCCURRING ON THE COAST OF SOUTHEAST ALASKA AND IN THE YUKON VALLEY.

Gavia imber.	Oidemia perspicillata.
Larus philadelphia.	Phalaropus lobatus.
Anas boschas.	Actitis macularia.
Histrionicus histrionicus.	Halixæetus leucocephalus alascanus.
Oidemia deglandi.	Picoides americanus alascensis.

<sup>1</sup> Known only from the Yukon Delta.

<i>Colaptes auratus luteus.</i>	<i>Tachycineta bicolor.</i>
<i>Selasphorus rufus.</i>	<i>Dendroica coronata hooveri.</i>
<i>Contopus richardsoni saturatus.</i>	<i>Dendroica townsendi.</i>
<i>Empidonax hammondi.</i>	<i>Wilsonia pusilla pileolata.</i>
<i>Sterna paradisæa.</i>	<i>Anthus pensilvanicus.</i>
<i>Corvus corax principalis.</i>	<i>Sitta canadensis.</i>
<i>Ammodramus sandwichensis alaudinus.</i>	<i>Hylocichla aonalaschkæ.</i>
<i>Spizella monticola ochracea.</i>	<i>Merula migratoria.</i>
<i>Hirundo erythrogastra unalaschkensis.</i>	<i>Hesperocichla nævia.</i>

## SPECIES OCCURRING ON WHITE PASS SUMMIT AND IN THE YUKON VALLEY.

<i>Sayornis saya yukonensis.</i>	<i>Anthus pensilvanicus.</i>
<i>Zonotrichia coronata.</i>	<i>Hirundo erythrogastra unalaschkensis.</i>
? <i>Wilsonia pusilla pileolata.</i>	

## SPECIES FOUND BY US ONLY ON WHITE PASS SUMMIT.

<i>Lagopus rupestris.</i>	<i>Zonotrichia coronata.</i>
<i>Lagopus leucurus.</i>	<i>Leucosticte tephrocotis littoralis.</i>

## SPECIES FOUND BY US ONLY ON THE COAST OF SOUTHEAST ALASKA.

? <i>Dendragapus obscurus fuliginosus.</i>	<i>Melospiza lincolni striata.</i>
<i>Sphyrapicus ruber.</i>	<i>Passerella iliaca townsendi.</i>
<i>Cyanocitta stelleri.</i>	<i>Helminthophila celata lutescens.</i>
<i>Corvus caurinus.</i>	<i>Anorthura hiemalis pacifica.</i>
<i>Junco hyemalis oregonus.</i>	<i>Parus rufescens.</i>
<i>Junco hyemalis connectens.</i>	<i>Regulus satrapa olivaceus.</i>
<i>Melospiza melodia rufina.</i>	<i>Regulus calendula grinnelli.</i>

## LAND BIRDS FOUND IN LYNN CANAL DISTRICT ONLY NEAR TIDE WATER.

<i>Contopus richardsoni saturatus.</i>	<i>Melospiza lincolni striata.</i>
<i>Sphyrapicus ruber.</i>	<i>Tachycineta bicolor.</i>
<i>Cyanocitta stelleri.</i>	<i>Helminthophila celata lutescens.</i>
<i>Corvus caurinus.</i>	<i>Anthus pensilvanicus.</i>
<i>Spizella monticola ochracea.</i>	<i>Sitta canadensis.</i>
<i>Junco hyemalis oregonus.</i>	<i>Merula migratoria.</i>
<i>Melospiza melodia rufina.</i>	

## LAND BIRDS FOUND IN LYNN CANAL DISTRICT ONLY NEAR THE LEVEL OF GLACIER.

<i>Colaptes auratus luteus.</i>	<i>Cinclus mexicanus.</i>
? <i>Dendragapus obscurus fuliginosus.</i>	<i>Anorthura hiemalis pacifica.</i>
<i>Junco hyemalis connectens.</i>	<i>Regulus satrapa olivaceus.</i>
<i>Wilsonia pusilla pileolata.</i>	

## SPECIES RECORDED FROM THE UPPER YUKON ONLY ABOVE THE PELLY RIVER.

<i>Tringa minutilla.</i>	<i>Tachycineta bicolor.</i>
<i>Symphemia semipalmata inornata.</i>	<i>Helminthophila peregrina.</i>
? <i>Megascops asio kennicotti.</i>	<i>Dendroica townsendi.</i>
? <i>Dryobates villosus hyloscopus.</i>	<i>Wilsonia pusilla pileolata.</i>
<i>Chordeiles virginianus.</i>	<i>Hylocichla aonalaschkæ.</i>
<i>Selasphorus rufus.</i>	<i>Hylocichla aonalaschkæ pallasii.</i>
<i>Contopus borealis.</i>	<i>Sialia arctica.</i>
<i>Hirundo erythrogastra unalaschkensis.</i>	

## SPECIES RECORDED FROM THE YUKON VALLEY BETWEEN FORT YUKON AND THE PELLY RIVER.

Falco peregrinus anatum.	Acanthis hornemanni exilipes.
? Falco columbarius.	Passerella iliaca.
? Falco columbarius richardsoni.	Sciurus noveboracensis notabilis.
Empidonax trailli alnorum.	Wilsonia pusilla.
Otocoris alpestris leucolæma.	Hylocichla aliciae.
Calcarius lapponicus alascensis.	Saxicola tenanthe.

## ANNOTATED LIST OF SPECIES.

1. *Æchmophorus occidentalis*. Western Grebe.

Several seen at Bocadequadra, near Dixon Entrance, May 28.

2. *Colymbus holbœlli*. Holbœll Grebe.

A young male was taken on the 'Canal' at St. Michael September 22. The irides were primrose yellow; basal two-thirds of the culmen, outside tarsi, and lobes, seal brown; rest of bill, ocher yellow; inside of the tarsi and lobes, maize yellow; nails, yellowish olive buff.

3. *Gavia imber*. Loon.

Seen at Bocadequadra May 28 and in the Inside Passage May 29. Several seen on Lake Bennett and a pair at Caribou Crossing between June 17 and 28. On Lake Marsh they were common and were frequently heard, especially at night. The last loon certainly referable to this species was seen there July 6.

4. *Gavia arctica*. Black-throated Loon.

A loon that flew over our boat on Thirty-Mile River July 18, and another seen near Big Salmon River July 20, I believe were *Gavia arctica*. I saw several loons at the Aphoon mouth of the Yukon August 27 and one at St. Michael on September 5 and 16. We obtained none of them, but the experience of others makes it probable that all were the black-throated. Dr. Romig, of the Moravian Mission on the Kuskokwim River, told me that his party killed two on August 27 on the portage from Bethel on the Kuskokwim to Hendricks Station on the Yukon Delta.

5. *Lunda cirrhata*. Tufted Puffin.

Osgood saw one at Whale Island, near St. Michael, September 8.

6. *Fratereula corniculata*. Horned Puffin.

We took two and saw about a dozen puffins near Whale Island September 8. Irides, drab gray; ring on eyelid and tip of bill, flame scarlet; rest of bill dull straw yellow; bare skin at gape and line along base of maxilla, cadmium yellow; line below lower eyelid and horns, black; palmations, cadmium orange; tarsi and toes, cadmium orange above, chrome yellow below; nails varying from drab gray to slate color.

7. *Simorhynchus pusillus*. Least Auklet.

Auklets were seen several times while we were crossing Bering Sea in the *Corwin* October 1-2 and increased in numbers as we approached the Pribilofs. They were common with various other (unidentified) species of water birds off Unalaska October 4 and abundant in Akutan Pass October 6. I refer them to this species, as Nelson found it the most abundant in these waters.

8. *Brachyramphus marmoratus*. Marbled Murrelet.

This bird was fairly common in the Inside Passage May 28-29, and one was killed at Bocadequadra. We saw a few on Lynn Canal May 30, and I shot one near Skagway May 31. Doubtless some of the many murrelets seen with auklets near the Pribilof and Aleutian islands in October were this species.

9. *Cephus columba*. Pigeon Guillemot.

Seen at Bocadequadra and along the Inside Passage May 28-29. Guillemots which I saw near Unalaska October 4 were probably this species.

10. *Uria lomvia arra*. Pallas Murre.

The murrees seen near St. Michael August 29 and about St. George Island and Unalaska in October were probably chiefly this species, though some may have been *Uria troile californica*.

11. *Stercorarius parasiticus*. Parasitic Jaeger.

Common at the Aphoon mouth of the Yukon August 27-28, and about St. Michael until September 10. About this time their numbers decreased, and the last one was seen September 16. All appeared to be adults (as were the four collected), and only one was in the black plumage.

12. *Stercorarius longicaudus*. Long-tailed Jaeger.

I saw one at the Aphoon mouth August 28, and both Osgood and I occasionally saw the species at St. Michael until September 12.

13. *Rissa tridactyla pollicaris*. Pacific Kittiwake.

Adult kittiwakes were tolerably common at St. Michael from September 19 to the end of our stay, but no young were seen. As we crossed Bering Sea October 1-5, and at Unalaska October 5-6, young kittiwakes were common, and we saw no adults except at St. George and Unalaska. The irides of the adult are vandyke brown; ring on eyelid orange rufous; bill sulphur yellow, whitish at tip; gape rufous; tarsi, toes, palmations, and nails slate black.

14. *Rissa brevirostris*. Red-legged Kittiwake.

One was seen by Osgood at Unalaska (Dutch Harbor) October 5.

15. *Larus barrovianus*. Point Barrow Gull.

Abundant on the Lower Yukon, at the Aphoon mouth, and during September at St. Michael, though most of the adults had gone by the middle of the month. While crossing Bering Sea we saw several young October 2 and others near Unalaska October 4. A young bird shot near St. Michael September 19 had the head of a recently killed ptarmigan in its throat. The irides of the young are Prout's brown; tip of bill and sides of nails black; rest of bill, toes, and palmaria vinaceous buff; rest of nails drab gray.

16. *Larus glaucescens*. Glaucous-winged Gull.

Large gulls, which doubtless were chiefly this species, were common from Dixon Entrance to Lynn Canal May 28-30, and we saw a few near Skagway June 1-2. At Unalaska, where I collected two, they were abundant October 4-6. A few gulls that followed the *Corwin* in the North Pacific I think also belonged to this species.

17. *Larus argentatus smithsonianus*. American Herring Gull.

The only large gulls I took on the Yukon—a female which had finished laying, collected at Lake Tagish June 30, and another taken near Charlie Creek August 8—were this species, and no others came close enough to make identification positive; hence I must refer all the large gulls seen to *Larus a. smithsonianus*, although on several we could see no black on the primaries. I saw one flying over White Pass Summit June 12 and another at Bennett City June 19. We saw eight or ten at Caribou Crossing and a few on Lake Tagish. No more were observed until we reached Lake Lebarge July 13; but from this point to the mouth of the river large gulls slowly became more numerous, one or two being noted every few days. Three fully grown young, with their parents, were seen on a sand bar about 15 miles above Circle August 12.

18. *Larus brachyrhynchus*. Short-billed Gull.

Our acquaintance with this bird dates from our arrival at Lake Marsh, July 1, where we found it common, and took downy young the next day. From this time, until we reached the Tatchun River, July 23, hardly a day passed that we did not see several; on July 20 we counted fourteen on a sand bar near Little Salmon River. After July 23 we saw no more until September 6, when young of the year appeared at St. Michael, and were common there until the 23d. The only adult seen at St. Michael was noted on September 14.

The adult has the irides Prout's brown; ring on eyelids and skin at commissural angle reddish orange; gape orange; bill, tarsi, and toes olive yellow; nails black, french gray at base.

Natal plumage: Creamy white, becoming pale cream color on forehead, chin, and anterior breast, mottled with different shades of brown,

except the center of chest and abdomen. Head markings slate-black, distinctly defined and numerous, the most characteristic being one that covers the entire nasal region, a V on the pileum, a W on the occiput, and a somewhat interrupted U on each side of the throat. On the upperparts the markings become pale seal brown, and with lighter tips render the lower neck, sides of breast, flanks, and anal region grayish. Bill brownish black; tip of bill, tarsi, toes, and palmations whitish; nails and edges of scutellæ of tarsi and toes hair brown.

19. *Larus philadelphia*. Bonaparte Gull.

I saw several small black-headed gulls, probably this species, in the Inside Passage May 29. I took a Bonaparte gull at Caribou Crossing on June 24 and saw several others. We saw one on Lake Marsh July 1, a few young at St. George Island October 3, and found them common at Unalaska October 4-5.

20. *Xema sabinii*. Sabine Gull.

Osgood found a dead bird of this species on the shores of Chilkat Inlet June 1. The specimen, unfortunately, was not in a condition to permit its preservation, but it was carefully identified at the time and showed no apparent variance from the description and figure in Ridgway's Manual.

21. *Sterna paradisæa*. Arctic Tern.

We saw a large flock of terns in the Inside Passage May 29, and two days later at Skagway saw a few more, securing two, which proved to be of this species. At Bennett, between June 15 and 20, we frequently saw two or three, and I was informed that arctic terns bred on a small lake near Log Cabin, British Columbia. We found a breeding colony of about twenty on a small rocky island lying in the entrance to Windy Arm, Lake Tagish, July 1. I found four single eggs (three fresh and one well advanced in incubation), one set of two (one fresh and the other at point of hatching), and also a young bird which had just left the shell. There were no nests; the young bird and eggs were in the short grass on the top of the island. Except a single bird, seen at Lake Marsh and probably belonging to this colony, we did not meet with terns again until August 27, when I found this species common at the Aphoon mouth. A single tern with injured primaries was seen frequently at St. Michael up to September 21. The downy young differs from the description given in Baird, Brewer and Ridgway's 'Water Birds,' in having the forehead plain dusky, the chin whitish, the basal half of bill, tarsi, and toes salmon pink, and the rest of bill and nails black.

22. *Diomedea albatrus*. Short-tailed Albatross.

A dark-brown albatross, probably the young of *D. albatrus*, joined the *Corwin* October 1, about 150 miles from St. Michael. It was soon



accompanied by others, and until we reached Cape Scott, October 12, a glance astern would seldom fail to show two or three following the vessel.

23. *Fulmarus glacialis glupischa*. Pacific Fulmar.

A single dark-colored fulmar, possibly this form, was seen October 4, between St. George and Unalaska.

24. *Oceanodroma furcata*. Forked-tailed Petrel.

To this species I refer a few light-colored petrels seen October 3, on Bering Sea north of the Pribilof Islands.

25. *Phalacrocorax pelagicus*. Pelagic Cormorant.

Cormorants were seen October 4 near Unalaska, where this species is reported as common.

26. *Phalacrocorax pelagicus robustus*. Violet-green Cormorant.

We saw a single cormorant at Whale Island September 8; and one—possibly the same bird—was seen by Osgood several times at St. Michael.

27. *Phalacrocorax urile*. Red-faced Cormorant.

This is the only cormorant reported by William Palmer from St. George, where we saw several October 3.

28. *Merganser americanus*. American Merganser.

A pair of mergansers was breeding on a small, rocky island in Lake Tagish, at the entrance to Windy Arm, June 30–July 1. The nest was found by Osgood in a crevice in the cliffs about 15 feet above the water. It was made of down, and contained seven eggs about one week advanced in incubation. Retrieving would have been impossible had we shot the bird, but as I succeeded in watching the female on the nest from a distance of less than 6 feet I feel positive of the species.

A few other mergansers, usually in pairs, were seen on Lake Tagish July 1; on Lake Marsh July 8, at Fifty-Mile River July 9 and 12 (a flock of a dozen males flying up the river in the evening of the latter date), near Little Salmon River July 20, and about 25 miles above Circle August 12. Near Charlie Creek we found the dried wing of an adult male of this species August 8.

29. *Anas boschas*. Mallard.

On the flats of Chilkat Inlet I saw seven June 2. In no part of the Yukon Valley above Circle did we find ducks abundant, except surf scoters, but the mallard undoubtedly occurs at all suitable places throughout the region. It must breed very early, as on June 24, only three weeks after the lakes were open to steamer navigation, I found a female with two young at Caribou Crossing, and on June 28 I shot

another female there and caught two of her half dozen downy young. Two ducks, probably mallards, were seen on Lake Marsh July 6, and at Miles Canyon Maddren was informed they had been common there earlier in the season. We saw several females with young in the marshy ponds at the foot of Lake Lebarge July 17, a few adults near the Little Salmon July 20, and a good-sized flock near Charlie Village August 10. Osgood shot one near Fort Yukon August 21.

In the large flocks of geese and ducks disturbed by the steamer on the Lower Yukon were two young mallards, secured at Hendricks Station August 25. Mallards were common at the Aphoon mouth August 27, and we saw a few at St. Michael September 2.

30. *Mareca americana*. Baldpate.

Five ducks that I took to be baldpates were seen a short distance above Fort Selkirk July 25.

31. *Nettion carolinensis*. Green-winged Teal.

Three teal that I saw in the creek at Circle, August 19, were probably this species. Green-winged teal were common in the tundra ponds about St. Michael during the first half of September, but apparently did not occur after September 16. All that were taken were young birds.

32. *Dafla acuta*. Pintail.

Maddren was told at Miles Canyon, July 11, that pintails were common, but we saw none near enough for identification until August 27, when I found them abundant at the Aphoon mouth. Seven were here killed by a passenger on the steamer. During September young pintails far outnumbered all other ducks on the marshes and tundra ponds about St. Michael. Large numbers were killed by the Eskimos, but no adults were seen. Their numbers had greatly decreased by September 20.

33. *Aythya marila*. Scaup Duck.

We saw a flock of about a dozen adult males at Caribou Crossing June 24, and another of about twenty on the Yukon, a short distance above Fort Selkirk, July 25.

34. *Aythya affinis*. Lesser Scaup Duck.

We found a pair with young on a small pond at Lower Lebarge July 17. Osgood secured the female.

35. *Clangula clangula americana*. American Golden-eye.

I am confident that a flock of ducks seen about 25 miles above Circle August 12 were males of this species or of *C. islandica*.

36. *Charitonetta albeola*. Buffle-head.

I shot a female on a small pond near Lake Marsh July 8, and saw a male near Little Salmon River July 20. Maddren was informed that buffle-heads were common near Miles Canyon, and a boy at Lower Lebarge said they bred commonly on the ponds near there, and that he took two young July 16.

37. *Harelda hyemalis*. Old Squaw.

Single young birds were found frequently during September in the small ponds about St. Michael, and a flock of about a dozen was seen in the harbor September 11. No adults were observed. One young bird, taken early in September, still retained natal down on the hind-neck.

38. *Histrionicus histrionicus*. Harlequin Duck.

We saw a male and two females in Wrangell Narrows May 29. A flock of twelve males came close to the shore at Bennett June 18; and on June 23 a single male swam so near that men sitting on the beach threw stones at it. One other harlequin was seen a few miles above Fort Selkirk July 25. Dr Romig told me he saw a number on the portage from the Kuskokwim to the Yukon August 24-25.

39. *Somateria v-nigra*. Pacific Eider.

We saw the head of a male of this species lying in the window of the hotel at St. Michael, and the soldiers at the barracks had a mounted bird, shot near St. Michael in the spring, but we saw no living eiders of any species during our trip.

40. *Oidemia americana*. American Scoter.

We noticed a few in Wrangell Narrows May 29, and I saw a number off Unalaska October 5.

41. *Oidemia deglandi*. White-winged Scoter.

This species was fairly numerous at Bocadequadra, Wrangell Narrows, and Lynn Canal May 28-30. We saw two on Lake Marsh July 6, two on Lake Lebarge July 14, and a flock of about twenty-five flying up Fifty-Mile River from Lake Lebarge on the evening of July 12.

42. *Oidemia perspicillata*. Surf Scoter.

In Lynn Canal, near Haines, June 1 we noted a large flock of surf scoters, most of which had disappeared the next day. They were abundant on all the Yukon lakes except Bennett, which was almost destitute of bird life. On Lake Tagish we saw fourteen June 30, and at Lake Marsh thirty to forty males almost every day between July 1 and 8. We saw no more, except a pair on July 11 on Fifty-Mile River, which connects Lake Marsh with Lake Lebarge, until we

entered Lake Lebarge on the evening of July 12, when a flock of at least a hundred flew high overhead from the direction of the lake. About 8 p. m. and at 10 p. m. of the same evening, and on the next morning, we saw what we took to be the same flock. The birds were probably taking a morning and evening flight, such as E. S. Bryant has noticed in the case of the white-winged scoters breeding at Devils Lake, North Dakota; and I believe that with both species these flights are taken chiefly to exercise the wing muscles. We saw no females on any of the lakes, nor could we find them on the shore, though they were undoubtedly nesting in the vicinity. We observed several on Thirty-Mile River July 18 and two near the Little Salmon July 20. Near Whale Island, at St. Michael, we saw a number September 8, and two scoters, probably young of this species, September 21. I think there were a few with the American scoters I saw at Unalaska October 5.

43. *Chen hyperborea*. Lesser Snow Goose.

I saw five snow geese at the Aphoon mouth August 28, and a large flock at St. Michael September 11.

44. *Anser albifrons gambeli*. American White-fronted Goose.

A single white-fronted goose was seen by Osgood among a number of other birds killed by natives about the Yukon Delta August 29.

45. *Branta canadensis hutchinsi*. Hutchins Goose.

Although Maddren was informed that a goose with four young was seen near White Horse Rapids about July 11, and although the sergeant in charge of the police station of Lower Lebarge told us that thousands of geese and ducks passed there in the spring, and that he had counted twenty-four distinct species, and had killed both Hutchins and cackling geese, we did not see a goose of any species until we were in the neighborhood of Charlie Village, August 10. There we saw a flock of about twenty of the *Branta canadensis* group, and Osgood shot two *hutchinsi* and saw many more near Fort Yukon August 21. Brown geese, apparently chiefly this subspecies, were common on the Yukon flats and on the lower river, especially the Yukon Delta. A Hutchins goose was brought to the steamer *Robert Kerr* by an Eskimo August 26, and I found the bird common at the Aphoon mouth August 27-28. Prospectors on the *Kerr* told me that geese bred abundantly at the head waters of the Porcupine and the marshes at the source of Birch Creek.

During September this species was common about St. Michael in small flocks, but very shy; Osgood took one September 23.

[*Philacte canagica*. Emperor Goose. Dr. Romig told me they were common on the tundra along the Kuskokwim.]

[*Olor columbianus*. Whistling Swan. We were told that a swan—probably this species—was killed at Circle during the spring.]

46. *Grus canadensis*. Little Brown Crane.

Along the Yukon we did not see any cranes, although I thought I heard one near the Little Salmon July 21, and a man who had spent the summer at Circle told me he had heard and seen the 'sand-hill crane' there frequently during the past two months. I was also informed by prospectors that these cranes were found in small numbers at the head waters of Birch Creek and Porcupine River.

Near St. Michael we saw flocks of from two to six individuals each almost daily during the first half of September, but none later than September 15. On the night of September 13 and all the following day there was a hard southwest gale. On the 14th we saw large numbers—Osgood counted ninety-six—flying south, high in the air.

47. *Crymophilus fulicarius*. Red Phalarope.

We saw a small flock near Skagway in Lynn Canal June 2, and others I believed to be this species near Wrangell Narrows and in Prince Frederick Sound May 29. Osgood took one at St. Michael September 17 during a heavy storm.

48. *Phalaropus lobatus*. Northern Phalarope.

Large flocks were seen near Dixon Entrance May 28, and smaller ones on the Inside Passage May 29. From a flock of about twenty on Lake Lebarge July 13 I shot a female that was changing to winter plumage, and on a small pond at Lower Lebarge July 17 I took a male that was in worn breeding plumage. At St. Michael September 2 I caught a young bird that had but one wing, and on St. George Island October 3 I shot one that was swimming alone in a pool. Phalaropes, probably this species, were seen on Bering Sea October 1 and 4.

49. *Gallinago delicata*. Wilson Snipe.

At Haines May 31 I was told that several Wilson snipe had been seen that day, but was unable to find them. We saw one on Fifty-Mile River not far below Lake Marsh July 10, and another in the marsh at Lower Lebarge July 17. Osgood saw one at Circle August 18, and I killed two from a small flock at Hendricks Station August 25. At St. Michael we saw eight or ten single birds between September 12 and 22.

50. *Tringa couesi*. Aleutian Sandpiper.

Common about the lava rocks that line the shore at St. Michael, where flocks of five to fifty were observed, but only small flocks after September 15. A few were occasionally seen on the tidal mud flats,

but none about the ponds in the interior of the island or on the salt meadow behind the town. Out of eighty specimens taken only eight were adults, and five of these were taken before September 9. On the rocky shores of a point opposite Dutch Harbor, Unalaska, I found them common October 5. Those taken at St. Michael were molting into first winter plumage, which is practically complete in the Unalaska birds. In this plumage there is considerable individual difference in the width and shade of the pale edgings of the feathers of the upperparts.

The irides were vandyke brown; bill, black changing to olive buff in basal half; tarsi and toes, yellowish olive buff washed with black; nails black.

I find great sexual variations in size in this species, the females, as in many other species of Limicolæ, averaging considerably larger, especially in length of bill. Measurements of twenty-nine males: Length 8.06 to 8.94 (average 8.57) inches; wing 4.37 to 5.12 (average 4.89) inches; exposed culmen 0.96 to 1.13 (average 1.06) inches; tarsus 0.91 to 1.03 (average 0.96) inches. Measurements of thirty-four females: Length 8.56 to 9.56 (average 9.03) inches; wing 4.47 to 5.31 (average 4.98) inches; exposed culmen 1.16 to 1.42 (average 1.24) inches; tarsus 0.96 to 1.05 (average 0.99) inches.

51. *Tringa ptilocnemis*. Pribilof Sandpiper.

We saw a number on St. George October 3, but too close to the rookery of fur seals to be obtained.

52. *Tringa acuminata*. Sharp-tailed Sandpiper.

First found September 18, when six were seen with a large flock of *T. a. pacifica* at St. Michael. We did not see more than a dozen of this species during the rest of September. Although the species has not been hitherto recorded from St. George Island, we took three and saw about a dozen during the short time we were there October 3. At Unalaska, October 5, I secured one which was with *T. couesi* on the rocky beach. The irides were vandyke brown; maxilla and distal half of mandible, dark seal brown, mandible changing to dull olive buff at base; gape ecru drab; tarsi and toes, greenish maize yellow; nails black.

53. *Tringa maculata*. Pectoral Sandpiper.

This species was present throughout our stay at St. Michael, usually associating with flocks of *T. a. pacifica*, but in very small numbers, not more than twenty being seen. All the specimens taken were young birds. Osgood took one at St. George October 3, and I one at Unalaska October 5.

54. *Tringa bairdi*. Baird Sandpiper.

Two sandpipers, probably of this species, flew by us on Lake Marsh, and we saw four more in the marshes of Lower Lebarge, but failed to secure any of them. I shot one young bird near the Tahkandik River August 7. Osgood shot one from a flock of four at Circle August 15, and another near Fort Yukon August 21.

55. *Tringa minutilla*. Least Sandpiper.

At the southern end of Lake Marsh, not far from where Six-Mile River enters, the surrounding country is level, and at high water the lake stretches far back through a dense growth of willows. At the time of our visit the retreating water of the lake had left a belt of grass between these willows and its margin. Here on the evening of July 2 I found three pairs of least sandpipers, and after a long search, somewhat interrupted by hordes of mosquitoes, I came upon a female surrounded by four downy young. Both parents tried time and again the well-known 'wounded-bird' tactics to lure me from the spot where the young were hidden in the bunches of grass, and, finding this a failure, would circle around me only a few yards off, uttering a plaintive twitter. I saw two other least sandpipers on the west shore of Lake Marsh July 7.

Natal plumage: Lower parts, forehead and orbital region, brownish white. Upperparts bright cinnamon rufous mottled with black; many feathers, especially on head, rump, and tail, tipped with white. Post-orbital line and loreal line blackish, and spot of bright cinnamon rufous on sides of chest. Irides dark brown; bill and nails, slate black; tarsi and toes, pale slate.

56. *Tringa alpina pacifica*. Red-backed Sandpiper.

Young red-backed sandpipers were very abundant at St. Michael during our stay, many times outnumbering all other Limicolæ. Early in September they frequented chiefly the mud flats on the coast, but after the middle of the month large numbers were found only about the pools of the salt marsh. September 24, when the tundra was quite thoroughly frozen, with snow in every hollow and a skimming of ice on the pools, I saw at least one hundred in this latter place.

In several taken early in September the back of the neck was still covered with down, but the majority were in full juvenile plumage. Some still retained this plumage at the time we left St. Michael, but the larger portion had molted into winter plumage. Only two adults were taken, September 1 and 5. A few were seen at St. George Island October 3.

57. *Calidris arenaria*. Sanderling.

I saw three at St. Michael September 11 and collected one, which proved to be a young female.



58. *Totanus flavipes*. Yellow-legs.

On July 1, while floating down Six-Mile River close to its entrance into Lake Marsh, we were attracted by the anxious cries of a pair of yellow-legs. Osgood shot both birds, and we found two downy young in the grass on the shore of the river. Entering Lake Marsh we heard a yellow-legs' whistle, and on July 2 I saw a yellow-legs near where I found the least sandpiper. I collected a female on the west shore of Lake Marsh July 8, and a male, the last bird of this species seen, near a small pond at Lower Lebarge July 17. Both these birds undoubtedly had eggs or young close by, for they alighted exclusively in trees, scolded vociferously, tilting the body with each cry, and refused to leave. Bare spaces on the breast show that both sexes assist in incubation.

Natal plumage: Upperparts and thighs, dark seal brown, many of the feathers tipped with cream buff and whitish; longitudinal lines on rump, cream color, inclosing central, seal-brown space. Forehead, buffy white, extending in narrow lines on sides of crown to occiput, and in broader lines above eye to nape, the latter crossed by transverse dark lines extending from eye to occiput. Line beginning at base of culmen enlarged to dark space on crown and occiput, extending down neck to back, seal brown; other dark lines extending from crown above eye to occiput, and from nostrils through eye to nape. Throat and center of abdomen silvery white; rest of lower parts and sides of neck, buffy white; each feather of lower parts becoming brownish black at base. Irides, vandyke brown; bill, black at tip, changing to greenish olive at base; tarsi and toes, yellow, paler than in adult, and mottled with brown; nails, brown. The juvenile plumage is appearing, in this specimen, on wings, wing coverts, chest, and sides.

59. *Helodromas solitarius cinnamomeus*. Western Solitary Sandpiper.

At Log Cabin, British Columbia, on the evening of June 14, we noticed a sandpiper wheeling through the air, like the woodcock at its breeding place, occasionally uttering a rather musical whistle. The next morning I found it feeding in a small swamp. It proved to be a solitary sandpiper, as I had suspected on the previous evening. Osgood saw another near Lake Marsh July 5, and I saw two near Little Salmon River July 21. On July 8, after rowing a few miles down Lake Marsh, we stopped for lunch on the west shore, where a forest fire had killed most of the trees, and fallen trunks piled in endless confusion, brush, small pools, and hordes of mosquitoes rendered the place anything but a paradise. Here I startled a solitary sandpiper and a yellow-legs at the same instant. They lighted on the half-fallen trees and scolded me, tilting their bodies at each cry. The solitary sandpiper, which doubtless had a nest there, differed chiefly from eastern specimens of *solitarius* in having dark, wavy markings

on inner webs of outer primaries. Osgood took a typical young of *cinnamomeus* and saw another on an island near Sixty-Mile Creek August 1.

60. *Symphemia semipalmata inornata*. Western Willet.

While in a meadow a short distance back from the southeast end of Lake Marsh July 2 I heard a willet whistle several times its unmistakable 'pill-willet,' but failed to see the bird.

61. *Heteractitis incanus*. Wandering Tattler.

Osgood took an adult at Skagway May 31. I shot a young bird from a flock of three at St. Michael September 1, saw one on Whale Island September 8, and secured two at Unalaska October 5.

The irides of the adult were vandyke brown; bill, black, base of mandible brownish; tarsi and toes, brownish ocher; nails, black. In the young, the bill changed from black to sage green in basal third of mandible, and to greenish olive at base of maxilla; tarsi and toes, dull gallstone yellow, greenish at joints.

62. *Actitis macularia*. Spotted Sandpiper.

I saw one at Skagway June 3, and Osgood one at Glacier June 8. This is preeminently the shore bird of the Yukon Basin; we saw two at Bennett June 18, and until we reached Circle, August 15, hardly a day passed without our seeing many running along the shore, or skinning over the river. They were especially abundant between White Horse Rapids and Lake Lebarge. After the 1st of August most of the spotted sandpipers seen seemed to be traveling upstream in small flocks. We saw no adults after August 4.

The first set of eggs was found at Caribou Crossing June 27; the last at the Tatchun River July 23. The first young noticed were in a nest containing three young and one pipped egg found on Lake Marsh July 7. Both sexes were incubating. Nests were close to the shore, and also on small rocky islands in the lakes.

63. *Numenius hudsonicus*. Hudsonian Curlew.

I secured one from a flock of four curlews on the marshes of Chilkat Inlet, and Osgood found a dead bird in the woods at Haines, June 1. Three young were brought to the steamer by an Eskimo at the Aphoon mouth August 28. I saw one at St. Michael September 2, and, I think, another September 14.

Adult: Irides, vandyke brown; bill and nails, black; tarsi and toes cinereous. Young (Massachusetts specimen): Irides, raw umber; maxilla, black; mandible, clove brown, blackish at tip, vinaceous toward base; tarsi and toes, olive gray; nails, black.

64. *Squatarola squatarola*. Black-bellied Plover.

At the Aphoon mouth of the Yukon I saw a flock August 28. Osgood saw three young which had been shot on the mainland near St. Michael September 10, and from this date to the end of our stay we saw occasionally one or two birds of the year, one of which was taken September 16.

65. *Charadrius dominicus fulvus*. Pacific Golden Plover.

None were seen until September 16, after which young birds became fairly common on the boggy tundra about St. Michael and the mud flats along the shore. The only adult seen was taken by Osgood September 25. We saw a number of young birds on St. George Island October 3, and Osgood secured one. Crossing Bering Sea we saw some near Unalaska October 4, and I saw one on October 8, when we were several hundred miles south of the Aleutian Islands. This bird flew several times around the *Corwin*, answering my every whistle, and seemed anxious to alight. The specimens collected differ greatly in the amount of the golden coloring, but all are far more golden than Massachusetts skins of *dominicus*, and all have the shorter wings of *fulvus*. Irides, vandyke brown; bill and nails, black; tarsi and toes, slate gray.

66. *Ægialitis semipalmata*. Semipalmated Plover.

Osgood collected a male at Caribou Crossing June 24, and a pair of adults and one pipped egg at the southern end of Lake Marsh July 2. I removed the young bird from the shell, and within half an hour the down was almost dry, the eyes were open, and it could hop about on its 'knees.' Maddren took another adult at this place July 6, and I a female and four eggs nearly hatched, on the west shore of Lake Marsh on the same day. The nest was a hollow, lined with a few grasses and dead leaves, and was situated about 8 feet from the water in the drift débris among the stones of the beach. We saw three or four on a sand flat near Charlie Village August 10; a few about 15 miles above Circle August 12, and the last at Circle August 15.

Bare pectoral spaces showed that both sexes assist in incubation. Natal plumage: Lower parts, white, separated by broad bare space on neck, changing to cream color on lower tail coverts. Above, cream color, mottled with black, changing to buff on wings and tail. Forehead and infraorbital patches, cream color; broad band on neck encircling head, white, bordered above by narrow band of black extending from bill around occiput, and connecting in malar region with black line leading to inner canthus of eye. Spot on forehead, on sides of chest at lower border of bare space, on sides and on flanks, black. Irides, dark; bill and nails, black; tarsi and toes, slate color, whitish posteriorly.

67. *Arenaria melanocephala*. Black Turnstone.

We found a small flock on the rocky shore at St. Michael August 31; I took three young there the next day, and on September 5 I saw a single turnstone flying across the marsh. On St. George Island, October 5, we saw a number of birds that we had no doubt were black turnstones, but I do not find this species recorded from the Pribilofs, and we were unable to obtain specimens. Irides, vandyke brown; bill, olive black; tarsi and toes varying from clay color to vinaceous cinnamon, and washed with black; nails, black.

68. *Dendragapus obscurus fuliginosus*. Sooty Grouse.

We were told that grouse were common on the heights above Skagway, but although we often found droppings we saw no birds, and the spring 'calling' of the male had ceased. Maddren and I heard a bird that must have been this species 'booming' far up on the hillside from the ravine above Glacier June 8.

69. *Canachites canadensis osgoodi*. Alaska Grouse.

*Canachites canadensis osgoodi* Bishop, Auk, XVII, 114, April, 1900.

We first met the Alaska grouse at Bennett City, where Osgood shot a laying female June 22. At Caribou Crossing he found feathers of this grouse in a magpie's nest and in one of his mammal traps. At Lake Marsh he shot four females and four young July 4-5, at Lake Lebarge a female July 14, at Lower Lebarge a female and one young July 17, and on Thirty-Mile River an adult male July 19. He found the birds frequenting the thickets of poplars and young spruces and remarkably easy to approach. I saw a male at Lake Lebarge July 16, and shot a well-grown young near the Tatchun River July 16, but did not meet with the species elsewhere. This bird was reported as common at Lower Lebarge by the police sergeant stationed there; at Rampart City by Mr. Burkman, and along the Kuskokwim by Dr. Romig.

70. *Bonasa umbellus umbelloides*. Gray Ruffed Grouse.

I secured a female and one young bird on the west shore of Lake Lebarge July 14, and another female that had a brood of young, two-thirds grown, at Lower Lebarge July 17. Osgood took a young bird from a covey near Rink Rapids July 22. The sergeant at Lower Lebarge called this species rare, but I was told it was common near Rampart City.

71. *Lagopus lagopus*. Willow Ptarmigan.

Two flocks were found on the tundra at the Aphoon mouth August 28, one alighting close to the steamer. Not seen at St. Michael until September 11, when about one hundred appeared. These were seen frequently after this date, but were exceedingly shy. Most of those

taken were young birds, and all were in full molt. The irides of a young male taken September 19 were vandyke brown; skin above eye, rufous; bill, slate black, whitish at tip and salmon buff at base of mandible; nails, white.

We were told that ptarmigan were very abundant near Atlin, British Columbia, at the head waters of the Porcupine River and Birch Creek, near Rampart City, along the Kuskokwim, and in winter at Glacier and Lower Lebarge. Doubtless some of these statements refer to the following species.

**72. *Lagopus rupestris*. Rock Ptarmigan.**

At White Pass Summit, June 11 and 13, we took three males still in white plumage (excepting a few dark feathers on head and lower neck), and saw a few others. Osgood found two eggs there, probably of the previous year, lying on the moss under an alpine hemlock. Dr. Romig told me that this species was more common than *L. lagopus* along the Kuskokwim.

[*Lagopus rupestris nelsoni*. Nelson Ptarmigan. We were told at Unalaska that this species had been abundant during the summer on Unalaska Island, but that the birds had been almost exterminated by the officers of an English man-of-war. We saw none during the day and a half we were there.]

**73. *Lagopus leucurus*. White-tailed Ptarmigan.**

Osgood took a white-tailed ptarmigan June 8 on the summit of the cliffs above Glacier, and saw several other ptarmigan, probably of this species. On June 8 he found at the same place, on the moss under an alpine hemlock, fragments of two ptarmigan eggs, sparingly dotted with brown as in *leucurus*.

**74. *Circus hudsonius*. Marsh Hawk.**

We saw one at Lake Marsh July 8, one at Lake Lebarge July 12, a young bird on which duck hawks were feeding near the Tahkandik River August 7, one about 20 miles above Circle August 12, and two at Circle August 15 and 20. At the Aphoon mouth I saw several August 28. At St. Michael we secured a young bird September 2, and saw single marsh hawks on September 6, 7, and 11. The young bird taken is noticeably darker than young from Dakota and New England.

**75. *Accipiter velox*. Sharp-shinned Hawk.**

I saw one at Lower Lebarge July 17, and two near White River July 30; Osgood found one feeding on a thrush near Charlie Creek August 9; at Circle I saw one August 17 and shot an adult female August 19. Osgood found a nest of this species, about 15 feet

from the ground, in a small spruce in the center of an island near the Nordenskiöld River July 22, and I secured the female, whose crop held the tibia, tarsus, and toes of a flicker. The nest contained three downy, but very pugnacious young, one infertile egg, and the remains of a young intermediate sparrow. I kept two of the young alive until July 31, when both were well feathered and trying to fly and were as irascible as ever. The last survivor succeeded in getting out of his box while we were moored at Dawson, flew into the Yukon, and was carried rapidly along by the current, though struggling valiantly to reach the shore. I suspect that it succeeded, as I heard a man who hurried after it say later that he would have 'fricasseed chicken for dinner.'

76. *Accipiter atricapillus*. American Goshawk.

I saw an adult flying high above the shore of Lake Marsh July 8 with a mammal, probably a ground squirrel, in its talons.

77. *Buteo borealis calurus*. Western Red-tail.

This is presumably the common hawk of the Upper Yukon; for the two large hawks taken are this species, and the numerous others seen resembled these in appearance, flight, and cry. About half were in the melanistic plumage.

Passing down Six-Mile River July 1 we saw three large buteos circling, and we noticed others frequently, usually in pairs, until we left Circle. Osgood and Maddren found a nest near Lake Marsh July 5 regarding which a pair of these birds were very solicitous. It was high in a spruce, and was empty except for a dead ground squirrel. On Fifty-Mile River July 10 I found a nest that was about 55 feet up in a spruce and contained two downy young. Osgood shot the female, which was in light plumage; the male, a melanistic bird, escaped. Osgood shot a melanistic female at Lower Lebarge July 17, and I found a pair—one light, the other dark—near Fort Selkirk July 25. These had a nest that was 60 feet up in a spruce and contained two young able to fly. I saw another nest with the birds about it on an island near the White River July 31.

78. *Archibuteo lagopus*. Rough-legged Hawk.

On September 1, 6, 7, and 9 we saw at St. Michael large hawks which from their proportions and flight were either buteos or archibuteos. Osgood shot one on Whale Island September 8, but could not retrieve it. Mr. Nelson's experience with the hawk family at St. Michael leads me to refer these birds to this species.

79. *Haliaeetus albicilla*. Gray Sea Eagle.

Lieutenant Satterlee, of the *Corwin*, found a dead bird of this species at Unalaska October 5, which proved to be a young female.

The wings had been removed at the carpal joint, but the unruffled plumage—the down yet persisting on the ends of the secondaries—removes all probability that it had been a caged bird. This is the first record of the occurrence of this species in western North America, although it is common in Japan and occurs in Kamchatka and occasionally on the Commander Islands.

80. *Haliaeetus leucocephalus alascanus*. Northern Bald Eagle.

We found this bird common along the Inside Passage, especially near Wrangell Narrows, and from the steamer I noticed three occupied nests. We visited one which was high in a gigantic dead cedar on a small island near Bocadequadra. Broken shells at the foot of the tree made it probable that the nest contained young. The female parent was secured by Maddren. On the flats of Chilkat Inlet June 1 I saw 28 eagles feeding. Here I found another occupied nest at least 100 feet up in a living spruce (it was so high that heavy charges of No. 4 shot did the bird no harm). A man passing by shot the male with a rifle. The next day I saw the female again on the nest. In the interior this bird is much rarer, though I saw one at Log Cabin June 20, and another at Bennett June 19. We saw the birds occasionally about the lakes (I found a deserted nest on Lake Marsh), and once or twice along the river, the last being observed near the White River July 31.

81. *Falco rusticolus*. Gray Gyrfalcon.

A female was caught in a steel trap set on a post at St. Michael September 21. Its stomach contained feathers. The irides were vandyke brown; tip of bill and nails, black; tarsi, toes, cere, gape, and rest of bill, pearl gray, the bill changing to pearl blue on maxilla near commissure.

82. *Falco peregrinus anatum*. Duck Hawk.

At Fort Selkirk the character of the Yukon Valley changes, and the high, sandy bluffs which have been constantly visible on one bank or the other are frequently replaced by rocky cliffs of varying height. Flying about one of these cliffs near Stewart River July 31 was the first duck hawk we noted. From that point to the Yukon Flats, a few miles above Circle, a day seldom passed without our seeing or hearing them, and from Camp Davidson to Circle I think there was at least one breeding pair every 10 miles. We saw a number of their nests on shelves on the cliffs, but at this time, the first half of August, the young had flown.

Osgood secured a young female August 5 on the cliff known as 'Old Woman,' and an adult female August 7 near the Tabkandik River, and shot several others which he failed to bag. I took a young male from a family on 'Castle Rock' August 5. We found that those taken



had been feeding on marsh hawks, Alaska jays, white-winged cross-bills, intermediate sparrows, and varied thrushes.

I saw two duck hawks near Nulato August 24, and a tame young bird spent part of the rainy evening of August 30 perched on the back of a chair in the hotel at St. Michael. The cere and bill of the young male were french gray, changing to black on tip of bill and along culmen and cere above; tarsi and toes, pale, grayish green; soles, tarsi behind, and edges of scutellæ in front, yellow; nails, black.

83. *Falco peregrinus pealei*. Peale Falcon.

One flew around the *Comin* when we were some distance south of the Aleutian Islands and out of sight of land October 7.

84. *Falco columbarius*. Pigeon Hawk.

We saw a pigeon hawk feeding on a large vole near Charlie Creek August 8. Osgood took a young male at a point 12 miles above Circle August 13, and I saw one at the Aphoon mouth August 28.

85. *Falco columbarius richardsoni*. Richardson Merlin.

At Circle August 18 I shot a young female merlin which is intermediate between *columbarius* and *richardsoni*. In general coloring both above and below, it is between typical examples of the two forms and approaches very closely a specimen of *richardsoni* taken by Captain Bendire at Walla Walla, Washington, December 3, 1880, and now in the American Museum of Natural History. My bird has light spots on outer webs of primaries and six light bars on tail similar to those of *richardsoni*, but the bars are narrower and more interrupted. The crop and stomach contained the remains of a red-backed mouse. The irides were vandyke brown; cere, greenish-yellow; maxilla, slate black at tip, changing to greenish-white toward cere and pale french gray at commissure; mandible, pale dull greenish, changing to pale french gray toward tip and commissure; tarsi and toes, straw yellow, the latter inclining toward sulphur yellow; nails, black. Mr. Cantwell writes in the 'Osprey'<sup>1</sup> of having *seen* Richardson's merlin, but does not state that he took specimens. These are the only records for this bird in the Yukon Valley.

86. *Falco sparverius*. American Sparrow Hawk.

We saw this species at Log Cabin June 14, Semenow Hills July 19 and 20, near the Tatchun River July 23, near Fort Selkirk July 26, about 30 miles below Fort Selkirk July 28, and, I think, at Circle August 15. We took specimens on July 19 and 28. This species has not previously been reported from along the Yukon.

<sup>1</sup>Osprey, III, 25, Oct., 1898.

[*Pandion haliaëtus carolinensis*. American Osprey. While the steamer was anchored near Holy Cross Mission August 25, one of the passengers, Mr. J. F. Burkman, fired at, but failed to get, a large hawk which he was positive was this species. As Mr. Nelson records it from the Lower Yukon, I see no reason to doubt Mr. Burkman's identification.]

87. *Asio accipitrinus*. Short-eared Owl.

We saw a short-eared owl flying overhead at St. Michael on the evening of September 7, and I flushed one from some bushes on Whale Island the next day. September 9 I set three steel traps near St. Michael on poles in the tundra. One of them failed to catch anything, but before September 25 the others yielded 6 short-eared owls and the nails of another. These birds had been feeding on mice and shrews. Osgood shot a short-eared owl at Unalaska October 5. These specimens average slightly *darker*, with the white of the face purer, than fall birds from New England.

88. *Scotiaptex cinerea*. Great Gray Owl.

From some low growth on a steep hillside at Miles Canyon July 11 we flushed a large gray owl that I am confident was this species. We saw a mounted specimen in Dawson August 2 and I was told at Circle that an owl answering the description of this species had been killed there recently.

89. *Nyctala tengmalmi richardsoni*. Richardson Owl.

While lying awake under my mosquito netting in a clearing at the base of the Semenow Hills on the night of July 19 I saw a small, round-headed owl alight on the limb of a dead tree only a few feet away. It flew before I could bring my gun to bear, but I have no doubt it was this species. Osgood took a young bird near Rink Rapids July 22. I was told at Circle that a small owl was common there, and that one had been caught recently.

90. ? *Megascops asio kennicotti*. Kennicott Screech Owl.

A reddish-brown owl, of the size and appearance of a screech owl, was seen by Maddren and myself at Caribou Crossing on the afternoon of June 27. We were drawn from camp by its peculiar notes, and saw it fly from a poplar across an opening to a spruce thicket. Later that day Osgood caught a glimpse of another, or perhaps the same bird, as it flew from the top of a small poplar.

91. *Bubo virginianus pallescens*. Western Horned Owl.

Owl pellets, some of them remarkably large, containing chiefly bones of rabbits, ground squirrels, and red squirrels, were found in great abundance, especially at Caribou Crossing and on Windy Island, Lake Tagish, but the most careful hunting failed to disclose the owls.

On Fifty-Mile River, near Lake Marsh July 8, we heard the hooting of a horned owl; and at our camp at Lower Lebarge one flew over, about midnight July 16, and lit in the top of a spruce just out of gunshot. I hurried after it but merely succeeded in seeing the bird swoop into the surrounding gloom.

At our camp near the Tatchun River July 22 one flew by and settled for an instant not far off; and the next day Osgood saw three extremely light-colored horned owls near by. We also heard the hooting of this species near the Yukon at the following places: Near Little Salmon River July 21, 20 miles below Fort Selkirk July 27, 20 miles below the Selwyn River July 29, near the Tatondu River August 6, about 15 miles above Circle August 12, and opposite Circle August 14. In the last case the identification is not without doubt, but the notes of the others were unmistakable.

[*Surnia ulula caparoch*. American Hawk Owl. At Bennett, June 18-22, a bird with a peculiarly weird cry flew about the cliffs above our camp every night. By a process of elimination I have attributed the serenade to this species.]

92. *Ceryle alcyon*. Belted Kingfisher.

This bird occurs about the Yukon lakes, but in small numbers. Osgood saw one at Bennett June 20; I heard one at Caribou Crossing June 29, and saw another on Lake Lebarge July 13.

We found kingfishers fairly common on Fifty-Mile River, and still more common on Thirty-Mile River. As the cliffs replaced the high banks below Fort Selkirk kingfishers became fewer, and none were seen after August 4, when we were about 40 miles below Dawson. Young able to fly were seen near Five-Finger Rapids July 22.

93. *Dryobates villosus leucomelas*. Northern Hairy Woodpecker.

Osgood took a single hairy woodpecker on Fifty-Mile River a few miles above Miles Canyon July 10.

94. ? *Dryobates villosus hyloscopus*. Cabanis Woodpecker.

Near the Little Salmon River July 21 I took a young female that corresponded in size and plumage with some young of this subspecies. It was seated in the entrance to a cavity in a burnt spruce. This is the first record of the occurrence of this bird in the Yukon Basin.

95. *Picoides arcticus*. Arctic Three-toed Woodpecker.

On July 1 I was attracted by the loud cries of a young bird, and traced the sound about 100 yards through a spruce grove on the bank of Six-Mile River. The noise proceeded from a full-fledged young woodpecker of this species that had thrust its head out of the opening to its house and kept up a continual screaming. With Osgood's assistance, the nest was opened but only this young bird was found. The

entrance was 5 feet 8 inches from the ground, on the lower side of a living, slightly leaning spruce, and the cavity was 10 inches deep. Osgood shot what we both supposed was one of the parents, for it certainly came in answer to the cries of the young; yet this bird proved to be a typical adult male of *P. americanus alascensis*. We saw no other woodpeckers there, except flickers.

96. *Picoides americanus alascensis*. Alaska Three-toed Woodpecker.

Osgood found the remains of an Alaska three-toed woodpecker at Haines June 1, and I shot a laying female near Glacier June 10. In the Yukon Valley we secured one on Six-Mile River; three on Fifty-Mile River above Miles Canyon July 10-11, two of them young adults; two on the Lewes River between Big Salmon and Little Salmon rivers July 20-21, and two at Circle, August 19-20. The young have whiter backs than the adults.

97. *Sphyrapicus ruber*. Red-breasted Sapsucker.

I took an adult male at Skagway May 31, and heard what I suppose was its mate.

98. *Colaptes auratus luteus*. Northern Flicker.

We saw and heard flickers several times at Glacier. One, which Osgood flushed from a hole high in a dead pine June 8, had yellow quills. In the Yukon Valley this is by far the most common woodpecker. We found it quite regularly from Log Cabin to Circle, but, like most Yukon birds, it was shy. At Caribou Crossing June 27 Osgood secured a female and found her nest, containing 8 young and 3 eggs, in a cavity 3 feet from the ground in a partly dead poplar. At Six-Mile River we found a nest about 6 feet from the ground, and at Lower Lebarge July 17 I found 7 well-fledged young in a cavity about 5 feet from the ground in a small dead tree in a burnt tract. July 25 I took a full-grown young near Selkirk.

Adult flickers from Alaska average slightly darker than *luteus* from Canada and farther south, the wings, tail, and bars of upperparts being somewhat blacker, and the light parts more olive and less buffy. Three young—one from near Fort Selkirk, the others nestlings from Lower Lebarge—show this difference in a marked degree, having the wings, tail, and bars of upperparts deep black, and the ground color above smoky olive, instead of buffy olive as in *luteus*; they are even darker than the young of *auratus* from Florida. But the slightness of the difference shown by the adults, the small number of specimens from Alaska, and the possibility that the plumage of the three young may have been discolored by the burnt trees where they were found—though microscopic examination shows no sign of this—make their separation as a subspecies inadvisable at present.

99. *Chordeiles virginianus*. Nighthawk.

From Caribou Crossing, where I shot two females June 27, until after passing the mouth of the Tatchun River July 24, we met with nighthawks on numerous occasions. I took an adult male at White Horse Rapids July 11. These birds were very fat, as might be expected from the abundance of flying insects. They are slightly darker than *virginianus* from the East.

100. *Selasphorus rufus*. Rufous Hummingbird.

We saw a rufous hummingbird on 'Eagle Island' at Bocadequadra May 28. At Glacier Osgood saw one June 6, and on June 10 I found a nest with two slightly incubated eggs  $3\frac{1}{2}$  feet from the ground on the branch of a small conifer near the falls of the river. I secured the female, and also one of two males which I saw the same day in the open country below Glacier. On Lake Bennett we saw one opposite West Arm June 24. Mr. George G. Cantwell has already added both this species and *Chordeiles virginianus* to the Yukon avifauna.<sup>1</sup>

101. *Sayornis saya yukonensis*. Yukon Phoebe.

*Sayornis saya yukonensis* Bishop, Auk, XVII, 115, April, 1900.

Osgood took the type specimen of this phoebe on the heights above Glacier June 8, and I saw one on the mountainside at Bennett June 17. We next met the bird about some cliffs below Fort Selkirk July 26, and after this saw family parties almost daily. Near Stewart River July 31, we saw a pair about their nest on the face of a cliff a few feet above the water. After passing Charlie Creek August 10, we saw no more until we reached Circle, where I killed a young one August 19. Full-grown young were taken July 30. The note is harsh, somewhat resembling that of *Contopus richardsoni*, but louder and shriller. We found the birds only about the cliffs, or the steep, grass-grown banks of the Yukon, a favorite perch being rocks along the shore. Those we met in August seemed to be migrating up the river.

102. *Contopus borealis*. Olive-sided Flycatcher.

At Six-Mile River I took a pair July 1, the female of which had finished laying. A bird which I heard near Bennett June 20, and a large flycatcher which I shot, but could not find, at Caribou Crossing June 25, I believe were this species.

103. *Contopus richardsoni saturatus*. Alaska Wood Pewee.

*Contopus richardsoni saturatus* Bishop, Auk, XVII, 116, April, 1900.

Osgood took a wood pewee at Skagway May 30, and I two males at Haines June 2. In the Yukon Valley, from Windy Island, Lake Tagish, where I took a male June 30, until we passed Little Salmon River July 21, we often heard this bird's 'pee-ah' coming from the

<sup>1</sup> Osprey, III, 25, Oct., 1898.

wooded banks. We next saw the bird about 12 miles above Circle, where I took a pair August 14. It was more common at Miles Canyon than elsewhere on the Yukon, and here on July 11 I found an unfinished nest (which resembled that of *C. richardsoni*) in the fork of a half-dead poplar about 10 feet from the ground. No form of wood pewee has previously been recorded from the Yukon.

104. *Empidonax trailli alnorum*. Alder Flycatcher.

We first found this species July 26 at Fort Selkirk, where the Pelly River, from the Rocky Mountains, joining the Lewes, forms the Yukon, and hardly lost it again until we reached Circle; later I heard one 15 miles below Fort Yukon on August 21. Wherever we landed we found this or the Hammond flycatcher in the alders and willows. Full-grown young in juvenile plumage were taken on August 5. The adults are apparently typical *alnorum*, having the greener upperparts, more conspicuous wing bars, and shorter bill of this form.

105. *Empidonax hammondi*. Hammond Flycatcher.

We saw several Hammond flycatchers at Skagway, and collected three. I took one at Glacier June 8, and another on a hill above Caribou Crossing June 26. After this we did not again meet with the bird until about 15 miles below Selwyn River, where Osgood shot a young one July 29. From that point to Charlie Creek it was almost equally common with *Empidonax t. alnorum*, frequenting the same localities; but after passing Charlie Creek, August 9, we saw no more of it. The young secured were molting. The male collected at Caribou Crossing is unusually pale for *hammondi*, but this is doubtless the result of wear, as the same thing is shown in *Contopus saturatus* and *Hyllocichla alma*.

106. *Pica pica hudsonica*. American Magpie.

Maddren saw a pair at Caribou Crossing June 26, and Osgood found their deserted nest. At Fort Selkirk July 26 I took two young—male and female—which had just assumed first winter plumage. They were feeding about the houses of the town. I was told that another young bird had been seen there recently.

107. *Cyanocitta stelleri*. Steller Jay.

Osgood found the remains of a Steller jay in the woods at Haines June 1.

108. *Perisoreus canadensis fumifrons*. Alaska Jay.

We first met this bird at Log Cabin, noted it also at Bennett and Caribou Crossing, and found it common from Lake Marsh to Circle, generally in families. Between White River and Circle it was less common than farther up the Yukon. I saw one 15 miles above Fort

Yukon, heard several at Hendricks Station August 25, and saw one at St. Michael September 18.

Adults had completed the summer molt by July 20; the young were in full juvenile plumage on June 20, and in first winter plumage on August 20. The molt is complete in the adults, while in the young the wings and tail remain unchanged.

The adults collected are all intermediate between *capitalis* and *fumifrons*; each has a black orbital ring, but this is broader in those from Circle. All those in juvenile plumage have the head dull plumbeous, like the back, as in *fumifrons*.

109. *Corvus corax principalis*. Northern Raven.

Of all the birds we met the raven occurred most regularly. On our entire trip down the Yukon hardly a day passed without our seeing the birds in twos and threes. We saw a few at Wrangell, found them more common at Wrangell Narrows, saw several at Skagway, and noticed the wing of one at Glacier. A few were noted across White Pass at Middle Lake and they were abundant at Log Cabin. A flock of at least 200 was observed at the latter place June 20, and another of 50 at Bennett two days later. During September at St. Michael we saw them frequently, but never in large numbers. At Unalaska they were abundant and remarkably tame.

An adult taken on June 20 is in full molt; a young taken July 22 is in juvenile plumage; on one taken August 23 the body feathers of the first winter plumage have replaced most of the juvenile, and the change is complete in one taken September 9.

[*Corvus americanus*. American Crow. I was told by one of the prospectors whom I met on a Yukon steamer that the crow, as well as the northern raven, occurs at the head waters of the Porcupine.]

110. *Corvus caurinus*. Northwest Crow.

Common on 'Eagle Island' at Bocadequadra, where Osgood found a finished but empty nest May 28. Crows were very common near Vancouver June 26, but we saw none after leaving Bocadequadra.

111. *Scolecophagus carolinus*. Rusty Blackbird.

Two blackbirds which I saw at Log Cabin June 15 were probably this species, and I was told that rusty blackbirds had been abundant there a few days before our visit.

Osgood took a specimen near Fort Yukon August 21, and I saw a small flock at the Aphoon mouth August 28. I was informed that these birds breed in large numbers on the tundra by the Kuskokwim and at the head of the Porcupine.

[*Coccothraustes vespertinus montanus*. Western Evening Grosbeak. A prospector told me that a grosbeak, whose description answered



that of this species, was common on the Copper River. He assured me it was not the pine grosbeak, which he knew well.]

[*Pinicola enucleator alascensis*. Alaska Pine Grosbeak. A red bird with dark wings—certainly not a crossbill—which I saw at Lake Marsh July 8 was probably a pine grosbeak, but we did not meet with any others during our trip. I was told this bird occurs along the Porcupine.]

112. *Loxia curvirostra minor*. Red Crossbill.

Osgood took a red crossbill and saw another at Unalaska October 5. We did not take any along the Yukon, but I feel positive that a red male crossbill which I shot at Lake Lebarge July 16, but could not find, belonged to this species.

113. *Loxia leucoptera*. White-winged Crossbill.

Crossbills in flocks of from half a dozen to one hundred individuals were often seen from Lower Lebarge to Charlie Village July 16 to August 11. Most of these flocks were probably *leucoptera*, and some certainly were. They were exceedingly restless, and the only ones taken (besides those found in the crop of a duck hawk), were three young at Camp Davidson August 5-6.

114. *Leucosticte griseonucha*. Aleutian Leucosticte.

We saw a number of Aleutian leucostictes on St. George October 3. At Unalaska I saw a flock of about twenty and another of two young October 5, and secured an adult and one of the young. The latter is in juvenile plumage, feathers of the first winter appearing only on the sides of the chest.

115. *Leucosticte tephrocotis littoralis*. Hepburn Leucosticte.

We found this bird only at White Pass Summit, where Osgood took two males and I one female June 13. It is doubtless this species of *Leucosticte* to which Cantwell refers in his paper on the 'Birds of the Yukon Trail.'<sup>1</sup>

116. *Acanthis hornemanni exilipes*. Hoary Redpoll.

I secured two young from a flock about 15 miles above Circle August 13, and Osgood one from a flock at Circle August 19. I saw several at the Aphoon mouth August 27, and we found them rather common in small flocks at St. Michael during September. All taken were young and were molting from juvenile to first winter plumage.

117. *Acanthis linaria*. Redpoll.

We saw several, usually in pairs and very shy, at Bennett June 17. One stopped for an instant on a bush close to our tent. Near Charlie Village I saw a male in high plumage August 11.

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<sup>1</sup>Osprey, III, 25, Oct., 1898.

118. *Spinus pinus*. Pine Siskin.

A very restless family of this species was seen on Windy Island, Lake Tagish, June 30, and Osgood secured one. I saw one at Lower Lebarge July 18, and took one from a small flock near the Selwyn River July 29, and Osgood one from a large flock near Sixty-Mile Creek July 31. We saw a large flock near Dawson August 1, a few near Forty-Mile Creek August 4, and Osgood saw one 15 miles above Circle August 12. Flocks of either this bird or redpolls were heard near the Tatoudu River and Charlie Creek August 7-8. I find no former record of this species for the Yukon Valley.

119. *Passerina nivalis*. Snowflake.

At White Pass Summit I shot a female June 12 that had an old fracture of the wing, which had healed in such a manner as to make long flight impossible. I was informed snowflakes had been very abundant there earlier in the year. At St. Michael I saw two September 16, and a flock of about twenty September 19. Osgood took one from a small flock September 25, and I three on September 28.

Snowflakes were common on St. George October 3, but the two young taken ( $\sigma$  and  $\rho$ ) are indistinguishable from those from St. Michael, and have bills smaller than the young of *townsendi*.

120. *Calcarius lapponicus alascensis*. Alaska Longspur.

I saw several small flocks at the Aphoon mouth August 27, and secured one specimen. A few were found at St. Michael the last of August, and large flocks there September 1-2. After that several were seen almost every day until September 22, when the last were taken. Osgood saw several at St. George October 3, and I saw one at Unalaska October 5.

121. *Ammodramus sandwichensis*. Sandwich Sparrow.

A few were seen at Unalaska October 5-6, and two young secured.

122. *Ammodramus sandwichensis alaudinus*. Western Savanna Sparrow.

I saw several savanna sparrows on the marshes of Chilkat Inlet June 1, and we took one at Haines, one at Skagway, and two at Glacier. Several pairs were found on the marshes near Log Cabin, a few at Caribou Crossing, and one pair on an island in Lake Tagish. They were fairly common about Lake Marsh, and Osgood found a set of four eggs there, securing the female July 5. After leaving Lake Marsh these sparrows were not seen again until we reached the Alaska boundary, when I took a young August 5. Osgood took a young specimen from a flock near Charlie Village August 10, and young were common at Circle August 14-19. I saw a number at the Aphoon mouth August 27-28, and we found a few at St. Michael up to September 11.

Breeding specimens from the Yukon lake region are indistinguishable in size and color from *alaudinus* from North Dakota. Those from Haines and Glacier are larger in bill and other measurements, slightly darker, and more buffy, but evidently belong to the same form. A male taken at Skagway May 31 is identical in color with a female *savanna* taken in Connecticut about the same date, but in measurements intermediate between *sandwichensis* and *alaudinus*. Young birds from St. Michael and the Yukon below Camp Davidson resemble closely the young of *savanna* in coloring, and have bills slightly shorter and deeper than adult *alaudinus* from the Yukon lakes, but are larger and have longer wings and tails than the latter.

123. *Zonotrichia leucophrys gambeli*.<sup>1</sup> Intermediate Sparrow.

Descending from the bleak, snow-covered rocks of White Pass, we reached at Portage June 14 a country of a more luxuriant vegetation. Here the intermediate sparrow appeared, and it stayed with us constantly until we left Circle, August 20. At Fort Gibbon August 23 I saw one adult and one young. With the exception of the bank swallow, this is the most abundant species inhabiting the Yukon Basin.

At Log Cabin June 20 I took a laying female; on Windy Island June 30 Osgood took a young, able to fly, and at Lower Lebarge I shot one molting into first winter plumage. We found young abundant in this plumage at Circle August 15-20, but saw no adults. This species has two distinct songs. That most often heard is a very mediocre performance, but the other, which I heard in its full perfection only on a hill at Caribou Crossing June 26, and about 2 a. m. on Fifty-Mile River July 9, possesses all the sweetness and clearness of the song of *Z. albicollis*. By July 15 the song season was practically over, but I heard one bird singing as late as August 10.

124. *Zonotrichia coronata*. Golden-crowned Sparrow.

Osgood found the golden-crowned sparrow on the heights above Glacier June 5. It was common at White Pass summit June 11-14, and was the only bird we saw along the trail to Portage June 14. We thought we heard it singing at Log Cabin. The song does not equal those of others of the genus. Osgood found an almost finished nest in a conifer at Summit Lake June 12. It was composed of sticks and moss, lined with grass, and placed about 2½ feet from the ground. The next day I shot a female that contained an egg ready for the shell.

125. *Spizella monticola ochracea*. Western Tree Sparrow.

At Haines I took a female June 2. At Caribou Crossing we took two pairs June 29, one of them with a nest containing three fresh eggs. The nest was buried in the moss at the base of a clump of willows in

<sup>1</sup>This is the species formerly known as *Zonotrichia leucophrys intermedia* Ridgway. See Ridgway, Auk, XVI, 36-37, 1899.

a willow swamp near the lake, and it was composed of fine, dry grasses, lined with feathers, covered externally with a thick coating of living moss. The eggs, which average 0.80 by 0.57 inches, are pale pea green, heavily mottled over the entire surface with reddish fawn color. At Lake Marsh July 8 I took an adult female, and 15 miles above Circle August 8 a young bird molting from the striped juvenile into the fall plumage. The species was abundant at Circle, and a number were seen on an island 15 miles above Fort Yukon August 21. I saw one at the Aphoon mouth August 27, and noticed seven during September at St. Michael, taking the last September 21.

126. *Spizella socialis arizonæ*. Western Chipping Sparrow.

We found this species almost daily from Log Cabin to Dawson, or between June 15 and August 1. In point of numbers it follows the intermediate sparrow and the slate-colored junco. It was last observed about 10 miles below Dawson August 3, but the range of the species may extend much farther north, as a large flock seen near the Selwyn River July 29 showed that the fall migration had begun.

We found a nest with four eggs at Lake Bennett June 24, large young in a nest on Lake Tagish June 30. Young able to fly were met with at Lake Marsh July 5, and a set of three eggs on Thirty-Mile River July 18. The nests were in small spruces, one 4 inches and another about 3 feet from the ground.

Yukon chipping sparrows, females especially, average darker than typical *arizonæ*, but coincide in measurements. Turner reports this species from Fort Yukon.<sup>1</sup>

127. *Junco hyemalis*. Slate-colored Junco.

From Log Cabin to Circle this bird occurs everywhere, contesting with the intermediate sparrow for supremacy in numbers. Two broods are, I think, regularly reared. Females taken at Log Cabin and Bennett had finished laying. On Windy Island June 30 I shot a young bird able to fly, and on the east shore of Lake Tagish the following day saw one pair building a nest and another feeding young. Maddren found a nest with four fresh eggs at Lake Marsh July 4, Osgood one with three fresh eggs at Lower Lebarge July 16, and I one with five young on Thirty-Mile River July 18, and another with four just hatched young near the Tatchun River July 23. By July 20 young in striped plumage were common, and August 2 I took one near Dawson molting into first winter plumage. The slate-colored junco, the intermediate sparrow, and the western chipping sparrow were most common about brush heaps left by lumbermen, weed-grown clearings resulting from forest fires, and cabins of the towns. Every nest found was sunk in the ground to the rim in an open place

<sup>1</sup>Contrib. Nat. Hist. Alaska, 174, 1886.

under a weed or a tussock of grass. One contained a few dark hairs besides the usual fine grass lining. Twenty adults differ from eastern summer specimens of *hyemalis* only in having in both sexes bills averaging 0.02 inch longer (measured from the nostril).

128. *Junco hyemalis oregonus*. Oregon Junco.

Tolerably common at Skagway and more so at Haines. At Skagway I took a female and four fresh eggs May 31. The nest, of dried grass lined with short, white hairs, was sunk in the ground and concealed by dead weeds under a birch only about 30 feet above the water of Lynn Canal.

129. *Junco hyemalis connectens*. Shufeldt Junco.

Maddren took a female at Glacier June 7, a male was taken near White Pass City June 9, and Maddren saw several near there that day. I took a male below Glacier June 10, and saw and heard a number singing a few hundred feet above White Pass City, where the spruce woods gave place to more open country. Their song is quite distinct from that of *oregonus*. This is a new record for Alaska.

130. *Melospiza melodia rufina*. Sooty Song Sparrow.

We heard several singing at Skagway May 31, and Osgood saw some at Haines June 2. At Haines I took a male June 1, and a pair, the female of which had finished laying, June 2.

131. *Melospiza cinerea*. Aleutian Song Sparrow.

Abundant at Unalaska, October 5-7, frequenting the roofs of buildings, lumber piles, wharves, beaches, and weeds of the level country and hillsides. The males were singing constantly, their song having the usual song sparrow character, but not the usual strength or beauty.

132. *Melospiza lincolni*. Lincoln Sparrow.

At Log Cabin June 15 we saw what was apparently a Lincoln sparrow. Osgood took a female and a set of five fresh eggs near Lake Marsh July 5, I another female on the west shore July 8, and we heard several singing near the lake. The nest found was composed of coarse grass lined with fine, and was in a tuft of grass in a swamp, about 4 inches above the water. We again met this species at Lower Lebarge, near Fort Selkirk, near the White River, at Camp Davidson, at Charlie Village, 15 miles above Circle, and at Circle, where one was taken August 19. July 27 a full-grown young was taken, and August 12 one that had almost finished molting into winter plumage.

133. *Melospiza lincolni striata*. Forbush Sparrow.

A Lincoln sparrow which Osgood saw at Haines June 1 should be referred to the northwestern subspecies.

**134. *Passerella iliaca*. Fox Sparrow.**

A wave of sparrows occurred at Circle August 19 just after a frosty night, and among other species I saw a single fox sparrow. The bird was too close to leave identification doubtful.

**135. *Passerella iliaca townsendi*.<sup>1</sup> Townsend Fox Sparrow.**

Osgood saw one at Skagway, and we noticed several at Glacier which were exceedingly shy. Osgood collected two at Glacier June 8-9, one of which was too badly shot to preserve; the other Mr. Ridgway pronounces somewhat nearer this form than *annectens*.

**136. *Petrochelidon lunifrons*. Cliff Swallow.**

This species was common at Log Cabin June 15 and 20. At Caribou Crossing we saw a few June 29, probably members of the small colony breeding on the cliffs of an island in Lake Tagish July 1. We next saw cliff swallows near the Hootalinqua River July 19, and from this point to a few miles above Dawson, August 1, we frequently met with colonies of varying size, the largest being near White River. Their nests were attached to cliffs bordering the river, except at Fort Selkirk, where they were breeding under the caves of houses. Full-fledged young were taken July 25, and I think the absence of this species below Dawson was due to their having already migrated. I was told that both cliff and bank swallows were exceedingly abundant along the Porcupine.

**137. *Hirundo erythrogastra unalaschkensis*.<sup>2</sup> Alaska Swallow.**

A few were flying over the marshes of Chilkat Inlet June 1; I heard that they were common at White Pass City June 9, and we saw two about the buildings of White Pass Summit June 10. At Log Cabin they were common on June 14, 15, and 20, and on the last date I took a male. A few were noticed at Bennett June 19-21. I refer all seen to this subspecies, for all had remarkably long tails. The single specimen taken had a length of 7.96 inches, wing 4.68 inches, tail 4.10 inches, fork of tail 2.33 inches. The forehead, lower wing-coverts, and abdomen are more highly colored than eastern skins of *H. erythrogastra*, and the shafts of the long tail feathers are whitish.

**138. *Tachycineta bicolor*. Tree Swallow.**

I saw several at Skagway May 31 and June 3, and over the Chilkat marshes June 1. We saw others near Caribou Crossing June 29; one July 6 and a pair July 7 at Lake Marsh; and several at Miles Canyon July 11. A few miles above Fort Selkirk July 25 I saw several entering and leaving an old flicker hole in a dead spruce.

<sup>1</sup> Auk, XVII, 30, Jan., 1900.

<sup>2</sup> Rept. Fur-Seal Investigations, 1896-97, pt. 3, 422, 1899.

139. *Tachycineta thalassina*. Violet-green Swallow.

Mr. Cantwell<sup>1</sup> has already added this species to the list of birds known to inhabit the Yukon Valley. We saw a single male among flocks of bank swallows flying over Fifty-Mile River above Miles Canyon July 11 and another between White Horse Rapids and Lake Lebarge. On July 18 I took a male from several that we saw near Hootalinqua, and at the Semenow Hills July 20 Osgood secured a female, finding her nest with four young in a crevice in the cliffs. Maddren shot a young July 28. After this we frequently saw colonies of from six to ten birds of this species, and one near White River that must have contained over fifty.

They were nesting about the cliffs as a rule, but several times we saw them enter holes in banks similar to those of *Clivicola riparia*, while at Fort Selkirk they were nesting in the interstices between the logs of the cabins. We often met with small colonies until within 15 miles of Circle, but after August 5 they kept so high about the cliffs that identification was possible only by their characteristic twitter. The two adult males have green rumps.

140. *Clivicola riparia*. Bank swallow.

We found a small colony nesting at the northern end of Lake Tagish July 1, and a larger one on the west shore of Lake Marsh July 7, but we were entirely unprepared for the great abundance of this species on Fifty-Mile River above Miles Canyon. There almost every bank was honeycombed with their holes. Along the rest of the Yukon as far as Circle bank swallows were common and often abundant, but after August 1 their former presence was generally manifested only by the deserted holes. At Circle I saw about thirty August 17, and a single bird on the following day. Eggs advanced in incubation were found July 7, and by the 22d the young were flying, and all acting as if preparing to migrate. As it grew dusk on the evening of August 5 we watched a large flock which circled over the Yukon, rising higher with each revolution, and at last disappeared toward some mountains due south.

141. *Ampelis garrulus*. Bohemian Waxwing.

We saw several on Six-Mile River July 1, two at Lake Marsh July 7, one on Fifty-Mile River July 10, two pairs (one of which was secured) at Miles Canyon July 11, one at Lower Lebarge July 16, two about a mile apart on Thirty-Mile River July 18, and four near the Selwyn River July 28. We took two adults and three young from a flock of twenty about 15 miles below the Selwyn July 29, and four from a similiar flock near Sixty-Mile Creek July 31. We saw them again at the Chandindu River August 4, Camp Davidson August 5,

<sup>1</sup>Osprey, III, 25, Oct., 1898.



50 miles above Circle August 11, and 15 miles lower August 12. The female taken July 11, which lacked the wax tips on the secondaries, contained an egg ready for the shell. The young resemble those of *A. cedrorum*, but are grayer, have less white on the abdomen, no pale streaking above, and have the wings, tail, and lower tail-coverts like adult *garrulus*. They lack the cinnamon suffusion of the head of the adult, have only a few black feathers on the throat, a much shorter crest, the wax-like tips of the secondaries peach-blossom pink instead of scarlet, and the lower tail-coverts paler. A still younger bird than the two described is obscurely streaked with whitish both on back and lower parts. On one of the young the wax tips are very small.

In habits and notes the Bohemian waxwing closely resembles the common cedar waxwing. Two males that we noticed while descending Thirty-Mile River were perched on the topmost sprays of tall spruces, uttering a lisping whistle at frequent intervals. One of them flew after a passing insect in the manner of a flycatcher. Flocks were easily approached, and when one bird was shot the rest would scatter, and each would alight on the top branch of some spruce and utter a characteristic call note. This note, which we often heard from passing flocks, was similar to the whistle just mentioned. The birds that we collected had been feeding on the purple berries of some unidentified plant.

142. *Helminthophila celata*. Orange-crowned Warbler.

Osgood took an adult male at Caribou Crossing June 26; I a female and two young 20 miles below Fort Selkirk July 27, and a young near Dawson August 2. Osgood secured an adult and one young at Camp Davidson August 5 and 6, and I saw one young 15 miles above Fort Yukon August 21. All taken were in alders or willows close to the water.

143. *Helminthophila celata lutescens*. Lutescent Warbler.

Common at Haines, where we took five June 1 and 2.

144. *Helminthophila peregrina*. Tennessee Warbler.

Found only at Caribou Crossing, where I heard four males singing and secured three of them June 25 and 27. They were in comparatively open swamps of willows and low spruces.

145. *Dendroica æstiva rubiginosa*.<sup>1</sup> Alaska Yellow Warbler.

I am positive I often heard the song of this species at Bennett June 17-22. I took an adult male at Caribou Crossing June 27, and think I heard the song about Lake Marsh. An adult female was taken by

<sup>1</sup>Auk, XIV, 76, 123, 1897.

Osgood near the Nordenskiold River July 22, and family parties were often found in the alders and willow thickets between the Pelly River and Circle. I took a young from a small flock 15 miles above Fort Yukon August 21, saw one at the Aphoon mouth August 28, and a few I thought this species at Hendricks Station August 25. Birds from the Yukon Valley do not differ from those of the Alaska coast. A young female is duller above and more buffy below than the young female of *D. aestiva*.

146. *Dendroica coronata hooveri*.<sup>1</sup> Hoover Warbler.

We found Hoover warblers common at Skagway, Glacier, Log Cabin, and Caribou Crossing, and also noted them at Haines, Bennett, Lake Tagish, Miles Canyon, White River, Sixty-Mile Creek, and 12 miles above Circle. At Skagway May 31 they were still in flocks, but at Glacier June 4-10 they seemed to be mated and settled for the summer. At Log Cabin we found a flock June 15, but five days later those still remaining there were beginning to nest. A small flock seen on an island near Sixty-Mile Creek August 1 showed that the return migration had begun. I took a young in striped plumage August 1. Adult males average paler below than typical *D. coronata*, the black markings being narrower, thus giving an effect of broad longitudinal markings rather than black clouding on the chest. Eight specimens of both sexes average slightly larger in length of wing and tail than the corresponding sexes from eastern and central United States. In six males, the exposed culmen averages 0.02 inch longer than in males from Connecticut, but the bill from nostril averages the same, as do both measurements in females. In juvenile plumage *hooveri* is darker than *coronata*, the black markings are broader and blacker, both above and below, and the brownish edgings to the feathers greatly restricted—entirely wanting on the lower parts and middle back.

147. *Dendroica striata*. Black-poll Warbler.

At Log Cabin June 15 this species was common, but on my return June 20 I saw only one pair—which I secured—and one other male. July 5 I took a male at Lake Marsh. Two birds taken at Caribou Crossing are somewhat smaller than average specimens from Dakota and Connecticut.

148. *Dendroica townsendi*. Townsend Warbler.

Osgood took a male at Skagway May 31. At Glacier it was tolerably common in the dense woods of spruce and fir, and unquestionably nesting; altogether we noticed about twenty individuals during our stay. Osgood took an adult at the southern end of Lake Marsh July 1, and I an adult female and young female on the west shore of Lake

<sup>1</sup> Bull. Cooper Ornith. Club, I, 32, 1899.

Lebarge July 14. The juvenile plumage differs from that of *D. cirrens* only in being slightly less brown on crown and back. This is a new species for the Yukon Valley.

149. *Seiurus noveboracensis notabilis*. Grinnell Water Thrush.

The first sound that I heard on the morning of August 1, when we were on a small island about 10 miles below Sixty-Mile Creek, was the unmistakable alarm note of the water thrush. This was the first time we had met with this species, and before starting that morning on our daily Yukon drift, Osgood and I each secured a young bird. Near Forty-Mile Creek, Tatondu River, and Charlie Creek water thrushes were again met with. At Circle I saw several August 16-20, took one 15 miles above Fort Yukon August 21, and saw two in a thicket at the Aphoon mouth August 28. The young in fall plumage taken on the Yukon are clove-brown above, including wings and tail—far darker than is usual in *notabilis*—and have darker streaks below.

150. *Wilsonia pusilla*. Wilson Warbler.

Osgood took an adult female near the Chandindu River August 4, and I a young female near Charlie Village August 11 and a young male 25 miles above Circle August 12. I also saw one 30 miles below Circle August 20. These birds, while not typical *pusilla*, are, like those of the Lower Yukon, nearer it than *pileolata*.

151. *Wilsonia pusilla pileolata*. Pileolated Warbler.

We found this the most abundant bird at Glacier June 5-10, frequenting the alder thickets from the valley as far as they extended up the hills. I saw a yellow warbler I thought this species on White Pass Summit June 12. Pileolated warblers were common at Log Cabin, Bennett, and Caribou Crossing, and I am confident I heard them singing at Lake Marsh. Adult males from Glacier resemble normal *pileolata* closely, but have the back rather more green; those from the Yukon Valley, while having the orange forehead and lower parts of this form, have the duller green back of *pusilla*.

[*Motacilla ocularis*. Swinhoe Wagtail. On the morning of August 28 the *Robert Kerr*, on which I was a passenger, was hindered from proceeding by a gale and low water on the bar, and was made fast to the bank at the Aphoon mouth of the Yukon. As I came on deck I saw half a dozen white wagtails fly about the vessel and settle in the grass close by. While I returned for my gun they left, but a thorough acquaintance with *Motacilla alba* in Egypt, where it is abundant during the winter, leaves me no doubt that these birds were wagtails.]

152. *Anthus pensilvanicus*. American Pipit.

A male taken at Skagway June 3 was probably a belated migrant. On the heights above Glacier Osgood saw several June 5, and we

found them common at Summit June 11-13. A female taken June 13 was laying, and a fresh but empty nest I found the same day I attributed to this species, no other being near. This nest was loosely formed of fine dry grass in a hollow in the deep moss which covered the almost perpendicular side of a boulder lying on a hill high above Summit, only a small hole for entrance showing in the moss. We often saw the song-flight at Summit. Launching himself with a sharp preliminary 'chip' from one of the granite boulders that abound there, the male would rise rapidly to a height of a hundred feet or more, uttering a sweet, clear song. After poising high in air and repeating this song for several minutes the singer would slowly float toward earth and alight 100 yards from where he started, soon to repeat the same performance. We found a pair on the heights above Bennett June 17, and a few, possibly members of one family, at Circle August 15-20.

153. *Cinclus mexicanus*. American Dipper.

We collected a female and set of four fresh eggs at the falls at Glacier June 8. A single ouzel seen farther down the river June 10 was probably the mate of the one taken. Osgood also took one at Unalaska October 5.

154. *Anorthura hiemalis pacifica*. Western Winter Wren.

We noticed a few at Glacier June 4-10, and I took a male there June 6.

155. *Anorthura alascensis*. Alaska Wren.

I saw one at St. George October 3, and we collected five at Unalaska October 5. The young were then molting.

156. *Sitta canadensis*. Red-breasted Nuthatch.

I took a male at Skagway May 31 and another near Log Cabin June 20, and heard one on an island at the junction of the Lewes and Pelly rivers July 26. This species has not heretofore been noted in the Yukon Valley.

157. *Parus atricapillus septentrionalis*. Long-tailed Chickadee.

We took this species at Bennett June 19, west shore of Lake Bennett June 24, Caribou Crossing June 26, Lake Marsh July 7, and Lake Lebarge July 15, but did not notice it again until we reached the Lower Yukon, although chickadees were heard several times whose specific identity was not determined. Thirty miles below Holy Cross Mission I took two August 25, and at the Aphoon mouth I saw a small flock August 28. Young able to fly were taken July 7. One taken August 25 had completed the molt into first winter plumage, while an adult taken the same day was in fresh plumage.

158. *Parus hudsonicus evura*.<sup>1</sup> Yukon Chickadee.

We took the Yukon chickadee at Caribou Crossing June 27, Lake Tagish June 30, Lake Marsh July 5, and Lake Lebarge July 14, and after reaching Thirty-Mile River July 19, found it regularly distributed in families or large flocks all the way to Fort Yukon, 15 miles above which I saw a flock August 21. At St. Michael I took a young female in first winter plumage September 20. Young able to fly were first taken July 5 and molting birds August 13. We took adults in full molt June 27, and one in which the molt was almost completed July 24.

159. *Parus rufescens*. Chestnut-backed Chickadee.

We found a few at Haines and Skagway, and I took one and heard another at Glacier June 5. A female taken at Skagway June 3 had finished laying.

160. *Regulus satrapa olivaceus*. Western Golden-crowned Kinglet.

Tolerably common at Glacier; often heard but seldom seen, and difficult to procure. A female that I took June 10 had the last egg ready for the shell.

161. *Regulus calendula*. Ruby-crowned Kinglet.

I took a male at Log Cabin, and on June 20, between that point and Bennett, heard another singing. Osgood took two young specimens, one at Lower Lebarge July 17, and the other 20 miles below Dawson August 4.

162. *Regulus calendula grinnelli*.<sup>2</sup> Sitka Kinglet.

At Skagway I heard a Sitka kinglet singing May 31, and at Haines took a male and heard another singing June 1. At Glacier I took a male June 6, and during our stay heard two or three others singing. While the Log Cabin bird is normal *calendula*, the Haines and Glacier birds have the more olive back and darker sides of crown of *grinnelli*.

163. *Myadestes townsendi*. Townsend Solitaire.

On the heights above Bennett I took an adult male June 17. On the hot noon of June 26, while seated on the summit of a hill some 1,500 feet above Caribou Crossing, I heard the most beautiful bird song that has ever delighted my ear. It seemed to combine the strength of the robin, the joyousness and soaring quality of the bobolink, and the sweetness and purity of the wood thrush. Starting low and apparently far away, it gained in intensity and volume until it filled the air, and I looked for the singer just above my head. I finally traced the song to a Townsend solitaire that was seated on

<sup>1</sup> Auk, XVII, 118, April, 1900.

<sup>2</sup> Auk, XIV, 399, 1897.

a dead tree about 150 yards away, pouring forth this volume of melody without leaving its perch. The singer came close enough later to make identification certain.

Osgood and Maddren saw one at Lake Lebarge July 14. Osgood took an adult at Miles Canyon July 11, another at the Semenow Hills July 20, a young in the spotted plumage 20 miles below the Selwyn River July 29, and another young 30 miles above the White River July 30. I saw an adult near the Selwyn River July 29, and took a molting adult near Sixty-Mile Creek August 1. Mr. Cantwell found this species in the Yukon Valley.

164. *Hylocichla aliciaæ*. Gray-cheeked Thrush.

Several thrushes which we heard singing on the west shore of Lake Marsh July 8 were, I think, this species, as their song differed from that of the dwarf, hermit, and Alma thrushes. I saw two, but they were so shy that I could not secure either. Near Sixty-Mile Creek, July 31, I took a young in spotted plumage, which was with the young of *almæ* which Osgood shot. At Circle I took a young in first winter plumage, also with *almæ*.

165. *Hylocichla ustulata almæ*.<sup>1</sup> Alma Thrush.

This is the common thrush of the Yukon basin, occurring everywhere from Log Cabin to Circle, perhaps in largest numbers at Caribou Crossing and Lake Marsh. Fifteen miles above Fort Yukon I took one, and saw others August 21. We found many nests, usually 6 to 10 feet from the ground in thick growths of young spruces, but none contained eggs. A nest containing four young just hatched, which I found at Caribou Crossing June 25, was about 8 feet from the ground in a thicket of small spruces. The nest resembled that of *H. u. swainsoni*. At Miles Canyon July 11 we saw young able to fly. Osgood took young in spotted plumage July 31, but those taken August 20 had assumed first winter plumage.

They were usually silent by day, but sang frequently during the short nights. At Caribou Crossing, the last of June, their song could be heard constantly from 8 p. m. to 8 a. m., one taking up the strain as another stopped. The song is much superior to that of *Hylocichla aonalaschkaæ* and almost equal to that of *H. fuscescens*. It has whispered notes like that of *H. mustelinus*. By the middle of July the song season was practically over, though we heard one of the birds singing July 23. When the nights became really dark, in August, I often heard the call-note of this bird near our camp between 2 and 3 a. m.

<sup>1</sup> Auk, XVII, 119, April, 1900.

**166. *Hylocichla aonalaschkæ*. Dwarf Hermit Thrush.**

We heard several singing at Skagway, and Osgood took one at Haines June 2. At Glacier they were tolerably common, and we secured several, but they were very shy, keeping in the thickets during the day and singing for several hours in the evening from the topmost spray of some spruce well up the mountainside. Several thrushes' nests in small spruces 6 to 8 feet from the ground were empty, for which condition the abundant red squirrels were probably responsible. At Log Cabin and Bennett we heard a few singing, and at Caribou Crossing Osgood took one June 27.

**167. *Hylocichla aonalaschkæ pallasi*. Hermit Thrush.**

About 15 miles below Little Salmon River July 22 we secured a pair, whose nest, containing four well-grown young, Osgood had found the evening before. Far from selecting the secluded nesting site usual with this species, this pair had placed their nest between two small bunches of flowers on an open southern hillside, just above a small piece of burnt poplar woodland, and exposed to the full glare of the sun.

**168. *Merula migratoria*. American Robin.**

Tolerably common at Haines and Skagway, but not found at Glacier. At Haines I took a female and four well-incubated eggs June 2. Robins were common at Log Cabin June 15, and were found regularly, but in gradually decreasing numbers, until August 1, when the last was noted near Sixty-Mile Creek. A flock seen July 29 showed that the southern migration had commenced. We found an empty nest 30 miles below Dawson and heard that the birds bred near Fort Yukon.

Although robins were by no means common at Caribou Crossing, I found, on June 25, 13 empty nests, most of them evidently built that year, and 4 empty nests of the Alma thrush, in a small patch of spruces. The red squirrels which lived in a hollow tree near by probably knew the location of most of these nests. Osgood took a well-grown young robin here on June 26.

**169. *Hesperocichla nævia*. Varied Thrush.**

At Haines I saw several June 1, and Osgood took one June 2. At Glacier varied thrushes were rather common, but exceedingly shy. About an hour before sunset they would fly to the top of some tall tree and repeatedly utter a long-drawn, plaintive whistle until darkness fell. Sometimes on cloudy days we would hear their song, but it was infrequent and had about stopped when we left Glacier, June 11. We next saw this species near the Tatchun River, where I took a young bird July 23. Thirty miles below Dawson we took young,



and met with the birds several times until August 21, when large flocks were seen near Fort Yukon.

At Glacier I found on June 7 a nest containing four eggs, varying from fresh to several days incubated. It was very large, built of sticks and moss and lined with dry grass; and was situated 15 feet from the ground, near the top of a small spruce growing in dense woods a short distance from the river. When I put my hand on the tree, the female flew from the nest with a hoarse, cackling cry and settled a few feet away; the male did not appear. The eggs average 1.25 by 0.84 inches and are Nile blue sparingly spotted with écreu drab and seal brown.

170. *Saxicola œnanthe*. Wheatear.

Osgood saw two young wheatears at Circle August 19, and secured one. At the Aphoon mouth I shot one on August 27, which fell into the river and was carried away by the rapid current, but I saw the white rump plainly.

171. *Sialia arctica*. Mountain Bluebird.

We found a pair on Fifty-Mile River a short distance above Miles Canyon July 10. The next day I secured the female and found the nest with four well-incubated eggs in a hole about 8 feet from the ground in a dead spruce in the midst of a burnt tract. July 22 I shot a male near the point where Fifty-Mile River empties into Lake Lebarge. Mr. Cantwell also found this species on Fifty-Mile River.

# INDEX.

[Names of new species in **black-face** type.]

- Abies lasiocarpa*, 9, 16.  
*Acanthis exilipes*, 82.  
     *linaria*, 82.  
*Accipiter atricapillus*, 73.  
     *velox*, 72.  
*Actitis macularia*, 69.  
*Echmophorus occidentalis*, 57.  
*Egialitis semipalmata*, 70.  
 Alaska tundra district, 15-16.  
 Albatross, short-tailed, 60-61.  
*Alces gigas*, 23.  
*Alnus sinuata*, 9, 16.  
*Amelanchier alnifolia*, 10.  
*Ammodramus alaudinus*, 83-84.  
     *sandwichensis*, 83.  
*Ampelis garrulus*, 88-89.  
*Anas boschas*, 61-62.  
*Andromeda polifolia*, 15.  
*Anorthura alascentis*, 92.  
     *pacifica*, 92.  
*Anser gambeli*, 64.  
*Anthus pensilvanicus*, 91-92.  
*Archibuteo lagopus*, 73.  
*Arctomys caligatus*, 31-32.  
*Arctostaphylos uvaursi*, 9, 10.  
*Arenaria melanocephala*, 71.  
*Artemisia arctica*, 15-16.  
     *frigida*, 11, 12.  
*Asio accipitrinus*, 76.  
 Auklet, least, 58.  
*Aythya affinis*, 62.  
     *marila*, 62.  
 Baldpate, 62.  
 Bat, little brown, 45.  
 Bear, Alaska grizzly, 41.  
     black, 41.  
 Beaver, American, 32.  
*Betula glandulosa*, 9, 10.  
     *nana*, 16.  
     *papyrifera*, 11.  
 Birds, classified lists of, 51-57.  
 Blackbird, rusty, 81.  
 Bluebird, mountain, 96.  
*Bonasa umbelloides*, 71.  
*Brachyramphus marmoratus*, 58.  
*Branta hutchinsi*, 64.  
*Bubo pallescens*, 76-77.  
 Buffalo berry, 10.  
 Buffle-head, 63.  
*Buteo calurus*, 73.  
*Calcarius alascentis*, 83.  
*Calidris arenaria*, 67.  
*Canachites osgoodi*, 19, 71.  
 Canadian Yukon district, 10-13.  
*Canis occidentalis*, 40.  
 Caribou, barren ground, 23.  
     mountain, 22.  
*Cassiopea tetragona*, 15.  
*Castor canadensis*, 32.  
*Cephus columba*, 58.  
*Ceryle alcyon*, 77.  
*Chamaecistus procumbens*, 16.  
*Chamaenerion angustifolium*, 13.  
*Charadrius fulvus*, 70.  
*Charitonetta albeola*, 63.  
*Chen hyperborea*, 64.  
*Chickadee, chestnut-backed*, 93.  
     long-tailed, 92.  
     Yukon, 93.  
 Chipmunk, gray-headed, 28-29.  
*Chordeiles virginianus*, 79.  
*Cinclus mexicanus*, 92.  
*Circus hudsonius*, 72.  
*Clangula americana*, 62.  
*Clivicola riparia*, 88.  
*Coccothraustes montanus*, 81-82.  
*Colaptes luteus*, 78.  
*Colymbus holboëlli*, 57.  
*Contopus borealis*, 79.  
     *saturatus*, 19, 79-80.  
*Cormorant, pelagic*, 61.  
     red-faced, 61.  
     violet-green, 61.  
*Corvus americanus*, 81.  
     *caurinus*, 81.  
     *principalis*, 81.  
 Crane, little brown, 65.  
*Crossbill, red*, 82.  
     white-winged, 82.  
 Crow, American, 81.  
     northwest, 81.  
*Crymophilus fulvicarius*, 65.  
 Curlew, Hudsonian, 69.  
*Cyanocitta stelleri*, 80.  
*Dafila acuta*, 62.  
*Dendragapus fuliginosus*, 71.  
*Dendroica hooveri*, 90.  
     *rubiginosa*, 89.  
     *striata*, 90.  
     *townsendi*, 90-91.  
*Dicrostonyx alascentis*, 20, 33.  
     *nelsoni*, 20, 38.  
*Diomedea albatrus*, 60-61.  
 Dipper, American, 92.  
*Dryobates hyloscopus*, 77.  
     *leucomelas*, 77.  
 Duck, harlequin, 63.  
     lesser scaup, 62.  
     scaup, 62.  
 Eagle, gray sea, 73.  
     northern bald, 74.  
 Eider, Pacific, 63.  
*Empetrum nigrum*, 9, 10.  
*Empidonax alnorum*, 80.  
     *hammondi*, 80.  
*Equisetum*, 13, 14.  
*Erethizon myops*, 20, 38.  
*Eutamias caniceps*, 19, 28-29.

- Evotomys alascensis*, 35.  
     *dawsoni*, 34.  
*Falco anatum*, 74.  
     *columbarius*, 75.  
     *pealet*, 75.  
     *richardsoni*, 75.  
     *rusticolus*, 74.  
     *sparverius*, 75.  
*Falcon*, Peale, 75.  
*Faunal districts*, 8-13.  
*Fiber spatulatus*, 19, 36-37.  
*Fisher*, 44.  
*Flicker*, northern, 78.  
*Flycatcher*, alder, 80.  
     Hammond, 80.  
     olive-sided, 79.  
*Fox*, Hall Island, 41.  
     red, 41.  
*Fraterecula corniculata*, 57.  
*Fulmar*, Pacific, 61.  
*Fulmarus glupischa*, 61.  
*Gallinago delicata*, 65.  
*Gavia arctica*, 57.  
     *imber*, 57.  
*Goat*, mountain, 25.  
*Golden-eye*, American, 62.  
*Goose*, American white-fronted, 64.  
     *emperor*, 64.  
     Hutchins, 64.  
     *lesser snow*, 64.  
*Goshawk*, American, 73.  
*Grebe*, Holboell, 57.  
     western, 57.  
*Grosbeak*, Alaska pine, 82.  
     western evening, 81-82.  
*Grouse*, Alaska, 71.  
     *gray ruffed*, 71.  
     *sooty*, 71.  
*Grus canadensis*, 65.  
*Guillemot*, pigeon, 58.  
*Gull*, American herring, 59.  
     Bonaparte, 60.  
     *glaucous-winged*, 59.  
     Point Barrow, 59.  
     Sabine, 60.  
     *short-billed*, 59-60.  
*Gulo luscus*, 44.  
*Gyrfaeon*, gray, 74.  
*Hare*, Alaska arctic, 40.  
     Dall varying, 40.  
*Harelda hyemalis*, 63.  
*Halæetus alascanus*, 74.  
     *albicilla*, 73.  
*Hawk*, duck, 74.  
     American sparrow, 75.  
     marsh, 72.  
     pigeon, 75.  
     *rough-legged*, 73.  
     *sharp-shinned*, 72.  
     western red-tailed, 73.  
*Helminthophila celata*, 89.  
     *lutescens*, 89.  
     *peregrina*, 89.  
*Helodromas cinnamomeus*, 68  
*Hesperocichla naevia*, 95-96.  
*Hesperomys arcticus*, 33.  
*Heteractitis incanus*, 69.  
*Hirundo unalashkensis*, 87.  
*Histrionicus histrionicus*, 63.  
*Hudsonian Yukon district*, 13-15.  
*Hummingbird*, rufous, 79.  
*Hylocichla alicia*, 94.  
     *almæ*, 94.  
     *aonalaschkæ*, 95.  
     *pallasi*, 95.  
*Jæger*, long-tailed, 58.  
     *parasitic*, 58.  
*Jay*, Alaska, 80-81.  
     Steller, 80.  
*Junco*, Oregon, 86.  
     Shufeldt, 86.  
     *slate-colored*, 85-86.  
*Junco connectens*, 86.  
     *hyemalis*, 85-86.  
     *oregonus*, 86.  
*Juniperus nana*, 9, 10, 13.  
*Kalmia glauca*, 10.  
*Kingfisher*, belted, 77.  
*Kinglet*, ruby-crowned, 93.  
     Sitka, 93.  
     western golden-crowned, 93.  
*Kittiwake*, Pacific, 58.  
     *red-legged*, 58.  
*Lagopus lagopus*, 71.  
     *leucurus*, 72.  
     *nelsoni*, 72.  
     *rupestris*, 72.  
*Larix americana*, 14.  
*Larus barrovianus*, 59.  
     *brachyrhynchus*, 59-60.  
     *glaucescens*, 59.  
     *philadelphia*, 60.  
     *smithsonianus*, 59.  
*Ledum grœnlandicum*, 10.  
     *palustre*, 15.  
*Lemming*, Alaska, 38.  
     Nelson pied, 38.  
     Yukon, 37-38.  
*Lemmus alascensis*, 20, 38.  
     yukonensis, 20, 37-38.  
*Lepargyrea canadensis*, 10.  
*Lepus dalli*, 20, 40.  
     *othus*, 20, 40.  
     *sallens*, 19, 39-40.  
*Leucosticte*, Aleutian, 82.  
     Heppburn, 82.  
*Leucosticte grisonucha*, 82.  
     *littoralis*, 82.  
*Longspur*, Alaska, 83.  
*Loon*, 57.  
     *black-throated*, 57.  
*Loxia leucoptera*, 82.  
     *minor*, 82.  
*Lunda cirrhata*, 57.  
*Lutra canadensis*, 41.  
*Lutreola ingens*, 19, 42.  
*Lynn canal district*, 8-9.  
*Lynx*, arctic, 40.  
*Lynx mollipilosus*, 20, 40.  
*Magpie*, American, 80.  
*Mairania alpina*, 15.  
*Mallard*, 61-62.  
*Mammals*, list, 22.  
*Mareca americana*, 62.  
*Marmot*, hoary, 31-32.  
*Marten*, Alaska, 43-44.

- Megascops kennicotti*, 76.  
*Melospiza cinerea*, 86.  
     *lincolni*, 86.  
     *rufoa*, 86.  
     *striata*, 86.  
 Merganser, American, 61.  
*Merganser americanus*, 61.  
 Merlin, Richardson, 95.  
*Merula migratoria*, 95.  
*Microtus drummondi*, 35-36.  
     *mordax*, 17, 35.  
     *operarius*, 36.  
     *xanthognathus*, 36.  
 Mink, Alaska, 42.  
 Moose, Alaska, 23.  
*Motacilla ocularis*, 91.  
 Mouse, Alaska jumping, 38.  
     Arctic white-footed, 38.  
     Bangs white-footed, 32-33.  
     Dall lemming, 37.  
     Dawson red-backed, 34.  
     tundra red-backed, 35.  
 Murre, Pallas, 58.  
 Murrelet, marbled, 58.  
*Mus decumanus*, 32.  
 Muskrat, northwest, 36-37.  
*Mustela actosa*, 19, 43-44.  
     *pennanti*, 44.  
*Myadestes townsendi*, 93-94.  
*Myosotis alpestris*, 10.  
*Myotis lucifugus*, 45.  
*Neotoma saxamans*, 19, 33-34.  
*Nettion carolinense*, 62.  
 New species, 19.  
 Nighthawk, 79.  
*Numenius hudsonicus*, 69.  
 Nuthatch, red-breasted, 92.  
*Nyctala richardsoni*, 76.  
*Oceanodroma furcata*, 61.  
*Ochotona collaris*, 38-39.  
*Oldemia americana*, 63.  
     *deglandi*, 63.  
     *perspicillata*, 63-64.  
 Old-squaw, 63.  
*Olor columbianus*, 65.  
*Oreamnos montanus*, 25.  
 Osprey, American, 76.  
 Otter, American, 41.  
*Ovis dalli*, 24-25.  
     *stonei*, 24.  
 Owl, great gray, 76.  
     American hawk, 77.  
     Kennicott screech, 76.  
     Richardson, 76.  
     short-eared, 76.  
     western horned, 76-77.  
*Pandion carolinensis*, 76.  
*Parus evura*, 93.  
     *rufescens*, 93.  
     *septentrionalis*, 92.  
*Passerella iliaca*, 87.  
     *townsendi*, 87.  
*Passerina nivalis*, 83.  
*Perisoreus fumifrons*, 80-81.  
*Peromyscus arcticus*, 33.  
     *oreas*, 32-33.  
 Petrel, forked-tailed, 61.  
*Petrochelidon lunifrons*, 87.  
 Pewee, Alaska wood, 79-80.  
*Phalacrocorax pelagicus*, 61.  
     *robustus*, 61.  
     *urile*, 61.  
 Phalarope, northern, 65.  
     red, 65.  
*Phalaropus lobatus*, 65.  
*Philactes canagica*, 64.  
 Phoebe, Yukon, 79.  
*Pica hudsonica*, 80.  
*Picea canadensis*, 10.  
     *sitchensis*, 9.  
*Picoides alascanensis*, 78.  
     *arcticus*, 77-78.  
 Pika, Alaska, 88-89.  
*Pinicola alascanensis*, 82.  
 Pintail, 62.  
*Pinus murrayana*, 9, 13, 16, 17.  
     *sitchensis*, 9.  
 Pipit, American, 91-92.  
 Plover, black-bellied, 70.  
     Pacific golden, 70.  
     sempalmated, 70.  
*Polemonium humile*, 10.  
*Populus balsamifera*, 9.  
     *tremuloides*, 8, 9.  
 Porcupine, Alaska, 38.  
 Ptarmigan, Nelson, 72.  
     rock, 72.  
     white-tailed, 72.  
     willow, 71.  
 Puffin, horned, 57.  
     tufted, 57.  
*Putorius alascanensis*, 43.  
     *arcticus*, 42-43.  
     *eskimio*, 20, 43.  
     *richardsoni*, 42.  
*Rangifer arcticus*, 23.  
     *montanus*, 22.  
     *tarandus*, 23.  
 Rat, northern bushy-tailed, 33-34.  
     Norway, 32.  
 Raven, northern, 81.  
 Redpoll, 82.  
     hoary, 82.  
*Regulus calendula*, 93.  
     *grinnelli*, 93.  
     *olivaceus*, 93.  
 Reindeer, domesticated, 23.  
*Ribes laxiflorum*, 9.  
*Rissa brevirostris*, 58.  
     *pollicaris*, 58.  
 Robin, American, 95.  
*Rosa cinnamomea*, 14.  
*Rubus arcticus*, 16.  
     *chamaemorus*, 16.  
 Sanderling, 67.  
 Sandpiper, Aleutian, 65.  
     Baird, 67.  
     least, 67.  
     pectoral, 66.  
     Pribilof, 66.  
     red-backed, 67.  
     sharp-tailed, 66.  
     spotted, 69.  
     western solitary, 68.  
 Sapsucker, red-breasted, 78.  
*Saxicola oenanthe*, 96.

- Sayornis yukonensis*, 19, 79.  
*Sceluropterus yukonensis*, 19, 25-26.  
*Sciurus hudsonicus*, 26-27.  
     *petulans*, 19, 27-28.  
     *vancouverensis*, 27.  
*Scolecophagus carolinus*, 81.  
*Scoter*, American, 63.  
     *surf*, 63-64.  
     *white-winged*, 63.  
*Scotiaptex cinerea*, 76.  
*Seiurus notabilis*, 91.  
*Selasphorus rufus*, 79.  
*Sheep*, Dall mountain, 24-25.  
*Shrew*, arctic, 44.  
     *mountain*, 45.  
     *Streator*, 44.  
     *tundra*, 45.  
*Sialia arctica*, 96.  
*Simorhynchus pusillus*, 58.  
*Siskin*, pine, 83.  
*Sitta canadensis*, 92.  
*Snipe*, Wilson, 65.  
*Snowflake*, 83.  
*Solitaire*, Townsend, 93-94.  
*Somateria v-nigra*, 63.  
*Sorex arcticus*, 20, 44.  
     *obscurus*, 45.  
     *streatori*, 44.  
     *tundrensis*, 20, 45.  
*Sparrow*, Aleutian song, 86.  
     *Forbush*, 86.  
     *Fox*, 87.  
     *golden-crowned*, 84.  
     *intermediate*, 84.  
     *Lincoln*, 86.  
     *sandwich*, 83.  
     *sooty song*, 86.  
     *Townsend fox*, 87.  
     *western chipping*, 85.  
     *western savanna*, 83-84.  
     *western tree*, 84-85.  
*Spermophilus osgoodi*, 20, 31.  
     *plesius*, 19, 29-31.  
*Sphyrapicus ruber*, 78.  
*Spinus pinus*, 83.  
*Spizella arizonae*, 85.  
     *ochracea*, 84-85.  
*Squatarola squatarola*, 70.  
*Squirrel*, Bennett ground, 29-31.  
     *Fort Yukon ground*, 31.  
     *Hudson Bay red*, 26-27.  
     *Yukon flying*, 25-26.  
*Stercorarius longicaudus*, 58.  
     *parasiticus*, 58.  
*Sterna paradisaea*, 60.  
*Surnia caparoch*, 77.  
*Swallow*, Alaska, 87.  
     *bank*, 88.  
     *cliff*, 87.  
     *tree*, 87.  
     *violet-green*, 88.  
*Swan*, whistling, 65.  
*Symphemia inornata*, 69.  
*Synaptomys dalli*, 37.  
*Tachycineta bicolor*, 87.  
     *thalassina*, 88.  
*Tattler*, wandering, 69.  
*Teal*, green-winged, 62.  
*Tern*, arctic, 60.  
*Thrush*, Alma, 94.  
     *dwarf hermit*, 95.  
     *gray-cheeked*, 94.  
     *hermit*, 95.  
     *varied*, 95-96.  
*Thuja plicata*, 16.  
*Totanus flavipes*, 68.  
*Tringa acuminata*, 66.  
     *bairdi*, 67.  
     *couesi*, 65.  
     *maculata*, 66.  
     *minutilla*, 67.  
     *pacifica*, 67.  
     *ptilocnemis*, 66.  
*Tsuga mertensiana*, 9.  
*Turnstone*, black, 71.  
*Tussilago frigida*, 16.  
*Uria arca*, 58.  
*Ursus alascensis*, 41.  
     *americanus*, 41.  
*Vaccinium ovalifolium*, 9.  
     *vitisidæa*, 15.  
*Viburnum pauciflorum*, 10.  
*Vole*, Drummond, 35-36.  
     *long-tailed*, 35.  
     *Nelson*, 36.  
     *yellow-cheeked*, 36.  
*Vulpes fulvus*, 41.  
     *hallengis*, 20, 41.  
*Wagtail*, Swinhoe, 91.  
*Warbler*, Alaska yellow, 89-90.  
     *black-poll*, 90.  
     *Hoover*, 90.  
     *lutescent*, 89.  
     *orange-crowned*, 89.  
     *pileolated*, 91.  
     *Tennessee*, 89.  
     *Townsend*, 90-91.  
     *Wilson*, 91.  
*Water thrush*, Grinnell, 91.  
*Waxwing*, Bohemian, 88-89.  
*Weasel*, Alaska least, 43.  
     *Juneau*, 43.  
     *tundra*, 42-43.  
*Wheatear*, 96.  
*White Pass district*, 9-10.  
*Willet*, western, 69.  
*Wilsonia pileolata*, 91.  
     *pusilla*, 91.  
*Wolf*, 40.  
*Wolverine*, 44.  
*Woodpecker*, Alaska three-toed, 78.  
     *arctic three-toed*, 77-78.  
     *Cabanis*, 77.  
     *northern hairy*, 77.  
*Wren*, Alaska, 92.  
     *western winter*, 92.  
*Xema sabinii*, 60.  
*Yellow-legs*, 63.  
*Yukon flats*, 14.  
*Zapus alascensis*, 38.  
*Zones*, 16.  
*Zonotrichia coronata*, 84.  
     *gambeli*, 84.