PROVINCE OF BRITISH COLUMBIA
DEPARTMENT OF RECREATION AND CONSERVATION

PROVINCIAL MUSEUM
of NATURAL HISTORY and ANTHROPOLOGY

REPORT FOR THE YEAR 1963

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1964

To Major-General the Honourable GEORGE RANDOLPH PEARKES,
V.C., P.C., C.B., D.S.O., M.C.,
Lieutenant-Governor of the Province of British Columbia.

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully submits herewith the Annual Report of the Provincial Museum of Natural History and Anthropology for the year 1963.

W. K. KIERNAN,
Minister of Recreation and Conservation.

Office of the Minister of Recreation and Conservation,
January, 1964.

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY,
VICTORIA, B.C., January 21, 1964.

The Honourable W. K. Kiernan,
Minister of Recreation and Conservation, Victoria, B.C.

SIR,—The undersigned respectfully submits herewith a report covering the activities of the Provincial Museum of Natural History and Anthropology for the calendar year 1963.

I have the honour to be,
Sir,
Your obedient servant,
G. CLIFFORD CARL,
Director.

DEPARTMENT OF RECREATION AND CONSERVATION

The Honourable WILLIAM KENNETH KIERNAN, *Minister.*

D. B. TURNER, Ph.D., *Deputy Minister.*

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY

Staff

G. CLIFFORD CARL, Ph.D., *Director.*

CHARLES J. GUIGUET, M.A., *Curator of Birds and Mammals.*

WILSON DUFF, M.A., *Curator of Anthropology.*

ADAM F. SZCZAWINSKI, Ph.D., *Curator of Botany.*

DONALD N. ABBOTT, B.A., *Assistant in Anthropology* (on leave from September 1st).

FRANK L. BEEBE, *Illustrator and Museum Technician.*

MARGARET CRUMMY, B.A., *Clerk-Stenographer.*

BETTY C. NEWTON, *Assistant in Museum Technique.*

SHEILA Y. NEWNHAM, *Assistant in Museum Technique.*

HELEN M. BURKHOLDER, *Clerk.*

JOHN H. W. SENDEY, *Student Assistant.*

CLAUDE G. BRIGGS, *Attendant.*

C. E. HOPE, *Relief Attendant.*

GORDON KING, *Relief Attendant.*

Totem-pole Restoration Programme

HENRY HUNT, *Chief Carver.*

E. C. (TONY) HUNT, *Assistant Carver.*

PROVINCIAL MUSEUM OF NATURAL HISTORY AND ANTHROPOLOGY

OBJECTS

(*a*) To secure and preserve specimens illustrating the natural history of the Province.

(*b*) To collect anthropological material relating to the aboriginal races of the Province.

(*c*) To obtain information respecting the natural sciences, relating particularly to the natural history of the Province, and to increase and diffuse knowledge regarding the same.

(Section 4, *Provincial Museum Act,* chapter 311, R.S.B.C. 1960.)

ADMISSION

The Provincial Museum is open to the public, free, on week-days, 8.30 a.m. to 5 p.m., and on Sunday afternoons, 1 to 5 p.m.

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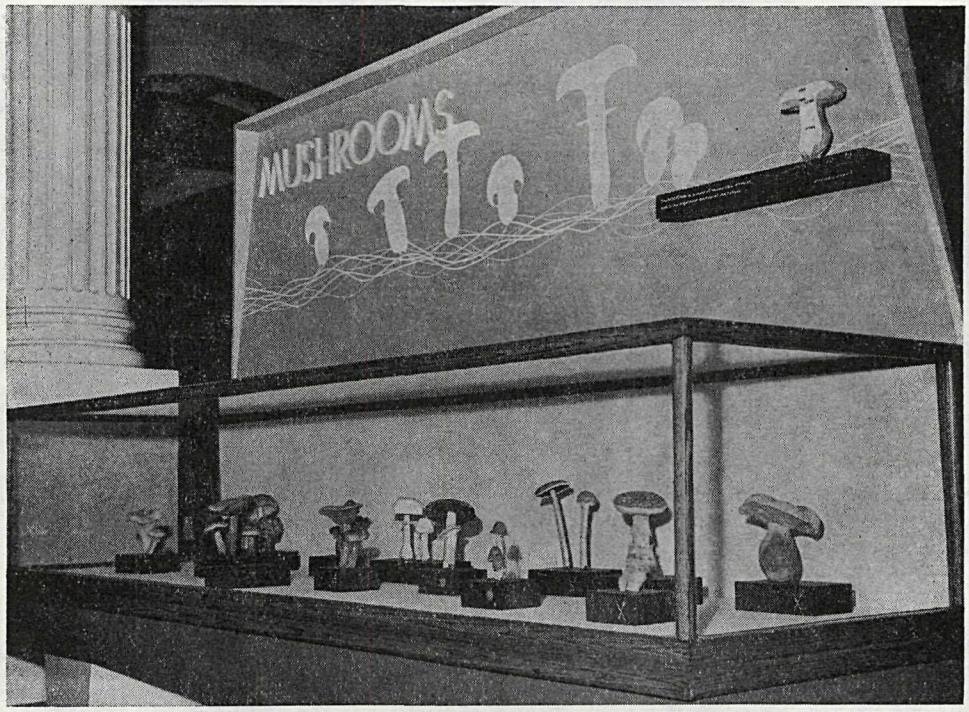
Hoary marmot exhibit in the Provincial Museum, Victoria.



Part of the mushroom exhibit in the Provincial Museum, Victoria.

REPORT OF THE PROVINCIAL MUSEUM

For the Year 1963

REPORT OF THE DIRECTOR

As measured by numbers of activities and by attendance, 1963 was not unusual. Staff members spent several short periods doing field work in various parts of the Province, and the number of visitors to the Museum was less than expected.

The year's highlight was the annual meeting of the Canadian Museums Association (May 22nd to 24th), which was held on the Pacific Coast for the first time in the history of the organization. The Provincial Museum and the Vancouver Art Gallery were co-hosts to delegates from centres as far east as Halifax. The Victoria meetings were held in the Legislative Buildings, and visits were made to Helmcken House, the Art Gallery of Greater Victoria, and to the Maritime Museum of British Columbia. The Honourable Earle C. Westwood, Minister of Recreation and Conservation, and Mr. L. J. Wallace, Deputy Provincial Secretary, spoke on behalf of the Government of British Columbia; Dr. A. E. Parr, senior scientist at the American Museum of Natural History (New York), and Mrs. Parr were guests of the association. A banquet was provided by the Province of British Columbia, and the delegates were entertained at tea at Government House by Major-General the Honourable George R. Pearkes and Mrs. Pearkes.

FIELD WORK

The major field work in 1963 was a preliminary survey of archæological sites in Provincial parks and park reserves, a project carried out in co-operation with the Archæological Sites Advisory Board of the Department of the Provincial Secretary and the Parks Branch of the Department of Recreation and Conservation. By boat and by car, Mr. Donald Abbott and Mr. John Sendey visited and examined numerous sites, mostly in Coastal areas. A detailed report of their findings is being prepared.

On two occasions during the year, Mr. C. J. Guiguet assisted biologists of the Fish and Game Branch in big-game surveys, first in North-western British Columbia, and second in the Big Bend area of the Columbia River valley.

In July Drs. Carl and Szczawinski were joined by Dr. T. M. C. Taylor, of the University of British Columbia, on a short visit to the Peace River system to plan a possible future survey in that area. Transportation down the Parsnip River by boat and return to Prince George by air, both provided by the Water Rights Branch, was greatly appreciated.

Dr. Szczawinski spent parts of two days collecting plant material in the Gold River area, west coast of Vancouver Island, through the courtesy of Mr. Stan Sharcott, Federal Fisheries Officer in that district. He also made limited collections in the Peace River area and at Kamloops.

In July Dr. Carl made a quick trip to Long Beach, Vancouver Island, to collect a skull of a stranded Minke whale, and later visited the whaling-station at Coal Harbour for photographic purposes.

PUBLICATIONS

The following publications have appeared in 1963:—

Donald N. Abbott—

" Preliminary Report on the Beach Grove Site." Manuscript on file.

G. Clifford Carl—

"Ira Edmund Cornwall (1875–1962)." Victoria Naturalist, Vol. 19, No. 8, pp. 111–112.

"Guide to Marine Life of British Columbia." British Columbia Provincial Museum Handbook No. 21, pp. 1–135.

"A Coastal Record of the Gopher Snake (*Pituophis*)." Canadian Field-Naturalist, Vol. 77, No. 3, p. 178.

Wilson Duff—

"Stone Clubs from the Skeena River Area." Report of the Provincial Museum for 1962, pp. 27–38.

"Planning for the Centennial." Museum Round-up, No. 12, pp. 25–27.

"Thunderbird Park." B.C. Government Travel Bureau, pp. 1–32.

Adam F. Szczawinski—

"Mounting Herbarium Specimens with the Use of Plastic." Museum Round-up, No. 12, pp. 27–28.

Kees Vermeer—

"The Breeding Ecology of the Glaucous-winged Gull (*Larus glaucescens*) on Mandarte Island, B.C." British Columbia Provincial Museum Occasional Paper No. 13, pp. 1–104.

T. M. C. Taylor—

"The Ferns and Fern-allies of British Columbia." British Columbia Provincial Museum Handbook No. 12 (second edition, revised), pp. 1–172.

Several other manuscripts are in various stages of completion. These include the first of a series of handbooks on the Indians of British Columbia by Wilson Duff, a handbook to mushrooms of the Province by A. F. Szczawinski and Robert Bandoni, a handbook to the thrushes, chickadees, kinglets, and waxwings by C. J. Guiguet, and a guide to marine fishes by G. C. Carl. Several publications, including the "Guide to Common Edible Plants" produced in 1962, are out of print and are now on the waiting list.

CURATORIAL ACTIVITIES

As part of a contract with a local pest-control service, the entire Museum wing and the separate laboratory and storage rooms were fumigated and certain areas were given regular periodic inspection. No recent signs of insect activity have appeared.

The plant collection has been greatly augmented by the addition of freshly collected specimens and by remounting large series of duplicate specimens from the Newcombe collection obtained in 1961. A large number of exchange specimens have also been received, some from Scandinavia. The total number of sheets in the herbarium now stands at 40,289.

Early in the year the anthropological materials in the basement storeroom were inspected, cleaned, and rearranged, and a new index file to archæological specimens was set up.

In the vertebrate division, a considerable number of skeletons of birds and mammals were prepared, and all stored material was inspected and found in good condition.

DISPLAYS

The major change connected with display consisted of a completely new presentation of the botanical exhibits incorporating a plan conceived and carried

out by Mr. Jean André, of Victoria, B.C. The modern colour scheme, combined with a simple arrangement of objects and new labels, greatly enhances the displays in this division of the Museum.

Two new habitat cases were added to the living-animal section, and several display cases of anthropological materials were completely revamped.

RESEARCH

Due to other commitments, little progress was made in long-term research projects; no island collecting was carried on in connection with the study of small mammals and no new material was collected pertaining to the social organization of the Tsimshian.

Several series of glaucous-winged gulls were collected and sent to the University of Washington at Seattle, where an investigation is making an exhaustive study of plumage changes in this species.

One of a series of research projects carried on by volunteer assistant Dr. J. F. L. Hart was completed, and the report is in press. This programme of studies is supported by a National Science Foundation grant administered by the Provincial Museum.

ATTENDANCE

The following attendance figures for 1963 are estimates based upon sample counts at irregular intervals:—

January	1,500	August	18,000
February	2,000	September	6,000
March	3,900	October	2,000
April	5,000	November	1,800
May	6,000	December	2,111
June	14,000		
July	20,000	Total	82,311

Compared with the total estimated attendance of 270,000 for the previous year, an all-time record, the number of visitors in 1963 is very much lower. It is about 15 per cent higher than that recorded in 1959, when about 70,000 persons visited the Museum.

As an extra service to visitors during the summer season, the Museum hours were again extended to 9 p.m. each evening, except Sunday. Many persons availed themselves of this extra opportunity, particularly on evenings when flag-lowering ceremonies were presented in front of the Legislative Buildings.

EXTENSION

Many illustrated talks and demonstrations have been given by staff members both locally and in other parts of the Province, as has been done in previous years. In February the Director gave a series of wildlife lectures in Arizona and Texas under the combined auspices of the Canadian Audubon Society, the National Audubon Society, and local conservation groups.

The Director has continued to contribute regularly to the weekly radio panel "Outdoors with the Experts," sponsored by radio station CJVI and now in its ninth year. Other staff members have appeared from time to time on television programmes featuring the work of the Museum.

THUNDERBIRD PARK

The totem-pole carving programme continued through the year with a staff of two Kwakiutl carvers, Henry Hunt and Eugene (Tony) Hunt. The major project was the carving on contract of a 65-foot Kwakiutl pole to be presented to the City of Buenos Aires by the Canadian Ambassador to Argentina and a group of Canadian businessmen. This pole was completed and shipped off in October. In June the City of Prince Rupert offered the Museum three old totem-poles—two Haida and one Nass River Tsimshian—which had been copied and declared surplus. Through the co-operation of the Royal Canadian Navy, these were brought to Victoria and stored in the Indian house in Thunderbird Park. In October a start was made on a copy of the 50-foot Nass River pole.

In addition to the large poles, the carvers produced a number of smaller carvings, to be used as gifts by Government departments. Some of these small sculptures by Henry Hunt have been retained for the Museum collection, as examples of his present art style. The 21-foot Kitwancool Frog pole, carved last year, was loaned to the Canadian Government Exhibition Commission for use in a trade fair in Philadelphia in November. Until that time it was displayed in front of the office of the Travel Bureau. Components of the old Thunderbird Park arch were given to H.M.C.S. " Naden " on indefinite loan, and now decorate the entrance to the wardroom. Landscaping work in Thunderbird Park was continued with the planting of cedar-trees and native shrubs in March.

STAFF ACTIVITIES

In April Mr. Wilson Duff presented a paper on " Sea Levels and Archæology on the North-west Coast " at the Northwest Anthropological Conference in Portland, and in October he attended a conference on museums and anthropological research at the National Museum in Ottawa. As Chairman of the Archæological Sites Advisory Board, he represented British Columbia at the Conference on the Development of Canada's Historical Resources, in Saint John, N.B., and as a member of the Indian Advisory Committee he attended two meetings of that group in Victoria and Kamloops.

For six weeks commencing June 17th, Mr. Duff attended the Summer Institute in Anthropology, held at the Arizona State Museum in Tucson, Ariz. The instructional course designed for professional museum workers in anthropology was sponsored by the American Association of Museums, financed by a grant from the National Science Foundation. Mr. Duff was especially honoured by being the only Canadian enrolled for the course.

Members of the staff participated in the annual seminar of the British Columbia Museums Association in Kelowna in September.

Mr. Donald Abbott, Assistant in Anthropology, left September 1st with eight months' leave of absence in order to attend Washington State College at Pullman, Wash., where he will be working toward a master's degree in anthropology.

Also in September, Mr. Frank Beebe was granted two months' leave in order to undertake a falcon-training programme sponsored by the Federal Wildlife Service with a view to controlling birds on aircraft runways.

Mr. John Sendey was employed as a student assistant for two months in the spring, and again in the fall.

BUILDING ALTERATIONS

As a temporary solution to the space problem existing in the herbarium, the Public Works Department walled off a portion of the exhibit space on the main floor

adjacent to the botanical office, creating a room in which most of the storage cases could be moved. The plant collection is now in its new location, and congestion in the office and study has been greatly relieved.

In April the stained-glass windows on the south wall of the Museum wing were removed, repaired, and reinstalled.

OBITUARIES

We record here, with regret, the passing of two persons who, over the years, have rendered many services to the Museum and to the Province as a whole.

Mrs. Mungo Martin, wife of the late Chief Mungo Martin, a weaver of Chilkat blankets, and a fine lady greatly revered by all (September 15th).

Mr. Andrew Misheal, a valued friend of the Museum, and a useful source of information concerning local groups of natives (September 22nd).

DONATIONS AND ACCESSIONS

BOTANICAL

Major plant collections were received from T. R. Ashlee, Victoria (Saltspring Island); C. Guiguet and R. Ritcey (Cassiar District); Mrs. D. Calverley, Dawson Creek; Stockholm Museum, Sweden (*Orchidaceæ* and *Ericaceæ*); Dr. S. S. Holland, Victoria (Northern British Columbia); John W. Thieret (District of Mackenzie); and J. E. Underhill, Victoria (Manning Park).

Herbarium exchange was continued with the following institutions: National Museum of Canada, Ottawa; Science Service, Department of Agriculture, Ottawa; Smithsonian Institute, Washington, D.C.; University of British Columbia, Vancouver; University of Washington, Seattle, Wash.; University of Victoria, Victoria; Stockholm Museum, Stockholm, Sweden; and others.

With the addition of over 2,300 sheets of specimens during 1963, the total now stands at 40,289.

Also, we wish to acknowledge in general the voluntary co-operation and help of those who contribute to botanical collections and knowledge. Unfortunately space does not permit us to list each one individually, but we include all of them in a grateful vote of thanks.

ZOOLOGICAL

Mammals

By gift—

Mrs. Fred H. Anderson, Victoria, one pair of ibex horns.
Mrs. Guy Barclay, Victoria, earbone and several teeth of whale.
Mrs. A. Bragg, Victoria, seven lion's claws, two teeth.
Art Brookman, Victoria, upper jaw of sea-lion.
Tom Carolan, Galiano Island, one blacktail deer's foot.
Miss Diana Cheney, Victoria, skull of blacktail deer.
Mr. and Mrs. W. E. Gardner, Victoria, left incisor of horse, right lower canine of young bull sea-lion.
Frank Godfrey, Victoria, skull of deer.
John Johnston, Victoria, bone found on Chatham Island.
D. G. McLennan, Victoria, one relic bone fragment of elk.
R. Prette, Victoria, partial skull of horse.
John Richardson, Victoria, adult bat.
L. F. Rodgers, Victoria, inter-vertebral disk of whale.
Miss Megan Rowe, Victoria, one tooth.
J. W. Sinclair, Victoria, harbour porpoise caught off Otter Point.

By Museum and Game Branch staffs—One grizzly bear, skin and skull; three rocky mountain elk, skins and skulls; three mountain goat, skins and skulls; one cougar, skin and skull; three California bighorn sheep, skins and skulls; two mink, skins and skulls; one badger, skin and skull; two Canada lynx, skins and skulls; four blacktail deer, skulls; one whitetail deer, skull; two Stone sheep, skulls.

Birds

By gift—

Mrs. J. W. Anderson, Victoria, one Savannah sparrow, one Lincoln sparrow.
J. Bird, Victoria, one flicker.
Tom Briggs, Victoria, one Virginia rail, one Pacific kittiwake.

Mrs. E. Cadwallader, Cortes Island, one nest of hummingbird.
Miss Coburn, Victoria, one nest of house finch with three eggs.
Wayne Colby, Victoria, one short-eared owl.
Mrs. and Mrs. A. R. Davidson, Victoria, two orange-crowned warblers, one petrel.
Mrs. K. Drost, Sidney, one sharp-shinned hawk.
J. Eddie, Victoria, one violet-green swallow.
F. P. Fatt, Victoria, one kinglet.
Bill Foukes, Duncan, one black pigeon hawk.
J. C. Haggarty, Victoria, one varied thrush.
Jack Hames, Courtenay, one yellow warbler nest and cowbird egg.
Alfred Hass, Victoria, one live hummingbird.
A. Hockley, Victoria, one hummingbird.
Canon C. W. Holdom, Crescent Beach, one varied thrush.
Miss Nora Hunter, Nelson, live pygmy owl.
Max Lohbrunner, Victoria, one red-necked grebe.
Miss Elaine McKinney, Victoria, one starling.
Kevin MacLean, Victoria, one wren's nest with six eggs.
P. W. Martin, Fish and Game Branch, three scientific-study skins—one spruce grouse, one blue grouse, one wandering tattler.
L. H. Metz, Victoria, one bushtit nest.
P. M. Monckton, Victoria, one fulmar.
John Palmer, Victoria, one screech owl.
W. A. B. Paul, Kleena Kleene, one rosy finch, one fox sparrow, one junco.
Dr. J. A. Pearce, Victoria, one snow goose.
D. J. Ready, Victoria, one ruby-crowned kinglet.
Karl Schanzenbacher, Victoria, one robin's egg.
R. Shepherd, Victoria, one pheasant.
Mrs. E. Silvester, Victoria, one mallard duck.
Mr. Thompson, Victoria, one kingfisher.
Undersea Gardens, Victoria, one Leach's petrel.
Roy Watson, Victoria, one whistling swan.
Francis, Paul, and Joyce Welle, Sidney, one banded sea-gull.
Mrs. M. Winstone, Victoria, one golden-crowned sparrow, one American robin.
Ralph Wherry, Victoria, one sparrow hawk, one red-tailed hawk.

Amphibians and Reptiles

By gift—

Mrs. Terry Blissett, Malahat P.O., collection of living *Ambystoma* larvæ from Shawnigan Lake Road.
Chris Sanford, Victoria, western painted turtle.
H. D. Taylor, Victoria, two live western painted turtles.

Fish

By gift—

L. C. Hamber and C. L. Hronek, Victoria, three fishes from Marble Bay—one rainbow, two coho fingerlings.
J. R. C. Hewett, Victoria, one lamprey.

Invertebrates

By gift—

Stuart Bailey, Victoria, one tiger moth.
Mark Edward Bailey, Victoria, one banded borer.

E. G. Barrett, Victoria, one banded argiope.
Kerry Bentley, Victoria, one caterpillar.
Capt. C. Billard, Victoria, one larva of striped cockchafer.
H. C. Davies, Victoria, one live black widow spider.
R. Davis, Victoria, one beetle.
Victor Epp, Victoria, one moth and two beetles.
K. B. Felker, Victoria, one black widow spider.
L. K. Fernstrom, Victoria, one black widow spider.
Mr. and Mrs. W. E. Gardner, Victoria, one barnacle shell.
Philip Henry, Victoria, one black widow spider.
J. Hunter, Victoria, one centipede.
A. L. Isaac, Brentwood, one larva of tiger beetle.
Douglas J. Johnson, Victoria, one striped cockchafer.
Miss Hazel King, Shawnigan Lake, one spider.
H. Lindsey, Victoria, one hornets' nest.
Mrs. A. E. C. McCorquodale, Victoria, one shamrock orb-weaver.
M. McCullogh, Sooke, one lubber grasshopper.
J. J. McIlveen, Victoria, one black widow spider.
W. A. Molnar, Victoria, one California prionus.
Barrie Morson, Victoria, several flat-grain beetles.
Bruce Ollson, Victoria, one spider.
Andre Ooievaar, Victoria, one black widow spider.
B. Peddlesden, Victoria, several garden worms.
J. J. Phillips, Victoria, one spiny wood-borer.
T. C. Smith, Victoria, one polyphemus moth.
Christopher Stewart, Victoria, one green webworm.
M. Underhill, Langford, one black widow spider.
D. Wardell, Victoria, one wolf or garden spider.
L. R. Willis, Victoria, one comb-footed spider, one black widow spider.

PALÆONTOLOGY

By gift—

L. Fieldhouse, Victoria, several fossils from Saskatchewan.
J. S. Ford, Lake Cowichan, collection of fossils.
Frank L. Godfrey, Victoria, eroded sandstone rock.
W. H. McElroy, Red Deer, Alta., fossils found on surface at Drumheller, Alta.
George Massey, Victoria, tooth of mammoth.
W. M. Milne, Errington, one fossil taken at Englishman River Falls.
A. G. Moonie, Cobble Hill, one ammonite from Haslam Creek.
Lawrence Pope, Victoria, three portions of fossil ammonite and fragments of a mammoth tooth.

Anthropological

The Livingstone Collection.—(Gift.) Archæological specimens from Cadboro Bay. Donated by Mr. and Mrs. E. H. Livingstone.

Dr. J. W. Frank Collection.—(Gift.) Seventeen ethnological specimens. (Per Miss M. H. Frank, Victoria.)

The T. W. S. Parsons Collection.—(Gift.) Archæological specimens from the Lytton area. Donated by Mrs. T. W. S. Parsons.

The A. E. Collins Collection.—(Gift.) Baskets, tumpline, and a hat. (Per Mrs. Earle Taylor, Picton, Ont.)

The Mrs. B. J. Beckerleg Collection.—(Gift.) Nineteen ethnological specimens. Donated by Mrs. B. J. Beckerleg, Pointe Claire, P.Q.

By gift—

R. M. Adamson, Saanich, perforated stone club.
Miss Violet Ashdown, Victoria, small Nootkan basket.
Mr. and Mrs. Alan Beecroft, Sooke, human skull.
Graham Bell, hand-maul fragment.
Mrs. S. L. Butcher, Victoria, collection of archæological specimens.
Mrs. W. H. Cross, Sidney, two stone artifacts.
W. J. Davey, Sooke, human skull and mandible.
Warren Davidson, Victoria, chipped opal drill.
Department of Highways, Sidney, human skull and four artifacts.
Wilson Duff, Victoria, abrasive-stone fragment and a flake scraper.
A. E. Evans, Victoria, nephrite celt.
J. B. Girdwood, Parksville, complete hand-maul.
R. Golding, Victoria, chipped basalt point.
C. J. Guiguet, Victoria, quartzite celt fragment.
Donald Hamer, Victoria, chipped basalt point.
Miss Harper, Victoria, Nootkan basket.
Mrs. Lyle Hayden, Victoria, collection of artifacts.
M. C. D. Hobbs, Vancouver, two human skulls.
J. Kirkendale, Victoria, carrying-basket.
C. Moncrieff, Victoria, human skeleton and associated bone artifact.
Charles Moss, Victoria, hand-maul fragment and abrasive stone.
Mr. and Mrs. J. P. Pendray, Victoria, ground slate point fragment.
T. Pendray, Victoria, chipped basalt point.
L. F. Rodgers, Goldstream, collection of artifacts.
Royal Canadian Mounted Police, Qualicum, human skeleton.
Royal Canadian Mounted Police, Victoria, human skeleton.
Mrs. J. Scott, Victoria, portion of pottery figure.
J. Sendey, Victoria, human skull and mandible.
G. H. Stevens, Victoria, basketry cradle.
D. N. Taylor, Victoria, basketry cradle.
H. Thornton, Ucluelet, stone fish-hook shank.
Donald Tibbles, Quesnel, chipped basalt point.
Ucluelet Elementary-Senior High School, Ucluelet, two glass trade beads.
A. H. Wilkerson, Victoria, two model totem-poles and a carved spoon.
Anonymous donor, cedar-root hat.

By purchase—

D. G. P. Sanderson, Victoria, two baskets, hat, and cradle.
Mrs. F. Twanley, Victoria, two model canoes and a model canoe paddle.

By the staff—

Three totem-poles, carved in Thunderbird Park by Henry Hunt.
Collection of archæological specimens found while site surveying in Provincial parks.

During 1963 the sum of $569, proceeds from the donation box in the Museum, was turned over to the Queen Alexandra Solarium for Crippled Children.

A RE-EVALUATION OF THE AVIFAUNA OF THE CARIBOO PARKLANDS

ANTHONY J. ERSKINE, CANADIAN WILDLIFE SERVICE, SACKVILLE, N.B.
AND
ROBERT C. STEIN, LABORATORY OF ORNITHOLOGY, CORNELL UNIVERSITY, ITHACA, N.Y.

The name " Cariboo " was originally applied to the mountainous area around Barkerville, British Columbia, at the time of the gold-rush of the 1860's. Subsequently this name has come to designate the area centred in the valley of the San Jose River, 100 miles farther south. This latter area has been the scene of more intensive bird study than most other parts of the Interior of the Province.

When Munro (1945) published a monograph on the avifauna of this area, he defined the " Cariboo Parklands " as a biotic area which occurred between 51° and 52° 15′ north latitude and between 120° 30′ and 122° 45′ west longitude. These limits were later modified (Munro and Cowan, 1947) to include more area in the valleys of the Fraser and Chilcotin Rivers, and to eliminate the humid north-eastern section.

While Munro's paper (1945) and supplement (1955) are still useful, Munro himself (pers. comm.) felt that such faunal lists should be reworked every 10 or 15 years. In the Cariboo, changes in the economic life of the area have led to changes in the biotic environment. Much field work has also been carried out in the area since 1945.

In 1945 the area was sparsely populated by cattle-ranchers. It was traversed by a narrow, winding gravel road, from which access to most other areas was possible only by trails. The local residents, fishermen and hunters, accounted for most of the travellers in the area. By 1959 the population had increased markedly. Exploitation of the lumber resources opened up many new areas. A modern paved highway, complete with motels and tourist resorts, provided ready access to the region, and secondary roads have improved in proportion. This Cariboo Highway is now the most direct automobile route between the Western United States and the Alaska Highway.

Munro (1958) discussed the differences between waterfowl populations on the lakes accessible in 1938 and those present on the same lakes in 1958. He concluded that human exploitation was largely responsible for the decline. Jobin (1952 f.), then Provincial Game Warden at Williams Lake, published a series of notes on unusual birds in the area. The collection of the late T. T. McCabe, reviewed by Dickinson (1953), contained many specimens from this area, though the collection emphasized birds from the Barkerville area.

Between 1948 and 1959, crews from the University of British Columbia and the British Columbia Game Commission engaged in summer waterfowl banding in the Cariboo, and some of their notes have been available to us. Mary Jackson contributed notes, mostly from summer work at Westwick Lake, near Springhouse, between 1952 and 1954. W. D. McLaren provided data from summer work during 1952, 1955, and 1958–59. L. G. Sugden and P. W. Martin, then Regional Game Biologists with the British Columbia Game Commission at Williams Lake and Kamloops respectively, contributed data collected between 1950 and 1960. H. W. Hammer of the British Columbia Forest Service contributed observations between 1956 and 1959.

Our own studies covered the summers of 1958 and 1959, with additional visits by Erskine in April, 1958, and October, 1959. Stein worked the brushy areas along the San Jose River, mainly near Lac la Hache, in 1958 and at 150 Mile in 1959.

Shorter periods were spent at Soda Creek and Springhouse. He was assisted by M. C. Michener, in 1958 and by R. S. Little in 1959. Erskine worked in the area between 100 Mile and Lac la Hache, particularly at Watson Lake, with shorter periods at Phililloo Lake (south of 126 Mile) and near Riske Creek. He was assisted by A. J. Wiggs in May and June, 1958.

The following list includes all species known for the Cariboo. Summaries of the status of species are presented only where the new data available differ from Munro's (1945, q.r.) account. Species not listed by Munro (1945) are marked (*). Records based upon specimens in the McCabe Collection or by Jobin are indicated by the initials " D " and " J 52 " (or etc.) respectively, which refer to Dickinson's review (1953) and to Jobin's notes (1952 a–j, 1953 a, b, 1954 a–c). Specimens referred to by Munro (1945, 1955) are in the Royal Ontario Museum of Zoology. The Jobin collection is in the National Museum of Canada. Specimens collected by Stein are on deposit at Cornell University. Other observations are from unpublished data, unless otherwise credited.

ANNOTATED LIST

Common Loon (*Gavia immer*).

Red-necked Grebe (*Podiceps grisegena*).

Horned Grebe (*Podiceps auritus*).

Eared Grebe (*Podiceps caspicus*): Populations in the Springhouse area were much larger in 1955–56 than when Munro studied them in 1941 (McAllister, 1958). The much higher water-levels of the 1950's may have some bearing on the increase.

Western Grebe (*Æchmophorus occidentalis*): The breeding colony at Williams Lake has broken up, and speedboat races are run through the feeding area; a few birds were seen on the lake but no breeding occurred in 1958–59.

Pied-billed Grebe (*Podilymbus podiceps*).

White Pelican (*Pelecanus erythrorhynchos*): Occurs regularly as a transient; e.g., 55 at Alkali Lake April 14, 1958 (Sugden); 25 at Rush Lake July 7, 1959.

Great Blue Heron(*Ardea herodias*): Recent records include one at Williams Lake Creek about January 1, 1959 (Brackenbury, *fide* Sugden); one at Sugar Cane Indian Reserve July 27, 1959; one at Westwick Lake August 5, 1959

American Bittern (*Botaurus lentiginosus*).

Whistling Swan (*Olor columbianus*).

Trumpeter Swan (*Olor buccinator*): Four swans, thought to have been this species, were at Rush Lake May 24–26, 1959 (I. McT. Cowan, *fide* McLaren).

Canada Goose (*Branta canadensis*): Numbers have probably declined since 1945, at least in accessible areas; 105 Mile Lake and Westwick Lake no longer had breeding birds in 1958–59, although broods were seen at 108 Mile Lake in both years. Disturbance is almost certainly to blame; illegal spring shooting has been alleged (by F. Davis, Highland Ranch, 105 Mile) to take place, and Erskine saw a brood run down by two men in an outboard boat at Watson Lake June 27, 1959. That brood was not seen there subsequently, and was thought to have moved overland to 101 Mile Lake (about 3 miles), where a brood of the same age and number was first seen a week later.

White-fronted Goose (*Anser albifrons*): Seven were seen west of Alkali Lake May 19, 1946 (Munro, 1955); 100 were at a pond 3 miles north of Alexis Creek about May 13, 1960 (Jackson).

(Lesser) Snow Goose (*Chen hyperborea*): Munro (1955) reported a major movement through the area April 26–May 19, 1946, peak number 100; one injured bird was seen near Riske Creek May 23, 1958 (Sugden and McLaren).

Ross Goose (*Chen rossii*).

Mallard (*Anas platyrhynchos*): Munro (1958) indicated that this species had suffered less than most ducks from the changes of the last 20 years.

Gadwall (*Anas strepera*): New records include two pairs at Alkali Lake May 19, 1946 (Munro, 1955); collected at Alkali Lake May 31, 1959 (J 52 a); young taken near 150 Mile House June 27, July 3, 1952 (J 53 a); nest at Cummings Lake 1954 (Jackson); Erskine saw several pairs, but no breeding evidence, in 1959.

Pintail (*Anas acuta*): Probably scarcer now than formerly, ranking about fifth in abundance of the dabbling ducks, after mallard, American widgeon, and green- and blue-winged teal.

Green-winged Teal (*Anas carolinensis*).

Blue-winged Teal (*Anas discors*): 1958–59 was apparently a peak period for this species; nesting had phenomenal success in 1958, but in the poor season of 1959 many adults apparently did not breed or failed early; large numbers of moulting birds of both sexes were taken in banding operations from mid-July.

Cinnamon Teal (*Anas cyanoptera*): None was noted in 1958, but in 1959 at least 18 individuals were noted on 11 dates from April 26 through June 29.

Shoveler (*Spatula clypeata*): Distinctly less abundant than green-winged teal at present.

American Widgeon (*Mareca americana*).

Redhead (*Aythya americana*): Munro's data (1958) suggested an increase in the past 20 years; other observations support that impression.

Ring-necked Duck (*Aythya collaris*): Donnelly Lake north-east of 150 Mile House) was the only lake frequented by banding crews where this species was trapped with any regularity.

Canvasback (*Aythya valisineria*): Munro's data (1958) suggested a decline in this species; in 1958–59 broods were seen regularly only at Watson and Pete Kitchen Lakes.

Greater Scaup (*Aythya marila*): As Munro surmised, this species seems to be a regular transient; all of the scaup seen April 5–6, 1958, were thought to be of this species; a pair was at Soda Lake Slough May 18, 1958; in 1959 seen at Cummings Lake April 26 (15) and at Racetrack Lake near Riske Creek October 11 (10).

Lesser Scaup (*Aythya affinis*).

Common Goldeneye (*Bucephala clangula*): An adult drake, hybrid between this species and the next, was collected at Westwick Lake May 13, 1954 (Jackson, 1959), and is now in the Department of Zoology collection, U.B.C.

Barrow Goldeneye (*Bucephala islandica*): Detailed breeding studies were made in 1952–54 (Mary F. Jackson, Ph.D. thesis, U.B.C., in preparation). Joint clutches between this species and the next were discussed by Erskine (1959 a, 1960 b).

Bufflehead (*Bucephala albeola*): Possibly decreased in numbers since Munro's studies (1957, 1942); certainly decreased since 1949–51 at Watson and Philillo Lakes, but local abundance probably fluctuates with availability of nest trees. Detailed breeding studies were made in 1958–59 (Erskine, 1960 b).

Oldsquaw (*Clangula hyemalis*): Reported as regular on Green Lake, sometimes in large numbers, in May (Martin); seen at Watson, Pete Kitchen, Cummings, and Westwick Lakes in late April through mid-May, 1959; adult male collected at Boitano Lake July, 1951 (Sugden, in U.B.C. collection).

Harlequin Duck (*Histrionicus histrionicus*): Jobin (1952 d) reported the species nesting near Likely, beyond the limits of the area as defined by Munro and

Cowan (1947); a pair was seen near Churn Creek (west of Gang Ranch) about May 20, 1959 (Sugden); a pair was seen twice and believed nesting at Mahood Falls June, 1958 (Hammer).

*Common Eider (*Somateria mollissima*): Hypothetical; sight record of five eiders on Alkali Lake in the fall of 1950 (J 52 b).

White-winged Scoter (*Melanitta deglandi*): Breeding occurs at Watson, Donnelly, Duga, and Cariboo Bill Lakes, as well as at 103 and 105 Mile Lakes.

Surf Scoter (*Melanitta perspicillata*): An adult male, at Watson Lake from at least June 30, was collected there July 13, 1959 (Stein); another summer record of birds seen near Riske Creek in 1954 (Jackson).

Ruddy Duck (*Oxyura jamaicensis*).

Hooded Merganser (*Lophodytes cucullatus*): Flying young were seen near Springhouse in 1953 (Jackson); a female and brood were seen at Phililloo Lake July 8 and 15, 1958, and Sugden found a nest there in June, 1961.

Common Merganser (*Mergus merganser*): Our only records include Bridge Lake May 19, 1958 (pair), and Green Lake May 24, 1959 (24), and Phililloo Lake April 27, 1959 (one female).

Red-breasted Merganser (*Mergus serrator*): One previous record; Munro (1955) had two males and a female on Lac la Hache May 8, 1946; McLaren saw two males and one female on Green Lake May 2, 1959.

Turkey Vulture (*Cathartes aura*): Hypothetical; no new records.

Goshawk (*Accipiter gentilis*): Nest seen at Axe Lake, near Springhouse, June 3, 1952 (Jackson); seen four times in 1958–59.

Sharp-shinned Hawk (*Accipiter striatus*).

Cooper Hawk (*Accipiter cooperii*): Somewhat less scarce in 1958–59 than the preceding species, fairly common in spring of 1954 (Jackson); a pair nested near 120 Mile in 1947 (Munro, 1955).

Red-tailed Hawk (*Buteo jamaicensis*).

*Harlan Hawk (*Buteo harlani*): Three collected near Williams Lake and 153 Mile in 1950–51; one female taken April 15, 1950, had eggs two-thirds developed (in oviduct?), but probably breeds farther north (known to breed near Atlin) (J 52 j).

Swainson Hawk (*Buteo swainsoni*): Previously known from three sight records; two were collected near Dog Creek in 1953 (J 54 a); also seen near 153 Mile May 15, 1958; 103 Mile Lake May 20, 1958; and (McLaren) Westwick Lake May 12, 1959.

Rough-legged Hawk (*Buteo lagopus*).

Golden Eagle (*Aquila chrysætos*): Reported to breed near Green Lake (Martin); single birds seen at 103 Mile Lake June 12 and July 8, 1959, and (Jackson) at Westwick Lake.

Bald Eagle (*Haliæetus leucocephalus*): The nest near 122 Mile was destroyed or abandoned before 1958, but a new nest on the opposite side of the lake was used in 1958 and 1959.

Marsh Hawk (*Circus cyaneus*).

Osprey (*Pandion haliæetus*).

Gyrfalcon (*Falco rusticolus*): One previous record (photograph) by Jobin; three collected near Alkali Lake November 6 and 17, 1950, and January 18, 1952; also other sight records (J 52 a and J 52 g).

Prairie Falcon (*Falco mexicanus*): Munro listed one sight record; Munro and Cowan (1947) listed Doc English Gulch near Riske Creek as a breeding area, and Jobin reported nests there and near Dog Creek active in 1953 (J 54 b); one bird was collected near Alkali Lake March 26, 1951 (J 52 a).

Peregrine Falcon (*Falco peregrinus*): A specimen, of the race *pealei*, was taken at Alkali Lake August 9, 1948 (J 52 a), and nests of *anatum* were reported in the Chilcotin (1946–51) and near Dog Creek (1953) (J 54 b); Martin also reported nests near Dog Creek.

Pigeon Hawk (*Falco columbarius*).

Sparrow Hawk (*Falco sparverius*): Certainly an abundant breeder at present; at least 20 birds, mostly young, were picked up dead on the highway in July, 1958 (Stein); the hatch was later and less successful in 1959, perhaps because grasshoppers were very scarce earlier.

Blue Grouse (*Dendragapus obscurus*): Still largely absent from the San Jose Valley, although specimens have been taken (D), and several were noted on the plateau east of the valley (Hammer).

Spruce (Franklin) Grouse (*Canachites canadensis*): One seen at Westwick Lake (Jackson) is the only recent record, although several were noted north of Alexis Creek August 13, 1958, and south of Big Creek August 7, 1959, just outside the area.

Ruffed Grouse (*Bonasa umbellus*): This species, as well as blue and sharp-tailed grouse, was much less numerous in 1959 than in 1958.

Sharp-tailed Grouse (*Pedioecetes phasianellus*): Specimens taken in the San Jose Valley (D) may have been from before the 1932 decline mentioned by Munro; occasional west of 70 Mile (Hammer) and in the Springhouse area, and booming-grounds noted west of the Fraser (Sugden).

Willow Ptarmigan (*Lagopus lagopus*): Apparently breeds in the mountains south of Big Creek, beyond the limits of the area (R. B. Weeden, pers. comm.).

White-tailed Ptarmigan (*Lagopus leucurus*): As for preceding species.

Gray Partridge (*Perdix perdix*): A covey was seen near 120 Mile in the winter of 1947–48 (Munro, 1955); about five were seen near Gang Ranch (where introductions had been made) in September, 1952 (Sugden).

*Chukar (*Alectoris græca*): Not listed by Munro, although Carl and Guiguet (1958) stated that introductions had been made near Alkali Lake and Dog Creek in 1940; Sugden saw two near Gang Ranch April 14 and 16, 1952.

Ring-necked Pheasant (*Phasianus colchicus*): No change; this and the two preceding species probably persist only through feeding at ranches.

Sandhill Crane (*Grus canadensis*): Jobin (*fide* Jackson) stated that cranes bred near Alkali Lake and Chain Lakes in the early 1950's; Hammer stated that nesting occurred in various localities south to 70 Mile; flocks of up to 200 were noted on spring migration at Westwick Lake (McLaren): 53 landed at Loch Lomond in a snowstorm May 4, 1959; Stein noted 22 near Springhouse July 11, 1958, and two at Lac la Hache July 28, 1959.

Virginia Rail (*Rallus limicola*): Only two observations in 1958–59.

Sora (*Porzana carolina*).

American Coot (*Fulica americana*).

*Semipalmated Plover (*Charadrius semipalmatus*): First specimens taken August 23, 1950, and May 19, 1951 (J 52 a); since noted as a regular transient in small numbers; records include near Riske Creek July 22 (1) and August 14 1958 (2), and May 14, 1959 (3), 103 Mile Lake August 8, 1958 (1); Martin collected one of seven near Green Lake May 13, 1958.

Killdeer (*Charadrius vociferus*).

Golden Plover (*Pluvialis dominica*): Munro listed one specimen only; Jobin listed specimens from " Mile Road " October 11, 1950, and April 30, 1951 (J 52 a); one bird was at 103 Mile Lake October 11, 1959.

Black-bellied Plover (*Squatarola squatarola*).

Common Snipe (*Capella gallinago*).

Long-billed Curlew (*Numenius americanus*): The Dog Creek breeding area has not been checked recently, although the McCabes collected there (D); Springhouse has breeding birds, 25 seen June 25, 1958 (Sugden), and 13 June 28, 1959 (Stein), being peak counts; birds in the San Jose Valley include a specimen from 122 Mile May 17, 1950 (Munro, 1955), and two seen at Watson Lake May 9, 1959.

Upland Plover (*Bartramia longicauda*).

Spotted Sandpiper (*Actitis macularia*).

Solitary Sandpiper (*Tringa solitaria*): Two spring sight records in 1959, May 8 at Phililloo Lake and (McLaren) May 12 at Doctor's Lake; regular in fall.

Greater Yellowlegs (*Totanus melanoleucus*).

Lesser Yellowlegs (*Totanus flavipes*): Munro listed no spring records, and none were seen regularly from April 25 to June 6 in the spring of 1959.

Pectoral Sandpiper (*Erolia melanotos*): One new spring record, Watson Lake May 14, 1958 (4).

Baird Sandpiper (*Erolia bairdii*): Sight records July 13 (6) and August 14, 1958 (4), as well as other records west and south of the region, suggest that it can be considered a regular transient in small numbers.

Least Sandpiper (*Erolia minutilla*): Appears to be regular in spring as well as fall; the earliest record was April 28, 1959, at Soda Lake; birds were noted five times each in May of 1958 and 1959.

*Dunlin (*Erolia alpina*): Collected October 13, 1950, and May 14, 1959 (J 52 a).

Dowitcher (*Limnodromus* sp. ?): All specimens to date have been of *L. scolopaceus*. The first spring record was one bird May 3, 1946 (Munro, 1955); numerous sight records were made in May, July, and August in both 1958 and 1959.

*Stilt Sandpiper (*Micropalama himantopus*): Collected near 153 Mile September 5, 1959 (J 52 a).

Semipalmated Sandpiper (*Ereunetes pusillus*): A few new sight records in July and August.

*Western Sandpiper (*Ereunetes mauri*): Collected May 24, 1951 (J 52 a).

*Hudsonian Godwit (*Limosa hæmastica*): Collected near 150 Mile House, May 21, 1953 (J 53 b).

Wilson Phalarope (*Steganopus tricolor*).

Northern Phalarope (*Lobipes lobatus*): The only record for 1958–59 was near Redstone in the Chilcotin August 13, 1958 (8).

Long-tailed Jaeger (*Stercorarius longicaudus*).

Herring Gull (*Larus argentatus*): One pair nested at 108 Mile Lake in 1947 and 1948 (Munro, 1955).

California Gull (*Larus californicus*).

Ring-billed Gull (*Larus delawarensis*).

Short-billed (Mew) Gull (*Larus canus*).

Bonaparte Gull (*Larus philadelphia*): Regular transient in small numbers, May 8–30 and August 1, 1958, May 8–June 6 and July 23–30, 1959.

Sabine Gull (*Xema sabini*).

Common Tern (*Sterna hirundo*): Two birds were seen at Bridge Lake, May 19, 1958.

Arctic Tern (*Sterna paradisæa*).

Black Tern (*Chlidonias niger*).

*Rock Dove (*Columba livia*): Omitted, probably intentionally, by Munro; noted at 115 Mile (up to 10) and in Williams Lake in 1958–59.

Mourning Dove (*Zenaidura macroura*): Apparently much more abundant than formerly; said to breed near Alkali Lake (Riedermann, in Munro, 1955); one taken near Hanceville August, 1955 (Sugden); seen four times in 1958 and five times in 1959 (Erskine); peak for one day, July 6 (15), and two collected at Sugar Cane I. R. July 27, 1959 (Stein).

Great Horned Owl (*Bubo virginianus*): Young birds seen at Colpitt Lake in 1953 (Jackson) represent the only known breeding record.

Snowy Owl (*Nyctea scandiaca*).

Hawk Owl (*Surnia ulula*).

Pygmy Owl (*Glaucidium gnoma*): Munro listed five dates, one in July and four in September; Jobin found it common in the winter 1950–51 (J 52 a); Dickinson (1953) reported a pair taken near 100 Mile House April 22, 19 ?; no recent records are known, although small birds respond to an imitation of the call (Hammer).

Great Gray Owl (*Strix nebulosa*): Munro listed one record; Jobin found it common in the winter (1950–51) and took three specimens (J 52 a); reported at all seasons and presumed nesting near Sheridan Lake, one bird shot December, 1956 (*fide* Hammer), also one found dead April, 1957, and one seen May, 1957, near 90 Mile (Hammer).

Long-eared Owl (*Asio otus*): Jobin collected three specimens near Alkali Lake in January–March 1949 (J 52 f); one was found dead on the road at 135 Mile in March, 1958 (Hammer).

Short-eared Owl (*Asio flammeus*): Probably more abundant now, since Munro had not seen it personally; seen near Alkali Lake July 29, 1958, and near Riske Creek June 10 (flightless juvenile picked up), July 25, and August 13, 1958; also (Jackson) near 149 Mile in 1953 and near Alkali Lake in 1956 and (Mrs. J. Roberts) regularly at Sugar Cane I. R. in April, 1959. Their numbers fluctuate locally.

*Burrowing Owl (*Speotyto cunicularia*): Jobin (J 52 f) collected this species near Alkali Lake November 20, 1949; his other record is beyond the limits of the area.

Boreal Owl (*Ægolius funereus*): Jobin found it common in the winter 1950–51 and collected two specimens (J 52 a).

Saw-whet Owl (*Ægelius acadicus*).

Common Nighthawk (*Chordeiles minor*): A very early arrival date was May 23, 1958, from which date the species was noted daily; it was not seen before May 29 in the Puget Sound area of Washington (Schultz, 1958) nor until later in the Great Basin (Rogers, 1958). Does this species reach the Cariboo from east of the Rockies?

Black Swift (*Cypseloides niger*).

Vaux Swift (*Chætura vauxi*).

Rufous Hummingbird (*Selasphorus rufus*): Abundance varies considerably on a local scale.

Calliope Hummingbird (*Stellula calliope*): Munroe listed only one record; sight records are quite numerous recently (Jackson, McLaren, Erskine, Stein); Stein took specimens July 10 and 21, 1959.

Belted Kingfisher (*Megaceryle alcyon*): One of McCabe's specimens was taken April 26 (D), earlier than Munro's records; one was seen at the outlet of Williams Lake April 6, 1958, and Jobin's record (J 52 d) of the species at Likely suggests that it may sometimes winter where open water persists.

Flickers (*Colaptes*): Short (1959) considered all North American flickers as one species; Dickinson (1953) did likewise, the McCabe series including several

from the Cariboo; Munro's data and the new information collected by Erskine (1961) bear out the introgression of *cafer* and *auratus* characters, the former predominating in the Cariboo.

Pileated Woodpecker (*Dryocopus pileatus*).

Lewis Woodpecker (*Asyndesmus lewis*): New sight records include one near Alkali Lake in 1956 (Jackson) and what was believed to be a family group (5) there July 29, 1956; individuals were also seen near Riske Creek June 10, 1958, and June 1, 1959 (McLaren), and near Pete Kitchen Lake May 11, 1959.

Yellow-bellied Sapsucker (*Sphyrapicus varius*): Jobin (J 52 a and J 52 h) collected *S.v. ruber* slightly beyond the limits of the area; Howell's work (1952), slightly to the north, was the basis for the merging of the red-breasted and red-naped forms. Our observations suggest that further collecting in the Cariboo will support the merging of those forms.

Hairy Woodpecker (*Dendrocopos villosus*): Does not appear to be common, as stated by Munro, since only 13 sight records were secured in 1958–59.

Downy Woodpecker (*Dendrocopos pubescens*).

Black-backed Three-toed Woodpecker (*Picoides arcticus*): A regular, but scarce resident of the area; collected near Williams Lake December 24, 1949, and January 11, 1951 (J 52 h), and March 31, 19 ? (D); near 120 Mile October 3, 1952 (Munro, 1955); nests have been found at Doctor's Lake (near Sorenson Lake) in 1954 (Jackson), at Phililloo Lake in 1958 (Erskine, 1959 b), and Loch Lomond in 1958 (Hammer), while sight records elsewhere include birds seen near Westwick Lake (McLaren), at Goose Lake (near 115 Mile), and by 111 Mile Creek.

Northern Three-toed Woodpecker (*Picoides tridactylus*): Probably also a resident, although breeding unproven; collected near Williams Lake January 12, 1951 (J 52 h), and at 103 Mile Lake May 5, 1947 (Munro, 1955); seen at Phililloo Lake May 30, 1958, and at Soda Lake July 31, 1958.

Eastern Kingbird (*Tyrannus tyrannus*): In 1958 McLaren found one nest in an aspen 100 yards from the nearest water; all other nests reported were on branches overhanging the water.

Western Kingbird (*Tyrannus verticalis*): Noted only in the lower valleys; Munro (1955) found it at Alkali Lake in May, 1946, and Stein saw two broods near 150 Mile July 22, 1959; Stein collected one at 126 Mile July 15, 1958.

Say Phœbe (*Sayornis saya*): Two were seen by the Chilcotin Road bridge over the Fraser River April 30, 1959.

Traill and Willow Flycatchers (*Empidonax traillii* and *Empidonax brewsteri*): Both breed commonly in the Cariboo. Stein (1963) reported no evidence of interbreeding between these song types, both considered to belong to a single species formerly.

*Least Flycatcher (*Empidonax minimus*): Not listed either by Munro or by Munro and Cowan (1947); heard regularly near Springhouse in 1952–54 (Jackson); first noted at Watson Lake May 20, 1958, and May 17, 1959, and seen and heard regularly thereafter into July; Stein (1961) collected two specimens with the assistance of playback of sounds of eastern least flycatchers.

Hammond and Dusky (Wright) Flycatchers (*Empidonax hammondii* and *Empidonax oberholseri*): First noted May 3, 1958, and May 13, 1959; Stein collected two specimens whose songs were recorded. Hammond recorded at Springhouse on July 2, 1958. Dusky flycatchers were more common.

*Western Flycatcher (*Empidonax difficilis*): Dickinson (1953) reported one taken near Riske Creek July 21, 19?; Jobin collected one juvenile at Alkali Lake on September 9, 1953 (J 54 c).

Western Wood Pewee (*Contopus sordidulus*).

Olive-sided Flycatcher (*Nuttallornis borealis*): Undoubtedly breeds, but breeding still unproven.

Horned Lark (*Eremophila alpestris*): Collections by McCabe (D) and sight records in 1958–59 confirm the occurrence of migrants and of birds probably breeding near Riske Creek and Springhouse.

Violet-green Swallow (*Tachycineta thalassina*): Of very local distribution; Stein took one specimen at 150 Mile House July 15, 1959; also seen near Riske Creek August 14, 1958, near the Chilcotin Road bridge June 9, 1959, and near Chasm (east of 59 Mile) June 29, 1958.

Tree Swallow (*Iridoprocne bicolor*): Abundant rather than merely common.

*Bank Swallow (*Riparia riparia*): Collected near Springhouse August 29, 1953 (one immature) (J 54 c), and at 111 Mile Creek (breeding female) July 2, 1959 (Stein); found nesting by 111 Mile Creek near Lac la Hache Station in 1958–59; and also seen near 122 Mile, Springhouse, and at the Chilcotin Road bridge.

Rough-winged Swallow (*Stelgidopteryx ruficollis*).

Barn Swallow (*Hirundo rustica*): Earliest arrivals noted May 2, 1958, and May 6, 1959.

Cliff Swallow (*Petrochelidon pyrrhonota*): A special study on nesting in this area was reported on by Myres (1957).

Gray Jay (*Perisoreus canadensis*): Regular, hardly common; no nests found, but dark-plumaged young seen in family parties June 2, 1958 (Sugden), and June 1, 1959.

Steller Jay (*Cyanocitta stelleri*): Not seen in 1958–59.

Black-billed Magpie (*Pica pica*): Seen regularly in winter (Sugden); two seen at the Chilcotin Road bridge October 11, 1959.

Common Raven (*Corvus corax*): Munro had not seen this species by 1945 but listed three records in 1948–51 (Munro, 1955); Jobin's records (J 52 c) are from outside the area; in 1958–59 it was seen regularly in small numbers in May and June.

Common Crow (*Corvus brachyrhynchos*).

Clark Nutcracker (Nucifraga columbiana): Breeding record near Springhouse in 1952 (Jackson).

Black-capped Chicadee (*Parus atricapillus*): This species is clearly less common above 3,000 feet and clearly commoner below that level than is the next species (cf. solitary and red-eyed vireos); Munro (1955) remarked this and the next species were very scarce for two years following extremely low temperatures in January, 1950.

Mountain Chickadee (*Parus gambeli*): *See under* Black-capped Chickadee.

*Boreal Chickadee (*Parus hudsonicus*): Collected near Lac la Hache October 4–5, 1952 (Munro, 1955), and 30 miles east of Williams Lake December 4, 1952 (J 53 a); also seen along the Horsefly Road in 1952–54 (Jackson).

*Chestnut-backed Chickadee (*Parus rufescens*): Jobin noted seeing it in Williams Lake, but his specimens from Likely and Horsefly are outside the area (J 53 a).

*White-breasted Nuthatch (*Sitta carolinensis*): Jobin's specimen from Lillooet (J 53 a) is outside the area, but McLaren saw one of this species near Chasm June 21, 1959.

Red-breasted Nuthatch (*Sitta canadensis*).

Brown Creeper (*Certhia familiaris*): Munro (1955) added one specimen and two sight records to the previous data.

Dipper (*Cinclus mexicanus*): Recent records are mostly from winter; along Churn Creek (near Gang Ranch) winter 1952–53 and December 16, 1958 (Sugden); at Williams Lake Creek January 25, 1959 (Miller, *fide* Sugden).

Long-billed Marsh Wren (*Telmatodytes palustris*).

*Rock Wren (*Salpinctes obsoletus*): Dickinson's reference (1953) to a specimen taken at " Mt. Bagbie, 100 Mile House " May 14, 19?, presumably refers to Mt. Begbie, near 84 Mile; Munro and Cowan (1947) list a specimen taken near Hanceville September 7, 1946; Jackson saw it south of the Chilcotin Road bridge.

*Mockingbird (*Mimus polyglottos*): Jobin listed one taken in the area May 18, 1951 (J 52 a).

Catbird (*Dumetella carolinensis*): Listed as accidental in 1945; later Munro (1955) found it not uncommon at Sugar Cane I.R.; a nest was found near Williams Lake in July, 1952 (Smith, *fide* McLaren), and Stein found it regular and nesting there and at 150 Mile in 1959.

Robin (*Turdus migratorius*).

Varied Thrush (*Ixoreus nævius*): Munro (1955) obtained suggestive evidence of breeding near 120 Mile in 1947; other recent records are from spring and fall.

Hermit Thrush (*Hylocichla guttata*).

Swainson Thrush (*Hylocichla ustulata*).

Veery (*Hylocichla fuscescens*): Munro had only one record besides that of Rhoads; later he noted three at Sugar Cane I. R. June 20, 1947 (Munro, 1955); Dickinson (1953) listed a specimen taken near 150 Mile House July 22, 19?; Stein found it near Horse Lake, at 115 Mile, and at Sugar Cane, where a nest was found July 6, 1959.

Western Bluebird (*Sialia mexicana*): Dickinson (1953) listed two males taken near Riske Creek July 21, 19?.

Mountain Bluebird (*Sialia currucoides*): Most observers feel that the species has decreased markedly since the starling reached the area, but no quantitative data are available from former years; the species is not abundant but may still be classed as common.

Townsend Solitaire (*Myadestes townsendi*).

Golden-crowned Kinglet (*Regulus satrapa*): Jobin's statement (J 53 a) that it is " rare at any time of the year " at Williams Lake may be correct for that locality, but in the summers of 1958–59 it was seen regularly in dense spruce stands north of 108 Mile and along the south side of 103 Mile Lake.

Ruby-crowned Kinglet (*Regulaus calendula*).

Water Pipit (*Anthus spinoletta*).

Bohemian Waxwing (*Bombycilla garrula*).

Cedar Waxwing (*Bombycilla cedrorum*).

Northern Shrike (*Lanius excubitor*): Noted near 135 Mile April 5, 1958 (1), and October 10, 1959 (2).

*Starling (*Sturnus vulgaris*): Jobin collected the first specimen April 30, 1948, and found it nesting near 150 Mile House the same year (J 52 i); he had suspected its presence since 1945; the spread of the species through 1957 has been documented by Myres (1958); in 1958 it increased still further, some nests being used twice in the same season (by the same pair?); little or no increase was noted in 1959. It is now one of the most abundant breeding passerines in areas with extensive grasslands, but was not seen around beaver meadows in predominantly wooded areas.

Solitary Vireo (*Vireo solitarius*): More abundant than the next species at Westwick Lake (elevation 3,000 feet, mostly Douglas fir) (Jackson), but much scarcer than the red-eyed at Watson Lake and in the San Jose valley (elevation 2,900 feet or less with much aspen and less fir).

Red-eyed Vireo (*Vireo olivaceus*): Probably the latest arrival among breeding species in the area; none seen before first song heard June 13, 1958, and June 15, 1959.

Warbling Vireo (*Vireo gilvus*).

Tennessee Warbler (*Vermivora peregrina*): Not noted in 1958–59.

Orange-crowned Warbler (*Vermivora celata*).

Nashville Warbler (*Vermivora ruficapilla*): Munro listed two sight records; Stein noted it near 115 Mile in July, 1959.

Yellow Warbler (*Dendroica petechia*): No nests previously reported; Stein found a nest near 115 Mile July 10, 1959.

*Magnolia Warbler (*Dendroica magnolia*): Jobin (J 54 c) obtained two specimens and a sight record August 17 to September 9, 1953, east and south of Williams Lake.

Myrtle Warbler (*Dendroica coronata*).

Audubon Warbler (*Dendroica auduboni*): A heavy migration occurred April 25 to May 12, 1959, with a peak of over 300 birds seen May 10.

Townsend Warbler (*Dendroica townsendi*).

*Blackpoll Warbler (*Dendroica striata*): Jobin (J 54 c) collected one of six seen near Alkali Lake and Williams Lake, September 7–9, 1953.

Northern Waterthrush (*Seiurus noveboracensis*): Munro considered it "much less common than in the country immediately to the north"; this species was one of the commonest and most vocally apparent warblers around the brushy stream-beds and wooded lakes in 1958–59.

MacGillivray Warbler (*Oporornis tolmiei*): Stein found a nest near 115 Mile July 10, 1959, and saw one near 150 Mile the following day.

Common Yellowthroat (*Geothlypis trichas*): Common in habitat; Hammer found it only rarely in the more wooded country south of 100 Mile.

Wilson Warbler (*Wilsonia pusilla*): Seen regularly in spring migration in 1958–59; no evidence of breeding has been secured.

American Redstart (*Setophaga ruticilla*).

House Sparrow (*Passer domesticus*): Noted only at 100 Mile House, Lac la Hache, Fir Crest Lodge (122 Mile), 150 Mile House, and Williams Lake in 1958–59.

*Bobolink (*Dolichonyx oryzivorus*): Jobin's (1952 a) specimens, presumably from the colony at Alkali Lake, were collected between June 7 and 13, 1951. A male was seen at Alkali Lake on July 29, 1958. Stein and Erskine saw a pair feed three well-grown young near 115 Mile July 12, 1958, and Stein collected three of four birds seen near 117 Mile July 14, 1959.

Western Meadowlark (*Sturnella neglecta*).

Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*): A few wintered at Westwick Lake in 1952–53 (Searle, *fide* Jackson).

Red-winged Blackbird (*Agelaius phœniceus*).

Bullock Oriole (*Icterus bullockii*): None noted in 1958–59.

Rusty Blackbird (*Euphagus carolinus*): Jobin's breeding record near Likely (J 52 h) is outside the area; Dickinson (1953) listed a female taken near 150 Mile on July 22, also suggesting breeding areas nearby.

Brewer Blackbird (*Euphagus cyanocephalus*).

Brown-headed Cowbird (*Molothrus ater*): Munro (1945) listed only three records but reported it common in 1947 (Munro, 1955); Dickinson listed a specimen

from Lac la Hache; in 1958–59 it was noted frequently, and Stein found one egg in a nest of Traill (Little, or "Fitz-bew") flycatcher at Watson Lake July 3, 1959; first dates May 17, 1958, and May 3, 1959.

Western Tanager (*Piranga ludoviciana*): Much more conspicuous in 1959 than in 1958 and probably more numerous; a nest was noted at Westwick Lake 1952–54 (Jackson).

*Lazuli Bunting (*Passerina amœna*): The first specimens were taken by Jobin near Williams Lake July 3 and 13, 1951 (J 52 a); one singing male was seen near the Chilcotin Road bridge July 23, 1958, and a pair was there June 9, 1959; Stein and Little found two nests and at least three pairs present near Sugar Cane I. R. July 2, 1959; collected a pair on July 11, 1959, there.

Evening Grosbeak (*Hesperiphona vespertina*): A heavy migration occurred in April, 1957 (Jackson); one female seen near 115 Mile July 17, 1958, is the first summer record for the region.

Purple Finch (*Carpodacus purpureus*).

Cassin Finch (*Carpodacus cassinii*): Munro's one record was near 87 Mile; Dickinson (1953) listed a male and female taken at Clinton May 8, 19?.

*House Finch (*Carpodacus mexicanus*): Jobin listed specimens from Williams Lake May 25, 27, and August 21, 1951 (J 52 a); it was seen and heard regularly in Williams Lake in 1958–59, but no others were noted nearer than Spences Bridge, 150 miles to the south.

Pine Grosbeak (*Pinicola enucleator*).

Rosy Finch (*Leucosticte tephrocotis*): Munro listed two October records only; later he noted it April 27–29, 1945, near Lac la Hache (Munro, 1955), while Jobin (J 52 a) collected it there November 15, 1950; one was seen at 103 Mile Lake May 10, 1959.

Hoary Redpoll (*Acanthis hornemanni*).

Common Redpoll (*Acanthis flammea*): Seen in Williams Lake April 6, 1958 (160).

Pine Siskin (*Spinus pinus*).

*American Goldfinch (*Spinus tristis*): Munro (1955) reported it as regular at Alkali Lake where he saw two May 18, 1946; it was noted at Sugar Cane I. R. in 1952–54 (Jackson), and Stein found nest there July 28, 1959.

Red Crossbill (*Loxia curvirostra*): Dickinson listed specimens March 31 and June 25 (D); it was noted from June through August and in October in 1959.

White-winged Crossbill (*Loxia leucoptera*): Munro (1955) added a second specimen, near Horse Lake September 9, 1951.

Rufous-sided Towhee (*Pipilo erythrophthalmus*): No specimens or sight records since 1892.

Savannah Sparrow (*Passerculus sandwichensis*).

*Le Conte Sparrow (*Passerherbulus caudacutus*): Noted near Westwick Lake in 1952–54 (Jackson); a pair with brood patches was taken near 115 Mile July 6, 1958, and another was heard there in 1959 (Stein); Stein also collected a male at 110 Mile July 17, 1959.

Vesper Sparrow (*Pooecetes gramineus*): Listed by Munro as "not very common"; in 1958–59 it was common or commoner than the savannah sparrow; it was present and singing April 25, 1959, two weeks before savannahs became common.

Lark Sparrow (*Chondestes grammacus*): Munro (1955) collected an adult male near 130 Mile May 11, 1946.

Slate-colored Junco (*Junco hyemalis*): Two sight records only.

Oregon Junco (*Junco oreganus*).

Tree Sparrow (*Spizella arborea*): One previous record; Jobin (J 52 a) collected it at Williams Lake April 7, 1951.

Chipping Sparrow (*Spizella passerina*).

Clay-colored Sparrow (*Spizella pallida*): Munro listed only the two specimens taken by Brooks (1903, 1905); Pitelka (1947) reviewed the status of the species in British Columbia and indicated that it ought to be found throughout the Interior; Jobin (J 52 a) collected it June 9, 1951; Stein found it at two localities near Springhouse in 1958 and located nests at Deep Creek I. R. and at Sugar Cane I. R. in 1959; also noted at 134 Mile, 111 Mile, and Disaster Lake in 1959; birds collected July 11, 1959, at Sugar Cane and July 23, 1959, at Disaster Lake.

*Harris Sparrow (*Zonotrichia querula*): Jobin (J 53 a) listed a sight record for Williams Lake in November, 1952, but his specimen from Lillooet is out of the area.

White-crowned Sparrow (*Zonotrichia leucophyrs*): It was not noted south of Lac la Hache after spring migration in 1958–59.

*Golden-crowned Sparrow (*Zonotrichia atricapilla*): The first specimens were secured May 22, 1950 (Munro, 1955), and May 10, 1951 (J 52 a). Single birds were noted at Watson Lake May 6 and 19, 1958, and several were seen there May 9, 10, and 17, 1959; McLaren saw it near Westwick Lake May 5–12, 1958, and April 25–May 15, 1959, and found it common at Loon Lake in May, 1955. It thus appears to be a regular migrant in spring.

Fox Sparrow (*Passerella iliaca*): Munro noted one record only; McLaren saw one bird at Sorenson Lake May 21, 1958, and Erskine saw one near 112 Mile May 7, 1959.

Lincoln Sparrow (*Melospiza lincolnii*): Present by April 25, 1959, although no song heard until May 9.

*Swamp Sparrow (*Melospiza georgiana*): Sight records were obtained by Erskine May 5, 1958, and by Stein July 25, 1959, both at Watson Lake.

Song Sparrow (*Melospiza melodia*).

Lapland Longspur (*Calcarius lapponicus*): Jobin listed specimens of October 24 and November 1, 1950 (J 52 a); one was noted in November, 1954 (Jackson).

Snow Bunting (*Plectrophenax nivalis*): Noted in November, 1954 (Jackson); seen regularly in winter, 100 at Springhouse January 9, 1959 (Sugden); seen at 103 Mile Lake and near Riske Creek October 11, 1959.

A DISCUSSION OF THE AVIFAUNA OF THE CARIBOO PARKLANDS

The present list includes 240 species, 31 more than Munro's 1945 total. One hundred and eighteen species have been shown or claimed to breed, while 24 more may also breed. Recent additions to the list include nine actual or presumptive breeding species, of which only least flycatcher, bank swallow, and starling are fairly generally distributed. The last named is a recent arrival, but the others were probably missed by oversight. It seems likely that future work will add very few regularly breeding birds to the Cariboo list. At this stage, comparison with bird lists from adjacent regions outside the Cariboo Parklands Biotic Area may be profitable.

Data given by Munro and Cowan (1947) have been useful for all areas, but particularly for the Dry Belt, for which no other summary is available. Areas to the north have been well documented (Dickinson, 1953; Munro, 1947, 1949; Stanwell-Fletcher, 1943), although only the last incorporates a year-round study. The McCabe collection also included series from Clearwater, in the poorly repre-

sented Columbia Forest Biotic Area to the east, and from Chezacut, Alexis Creek, Kleena Kleene, and Anahim Lake in the Chilcotin basin to the west. Paul (1959) listed his own observations around Kleena Kleene, and made comparisons with an unpublished manuscript from Chezacut, while Edwards (1948) discussed waterfowl breeding near Anahim Lake. None of these lists embody the duration and continuity of the Cariboo list, but they probably provide a satisfactory basis for comparison.

A listing of species shared with adjacent areas follows, grouped by habitats:—

(1) Species associated with sloughs or marshes and most abundant in the Cariboo and the Dry Forest; in suitable habitat elsewhere—horned and eared grebes, pintail, green- and blue-winged teal, shoveler, redhead, canvasback, lesser scaup, ruddy duck, sora, coot, Wilson phalarope, black tern, long-billed marsh wren, yellow-headed blackbird.

(2) Species associated with sloughs or marshes and most abundant in the Dry Forest; breeding in the Cariboo mainly in the low valleys or in the south—gadwall, cinnamon teal, Virginia rail.

(3) Species associated with open country (some, marked (*), need trees nearby) and most abundant in the Cariboo and the Dry Forest; in suitable habitat elsewhere—red-tailed hawk, golden eagle, marsh hawk, sparrow hawk*, sharp-tailed grouse, killdeer, long-billed curlew, short-eared owl, eastern kingbird*, horned lark, starling*, western meadowlark, Brewer blackbird, savannah and vesper sparrows.

(4) Species associated with open country and most abundant in the Dry Forest; breeding in the Cariboo mainly in the low valleys or in the south—prairie falcon, gray partridge, chukar, pheasant, mourning dove, Lewis woodpecker*, western kingbird*, bobolink.

(5) Species associated with open country and breeding (in British Columbia) only in the Dry Forest, or casual occurrence in the Cariboo—white-breasted nuthatch*, rock wren, lark sparrow.

(6) Species associated with deciduous or shrubby woodland, abundant in the Cariboo, the Dry Forest, and often in suitable areas elsewhere—calliope hummingbird, dusky (Wright) flycatcher, willow flycatcher, Swainson thrush, cedar waxwing, solitary, red-eyed and warbling vireos, chipping sparrow.

(7) Species associated with deciduous or shrubby woodland, and most abundant in the Dry Forest; breeding in the Cariboo mainly in the low valleys or in the south — Cooper hawk, catbird, veery, MacGillivray warbler, Bullock oriole, lazuli bunting, Cassin finch, common goldfinch.

(8) Species associated with deciduous or shrubby woodland and most abundant in the Dry Forest; of casual occurrence in the Cariboo—Nashville warbler, rufous-sided towhee.

(9) Species associated with deciduous or shrubby woodland, abundant in the Cariboo and areas to the north, but not breeding in the Dry Forest—Traill flycatcher, least flycatcher, white-crowned sparrow, Lincoln sparrow, swamp sparrow in northern areas only, casual in the Cariboo.

(10) Species associated with more densely forested areas and most abundant in the Boreal, Subalpine, Columbia, or Coast Forests; breeding in the Cariboo in the north and at higher elevations—ring-necked duck, white-winged scoter, goshawk, spruce (Franklin) grouse, pileated and both three-toed woodpeckers, gray jay, raven, mountain chickadee, hermit thrush, golden-crowned kinglet, northern waterthrush, purple finch.

(11) Species associated with more densely forested areas and most abundant in the Boreal, Subalpine, Columbia, or Coast Forests; of casual occurrence

in the Cariboo—boreal and chestnut-backed chickadees, varied thrush, Townsend warbler, rusty blackbird.

(12) Many species (not all listed here) are fairly cosmopolitan, breeding in most parts of the Interior of British Columbia. These include water birds (e.g., common loon, mallard, common snipe), upland game (e.g., ruffed grouse), and ubiquitous passerines (e.g., crow, robin, song sparrow).

The Cariboo Parklands possess no breeding birds not also breeding in adjacent areas. No qualitative differences exist between the birds of the Cariboo and those of the Chilcotin area, and the lower, eastern part of the Chilcotin basin has long been included in the Cariboo Parklands Biotic Area. Although the western part is somewhat higher, with smaller proportions of parkland and sloughs than have been considered characteristic of the Cariboo, there seems no valid reason not to include the whole Chilcotin area west to Anahim Lake in the same avifaunal unit. To do so would add to the list only four species—wood duck (*Aix sponsa*), band-tailed pigeon (*Columba fasciata*), and winter wren (*Troglodytes troglodytes*), listed as " casuals " by Paul (1958), and pomarine jaeger (*Stercorarius pomarimus*), of which a specimen, taken in the Chilcotin in 1911, is listed by Munro and Cowan (1947).

The Cariboo Parklands in this broader sense is a mixing-ground for species of northern (eastern) and southern (western) affinities. Most workers have considered that the birds of the Cariboo Parklands had their closest affinity with those of the Dry Forest to the south. Such impressions have been largely based upon studies in the San Jose Valley, which is not truly representative of the area as a whole (Myres, 1958). The greater part of the plateau is occupied by forests of Douglas fir, lodgepole pine, or both, and the " characteristic " open meadows bordered by aspen are few and well scattered, away from the Cariboo Highway. Floral zonation schemes place the Cariboo Parklands in the Interior Douglas Fir Zone (Tisdale and McLean, 1957; Krajina, 1959). Some workers (e.g., Rowe, 1959) include that in the Montane Forest formation, which also includes the Ponderosa Pine Zone to the south.

The Biotic Area concept of Munro and Cowan (1947) is not necessarily more useful for avifaunal studies here than are the florally designated zones. For example, the Douglas fir parkland adjoining the grasslands of the Chilcotin and Upper Fraser Valleys shares the southern element of birds (groups 4 and 7 above) with the ponderosa pine parkland farther south in the Dry Forest Biotic Area, while both lack the northern element (group 10) found in Douglas fir forests at higher elevations in the Cariboo Parklands.

The avifauna of the Cariboo Parklands belongs neither to the Boreal-Subalpine Forest nor to the grasslands of the Great Basin, but contains elements common to both. From the view-point of continental ornithogeography, the area is no more than an ecotone. However, on a Provincial scale, the area is of sufficient extent to warrant consideration as a unit, is easily recognizable by its " parkland " physiognomy, and possesses great merits as a scene for field studies of birds. A number of species (*see* groupings above) reach their northern or southern limits in the area, and some species (or subspecies) meet and overlap there; e.g., flickers. The area offers almost ideal conditions for summer field work.

SUMMARY

Munro's 1945 monograph on the birds of the Cariboo Parklands, British Columbia, has been revised. Additional data are presented, and data are assembled from a host of short notes dealing with the area, to provide a more complete list.

Although relatively complete as to breeding birds, the list still lacks any comprehensive data on birds present in November through March. The list is compared with those of nearby areas, and the suggestion is made to extend the Cariboo Parklands Biotic Area to include all of the Chilcotin area west to Anahim Lake.

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