CARIBOU BIBLIOGRAPHY

by

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Bibliography on Caribou

The bibliography on caribou was undertaken at the request of John G. Stelfox, Canadian Wildlife Service, Edmonton. The areas covered include: all aspects of caribou in Western Canada, Alaska, and in the United States south of the 49th parallel. Geographical areas not covered are all areas east of the Great Lakes, Labrador, and Newfoundland. Generally speaking, the imported reindeer were not covered.

The bibliography attempts to cover all the major resources of literature, but undoubtedly articles have been overlooked. This is due to oversight and not bias on the compiler's part.

Part of the bibliography was compiled by running a 12 year retrospective computer search through Biological Abstracts. The material obtained in this manner has a somewhat different format from the rest of the bibliography as the search material was inserted without editing it in any way.

Included after the bibliography is a list of sources consulted. The search generally went back from 1971 or 1972 as far as the individual bibliographical tools went.

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Abrahamson, G.
Canada's reindeer.
Canadian Geographical Journal, 1966, 66 (6), 188-193, map, illus.

Describes the government reindeer herding project for the Mackenzie District Eskimos. Covers the migration area of the herd and although the terrain is suitable for the animals, the Eskimos do not like herding.

Ahti, Teuvo
Notes on the caribou ranges north of Great Slave Lake, N.W.T., 1961

Canadian Wildlife Service, CWSC - 930

Alaska Cooperative Wildlife Research Unit
Caribou movements

College, Alaska, Quarterly Report, 3 (4) to 6 (2) April/June 1951 to October/December 1954, in progress

Reports on the movements, abundance, and distribution of the Steese Highway caribou herd. Also discussed are food, age of kill, and counts.

Alaska Cooperative Wildlife Research Unit
Population dynamics and movements of the "Steese Highway" caribou herd.

Quarterly report, 3(4), 1952.

Alaska Department of Fish and Game
Annual Report of Progress

Federal Aid in Wildlife Restoration Project, Vol. 1 1959-60
Juneau, 1960 - (in progress) v. pagings, maps, tables, diagrams

Reports from wildlife investigations conducted since July 1, 1959, Includes the numbers, distribution, biology of animals, ecological conditions, and harvest by hunters. It is outlined as a basis for wildlife management and covers elk and caribou.

Allen, J. A.
Description of a new caribou from northern B.C., and remarks on Rangifer montanus.
American Museum of Natural History, Bulletin No. 16 1902b, 149-158 illus.
Describes Rangifer osborni.

Allen, J. A.
The mountain caribou of northern British Columbia.

American Museum of Natural History, Bulletin No. 13, 1900, pp. 1-18 illus.

Describes the caribou in northern B.C. giving location, physical description, and measurements of each specimen. Especially noted is R. montanus.

Allen, J.A.
A new caribou from the Alaska peninsula.

American Museum of Natural History, Bulletin No. 16, 1902a, 119-127, illustrated.

Describes Rangifer granti.

Altmann, Stuart A.
Adaptions of caribou to arctic conditions. In: American Society of Zoologists, Fifty-eighth Annual meeting, Denver, Colorado, December 1961. Amer. Zool. 1(4): 433. 1961 --Abstract

Altmann, S. A.
Caribou behavior at calving time, 1962.

Canadian Wildlife Service, 1962, CWS 463, 23 pp; tables, map.

Describes the calving behavior of the caribou in the Keewatin Dist.

Anderson, R. M.
Arctic game notes. Distribution of large game animals in the far north - extinction of the musk ox - the chances for survival of moose and caribou, mountain sheep, polar bear and grizzly.

American Museum Journal, 1913, vol. 13, pp. 5-21, illus.

Anderson, R. C.
The ecological relationships of meningeal worm pneumostrongylus tenuis and native cervids in North America.

Journal of Parasitology ,56 (4, sec. II, pt. 1), 1970, 6-7.

Anderson, Roy C. and Uta R. Strelive
The experimental transmission of Pneymostrongylus tenuis to caribou (Rangifer tarandus terraenovae). CAN J ZOOL 46(3): 503-510 illus. 1968. --Two caribou calves (R. tarandus terraenovae) were infected

Anderson, Roy C. and Uta R. Strelive Cont.
experimentally with P. tenuis from white-tailed deer (Odocoileus virginianus borealis). The female calf showed slight neurologic signs from the 5th day to the 14th day when she died from a mycotic infection. The male calf 1st showed neurologic signs on the 7th day. These signs became progressively more extreme and by the 29th day, when the animal was necropsied, it showed severe locomotory ataxia with knuckling and posterior weakness. Histological study of the spinal cord of the male revealed numerous worms in all regions of the spinal cord and in the brain stem and medulla oblongata. Traumatic lesions and worms were unusually numerous in lateral and dorsal funiculi. It is suggested that the more severe neurologic signs were caused by migration of worms into funiculi from dorsal horns of grey matter. The results are discussed in relation to the management of woodland caribou in eastern North America. --Author.

Anderson, R. M.
Investigation into wildlife conditions in National Parks (Waterton Lakes, Banff, and Jasper) in the Province of Alberta, 1938.

Ottawa, Typewritten report in files of Canadian National Parks Bureau, 16 pp.

Annabel, R.
Alaska's thundering herds.

Saturday Evening Post, December 27, 1947, Vol. 220, pp. 19-, illus.

Audubon, J. J., and Bachman, J.
The quadrupeds of North America.

New York, 1854, Vol. 3 illus. (see pp. 111-124 on caribou).

Baker, B. E., and B. H. Lauer.
Casein: X. The carbohydrate content of casein prepared from the milks of different species. CAN J ZOOL 49(4): 551-554. 1971. --Milk was collected from the following animals: caribou, dall sheep, fin whale, harp seal, moose, musk-ox, polar bear, and reindeer, The caseins prepared from these milks were analyzed for their hexose, hexosamine, and sialic acid contents. The hexose, hexosamine, and sialic acid contents ranged from 0.48 to 4.49, 0.09 to 0.59, and 0.0 to 2.29%, respectively.

Banfield, A. W. F.
The barren-ground caribou.

Canadian Department of Resources and Development, 1951 56pp.

Banfield, A.W. F.
The Canadian Caribou research program.

Transactions of the Northeastern Wildlife Conference, 1958, Vol. 1, p. 123.

Describes the importance of the program.

Banfield, A. W. F.
The caribou crisis.
Beaver, 1956, Outfit 286, Spring.

Describes the barren-ground caribou - the number of animals, age and sex composition of the herds.

Banfield, A. W. F.
Dermoid cysts: a basis of Indian legends Journal of Mammalogy 39 (3), August 1958, 451-452.

Dermoid cysts containing hair, teeth, nails, or other ectoderm products or abnormal repressed twins could be the basis of Indian legends about caribou and moose.

Banfield, A. W. F.
The disappearance of the Queen Charlotte Islands' Caribou. NATL MUS CANADA BULL 185. 40-49. illus. Map 1963. This form, Rangifer tarandus dawsoni, was first reported in 1878 and described in 1900 from a single specimen. Only a few individuals were seen afterwards, 3 specimens being killed in 1908. The last observation reported was in 1910. In 1961, the author spent 4 weeks on the island searching for traces of the caribou or clues to their former distribution, habits, and fate. An aerial survey showed a small region of broad, low peatlands which would have offered the type of habitat required by the caribou. Apparently the extinction of the race must have occurred shortly after 1910, but it is doubtful that human interference was the cause. Deterioration of habitat because of amelioration of climate and loss of genetic plasticity through isolation were probably important contributory factors.

Banfield, A. W. F.
The post glacial dispersal of American caribou. In: 16th International Congress of Zoology, 1963. Proc. Int. Congr. Zool. 16(1), 206, 1963.

Banfield, A. W. F.
Preliminary investigation of the barren-ground caribou. Part I. Former and present distribution, migrations, and status.

Canadian Wildlife Service, Wildlife Management Bulletin, Series I, No. 10A, 1954 79 pp. illus.

Discusses the methods of investigation, the physical environment, historical records, present distribution, population, migration routes (spring, summer, and autumn), human influences on migration, and the changes in range, status and migration of the caribou.

Banfield, A. W. F.
Preliminary investigation of the barren ground caribou. Part II. Life history, ecology, and utilization.

Canadian Wildlife Service, Wildlife Management Bulletin, Series I, No. 10B, 1954 112 pp., illus.

Discusses the physical description, range vegetation studies, food requirements, behavior, vital statistics, mortality studies, parasites (external and internal), bacterial diseases and accidents.

Banfield, A.W.F.
The present status of North American caribou.

Transactions of the North American Wildlife Conference, 1949, 477-491, maps.

A collection of recent literature pertaining to the distribution and status of North American caribou.

Banfield, A. W. F.
A provisional life table for the barren ground caribou.
Canadian Journal of Zoology 33(3), June, 1955, 143-147, graph.

The provisional life table was prepared from a collection of 292 mandibles of Rangifer arcticus in 1948 and 1949. Both sexes were used. Expected lifespan at birth was 4.09 years and the average mortality rate for the first ten years was 71%. Average longevity was about 13 years.

Banfield, A. W. F.
A revision of the reindeer and caribou genus Rangifer.

Canadian National Museum Bulletin, No. 177, 1961, 137 pp., photos and tables.

Describes individual variations in caribou, geographical variations, and the taxonomy.

Banfield, A. W. F.
Second report on the barren-ground investigation.
Arctic Circular, 1952, vol. 5, no. 4, pp. 43-44.

Banfield, A. W. F.
A selection of neotypes for subspecies of Rangifer tarandus (Linne), Mammalia - Cevidae

Canadian National Museum Bulletin, 1963, no. 185, Contributions to Zoology, 1962, pp. 60 - 71, illus.

Describes 5 taxa of Canada, Scandinavia, and Greenland which, prior to this, were described without specifying type specimens, which led to considerable confusion.

Banfield, A. W. F.
The status, ecology, and utilization of the continental barren-ground caribou (Rangifer Arcticus arcticus).

University of Michigan, Ph. D. Thesis, 1951

Banfield, A. W. F.
Use of caribou antler pedicels for age determination.
Journal of Wildlife Management, 24 (Jan. 1960), 99-102, illus., tables.

Both sex and age influence pedicel form, with the males carrying pedicels of greater girth than the females. It was concluded that the caribou pedicels show the presence of an annual growth ring during and after antler formation.

Banfield, A. W. F.
Wolf and the Caribou.
Beaver, March 1952, outfit 282, pp. 40-41, illus.

Banfield, A. W. F., Flook, D. R., Kelsall, J. P., and Loughney, A. G.
An aerial survey technique for northern big game.

Transactions of 20th North American Wildlife Conference, 1955, pp. 519 - 532, graph.

Describes the technique of surveying big game (especially caribou) from the air.

Barclay, Edgar N.
The reindeer or caribou of the upper Macmillan basin.

Proceedings of the Zoological Society of London, 1935, pp. 305-307, 2 plates.

Article contrasts Rangifer montanus selousi (Yukon Territory) with Rangifer montanus osborni from Cassiar, British Columbia.

Becklund, Willard W., and Martha L. Walker
Lab., Anim. Dis. and Parasite Taxonomy, hosts and geographic distribution of the Setaria Nematoda: (Filarioidea) in the United States and Canada. J PARASITOL 55(2): 359-368. Illus. 1969.--
Three species of Setaria Viborg, 1795, nematodes of the peritoneal cavity were found among 439 specimens collected from 12 species of ungulates in the USA and Canada. S. equina (Abildgaard, 1789) was found among specimens from horses (Equus caballus), mules (E. asinus XE. caballus), a burro (E. asinus), and a cow (Bos taurus): Setarialabiatopapillosa (Perroncito, 1882) from cattle (Bos taurus), antelope (Antilocapraamericana) bison (Bison bison), moose (Alces alces), a deer (Odocoileus hemionus), a bighorn sheep (Ovis canadensis), a caribou (Rangifer caribou), and a horse; and Setaria yehiDesset, 1968 from deer (Odocoileus hemionus and O. virginianus), caribou (Rangifer caribou and R. arcticus) and bison. Nomenclatural problems involving S. labiatopapillosa and S. yehi are discussed and definitive conclusions are given. Information is given for all 3 species on geographic distributions, morphology, and intraspecific variation. A key with comparitive illustrations is furnishedfor the easy identification of the worms.

Bell, W. B.
Alaska's reindeer - caribou.
American Forests. January 1929, vol. 35, pp. 16 - 20.

Benett, G. F. and Sabrosky, C. W.
The nearctic species of the genus Cephenemyia, Diptera, Oestridae
Canadian Journal of Zoology, 1962, vol. 40, no. 3, pp. 431-448, tables, maps, illus.

The larvae and adults of 5 species of deernose bots (including Cephenemyia trompe) the distribution and the hosts which include caribou and reindeer.

Benson, D. A.
Statistical refinements of caribou aerial census techniques, 1965

Canadian Wildlife Service, CWSC 1030, 1965 .

Describes the techniques of population analysis.

Bergerud, A. T.
Caribou population density biomass calculation.

In: Golley, F. B. and Helmut, K. eds.
A practical guide to the study of the productivity of large herbivores. Philadelphia, F. A. Davis Co., 1968, 21-42.

Bergerud, A. T.
Personal communications on caribou reproduction and havestable surpluses.

Alberta Fish and Wildlife Division, File no. 400-8, D.-408

Bergerud A. T.
A spring caribou calving study, May and June, 1957.

Canadian Wildlife Service, CWSC -905, photos, tables, and maps.

Describes daily activities, food preferences, population dynamics, calving, habitat preferences, and distribution.

Bergerud, Arthur T.
ARTHUR BUTT, H. LLOYD RUSSELL, and HEMAN WHALEN. Immobilization of Newfoundland caribou and moose with succinylcholine chloride and Cap-Chur equipment. JOUR WILDL MGMT. 28(1); 49-53. Illus. 1964.--Succinylcholine chloride was used in CO_2-propelled darts from commercial Cap-Chur equipment to capture and mark successfully 112 caribou (Rangifer tarandus) and 31 moose (Alces alces). Marking success varied from 0.5 to 2.8 animals per man-day, depending on the number of animals located and the stalking technique used. The effective dosage for a captive male moose was 0.025-0.035 mg/lb, and for a wild moose 0.020-0.030 mg/lb. Free-ranging caribou required heavier dosages (0.045-0.065 mg/lb) than captive caribou (0.025 - 0.040 mg/lb)
--Authors

Blanchard, Richard L., and Jasper W. Kearney
Natural radioactivity and 137C's in Alaskan caribou and reindeer samples (human). ENVIRON SCI TECHNOL 1(11); 932-939 illus. Map. 1967.--The concentrations of ^{210}Po, ^{210}Ph, ^{226}Ra, and ^{137}Cs were determined in bone, muscle, and rumen content of caribou and reindeer from Alaska. The ^{210}Po and ^{137}Cs concentrations in the muscle varied with the season, reaching a maximum in spring and a minimum in the fall. A similar variation in the ^{210}Po and ^{137}Cs concentrations was observed in the rumen content. The relationships of ^{210}Po and ^{137}Cs between muscle and rumen content are examined. The ^{210}Po and ^{210}Pb ratio in muscle also varied during the year reaching a maximum in the spring. The ^{210}Pb content of the bone did not appear to vary with the season; however, an increase occurred with increasing latitude and age. Except for animals 1

Blanchard, Richard L., and Jasper W. Kearney Cont.
year or less in age, the ^{210}Po to ^{210}Pb activity ratio was near unity. The specific activities of ^{226}Ra in bone and muscle were small in comparison with the concentrations of ^{210}Pb, ^{210}Po, and ^{137}cs. -- Authors.

Botts, R. P., Parrish, H. M., and Blenden, D.C.
Comparison of endemiologic studies in animal and human populations.
Canadian Journal of Public Health, 57(10), 1966, 471-474.

BRODY, JACOB A., BOB HUNTLEY, THERESA M. OVERFIELD, and JAMES MAYNARD
Studies of human brucellosis in Alaska. J INFECT INS 116(3); 263-269 Illus. 1966. --Eight clinical cases of brucellosis in humans residing above the Arctic Circle in Alaska have been documented since 1959. The population of this region includes about 6,500 Eskimos and Indians. Serological surveys and results of skin tests give strong support to the accumulating evidence that the source for human infection is the caribou (wild reindeer, Rangifer tarandus). In communities where caribou is eaten, 5 to 20% of the residents had positive titers to Brucella, and more than 50% of the inhabitants in 1 village tested had positive skin test reactions. Evidence suggests that contact with Brucella organisms is continuous and affects all age groups and both sexes approximately equally. The problems of interpretation of skin test reactions in Alaskan populations are difficult to resolve, and the possibility that animals other than caribou may be involved in transmitting human infection is suggested. --Authors

Bronson, Wilfred S.
Horns and antlers.
New York, Harcourt, Brace and Co., 1942, 143 pp. illus.

Non-technical accounts of Wapiti, reindeer, caribou, etc.

Brooks, Allan
Past and present big-game conditions in B. C. and the predatory mammal question.
Journal of Mammalogy, 7 (1), 1926, 37 - 40

Discusses the role that predatory mammals play in the population density of caribou, elk, moose, and deer. Feels that caribou and elk are holding their own in B. C.

Brooks, A. H. and Prindle, L. M.
The Mount McKinley Region, Alaska.

U. S. Geological Survey, Professional Paper No. 70, 1911, 234 pp.

Broughton, E. and Choquette, L. P. E.
Additional information on disease conditions and parasites of barren-ground caribou.

Transactions of the 33rd Federal-Provincial Wildlife Conference, Edmonton, Alberta, July 8-10, 1969, pp. 30-39.

The field observations and post-mortem and laboratory examinations would suggest that the health of the Kaminuriak barren-ground caribou is fairly good at present. More research is needed to assess the significance of conditions of verminous pneumonia, besnoitiosis and brucellosis in the caulson.

Broughton, E. et. al.
Brucellosis in reindeer, Rangifer tarandus L., and the migratory barren-ground caribou, Rangifer tarandus gwenlandicus (L.) in Canada.
Canadian Journal of Zoology, 48, September 1970, 1023-1027 fig.

Serum samples from 1962 reindeer at the Mackenzie River Delta in the last decade and 320 Kaminuriak barren-ground caribou were tested for brucellosis. All sera with titers of 1:25 or higher were taken to be positive. Brucellosis does not seem to represent a threat to either herd.

Brown, W. G. E.
The photo-interpretation of winter range vegetation in the Stony Rapids area, Saskatchewan, February 1961.

Canadian Wildlife Service, CWS - 234.

Brownlee, J. H.
Caribou migration on the Yukon Plateau in the autumn of 1915.
Geographical Review, 2 (July 1916), 58-60, illus.

Bruemmer, F.
Caribou hunt; photo-story.
North, May - June 1968, vol. 15, pp. 2-9, illus.

Burkholder, Bob L.
Observations concerning wolverine.
Journal of Mammology, 43 (May 1962), 263-264.

A report of an incident where a wolverine attacked and killed a full-grown male caribou on the Gulkana River.

Burt, W. H.
A caribou antler from the Lower Peninsula of Michigan.

Journal of Mammalogy, 23 (1942), 214.

In 1940 a caribou antler was discovered in a drainage ditch near Minden City, Michigan. It is the first authentic evidence of caribou on the lower peninsula. (See Museum of Zoology No. 84108).

Cahaline, Victor H.
The status of mammals in the U. S. National Park System, 1947.
Journal of Mammology, August 1948, vol. 29, no. 3, pp. 247-259.

An annotated list which includes the caribou where they were (i.e. in Glacier Park, Isle Royale), and where they are found today.

Cahn, Alvin R.
The mammals of Istaca County, Minnesota
Journal of Mammology, 1921, vol. 2, pp. 68-74.

Gives a list of mammals once known in the county within the past 15 to 20 years which are now believed by the author to be extinct or exterminated. Included is Rangifer caribou sylvestris.

Cameron, A. W.
Canadian mammals.

Ottawa National Museum of Canada, 1964, 81 pp., illus., maps.

Gives information on physical characteristics, breeding, feeding, migration habits, etc. of many species - including caribou. Distribution areas are mapped.

Canada. Department of Interior
Description of a guide to Jasper National Park, 1917.

Ottawa Publication of Department of Interior, 97 pp.

Canada Year Book
The barren-ground caribou.

Ottawa, Dominion Bureau of Statistics, 1954, 3pp.

Canada's caribou crop could be on way out.
American Cattle Producer, June 1958, vol. 40, p. 27.

Canadian Weekly Bulletin
News notes.

Canadian Weekly Bulletin, 1950 Vol. 15, No. 26, P. 4.

The field study by Canadian Wildlife Service (1960) is to include a study on the effects of snow on barren-ground caribou migration and population studies of the caribou.

Canadian Wildlife Service
The Caribou (Rangifer tarandus) (the Hinterland 'Who's Who' Series)

Ottawa CAnadian Wildlife Service, 6 pp., photos, map.

Generally describes the caribou, its habitat, diet, and management.

Caribou herds decline
For and Outdoors, October 1958, Vol. 54, P. 11, illus.

Child, K. N.
Impact of North Slope oil developments and trans-Alaska pipeline on caribou movements, migrations, and habitat utilization.

Alaska Cooperative Wildlife Research Unit, Quarterly Progress Report, 1970, Vol. 22, No. 1, Pp. 4-6.

Choquette, L. P. E., E. Broughton, F. L. Miller, H. C. Gibbs, and J. G. Cousineau
Besnoitiosis in barren-ground caribou in Northern Canada. CAN VET J 8(12): 282-287. Illus. 1937.--The occurrence of besnoitosis in barren-ground caribou in 2 widely separated areas in Canada's Northwest Territories was reported. This is the 1st published report of the disease to any animal species in Canada. Besnoitia cysts were found in cutaneous lesions and in the subcutaneous fascia. The gross and microscopic pathology were described summarily. As in cattle, the infection may exist without skin involvement. The natural transmission of besnoitosis is unknown. It is likely that arthropods, particularly bloodsucking flies, are involved in the natural transmission of the disease in ungulates. The significance of besnoitiosis in barren-ground caribou populations in Canada is unknown.

Choquette, L. P. E., G. G. Gibson, and B. Simard
Fascioloides nagna (Bassi, 1875) Ward, 1917 (Trematoda) in woodland caribou, Rangifer tarandus caribou (Gmelin), of north-eastern Quebec and its distribution in wild ungulates in Canada. CAN J ZOOL 49(2)

Choquette, L. P. E., G. G. Gibson, and B. Sinard Cont.
280-281, illus. 1971 --F magna was found in a new host, woodland caribou, R. tarandus caribou, for the 1st time in Quebec, in eastern Ungava. The distribution of F. magna in wild ungulates in Canada is reviewed.

Choquette, L. P. E., Whitten, L. K., Rankin G., and Seal, C. M.
Note on parasites found in reindeer (Rangifer tarandus) in Canada. Canadian Journal of Comparative Medicine and Veterinary Sciences, 1957, Vol. 21, pp. 199-203, Table.

In 1953-1955 parasitic infections were examined in reindeer at Aklavik, N.W.T. A total of 1664 animals were examined. 46.4% were harbouring larval tapeworms; 25.5% Cysticercus tenuicollis; 9.5% hydatid cyst; 12.8% Cysticercus tarandi. Warble fly larvae were also noted in a number of cases.

Clarke, C. H. D.
Notes on the status and distribution of certain mammals and birds in the Mackenzie River and western Arctic area in 1942 and '43. Canadian Field-Naturalist, May-June 1944, Vol. 58, pp. 97-103.

Article includes notes on Rangifer caribou and Rangifer arcticus. Gives the status of the animal and its geographical distribution.

Coleman, James R.
Projected values of cesium - 137 body burdens in Anaktuvuk Pass Eskimos for the summer of 1965. Based on findings in caribou muscle. RADIOL HEALTH DATA US PUBLIC HEALTH SERV 6(10): 578-582. Illus. 1965. --A method of predicting body burdens of cesium-137 in Anaktuvuk Pass Eskimos is developed, using whole body counting data for a control group of local Eskimos and cesium-137 levels in caribou flesh. The model yields reasonably accurate approximations to the observed data. It is concluded that expected body burdens will be lower in July 1965 than those observed in July-August 1964, and an average body burden of approximately 0.9 Ci is estimated for the summer of 1965.

Continuing Caribou Crisis
Canadian Audubon, Nov. - Dec. 1963, Vol. 25, pp. 170.

Cottle, W. H.
Thermal responses and cold tolerance of young caribou calves, 1959. Canadian Wildlife Service, CWSC-800, Preliminary report, 11 pp. Table Discusses the possibility that calves born under adverse conditions (wind, temperature, and precipitation) could lead to loss of themoregulation and death.

Courtright, Alan M.
Results of some detailed analyses of caribou rumen contents. Alaskan Science Conference, 1959. Proceedings published, 1960, pp. 28-36, illus.

Courtright, Alan M. Cont.
With a series of 11 screens of varying mesh size, the author shows how results vary when compared to earlier rumen studies which disregarded "finer" particles. Results include a variance of 50-65% in the concentration of protozoans.

Cowan, Ian McTaggart
The diseases and parasites of big game mammals of western Canada.

Report on the Proceedings of the 5th Annual B. C. Game Convention 1951, pp. 37-64, illus.

A description of diseases and parasites which attack big game animals including caribou and elk.

Cowan, Ian McTaggart
The mammals of British Columbia.

British Columbia Provincial Museum, Department of Recreation and Conservation, Handbook No. 11, 1965, pp. 381-386, photo, map.

Describes the caribou with regard to measurements, antlers, and distribution.

Cowan, Ian McTaggart, and Brink, V. C.
Natural game licks in the Rocky Mountain National Parks of Canada.

Journal of Mammalogy, 1949, vol. 30, pp. 379-390, tables.

Describes the salt licks in the Rocky Mountain Parks and their locations. These are frequented by big game including elk and caribou.

Cowan, Ian McTaggart
Parasites, diseases and injuries of game animals in Banff, Jasper, and Kootenay National Parks, 1944.

Canadian Wildlife Service CWSC -314, photos and tables.

Animals examined included: Bighorn sheep, mountain goat, mule deer, elk, moose, and caribou. Discusses the parasites, bone injuries, and some bacterial diseases - which were still under study.

Cowan, Ian McTaggart
Some vital statistics of big game on over-stacked mountain range.

Transactions of the North American Wildlife Conference, 1950, vol. 15, pp. 581 - 588.

Cowan, Ian McTaggart Cont.
Describes the competition for declining food supply on winter ranges by big game animals - moose, elk, mule deer, and bighorn in the national parks (1943-46). Reproduction was affected in all but in elk although fertility was high, losses in prenatal and natal phases reduced the potential year class by 66-80% within 18 months of conception.

Cowan, Ian McTaggart
The timber wolf in the Rocky Mountain National Parks of Canada.

Canadian Journal of Research, Sect. D, Zoological Sciences, 1947, vol. 25(5), pp. 139 - 174, plates, maps.

The range of the timber wolf (Canis lupis occidentalis) is heavily populated with ungulates. The annual diet of the wolves in the national parks (1943-1946) was 80% big game. Elk contributed 47%. It was concluded that at the present, wolves were not detrimental to the wildlife in the parks.

Cowan, Ian McTaggart
Wildlife investigations in Banff and Jasper and Kootenay National Parks, 1943.

Ottawa Typewritten reports in files of Canadian National Parks Bureau, 72 pp.

Cringan, A. W.
History, food habits, and range requirements of the woodland caribou of continental North America.

Transactions of the 22nd North American Wildlife Conference, 1957, pp. 485-501, Tables.

Discusses the history and present status of the wood land caribou.

Crisler, Lois
Observations of wolves hunting caribou
Journal of Mamm logy, 1956, vol. 37 (3), pp. 337-346

Wolves (Canis lupus) seemed to have much trouble in catching a healthy caribou. A 13½ month observation period in the Brooks Range, Alaska showed that ½ of observed kills were sick or crippled caribou. The predation seemed highly selective for unhealthy animals.

Cromwell, D.
Counting the caribou
Alaska Sportsman, August 1960, Vol. 26, No. 8, p. 47, map.

Gives the locations and approximate numbers of 7 caribou herds in Yukon and Alaska. Population has increased since 1945.

Crowe, P. E.
Notes on some mammals of the southern Canadian Rocky Mountains.

American Museum of National History, Bulletin 1943, Vol. LXXX, Article XI, pp. 391-410.

In the Addenda are added 2 specimens of mountain caribou (Rangifer montanus Seton-Thompson). These specimens were taken at Thoral Creek near Mt. Robson, generally the locality for fortidens. The caribou taken agree more closely, however, with montanus in their dental characters.

Crum, Eloise B.
Redescription of Taenia Krabbei Moniez.

Journal of Parasitology, 1926, vol. 13 (1) pp. 34-41, illus.

T. Krabbei is redescribed by means of sections studies and the internal anatomy of the worm is reconstructed in the larval stage in the reindeer (Rangifer tarandus), and in the adult stage in the dog (Canis familiaris).

Darling, Frank F.
Caribou, reindeer and moose in Alaska.
Oryx, August, 1954, vol. 2, no. 5, pp. 280-85.

A summary of the investigation into the present and past status of these animals. The changes due to man's interference are discussed. The decline in reindeer introduced into Alaska in 1891 was due to forest fire and overgrazing of winter feed.

Darling, F. F., and Leopold, A. S.
What's happening in Alaska.
Animal Kingdom, Nov.-Dec., 1952, vol. 55, no. 6, pp. 170-174, illus.

Describes how the caribou have declined and have been restricted by climatic change and how the moose benefits from this. Fire restricts the lichen-climax caribou range. Concludes that Alaska needs to preserve climax forms of life (caribou) and their ranges but can simply manage earlier succession stages such as moose and deer.

Dauphine, T. C.
A wolf kills a caribou calf.
Blue Jay, 27(2), 1969, 99.

De Vos, Antoon
Behavior of barren-ground caribou on their calving grounds.

Journal of Wildlife Management, July, 1960, vol. 24, no. 3, pp. 250-258, tables.

The report of a study made in the Mackenzie and Keewatin areas on the leadership, banding size, composition, calving, calving progress, and calf behavior are discussed. Also the cow-calf relationship is discussed.

De Vos, A.
Caribou in an arctic spring.
Canadian Audubon, May - June 1960, vol. 22, pp. 86-89, illus.

Describes the activities of the caribou in the spring as well as other animals.

De Vos, A., P. Brokx, and V. Geist
A review of social behavior of the North American cervids during the reproductive period. AMER MIDLAND NATUR 77(2): 390-417. Illus. 1967.--A comparative study was made of the social behavior during the reproductive period of the genera Rangifer, Cervus, Alces and Odocoileus in North America. The social organization and gregariousness of various species are outlined. Rutting behavior consists of antler rubbing and thrashing, the construction of rutting, pits and wallows, rubbing of tarsal glands, and vocalization among males. Patterns of aggression and courtship behavior are discussed. The mating behavior of the various species is compared. Various aspects of maternal behavior, including parturition, nursing and grooming, hiding of the young, and the heeling, integration and early development of the young are discussed. Brief reference is made to vocalization and signals between mothers and their offspring and defense of the young by their mothers.

Desmeules, Pierre, and Joan Heyland.
Contribution to the study of the food habits of caribou. 1. Lichen preferences. NATUR CAN 96(3): 317-331. Illus. 1969. (Engl. sum) -- A study of the lichen preferences of 10 captive caribou was conducted in Laurentide Park (Quebec) during June and early July, 1966, using a 2-compartment feeder. On the basis of pre-trials, 5 lichen rations, Cladonia spp. (a mixture of C. alpestris, C. mitis and C. uncialis), Cladonia rangiferina, Cetraria islandica, Stereocaulon spp., and Arboreal lichens (a mixture of Usnea spp., Evernia mesomorpha and Alectoria spp.) were selected for detailed study. Each of these rations was compared with each of the other 4 during a series of 30 1-hr. trials. The 3 different criterion measures used yielded the following preference order: Cladonia spp., C. rangiferina, Arboreal lichens, Cetraria islandica, Stereocaulon spp.

Desmeules, Pierre, and Joan Heyland
Contribution to the study of the food habits of caribou. II. Daily consumption of lichens. NATUR CAN 96(3): 333-336. 1969. (Fr. sum.) --A study to determine the quantity of lichens consumed daily by caribou was conducted in Laurentide Park. Quebec, between June 16 and Oct. 4, 1966, using 13 captive caribou. Estimates of mean consumption of lichens, per animal, per day were derived from animals feeding as a group and singly; these were 18.2 and 17.0 lb., green weight, respectively. In addition, animals feeding as a group consumed approximately 5 lb. of commercial feed per animal.

Des Meules, P., Simard, B. R., and Brassard, J. M.
A technique for the capture of caribou, Rangifer tarandus, in winter. Canadian Field - Naturalist, 1971, vol. 85, pp. 221-229, illus., tables, photos.

Describes a new technique for the capture of caribou which was developed in Northern Quebec. It involves herding them towards nets by means of aircraft. An average of 8 caribou per drive were captured.

Dice, Lee R.
Notes on the mammals of interior Alaska.

Journal of Mammalogy, 1921, vol. 2 pp. 20 - 28.

An annotated list which includes a reference to Rangifer stonei.

Dikmans, G.
A note on Nematodirella (Nematoda: Trichostrongylidae) from three different hosts.

Proceedings of Helminth Society of Washington, 1935, vol. 2(1), pp. 58-59, illus.

Describes N. longispiculata longispiculata from Rangifer tarandus.

Dilworth, Tim G., and Joseph A. McKenzie
Attempts to identify meat of game animals by starch-gel electrophoresis. J WILDL MANAGE 34(4): 917-921. Illus. 1970.--Total protein, esterase, and lactic dehydrogenase patterns of muscle extracts from domestic cow (Bos taurus), pig (Sus scrofa), and sheep (Ovis aries), and from moose (Alces alces), deer (Odocoileus virginianus), and caribou (Rangifer tarandus) were compared. The electrophoretic patterns were genera specific. Electrophoretic analysis shows promise as a method for identification of meat for game law enforcement.

Downing, S. C.
Barren-ground caribou
Canadian Nature, Jan. - Feb. 1950, Vol. 12, pp. 12-13 illus.

Dutilly, A. A.
A bibliography of reindeer, caribou and musk-ox.

Washington Office of the Quartermaster General, Dept. Army, Environmental Protection Section, Report 129, 462 pages.

List of 2, 422 papers in periodicals, documents, works, references, etc. Many are annotated, and includes an index, glossary to the vernacular names of animals, and a list of scientific names for various species.

Eakin, H. M.
The Cosna-Nowitna Region.

U. S. Geological Survey, Bulletin No. 667, 1918, pp. 1-54.

Eddleman, L. E., Remmenga, E. E., and Ward, R. T.
An evaluation of plot methods for alpine vegetation.
New York, Bulletin of the Torry Botanical Club, Nov. - Dec. 1964, Vol. 91, No. 6, pp. 439-450.

A study in northern Colorado to evaluate plot shape, size and number for a quantitative study of alpine vegetation. Placement designs were block random and random. Densities for 7 species (both common and uncommon) were determined. The evidence from the study favoured slightly, rectangles over squares.

Edwards, R. Y.
Fire and the decline of a mountain caribou herd.
Journal of Wildlife Management, 1954, vol. 18, no. 4, p. 521.

Fire caused the decline of the Wells Gray herd due to the fact that since 1926 around 70% of the forest below 4,000 feet has been burned. The caribou are now confined to the unburnt remainder. In order to increase the herd, it will be necessary to protect both the herd and the lowland forest from fire.

Edwards, R. Y., and Ritcey, R. W.
Foods of caribou in Wells Gray Park, British Columbia.
Canadian Field-Naturalist, Jan. - March, 1960, vol. 74, no. 1, pp. 3-7.

During the winter the main source of food for the caribou is arboreal lichens of the genus Alectoria. 5 subspecies of these lichens are present in the park and they appear to be essential for the winter

Edwards, R. Y. and Ritcey, R. W. Cont.
survival of the caribou. The study is based on 93 observations of feeding and the examination of 13 caribou stomachs.

Edwards, R. Y.
Land form and caribou distribution in British Columbia.

Journal of Mammology, August 1958, vol. 39, no. 3, pp. 408-412, map.

It is suggested that mountainous areas inhabited by Rangifer arcticus have a characteristic land form. They have rolling mountains with summits above the tree lines or are elevated tablelands. These areas in B. C. permit the existence of extensive alpine-arctic meadows associated with open, subalpine forests.

Edwards, R. Y., Soos, J., and Ritcey, R. W.
Quantitative observations on epidendric lichens used as food of caribou.
Ecology, 1960, vol. 41 (3), pp. 425 - 430

The caribou (Rangifer arcticus Richardson) in Wells Gray Park, B.C. appear to be dependent on epidendric lichens (Alectoria Ach.) for their winter food. The purpose of the study was to evaluate the amount of food available to the caribou. This varies according to several factors including snow depth. The lichens appear in great abundance on timberline trees and the high forests are the most favoured habitat for these caribou in the winter.

Elkins, W. A.
Pressing problems in administration of wildlife resources in Alaska pp. 265-81. in:

Science in Alaska: Selected Papers of the Alaskan Science Conference, Nov. 1950, H. B. Collins, editor, Arctic Institute of North America Special Publication No. 1 June 1952.

Discusses the administration of wildlife in Alaska including caribou

Epsmark, Y.
Rutting behavior in reindeer (Rangifer tarandus L)
Animal Behavior, 1964, vol. 12, pp. 159-163, photos, tables.

Describes the rutting behavior of reindeer at Gallivore in Swedish Lapland in 1962.

Erickson, A. B., and Highby, P. R.
Parasites of the woodland caribou.

Erickson, A. B., and Highby, P. R. Cont.
Journal of Parasitology, 1942, vol. 28 (3), p. 423.

Parasites taken from caribou in Saskatchewan and 1 in Minnesota include: Taena Krabbel, Dictyocaulus viviparus, Setaria cervi, Cephenomyia phobifer, Moniezia expansa, and flukes.

Ericson, Carol A.
The onotogeny of vocalization and related behavior in a small herd of reindeer, Rangifer tarandus tarandus. (abstract)

Bulletin of the Ecological Society of America, December 1970, vol. 51, no. 4, p. 40.

Evans, H. Frank
An investigation of woodland caribou (Rangifer tarandus caribou) in northwestern United States. TRANS N AMER WILDLIFE NATUR RESOURCES CONF 29: 445-453. Maps. 1964.

Farley, Frank L.
Changes in the status of certain animals and birds during the past fifty years in central Alberta.
Canadian Field - Naturalist, December 1965, vol. 39, p. 201.

Discusses the fact that caribou at one time ranged as far south as St. Paul de Metis between Frog Lake and Lac La Biche.

Figgins, J. D.
Description of a new species of caribou from the region of the Alaska-Yukon boundary.

Proceedings of Colorado Museum of Natural History 1919, vol. 3, 3 pp. - plates.

Flinn, P.
The caribou of northern Idaho.

Idaho Wildlife Review, 1959, vol. 11 (5), pp. 10-11.

Discusses the precarious position of the caribou in northern Idaho. Causes for the decline were fire, logging and man. Only a few calves are seen per year - no more than 6/100 caribou. Also discusses the caribou's habitat in Idaho.

Fraser, F.
Wildlife management in the Yukon Territory.
Forestry Chronicle, June 1953, vol. 29, no. 2, pp. 150-157.

Gives statistics for the number of caribou taken by non-resident hunters for the years 1949-50 and 1950-51.

Freuchen, Peter.
Extinction threatening the caribou of Canada (text in Danish and Eskimo).

Atuagagdliutit, Grønlandsposten, Dec. 15, 1955, U Kiut 95-iat, nr. 25-26, pp. 29, 39, illus.

Caribou in Canada have been reduced from 668,000 to 300,000 animals (1950 - 1955). Strict protection laws should be enforced and predatory animals (wolves and wolverines) should be reduced.

Fuller, W. A.
Caribou checking station, Dawson City, Yukon, October, 1957.

Canadian Wildlife Service, CWSC-729.

Fuller, W. A.
Notes on caribou in Wood Buffalo Park, winter of 1950-51.

Canadian Wildlife Service, CWSC-206, 1951.

Gives a general description of the barren-ground caribou in Wood Buffalo Park. Includes the number of herds involved, peculiarities of distribution, and utilization.

Fuller, W. A.
Observations on Yukon caribou, 1956-57.

Canadian Wildlife Service, CWSC 687, 8 pp.

Describes the Yukon caribou R. a. stonei and R. a. osborni. Discusses the most important 4 herds in the Yukon and includes a calf count (1956-57) from the Dawson herd. Recommends that predator control operations on winter range be continued and that a survey on diseases and parasites be done on animals taken from hunters.

Georgeson, Charles C.
Reindeer and caribou.

Seattle, Washington, the Shorey bookstore, 1967, pp. 377-390, plates, tables. (U.S. Dpt. of Agriculture, Bureau of Animal Industry.) Circular no. 55.

Gibbs, H. C.
Some haematological values for barren-ground caribou.
Canadian Journal of Comparative Medicine, and Veterinary Science, May, 1960, vol. 24, no. 5, pp. 150-152.

The average haemoglobin value for Rangifer arcticus is 14.5. This is compared with the values for other deer.

Gibbs, Harold C.
A redescription of Avitellina arctica Kolmakov, 1938 (Anoplocephalidae: Thysanosominae), from Rangifer arcticus arcticus in northern Canada. Jour. Parasitol. 46(5): 624-628. Illus. 1960.--This paper supplements the somewhat meager description of the type material. The finding of Avitellina arctica represents the first report of a sp. of the sp. of the genus of cestodes from the American continent.

Gillese, J. P.
Caribou population decline.

Ottawa, Northern Affairs Bulletin, 1956, no. 7, pp. 4-6.

The population decline in caribou (60% from 1948-55) is attributed to wolves and unnecessary slaughter by Eskimos.

Glenn, L. P.
Caribou report.

Alaska. Department of Fish and Game, Federal Aid in Wildlife Restoration. Project W-15-R-1 and W-15-R-2, 1967, 36 pp.

Grant, M.
The caribou.

New York Zoological Society, 7th Annual Report, 1902, 24 pp., plates, map.

Report on the American species of the genus Rangifer (including separate studies on Barren ground, woodland, and Newfoundland caribou). Discusses the name, classification, types, and distribution.

Grant, Madison
Caribou.

In: Gray, Prentiss N ., ed. et. al. Records of North American big game. New York Derrydale Press, 1932, 178 pp. illus.

Green, H. U.
The wolf of the Banff National Park, Alberta, 1951.

Canadian Wildlife Service, CWSC-450, Tables.

Describes the physiography, physical characters, behavior, habitat, prey relationship etc. of wolves in Banff National Park.

Green, Morton and Jason A. Lillegraven
Significance of Rangifer in the Herrick Formation of South Dakota. PROC S DAK ACAD SCI 44, 48-51, Illus. 1965.--A basal fragment of antler of a Pleistocene caribou closely referable to the woodland species, Rangifer tarandus, an inhabitant of the Canadian Life-Zone was found in the Herrick Formation of southeastern South Dakota. This represents a 1st record for the state. The well authenticated Wisconsin to Recent distribution of Rangifer plus the occurrence of Stegomastodon, a form not known after the Kaisan, indicates that 2 biostratigraphic levels are present.

Guilday, John E.
Archaeological evidence of caribou from New York and Massachusetts (USA, bones, Rangifer tarandus). J MAMMAL 49(2): 344-345, 1968.

Gunderson, H. L., Breckenridge, W. J., and Jaroz, J. A.
Mammal observations at Lower Back River, Northwest Territories, Canada.

Journal of Mammology, May 1955, vol. 36, no. 2, pp. 254-259.

An annotated list of mammals collected on the Back River. Includes barren-ground caribou. There were signs of caribou but none were seen.

Gunderson, H. L., Breckenridge, W. J., and Jarosz, J. A.
Mammal observations, Lower Back River, N. W. T. 1954.

Canadian Wildlife Service, CWS 8, 1954.

Briefly describes signs of Rangifer arcticus.

Hadwen, S.
Cyst - forming protozoa in reindeer and caribou and a sarcosporidian parasite of the seal (Phoco richardi).

American Veterinary Medical Association Journal, 1922, vol. 61, (n.s. 14), pp. 374-382, illus.

Article describes a parasite Sarcosporidia and a new species Fibrocystis tarandi. Also included is the probable effect the cysts have on the caribou and reindeer.

Hadwen, S.
Geographical races of animals with especial reference to reindeer.

Transactions of the Royal Society of Canada 1932, Series 3, vol. 26, pp. 237-256.

Hadwen, S. and Palmer, L. J.
Reindeer in Alaska.

U. S. Dept. of Agriculture Bulletin No. 1089, 1922, 74 pp.

Hall, Raymond E. and Kelson, Keith R.
The Mammals of North America, Vol II.

New York, Ronald Press Co., 1959, pp. 1017-1021, illus., maps.

Gives a general description of the caribou and the location of the various species and subspecies.

Hammel, Harold T. et. al.
Thermal and metabolic measurements on a reindeer at rest and in exercise.

U. S. Air Force: Arctic Aeromedical Laboratory, Technical documentary report 61-54, Fort Wainwright, Alaska, June, 1962, 34 pp., illus. tables.

The report studies the adaptations to cold stress when at rest and the heat-dissipating capacity when in motion. Includes oxygen consumption, evaporative heat loss, temperature of expelled air and surface temperature of various parts of the body.

Hanson, Wayne C.
Cesium - 137 body burdens in Alaskan Eskimos during the summer of 1965. SCIENCE 153(3735): 525-526. 1966.--Cesium-137 body burdens of Anaktuvuk Pass, Alaska, residents during the summer of 1965 were about 30% less than during 1964. Lower amounts of cesium-137 in the people reflected a similar decrease of this isotope in caribou flesh, which serves as the principal food of the natives.

Hanson, W. C.
Cesium-137 in Alaskan lichens, caribou, and Eskimos. HEALTH PHYS 13(4): 383-389. Illus. 1967.--Cesium-137 concentrations in Alaskan arctic ecosystem componesis during the period 1962-1965 varied with seasonal and environmental conditions, emphasizing the important influence of ecologic factors upon fallout accumulation in the lichen-caribou (reindeer)-man food chain. Concentrations in lichens at Anaktuvuk Pass, Alaska increased with time and varied among several species. Caribou flesh contained maximum ^{137}Cs levels during winter periods and lowest values during summer months corresponding to lichen utilization. Body burdens in natives utilizing the caribou as a food base reflected the ^{137}Cs cycle in caribou flesh, but lagged by a few months. Maximum values occurred during summer and minimum values were found during mid-winter. Biological half-time of 137 Cs was estimated to be about 13 years in lichens by measuring retention of 134 Cs artificially applied to natural

Hanson, W. C.
lichen communities, three to five weeks in caribou and about 65 days in Eskimos. Cesium - 137 concentrations increased by about a factor of two at each successive trophic level of the food chain, The trend with time was one of steady increase, although unusual variations occurred during 1964 and 1965 and were believed to be associated with caribou migration patterns. Recent data suggest ^{137}Cs body burdens of the Anaktuvuk Pass Eskimos will continue to increase during the summer of 1966 in contrast to the downward trend reported in Scandinavia.

Hanson, W. C., F. W. Whicker, and A. H. Dahl
Iodine 131 in the thyroids of North American deer and caribou: Comparison after nuclear tests. Science 140(3568): 801-802. Illus. 1963.--Concentrations of I^{131} in the thyroids of deer from Washington, Colorado, and Maryland, and of caribou from Alaska were measured after the resumption of nuclear weapon tests by the U.S.S.R. on 1 September 1961. Maximum concentrations occurred nearly 2 months after the first nuclear test and then decreased at an effective half-time of about 15 days. Thyroids from Washington and Colorado deer showed the highest concentrations, thyroids from Alaskan caribou the lowest.

Harper, Francis
The Barren-ground caribou of Keewatin.

University of Kansas, Museum of Natural History, Miscellaneous Publication No. 6, October, 1955, pp. 1 - 163, figs.

Harper, Francis.
Caribou and Eskimos (and the fall-out problem) I U C N Bull. 6. 6-7. 1963.--Excerpts from a forthcoming report emphasize the fall-out problem in the decrease of caribou and possible effects on the Eskimo population.

Harper, Francis
Mammals of the Athabaska and Great Slave Lakes region. Journal of Mammology, 1932, vol. 13, pp. 19-36.

An annotated list which includes both barren-ground and woodland caribou references gives places where these animals have been sighted by local residents.

Harper, T. A. , Ruttan, R. A., and Benson, W. A.
Hydatid disease (Edrinococcus Granulosus) in Saskatchewan big game.

Transactions of the 20th North American Wildlife Conference, 1955, pp. 198-208, illus.

Harper, T. A., Ruttan, R. A., and Benson, W. A., Cont.
An attempt was made to collect specimens of Hydatids from all Saskatchewan big game. Includes barren-ground caribou. The sample for caribou was small, but the evidence suggests a relatively high rate of infection.

Hart, J. S. et. al.
Influence of climate on metabolic and thermal responses of infant caribou.
Canadian Journal of Zoology, Dec. 1961, vol. 39, pp. 845-856, tables, graphs.

Measures the metabolic and thermal responses of infant caribou to climate. Temperature regulation was well-established at birth but the calves were very sensitive metabolically to the cold, wind or precipitation. Storms on the barrens were severe enough to produce some mortality.

Hart, J. S., and Heroux, O.
The influence of climate on metabolic and thermal responses of baby caribou at Mosquito Lake, N. W. T., 1958.

Canadian Wildlife Service, CWS-413 - 1958.

Discusses the influence of climate on baby caribou. Includes cold toleration.

Hatcher, V. B., E. H. McEwan, B. E. Baker.
Caribou milk: 1. Barren-ground caribou (Rangifer tarandus groenlandicus): Gross composition, fat and protein constitution. CAN J ZOOL 45(6 Part 1): 1101-1106. Illus. 1967.--Colostrum and early milk were obtained from a caribou captured in the Beverly Lake area of the Northwest Territories and maintained in captivity at the Wildlife Research Unit of the University of British Columbia. The gross composition of the colostrum and early milk, the amino acid composition of the casein and whey protein isolated from the early milk, and the fatty acid composition of the early milk were determined.

Hemming, James E.
The distribution and movement patterns of caribou in Alaska.

Alaska Dept. of Fish and Game, Game Technical Bulletin No. 1 July 1971, 60 pp., photos, maps.

A report describing the present distribution and movement patterns of caribou on the basis of 22 years of studies in Alaska. Includes a description of the major herds, minor herds and the introduced herds.

Hemming, J. E. and Glenn, L. P.
Caribou report.

Alaska Dept. of Fish and Game, Federal Aid in Wildlife Restoration, Project W-15-R-2, 1968, 41 pp.

Hemming, J. E. and Glenn, L. P.
Caribou report.

Alaska Dept. of Fish and Game, Federal Aid in Wildlife Restoration, Project W-15-R-3 and W-17-1, 1969, 37 pp.

Hemming, J. E., and Pegau, R. E.
Caribou report.

Alaska Dept. of Fish and Game, Federal Aid in Wildlife Restoration, Project W-17-1 and W-17-2, 1970, 42 pp.

Henshaw, J.
The activities of the wintering caribou in northwestern Alaska in relation to weather and snow conditions.

International Journal of Biometeorology, Jan. 1968, vol. 12, no. 1 pp. 21-27.

The study observed the activities of wintering caribou in relation to weather and snow cover phenomena and assessed the contributions that this relationship made towards the herds viability.

Henshaw, John
Conflict between Dall sheep and caribou. CAN FIELD-NATUR 84(4): 388-390. Map. 1970 (recd 1971) --Observations on habitat preference and behavioral interactions between dall sheet (Ovis dalli) and caribou (Rangifer tarandus) when they encounter each other are given.

Henshaw, John
Consequences of travel in the rutting of reindeer and caribou (Rangifer tarandus). ANIM BEHAV 18(2): 256-258. 1970.--Observations of rutting reindeer indicate that during herding, breeding is greatly intensified and that the general pattern of courtship behavior exhibited in stationary groups does not occur. This may be explained by concepts which illustrate movement, high density of animals, high excitement and antler contact as possible erotic stimuli. The maintenance of movement, as well as high density, appears to be important to caribou during the rutting season.

Henshaw, J. A.
An environmental study of wintering caribou in northwestern Alaska.

London, Institute of Biology, M. A. Thesis, 1964, 154 pp., figs., tables, map. (Ann Arbor, University Microfilms Inc., 1964).

Henshaw, J.
A theory for the occurrence of antlers in females of the genus Rangifer.
Deer 1, 1968 b, pp. 222-226, errata 274.

Hewitt, C. G.
Mammals of the alpine club expedition to Mt. Robson.
Canadian Alpine Journal, Special No. 1912, 44 pp.

Hillaby J.
The wind, the white man and the caribou, Rangifer tarandus population number recovery.

New Scientist 38(595), 1968, 222-224.

Hobbs, Wm. H.
Caribou and the meat shortage
Science, 1943, vol. 97 (2521), p. 377.

Caribou herds in Alaska could be a potential source of meat. It could be shipped to the southwest Pacific bases.

Hock, Raymond J., and Victor Cottini
Mammals of the Little Susitna Valley, Alaska. AMER MIDLAND NATUR 76 (2): 325-339, illus. maps. 1966.--The mammalian fauna of a valley in the Talkeetna Mountains, near Anchorage, Alaska, was studied over a 5-year period. The area ranges in altitude from 445 to 1185 m. Nearly all of this area is above the timberline, but 5 vegetative zones are recognizable. The Valley has cool, wet summers and cool winters of heavy snowfall. The annual cycles of vegetation, climate and mammal occurrence are discussed. Thirty species of mammals (including the caribou, no longer present) are recorded from this small area. Ten other species are known from nearby areas, so the species count may be much larger. The most obvious mammals, the Arctic ground squirrel and hoary marmot, were the objects of special study. Notes on the annual cycle and life history of these latter species are included.

Hoff, G. L. et. al.
Isolation of a Bunyamwera group arbovirus from a naturally infected caribou.
Journal of Wildlife Diseases, 6(4), 1970.

Hollister, N.
Mammals of the Alpine Club expedition to the Mt. Robson region. Canadian Alpine Journal, 1913, Special No., 44 pp. illus.

Discusses Rangifer fortidens.

Hollister, N.
New mammals from Canada, Alaska, and Kamchatka.

Smithsonian, Miscellaneous Collection 56, no. 35, Publication 2072, 1912, pp. 8, illus.

Describes Rangifer excelsifrans, R. fortidens, and R. phylardus.

Holzworth, John M.
The wild grizzlies of Alaska; a story of the grizzly and big brown bears of Alaska . . . together with notes on the mountain sheep and caribou . . .
New York, Putnam 1930, 417 pp., illus.

Pages 388-408 are largely devoted to sheep and caribou. Gives the measurements and locality for each animal taken.

Hornaday, W. T.
Campfires in the Canadian Rockies.

New York, Chas. Scribner's Sons, 1923, 353 pp.

Jacobi, Arnold
Das Rentier Eine zoologische monographie der Gattung Rangifer. Zool. Anzeiger, Erganzungsband zu Band 96, 1931, pp. 1-264, plates, figs, maps.

A comprehensive monograph of the genus Rangifer. Reviews the prehistory of the reindeer, and also its general anatomy and physical characteristics. Discusses possible origins of various branches of Rangifer in Europe, Siberia and North America. The habits of various types of Rangifer are discussed in detail, their movements, diet, enemies, diseases, and behaviour toward man and other animals.

Johnson, Charles E.
Notes on the mammals of Northern Lake County, Minnesota. Journal of Mammology, 1922, vol. 3, pp. 33-39.

Includes a reference to Rangifer caribou caribou. Several were reported seen in 1917. Little evidence that caribou are there.

Johnson, Charles E.
Recollections of the mammals of northwestern Minnesota.

Journal of Mammalogy, 1930, vol. 11, pp. 435-452.

A recollection of mammals in Minnesota including the woodland caribou which appeared in large numbers.

Johnson, Donald R.
Historic record of caribou in Central Idaho (Rangifer tarandus). MURRELET 48(3): 57. 1967 (1968).

Jones, F. F.
Movements, distribution, and numbers.

in: Caribou investigations. Alaska Dept. of Fish and Game, Federal Aid in Wildlife Restoration, Project W-6-R-3, 1963, pp. 63-66.

Jones, Robert D., Jr.
Raising caribou (Rangifer tarandus) for an Aleutian introduction. J WILDLIFE MANAGE 30(3): 453-460. Illus. Map. 1966.--Caribou calves captured in 1958 and 1959 to interior Alaska were moved to Adak Island in the central Aleutians, where they were held about 2 months in semi-domesticity and then released. Bottle-feeding and methods of care are described. Since their release the original 23 have expanded to 83 animals in five reproductive seasons. The herd is now wild in disposition, produces unusually large animals with commensurate antler growth, and is free of the parasites associated with native herds.

Judd, W. W.
Mammals observed in the Yukon Territoty, Canada, in the summer of 1949.

Journal of Mammalogy, 1950, vol. 31, pp. 360-361.

A list of mammals observed in the Dawson and Whitehorse areas. The shed antlers of Rangifer arcticus were found on slopes.

Kelsall, John P.
Barren-ground caribou and their management.
Canadian Audubon Magazine, Nov.-Dec. 1963, vol. 25, no. 5, pp. 144-149.

The population of Rangifer tarandus has declined from 2-3 million to 278,900 in 1955. Over utilization by man is a major factor. Sport hunting of caribou is abolished and hunting only allowed by Treaty Indians.

Kelsall, J. P.
Barren-ground caribou movements in the Canadian Arctic.

Transactions of the North American Wildlife Conference, 20th, 1955, pp. 551-560, Map.

Discusses the movements, distribution and numbers of Rangifer arcticus arcticus after six years of study.

Kelsall, J. P.
The caribou.

Canada, Dept. of Indian Affairs and Northern Development, Canadian Wildlife Service, 1968, illus., photos, maps, 340 pp.

Discusses the caribou, its habits, habitat, range studies, migration, population dynamics, and factors limiting population.

Kelsall, J. P.
Caribou calving, 1953.

Canadian Wildlife Service - CWSC 272, tables.

Discusses movements during the calving period, the calving grounds, calf behavior, precocity, grazing, behavior of animals associated with calving, and calf mortality factors.

Kelsall, J. P.
Caribou feeding habits on forested winter ranges, January, 1957.

Canadian Wildlife Service CWSC-269, Tables.

Discusses the winter forested ranges of Rangifer arcticus arcticus (Richardson). Includes feeding habits and plants found in feeding craters.

Kelsall, J. P.
Caribou winter range study, 1950-51.

Canadian Wildlife Service, CWSC - 61.

Kelsall, J. P.
Continued barren-ground caribou studies.

Canadian Wildlife Service, Wildlife Management Bulletin Series I, no. 12, February 1957, 148 pp., figs., maps.

A study based on three years work in the MacKenzie District, N.W.T., which discusses the habits of the caribou, its behaviour, enemies, etc.

Kelsall, J. P.
Cooperative studies of barren-ground caribou 1957-58.

Canadian Dept. of Northern Affairs and National Resources, Wildlife Management Bulletin Series 1, No. 15, August 1960, 145 pp., maps.

A report on the movements of the study herd, population, birth of calves, predation, wind chill study, range studies, accidents, diseases, parasites, and human utilization.

Kelsall, J. P.
The decline of the caribou.

Oryx, August 1964, Vol. 7, No. 5, pp. 240-246, illus.

Discusses the population of R. tarandus arcticus in Canada prior to 1955 and of recently initiated studies on the species.

Kelsall, J. P.
Forest fire on caribou winter ranges, 1957.
Canadian Wildlife Service, CWSC-276, maps, tables.

Discusses the importance of forest fire in the ecology of the caribou and describes the study area and methods used.

Kelsall, J. P.
Interaction between barren-ground caribou and muskrats.
Canadian Journal of Zoology, May 1970, Vol. 48, p. 605.

Describes the systematic exposure, trampling and eating of muskrat pushups on the ice in winter. The caribou may be attracted by the green vegetation therein, but the muskrat may be frozen out.

Kelsall, John P.
Warble fly distribution among some Canadian caribou.

Paper for presentation at the First International Reindeer Caribou Symposium, University of Alaska, August 9-11, 1972, graphs, map, tables, 13 pp.

Suggests that the warble fly infestation in caribou can be judged from the number of breathing holes or scars on tanned hides. Assessed by sex of symmetrical, geographical, and numerical distribution of larvae among nine caribou herds in Canada. The larvae are approximately twice as abundant on the posterior as on the anterior and tend to be greater on males. Temperature in particular seems to account for the differences in infestations between herds.

Kevan, Peter G.
The caribou of the northern Yukon Territory - a history of man's interest in them with special reference to wildlife biology. Dec. 1970.

Canadian Wildlife Service, CWS-622, Dec. 1970, 47 pp., tables, maps. The report consolidates previous work done by C.W.S. in the Yukon Territory; report is divided into 4 sections.

Kilham, W. H. Jr.
Wild sheep and the wilderness of the Brooks range.

Explorers Journal, 49(1), 1971, 17-28.

Kindle, E. M.
Wildlife of Jasper Park.

Canadian Field-Naturalist, 1928, vol. 40, no. 5, pp. 111-118.

Briefly mentions the caribou.

Klein, D. R.
Interactions of Rangifer tarandus reindeer and caribou with its habitat in Alaska.

Rustatteteellisia Julkaisuja, 30 (1970), 289-293.

Klein, David R.
Tundra ranges north of the boreal forest. J RANGE MANAGE 23(1) 8-14. Illus. Maps. 1970.--Tundra rangelands of Alaska and northern Canada occupy about 200,000 and 900,000 mi^2 respectively. The tundra supports far lower numbers of large grazers than other natural areas, averaging less than 100 lb. per square mile. Forage quality of tundra plants is high because of rapid growth and wide variation in seasonal progression of growth. The native grazers, caribou and muskoxen appear to offer the best potential for conversion of tundra vegetation into commodities utilizable by man.

Klein, David R. and Fritz Schönheyder.
Variation in ruminal nitrogen levels among some Cervidae. CAN J ZOOL 48(6): 1437-1442. Illus. 1970 (recd. 1971).--Among black-tailed deer (Odocoileus hemionus sitkensis), roe deer (Capreolus capreolus) and reindeer (Rangifer tarandus), N levels in the contents of the rumen show consistent patterns of variation. Among deer of each species on the same range during the same season, the animal-derived N component of the rumen contents decreases as the vegetative N component increases. This inverse relationship may result from one, or more likely both, of the following causes. The ability of the ruminant to maintain a fairly constant rumen environment to allow for its most efficient function or an adaptability in these deer species to compensate for low N levels in the forage by recycling of N through the saliva and further conservation of ruminal N by recycling it through successive generations of microbial populations. The apparent ability to compensate for variations in forage N levels is limited when deer are on range of general poor quality or during fall and winter when forage N levels are reduced.

Krebs, Charles J.
Population dynamics of the Mackenzie Delta reindeer herd, 1938-1958.

Arctic, June, 1961, vol. 14, no. 2, pp. 91-100, graphs, tables.

Discusses the size fluctuations in government and Eskimo herds of Rangifer tarandus in the Mackenzie District. Eskimo herds gradually declined. Describes the losses, birth rates, dispersal and death rates.

Krebs, C. J., and Cowan, Ian McTaggart
Growth studies of reindeer fawns.
Canadian Journal of Zoology, 1962, vol. 40, no. 5, pp. 863-69. tables graph.

Describes the growth patterns of 4 animals kept with their mothers in the Mackenzie Delta. 3 phases of growth were distinguishable.

Kuyt, E.
Caribou - wolf interrelations, 1962.

Canadian Wildlife Service, CWSC - 978, 1963, tables.

Discusses wolves and their interrelations with caribou.

Kuyt, E.
Movements of young wolves in the Northwest Territories of Canada.

Journal of Mammology, May 1962, vol. 43, no. 2, p. 270.

Mentions the suggestion that wolves raised on the summer caribou range will move with the caribou in the winter.

Lent, Peter C.
Caribou calving study, northwestern Alaska.

Alaskan Science Conference, 1960, (Proceedings published 1961,) pp. 27-36, maps.

Uses aerial observations to describe the conversion at the calving ground and its natural characteristics. Traces post-calving movements and tagging operations on the calves, weight and measurements were also taken. The tagging method is described in some detail.

Lent, Peter C.
The caribou of northwestern Alaska. In: Environment of the Cape Thompson Region, Alaska, United States Atomic Energy Commission: Oak Ridge, Tenn. 491 - 517. Illus. Map. 1968.--The caribou population of northwestern Alaska (between 160,000 and 200,000

Lent, Peter C. Cont.
individuals) occupies an area of up to 140,000 square miles at the time of its maximum dispersal in midwinter. During the migration in April and May, the cows coverage upon a definite calving area in the northern foothills of the Arctic Slope. Here the calves are born, primarily between May 25 and June 15. After the initial calving-season mortality, the percentage of females over 24 months old with calves was 73 in 1960, 42 in 1961, and 53 in 1962. In July 1961 these females over 24 months old were estimated to be 47% of the population, excluding the calves (about 61,000 cows). An unusually low natality was recorded in 1961. After reaching a maximum concentration at the end of June, the population undergoes further movements and dispersals, reaching approximately the winter distribution by Nov.

Lent, P. C.
Caribou investigation, Northwest Alaska, 1960.

Canadian Wildlife Service, CWS - 217, maps photos.

Discusses pre-calving movements, calving, population dynamics, etc. of Alaskan caribou.

Lent, Peter C.
Observations on antler shedding by female barren-ground caribou.

Canadian Journal of Zoology, May 1965, vol. 43, no. 3, pp. 553-558 figs.

A study in northwestern Alaska indicated that most barren cow caribou had shed their antlers by the start of the calving season. Nearly all pregnant cows retained antlers for up to 1 week post partum. This retention could be explained by high estrogen production levels and the shedding may be triggered by a rapid decrease in estrogen output.

Lent, P. J.
Rutting behaviour in a barren-ground caribou population.

Animal Behaviour, 1965, vol. 13, no. 2 and 3, pp. 259 - 264, table

Observations were made in October and November, 1960-61 in northwest Alaska. Rutting peak was reached about the third week of October during migration and no harem organization was formed in the migration.

Lentfer, J.
Caribou report.

Alaska - Dept. of Fish and Game, Federal Aid in Wildlife Restoration,

Lentfer, J.
Project W-6-R-56, 1965, 20 pp.

Lentz, C. P. and Hart, J. S.
The effect of wind and moisture on heat loss through the fur of newborn caribou.

Canadian Journal of Zoology, 1960, vol. 38, pp. 679-688, graphs.

Factors such as erectness of fur, direction of the hair, grain of the fur with respect to direction of air movement and wetness of the skin affected heat transfer.

Leopold, Aldo S., and Darling, F. F.
Effects of land use on moose and caribou in Alaska.

Transactions of the North American Wildlife Conference, 18th, 1953, pp. 553-562.

A report of a four-month survey in 1952, of big game ranges. Deals with ecological similarities of moose and caribou - especially with regard to food, effect of settlement, influence of reindeer introduction, effect of hunting and predation, and management prospects.

Leopold, A. S., and Darling, F. F.
Wildlife in Alaska; an ecological reconnaissance.

New York, Ronald Press, 1953, 129 pp., plates, maps, tables.

A report on the results of a study of horned animals (1952, June to September), in Alaska (including Mt. McKinley National Park). Discusses wildlife in general, natural resources, and native peoples relation to the wildlife. Moose, caribou and reindeer are dealt with in detail. Stresses the importance of wildlife management.

Lewin, Victor, and Stelfox, John G.
Functional anatomy of the tail and associated behaviour in woodland caribou.

Canadian Field-Naturalist, 1967, vol. 81, no. 1, pp. 63-66, illus.

The paper discusses the nature and function of the tail of woodland caribou. The normal alarm behaviour involves tail erection frequently accompanied by a circling motion. This gives a 2-fold alarm system: visual and olfactory.

Llano, G. A.
Utilization of lichen in the Arctic and Subarctic.

Economical Botany, 1956, vol. 10, no. 4, pp. 367-392, illus.

An analysis of the economic importance of lichens.

Loughrey, A. G. and Kelsall, J. P.
The ecology and population dynamics of the barren-ground caribou in Canada, Rangifer tarandus groenlandicus.

In: Ecology of the Subarctic regions, Proceedings of the Helsinki Symposum Sponsored by UNESCO, 1970, pp. 275 - 280.

MacFarlane, R.
Notes on mammals collected and observed in the northern Mackenzie River District, Northwest Territories of Canada, with remarks on explorers and explorations of the far north.

U. S. National Museum Proceedings, 1905, vol. 28, pp. 679 - 685.

Describes the location and use of woodland and barren-ground caribou.

MacGregor, J. G.
Pack saddles to Tête Jaune Cache.

Toronto, McClelland and Stewart Ltd., 1962, 256 pp.

Maki, Sajiro
On the conjunction and separation of the sex chromosomes of Mammalia, during the 1st maturation division (In Japanese).

Dobutsugaku Zasshi (Zool. Mag.) 1947, vol. 57,(10), pp. 157-158.

A summary of the author's ten year study of the separation of sex chromosomes in 40 species of Mammalia. The X is J- or V shaped; Y is attached to the longer arm (Pteropus, Rangifer tarandus).

Manery, J. F., Barlow, J. S. and Forbes, J. M.
Electrolytes in tissues, red cells, and plasma of the polar bear and caribou.

Canadian Journal of Zoology, 1966, vol. 44, no. 2, pp. 235-40, tables.

Na, Ca and electrolytes in caribou red cells did not differ from the values in other Artiodactlya.

Manuel, Frank
Newfoundland big game aerial census techniques, 7 pp. illus., map, tables.

Discusses the various techniques for aerial census for big game - including caribou.

Manville, R. H.
The mammals of Drummond Island, Michigan.
Journal of Mammology, August 1950, vol. 31, no. 3, pp. 358-9.

Notes that Rangifer caribou are no longer present on the island.

Manweiler, J.
Woodland caribou from Saskatchewan.

Parks and Recreation, Nov. 1938, vol. 22, no. 3 pp. 134-138.

Successfully caught with a rope snare.

Marvin, A.
Caribou! Caribou!

Rod and Gun, Oct. 1968, vol. 70, pp. 10-13, illus.

McCabe, R. A.
Observations on the disappearance of shed caribou antlers.

Journal of Mammology, May 1957, vol. 38, no. 2, pp. 275-277.

Discusses the fact that caribou antlers are chewed when shed by both caribou and other animals.

McCowan, D.
The mountain caribou - Rangifer montanus.

in: Mammals of the Canadian Rockies, Toronto, Macmillan, 1950, pp. 59-64, illus.

Describes the mountain caribou, its appearance and habitat.

McEwan, E. H., A. J. Wood, and H. C. Nordan
Body temperature of barren ground caribou. CAN J ZOOL 43(5): 683-687. Illus. 1965. --Rectal temperatures were recorded for barren ground caribou during their first 100 days of life. The normal rectal temperature of caribou was found to be 39°± 0.78°C. Temperature elevations of 2.2° C occurred as a result of activity. The practical implications of these observations are discussed.

McEwan, E. H.
Caribou nutrition research - U. B. C.

Canadian Wildlife Service, CWS - 1 - 63, 1 page.

1 page graph.

McEwan, E. H.
Caribou stock no. 2 aerial survey, August 6-7, 1953.

Canadian Wildlife Service CWSC - 247, tables, and maps.

An aerial survey to determine the summer caribou range and calf counts.

McEwan, E. H.
Caribou survey from Aklavik to Blow River, September 29, 1953.

Canadian Wildlife Service, CWSC - 244.

McEwan, E. H.
Energy metabolism of barren ground caribou (Rangifer tarandus).

Canadian Journal of Zoology, March, 1970, vol. 48, no. 2, pp. 391-92.

Heat production for two fasting caribou was 91 Kcal and 102 Kcal-/$W^{0.75}$ per 24 hr. This was 20 to 30% higher than for the quoted interspecific mean of 70 Kcal/$W^{0.75}$ per 24 hr. For maintenance feeding of two female caribou the mean heat production values were 707.0 Kcal and 124.5 Kcal-/$W^{0.75}$ per 24 hr.

McEwan, E. H.
Growth and development of barren-ground caribou: post natal growth rates.

Canadian Journal of Zoology, Sept. 1968, vol. 46, pp. 1023-1029, tables, graphs.

A comparison of growth curves of minimum body weight of fast growing caribou raised in captivity with slower growing wild caribou. The captured animals showed a cyclical pattern of growth which is characteristic of other cervid species.

McEwan, E. H.
Hematological studies of the barren-ground caribou.
Canadian Journal of Zoology, 1968, vol. 46, pp. 1031-36, tables.

McEwan, E. H. Cont.
Compares the erythrocyte, hemoglobin, packed cell volumes, and leucocyte counts for wild caribou and captive animals maintained on a high plane of nitrition. The blood area nitrogen level was 28% higher for captive than wild caribou. The difference is due to protein intake.

McEwan, E. H.
A pneumatic scale for weighing wild ungulates.

Journal of Wildlife Management, July 1967, vol. 31, pp. 593-595, fig.

A pneumatic scale suitable for weighing in the field, dead or immobilized ungulates is discussed. Weights in the laboratory for 16 reindeer (Rangifer tarandus), did not vary significantly from weights in the field.

McEwan, E. H.
Report on caribou studies in the Northwestern Yukon Territory, 1954.

Canadian Wildlife Service, CWSC - 248, 1954.

Describes and discusses autumn migration local hunting, and spring and winter distribution.

McEwan, E. H.
Seasonal annuli in the cementum of the teeth of barren-ground caribou.

Canadian Journal of Zoology, 1963, vol. 41, pp. 111-113.

The incisor teeth of Rangifer tarandus have annual growth layers in the cementum which are made up of light and dark zones. Each dark zone indicates 1 winter season.

McEwan, E. H.
Twinning in caribou.

Journal of Mammology, 1971, vol. 52, no. 2, p. 479.

A female caribou (Rangifer tarandus tarandus) gave birth to twin female calves. One calf lived for 12 hours (birth weight 3.0 kilograms) and the other (weight 2.5 kilograms) was either born dead or died soon after birth. Caribou generally only produce 1 calf per pregnancy. Author indicates this is the first time twins have been reported for this species.

McEwan, E. H.
Yukon caribou investigation, 1954.

Canadian Wildlife Service, CWSC - 245, maps.

Contains information on the movements of the Yukon caribou herds.

McEwan, E. H., and Whitehead, P. E.
Changes in the blood constituents of reindeer and caribou occurring with age.

Canadian Journal of Zoology, July 1969, vol. 47, no. 4, pp. 557-62 figs.

Results of a study which measured the packed-cell volume, hemoglobin, mean corposcular hemoglobin concentration, reticulocytes, total leucocytes, and plasma protein. This was measured each week for 1 year using 6 reindeer and 6 caribou.

McEwan, E. H. and Wood, A. J.
Growth and development of the barren-ground caribou; heart girth, hind foot length and body weight relationships.

Canadian Journal of Zoology, May 1966, vol. 44, pp. 401 - 411, tables, graphs.

Describes the changes in a well-nourished Rangifer tarandus groenlandicus (captive) with regard to body weight and proportions associated with growth. Also compares these changes with the corresponding changes in wild caribou.

McEwan, E. H. and Whitehead, P. E.
Measurement of the milk intake of reindeer and caribou calves using tritiated water.

Canadian Journal of Zoology, 1971, vol. 49, no. 4, pp. 443-447, illus.

Using a tritium dilution technique, the relation between water turnover and milk intake in 5 reindeer and caribou calves was determined.

McEwan, E. H. and Whitehead, P. E.
Seasonal changes in the energy and nitrogen intake in reindeer and caribou.

Canadian Journal of Zoology, September 1970, vol. 48, no. 5, pp. 905-913, tables, graphs.

The article summarizes the relation between energy intake and body weight for reindeer and caribou. Caloric intake was 35-45% lower in winter than in the summer growth period. The amount of digestible

McEwan, E. H. and Whitehead, P. E. Cont.
nitrogen required for N equilibrium was 0.462 g. $N/W^{0.75}$ per day. The estimated energy requirements for a 70 - kg. reindeer was 5.5 M cal/day in the winter.

McEwan, E. H., Wood, A. J., and Nordan, H. C.
Body temperature of barren-ground caribou. (same as page 39)

Canadian Journal of Zoology, Sept. 1965, vol. 43, no. 5, pp. 683-87, fig.

Records the rectal temperature for barren-ground caribou during the first 100 days of life. The normal rectal temperature was 39° ± 0.78° C. for the caribou and increased 2.2° C with activity. Also, the practical implications of these findings are discussed.

McEvay, James
Report on the geology and natural resources of the country traversed by the Yellowhead Pass route.

Canada, Geological Survey 1900, 44 p.

McDermott, P. J. Jr.
Report of big game division shows history and status of Idaho game.

Idaho Wildlife Review, Jan. - Feb. 1952, vol. 4, no. 3, pp. 4--7, illus.

McGowan, T. A.
Caribou report.

Alaska Dept. of Fish and Game, Federal Aid in Wildlife Restoration, Project W-6-R-6 and W-15-R-1, 1966, 19 pp.

Mech, L. D. and Frenzel, L. D. Jr.
An analysis of the age, sex, and condition of deer killed by wolves in northeastern Minnesota.

U. S. Forest Service Research Paper no. 52, 1971, 35-51.

Merriam, C. H.
Results of a biological reconnaissance of south-central Idaho.

North American Fauna, 5, 1891, 127 pp.
Reference is made to the woodland caribou. They were common in northern Idaho and as far south as Elk City, Idaho County. Refers to a hunter claiming to have killed 25 in 1888. (see p. 80)
Rangifer caribou is also listed on p. 32 in the checklist of mammals.

Millar, W. N.
The big game of the Canadian Rockies.

Toronto, Methodist Book and Publishing House. Conservation of fish, birds, and game. Proceedings of Committee Meeting, No. 1-2, 1915, pp. 100-124.

Millar, W. N.
Game preservation in the Rocky Mountain Forest Reserve.

Canada, Dept. of Interior, Forestry Branch, Bulletin no. 51, 1915.

Miller, Donald R., and Robertson, J. D.
Results of tagging caribou at Little Duck Lake, Manitoba.

Journal of Wildlife Management, Jan. 1967, vol. 31, no. 1, pp. 150 to 159, figs.

2,438 barren-ground caribou (Rangifer tarandus) were eartagged (Herculite streamers were attached to the tags) from 1959 to 1965. They were recovered between 62 and 328 miles from the tagging site. The tagging showed that this Manitoba - Keewatin herd shares a part of the winter range with the Saskatchewan herd. Both, however, have separate calving grounds and summer ranges.

Miller, F. L. and Broughton, E.
An unusual display of territorial aggressiveness by sandhill cranes (Grus canadensis hinne).

Canadian Field-Naturalist, 1971, vol. 80, pp. 66-67.

Sandhill cranes were repeatedly successful in driving away a caribou cow from their nesting territory where it's calf had died.

Miller, Frank L., and Gaston D. Tessier
Dental anomalies in caribou, Rangifer tarandus. J MAMMAL 52(1): 164-174. Illus. 1971. --The dentitions of 43 of 1226 R. tarandus skulls examined had anomalies. Of the 43, 13 had supernumerary teeth, 25 had missing teeth, and 5 had extreme variations in root development and abnormal dentary patterns. These anomalies appear to be genetically produced and further study from the standpoint of evolutionary origin might be fruitful.

Miller, Frank L., and Parker, G. R.
Placental remnants in the rumens of maternal caribou.

Journal of Mammology, Nov. 1968, vol. 49, no. 4, p. 778.

Miller, Frank L., and Parker, G. R. Cont.
8 caribou cows and calves were collected in June 1966 in the Keewatin District. Placental tissue was found in the rumens of all 8 cows. Placental tissue may remain in the rumens of domestic reminants for several weeks or more and the same is believed true for caribou.

Moberly, H. J. and Cameron, W. R.
When fur was king.

New York, E. P. Dulton and Co. Inc. 1929, 237 pp.

Moberly, W.
The rocks and rivers of British Columbia.

London, H. Blackwood and Co. 1984, 102 pp.

Modell, W.
Horns and antlers.

Scientific American, 220 (4), 1969, 114-122.

Mowat, F.
Never cry wolf.

Toronto, McClelland and Stewart, 1963, 247 pp.

Wolves kill the weaker caribou, and do not prey on healthy animals. Other causes should be sought for decline in herd numbers.

Munro, D. A.
A preliminary report on the caribou of the northern Yukon Territory.

Vancouver, University of British Columbia, 1953, 29 pp., maps.

Gives the results of an aerial and ground survey in 1953. The physiography of the northern Yukon Territory is given and the 25 to 30,000 head Porcupine herd of caribou and their movements are discussed. Wolf predation was negligible.

Munro, D. A.
A preliminary report on the caribou of the northern Yukon Territory, July 31, 1953.

Canadian Wildlife Service, CWSC - 248, maps, tables.

Study was to determine herd movements, the number of animals in the herds, history of the herds to aid in understanding present status, and to assess the extent of human utilization of caribou.

Murie, Adolph
The wolves of Mount McKinley.

U. S. Government Printing Office, 1944, Fauna of the National Parks of the U. S. - Fauna Series No. 5, 238 pp., illus.

Article describes the ecology of the wolves in the Mt. McKinley Park in relation to Dallsheep and caribou. The study was conducted from 1939 - 1941. Caribou calves constitute the main food supply when available to the wolves. The caribou acts as a buffer species between the Dall sheep and the wolves.

Murie, O. J.
Alaska - Yukon caribou.

U. S. Dept. of the Interior, Fauna Series No. 54, 1935, illus., maps, photos.

Discusses the caribou's relationship to man, its status, physical appearance, temperment, breeding habits, diet, habitat, migration, distribution and taxonomic status. Specifically mentions caribou of B. C. and Alberta. (P. 83)

Murie, O. J.
Description and distribution of the caribou.

in: North American big game. Compiled by: A. Ely, H. E. Anthony, and R. R. M. Carpenter. New York, Charles Scribner's Sons, 1939, pp. 239-246.

Murie, O. J.
Trailing the caribou herds.

American Forests, January 1924, vol. 30, pp. 27-29, illus.

Nadler, Charles F., Charles E. Hughes, Kathleen E. Harris, and Nancy W. Nadler
Electrophoresis of the serum proteins and transferrins of Alces alces (elk) Rangifer tarandus (reindeer), and Ovis dalli (Dall sheep) from North America. COMP BIOCHEM PHYSIOL 23(1): 149-157. Illus. 1967.
--Serum proteins of A. alces, R. tarandus and O. dalli were analyzed by starch-gel electrophoresis and radioautography with ^{59}Fe. Protein patterns of Alaskan A. alces were similar to patterns reported from Norway. There was no intraspecific polymorphism of the proteins, including the 2 or perhaps 3 transferrins. Sera of R. tarandus from Alaska exhibited transferrin polymorphism manifested by a variety of 2, 3, or 4-band patterns; the data were similar to those reported from Norwegian Rangifer. The 3 transferrin genes most prevalant in Norway also appeared most common in Alaska. The proteins of O. dalli, with a single rapidly migrating transferrin, differed considerably from Rangifer and Alces which shared many common features and are

Nadler, Charles F., Charles E. Hughes et al, Cont.
considered most closely related. The value of serum proteins as a means for studying systematic relationships among wild Artiodactyla, especially Rangifer, is discussed.

Neiland, K. A.
Rangiferine bruceliosis in Alaskan canids. J WILDL DES 6(3): 136-139. 1970.--The 1st known case of rangiferine bruceliosis caused by Brucelia suis biotype 4 in a sled dog was proven by isolation of the organism from the naturally infected animal. The infection was undoubtedly contracted from eating raw, infected barren-ground caribou, Rangifer tarandus granti, in which the disease is enzootic. Limited experience with infections in sled dogs suggests that the disease may run a comparatively mild course in them. Serological evidence indicating the natural occurrence of the disease in wolves, Canis lupus, also is reported for the first time.

Neiland, Kenneth A.
Weight of dried marrow as indicator of fat in caribou femurs. J WILDL MANAGE 34(4): 904-7. Illus. 1970.--Analyses of 34 femur marrow samples from barren ground caribou, Rangifer tarandus granti, revealed that this tissue is a 3-component system comprised of water, fat and non-fat residue. Both the water and fat, and residue and fat are linearly and inversely related. Because the residue amounts to only 2-6% of the net weight, the dry weight of the marrow, except at low fat levels, is essentially equal to the weight of fat in the marrow. For maximum accuracy at low fat levels, the dry weight:fat inequality can be corrected by subtracting the average residue value for that fat level from the dry weight. Such corrected dry weights adequately measure femur fat content at all fat levels for many studies concerned with marrow fat reserves.

Neiland, K. A., J. A. King, B. E. Huntley, and R. O. Skoog.
The diseases and parasites of Alaskan wildlife populations: I.Some observations on brucellosis in caribou. BULL WILDLIFE DIS ASS 4(2): 27-35. 1968. --Data on brucellosis in several Alaskan caribou herds during 1962-65 is summarized. During this time agglutination-reactor prevalence rates (1:20 or higher) gradually declined in the Nelchina (6.5% to 1.0%) and Arctic (30% to 12%) caribou herds. A simultaneous decline (5% to 3.4%) in the prevalence of placental retention and/or excessive bleeding at parturition was also observed on the Arctic calving grounds in northwest Alaska in 1963 and 1965. Various additional conditions were observed, from each of which brucella organisms were isolated on several occasions. These include orchitis-epididymitis, bursitis-synovitis and metritis, singly or in combination. In some cases, the observed lesions no doubt resulted in one or more of the following signs: sterility, lameness, and/or abortion with (probable) subsequent death of the female following putrefaction of retained placental structures. During 1963 about 25% of 107 cows showing placental retention and/or "excessive bleeding" were unaccompanied by

Neiland, K. A., J. A. King et al., Cont.
calves when seen a few days post-partum. The Russian and American points of view regarding naming the causative organism of rangiferine brucellosis are briefly reviewed. Brucella suis biotype rangiferi is proposed as a compromise, based on both the principles of bacterial taxonomy and the natural ecology of the organism.

Nelson, U. C.
Woodland caribou in Minnesota.

Journal of Wildlife Management, July 1947, vol. 11, pp. 283-4.

During a winter aerial survey, the attempt was made to try and locate caribou. None were seen.

Olson, Sigurd F.
North to the dwindling caribou. AUDUBON 65(6): 346-51. Illus. 1963.--A wilderness visitor records some vivid scenes where the tundra meets the taiga and the Eskimo meets the migrating herds.

Olson, S. T.
Management studies of Alaska caribou - herd composition.

U. S. Fish and Wildlife Service, Project Completion Report.

Palliser, John
The journals, detailed reports and observations, relative to the exploration by Capt. Palliser, between the western shore of Lake Superior and the Pacific Ocean.

London, 1860

Palmer, Harvey E., and Richard W. Perkins.
Cesium-134 in Alaskan Eskimos and in fallout. Science 143(3588): 66-67. Illus. 1963.--Whole-body counts of Alaskan Eskimos during the summer of 1962 showed the presence of cesium-134 as well as cesium -137. Cesium-134 was also found in reindeer and caribou meat; this finding was confirmed through coincidence counting. There was generally about 1 percent as much cesium-134 as there was cesium-137. Cesium-134 was also found on air filters collected at Richland, Wash. The appearance of cesium-134 seems to be world-wide and continuing.

Palmer, L. J.
Caribou versus fire in interior Alaska.

U. S. Fish and Wildlife Service. Unpublished, 1941, 14 pp.

Palmer, L. J.
Food requirements of some Alaskan game animals.

Journal of Mammalogy, 1944, vol. 25(1), pp. 49-54.

Studies of the past 20 years have shown that the population density for caribou is 5-10 animals/sq. mi. The suggested food requirements per month for caribou are 250 lb./caribou. The principal forage for these animals is listed under each of the species discussed.

Palmer, L. J.
Improved reindeer handling.

U. S. Dept. of Agriculture Circular No. 82, 1929, 18 pp.

Palmer, L. J.
Progress of reindeer grazing investigations in Alaska.

U. S. Dept. of Agriculture, Bulletin No. 1423, 1926.

Palmer, Lawrence J., and Rouse, Charles H.
Study of Alaska tundra with reference to its reactions to reindeer and other grazing.

U. S. Dept. of the Interior, Research Report Fish and Wildlife Service 10, 1945, pp. 1-48.

Article discusses the plant composition of the Alaska tundra. Studies began in 1920 to work out the principal range requirements of reindeer. Grazing and fire have created a confusion in plant mixture and occupation. Lichen ranges may require 20-40 years to fully recover from grazing or fire. The authors recommend moderate grazing and rotational use of the tundra.

Parker, G. R.
The research and management of barren-ground caribou in northern Canada.

Canadian Geographical Journal, June 1972, vol. LXXXIV, no. 6, pp. 200-207, photos.

A study and ear-tagging programme to study the range limits, areas of seasonal distribution, critical migration routes.

Parker, G. R.
Trends in the population of barren-ground caribou of mainland Canada over the past two decades: a re-evaluation of the evidence.

Parker, G. R. Cont.
Canadian Wildlife Service, Occasional Papers No. 10, 1971, 11 pp., tables, photos.

Canadian Wildlife Service aerial surveys in 1967 and 1968 gave a population estimate of 385,000 barren-ground caribou in 4 major populations on mainland Canada. A suggested increase of about 50% during the 12 years since the 1955 survey is given. But contrary to the major increase, it would appear that the actual number of caribou changed only slightly from 1955 to 1967.

Pegau, Robert E.
Effect of reindeer trampling and grazing on lichens.

Journal of Range Management, March 1970, vol. 23, no. 2, pp. 95-97 figs.

A band of about 500 reindeer were put in an area of non-utilized dwarf shrub meadow near Nome during both wet and dry conditions. After one summer about 68% of the lichens were dislodged and 16% shattered into pieces of less than 0.5 inch. At least 15% of lichens should be considered as unavailable because of trampling.

Pimlott, Douglas H.
Wolf control in Canada.

Canadian Audubon, Nov.-Dec. 1961, vol. 23, no. 5, pp. 145-152, illus.

Discusses wolf predation. In the winter range of the barren-ground caribou, human kill approaches the birth rate and wolf control is necessary to provide for herd survival.

Plead 'save-the-caribou' as herds near extinction.

Financial Post, January 1958, vol. 52, p. 28.

Porshild, A. E.
Mammals of the Mackenzie Delta

Canadian Field-Naturalist, Jan.-Feb. 1945, vol. 59, pp. 4-22.

An annotated list of mammals in the Mackenzie Delta. It includes barren-ground caribou and western woodland caribou and gives geographical locations for each.

Porshild, A. E.
Reindeer and caribou grazing in Canada.

Transactions of the North American Wildlife Conference, 1942, vol. 7, pp. 381-391.

The article describes the reindeer and caribou in Canada, their diet and ranges. Caribou disappear from reindeer range and birds decrease in reindeer ranges.

Porshild, A. E.
Reindeer grazing in northwest Canada.

Canada Dept of the Interior, 1929,

Prasil, R. G.
Summary report on Stone's caribou, observations in Mount McKinley National Park, 1967-1968.
U.S. National Park Service Special Report, 1968. 8 pp.

Preble, E. A.
A biological investigation of the Athabaska-Mackenzie region.

U. S. Dept of Agriculture, North American Fauna, No. 27, 1908, 574 pp.

Pruitt, W. O.
Behaviour of the barren-ground caribou.

University of Alaska, Biology Paper No. 3, April 1960, 44 pp., figs.

Discusses caribou behaviour in the snow season, migration, behavioural reactions to insects, reproductive behaviour, doe-fawn relationships, and general behaviour. Based on a 1-year field study in the Northwest Territories, Manitoba and Saskatchewan.

Pruitt, W. O.
A flight-releaser in wolf-caribou relations.

Journal of Mammalogy, 1965, vol. 46, no. 2, pp. 350-1, illus.

This report describes the ability of barren-ground caribou to distinguish a stalking wolf from one not. A parka hood representing a stalking wolf outline caused caribou to flee but a clearly visible human figure did not and the caribou resumed feeding.

Pruitt, W. O.
The function of the brow-tine in caribou antlers.

Arctic, 1966, vol. 19, no. 2, pp. 111-13, illus.

Article describes Rangifer tarandus groenlandicus and R. t. groenlandicus-granti in Manitoba and northern Alaska. The tine acts as protection for the buck caribou's eyes.

Pruitt, W. O.
Locomotor speeds of some large northern mammals.

Journal of Mammalogy, February 1960, vol. 41, no. 1, p. 112.

A short article on the speeds of some mammals. Includes a barren-ground doe and fawn (Rangifer arcticus) which were clocked at 5 miles per hour.

Pruitt, W. O.
New "caribou problem."

Beaver, Winter 1962, outfit 293, pp. 24-25, illus.

Pruitt, William O.
On post natal mortality in barren-ground caribou.

Journal of Mammalogy, Nov. 1961, vol. 42, no. 4, pp. 550-1, tables.

Describes 3 days observations on a hill at Fawn Lake, Keewatin which was used by does. Estimated that less than 4.5% of newborn caribou died.

Pruitt, W. O.
Snow as a factor in the winter ecology of the barren-ground caribou Rangifer arcticus. Arctic 12(3): 159-179. 1959.--During the winter 1957-58, 114 snow observation stations were established in parts of northern Sask. and southern northwest territories. Approx. 8850 miles were flown at low altitudes over the region. During these flights the positions of bands and wintering individuals of caribou were plotted on topographic maps. Areas of heavy caribou concentration were characterized by snow cover that was soft, light, and thin. Areas having no caribou had snow cover that was sometimes soft but also could be very hard, dense and thick. Caribou appear to have a threshold of sensitivity to the hardness, density and thickness of the snow cover. The threshold of hardness sensitivity appears to be approximately 50 g/cm^2 for forest snow and 500 g/cm^2 for lake snow.

Pruitt, W. O. Cont.
The density threshold appears to be approx. 0.19 or 0.20 for forest snow and 0.25 or 0.30 for lake snow. The thickness threshold appears to be approximately 60 cm. When these thresholds are exceeded, caribou react by moving until they encounter snow of less hardness, density or thickness. Caribou will dig feeding craters only twice in a given unit of snow after which it becomes so hard that they seek undisturbed snow for feeding.

Quay, W. B.
Histology and cytochemistry of the skin gland areas in the caribou, Rangifer.

Journal of Mammalogy, 1955, vol. 36, (2), pp. 187-201.

Histology and cytochemistry of the tarsal gland, and preorbital pocket, containing both sebaceous and apocrine sudoriferous glands were studied in formalin - alcohol fixed skin samples from an adult male and female caribou (Alaska). Development of the gland is the same for both sexes except for the tarsal gland.

Racey, K.
Notes on some mammals of the Chilcotin, British Columbia.

Canadian Field - Naturalist, Feb. 1936, vol. 50, no. 2, pp. 15-21.

An annotated list including Rangifer montana Seton Thompson (p. 20).

Radvanyi, A.
Preliminary report on a caribou survey flight from Aklavik to the Eagle, Rock, Bell, Porcupine and Driftwood River area, Yukon Territory, 1960.

Canadian Wildlife Conference, CWSC - 816, maps.

Describes the location, numbers and herd composition for caribou in the Yukon Territory.

Radvanyi, A.
Summer report on field work. Caribou calving studies, Prince Albert, Fort Rae Beaver Transplant, 1954.

Canadian Wildlife Service CWSC - 137.

Rand, A. L. (compiler)
Mr. W. H. Bryenton's notes on Manitoba mammals of the Herb Lake - Flin Flon area.

Canadian - Field-Naturalist, Sept.-Oct. 1948, vol. 62, pp. 140-50.

Rand, A. L. (compiler) Cont.
A description of mammals including barren-ground caribou and woodland caribou. Gives geographical locations where the animals were seen and the dates on which they were seen.

Rausch, R. A.
A summary of wolf studies in southcentral Alaska, 1957-68.

North American Wildlife and Natural Resources Conference, Transactions 1969, 117-131.

Roberts, L.
Caribou trek.
Country Life, December 1938, vol. 75, pp. 44-45, illus.

Robertson, J. D.
Caribou tagging.
Beaver, summer 1961, outfit 292, pp. 24-27, illus.

Article describes a method for tagging barren-ground caribou at water crossings. The method was used at Duck Lake, Manitoba. Ear tags with 8" X 1¼" streamers helped to trace herds seasonal movements.

Rogers, Lore A.
Caribou on Katahdin. APPALACHIA 35(2): 292-300. Illus. 1964.
--Until about 1905, caribou lived on the tableland of Mt. Katahdin in Maine. There is a plateau about 3 mi. long, at an elevation well above timberline, which provided an exceptional winter food supply with abundant growth of "caribou moss." After 1907 there were no more authentic reports of caribou in Maine. In 1963 a project was carried out by which caribou obtained from Newfoundland were brought to Katahdin and released there. A detailed account of the project is given. Twenty-three animals were transferred after being partly anesthetized, and carried in a sling by helicopter. They were later observed grazing in a normal manner, and breeding is expected.

Rosenmann, M. and Morrison, P.
Some effects of water deprivation in reindeer.

Physiological Zoology, April 1967, vol. 40, pp. 134-142.

Attempts to determine the effect of water deprivation on reindeer. Heart rate increased up to 3 fold following dehydration. The reindeer show good capacity for heat-resistance but have very little resistance to water deprivation with or without heat stress.

Rausch, R.
Notes on the description of some Arctic mammals.

Journal of Mammalogy, Nov. 1950, Vol. 31, no. 4, pp. 464 - 466.

An annotated list of mammals including Rangifer arcticus stonei Allen.

Rausch, R.
On the status of some Arctic mammals
Arctic, 1953, vol. 6(2), pp. 91-148, illus.

Rangifer tarandus stonei occur in 3 distinct herds on the Arctic slope of Alaska. Several important factors affect the caribou: the diminished importance of hunting by non-Eskimo; decline in numbers of Eskimo; and elimination of reindeer from the Arctic slope. The fungus Actinomyces necrophorus is the possible cause of a crippling foot disease which affects caribou.

Rust, H. J.
Mammals of northern Idaho.

Journal of Mammalogy, 1946, vol. 27, no. 4, pp. 308-27, map-tables.

An annotated list of mammals occuring in Idaho. Includes mountain caribou (Rangifer montanus). Tracks were reported near the Idaho boundary as late as 1920 and shed antlers are found in remote areas which indicates overwintering. The author concludes that it is likely that caribou still occur irregularly in northern Idaho.

Savel'er, D. V.
The protection of reindeer from insect pests.

Problems of the North. Translated by National Research Council of Canada, 1970, no. 13, pp. 129-133.

Discusses the problems of Warble flies, nose flies, mosquitoes, and black flies in relation to reindeer. Also discusses the experimental treatment for reindeer.

Schorger, A. W.
A record of the caribou in Michigan.

Journal of Mammalogy, 1940, vol. 21, p. 222.

An historical record (1860) of Rangifer caribou caribou in Michigan.

Scott, Peter
Oil and wildlife in Alaska. ORXY 10(4): 220-235, Illus. 1970.
--The discovery in Alaska of oilfields has raised some complex problems for conservationists. Alaska has a rich and impressive

Scott, Peter Cont.
wildlife and habitats that are extremely vulnerable; in summer, when the surface soil thaws out on top of the permanently frozen layers below, one caterpiller tractor can make scars that may lead to disastrous erosion and take years to heal. Migrating caribou have difficulty getting over the unburied parts of a 4-ft. diameter pipeline that runs for hundreds of miles across their traditional routes. Ways to minimize the effects of oil developments are discussed.

Scott, Robert F., Chatelain, E. F., and Elkins, W. A.
The status of the Dall sheep and caribou in Alaska.

Transactions of the North American Wildlife Conference, 1950, vol. 15, pp. 612-626.

The caribou are the most numerous of Alaska's large animals. A liberal population estimate for the caribou is 160,000. Hunting, predation, and weather are the known factors affecting population.

Scotter, George.
Aboreal and terrestrial lichens as a food source for the Western caribou. Proc. Utah Acad. Sci., Arts, and Letters 39:204 1961/1962.

Scotter, G. W.
Caribou countdown.

North, 1965, vol. 12, no. 6, pp. 14-15, illus.

Discusses the C.W.S. programme to study caribou movements in northern Canada using ear-tagging with aerial and ground observations.

Scotter, George W.
Chemical composition of forage lichens from Northern Sask. as related to use by barren-ground caribou. CAN J PLANT SCI 45(3): 246-250 1965. --As part of a study stimulated by the decline in numbers of the barren-ground caribou in Northern Canada, the quality of their winter forage plants was studied (Rangifer tarandus groenlandicus). Twenty-five lichens and eight vascular plants, comprising the important forage species on the winter range of the animals, were collected in June, Sept., and March. They were analyzed for crude protein, ether extract, crude fiber, ash, calcium, and phosphorus. In general, lichens were found to be low in protein, calcium, and phosphorus in relation to the estimated nutrient requirements of the caribou. They do however appear to supply a major part of the energy needs of this species. An attempt has been made to list the groups of lichen species studied in the order of animal preference. Seasonal fluctuations in chemical composition are indicated.

Scotter, G. W.

A contribution to the flora of the eastern arm of Great Slave Lake, Northwest Territories.

Canadian Field-Naturalist, 1966, vol. 80, no. 1, pp. 1-18, photos, map.

An annotated list of the flora of Great Slave Lake including lichens used as food by barren-ground caribou.

Scotter, George W.

Ecology of alpine vegetation in the national parks of western Canada.

Canadian Wildlife Service project no. 382-5206, May 20, 1970, v. paging.

A progress report on the ecology of alpine vegetation. Includes lists of several hundred vascular plants, lichens, and bryophytes collected from the study area, preliminary soil work, and micro-environmental measurements.

Scotter, George W.

Effects of forest fires on the lichen winter ranges of barren-ground caribou in northern Canada.

Utah State University, PhD Thesis, 1968, 143 pp.

The devastation of winter range by forest fires is suggested as a probable cause for the caribou's decline.

Scotter, George W.

Effects of forest fires on the winter range of barren-ground caribou in northern Saskatchewan.

Canadian Wildlife Service - Wildlife Management Bulletin, Series I, no. 18, 111 pp., figs., map.

A study of a small area of the winter range of Rangifer tarandus groenlandicus, which indicates that if the total devastating effects of fire on plant productivity, succession and growth rates of reindeer lichens is the same for the whole range, then there is little doubt that fires have been one of the major causes for caribou decline.

Scotter, George W.

Productivity of arboreal lichens and their possible importance to barren-ground caribou (Rangifer arcticus). Arch. Soc. Zool. Bot. Tennicae "Vanamo" 16(2): 155-161. 1961.(1962): --Arboreal lichens may make substantial contributions to the winter diet of barren-ground caribou, particularly under severe winter conditions.

Scotter, George W. Cont.
The average productivity of arboreal lichens was approx. 485 Kg/acre in black spruce forests and approx. 830 kg./acre in jack pine forests in the Black Lake region of the northern Sask. The largest portion of lichens available to barren-ground caribou was from ground level to 10 feet above ground. More than 50% of arboreal lichens occurred within this range in black spruce forests, and nearly 20% in jack pine forests. Of the arboreal lichens encountered, Alectoria jubata, Evernia mesomorpha and Usnea hirta were the most abundant species.

Scotter, G. W.
Sieve mesh size as related to volumetric and gravimetric analysis of caribou rumen contents.

Canadian Field-Naturalist, 1966, vol. 80, no. 4, pp. 238-241, table.

Describes a study to determine which of 3 mesh sizes is best for use when determining the percentage composition of forage samples. The 2 mm. mesh gave the best results.

Scotter, G. W.
Study of the winter range of barren-ground caribou with special reference to the effects of forest fires.

Canadian Wildlife Service, Progress Report no. 3, Dec. 1965, photos, tables, 81 pp.

Purpose is to study the effects of fire on winter range of the barren-ground caribou. Covers the 1963 field season in northwestern Manitoba.

Scotter, G. W.
Wildfires in relation to the habitat of barren-ground caribou in the taiga of northern Canada.

Tall Timbers Fire Ecology Conference, Annual Proceedings, 10(1970), 85-105.

Scotter, G. W.
The winter diet of barren-ground caribou in northern Canada.

Canadian Field-Naturalist, 1967, vol. 81, no. 1, pp. 33-39, table.

Article discusses the analysis of 20 rumen contents. The forage particles were weighed and the weight of various plants or plant groups combined to give an aggregate percentage composition. 50% was found to be terrestrial lichens.

Section on Wildlife Investigations on Public Lands
Inventory of big game animals of the United States, 1950 and 1951.

U. S. Fish and Wildlife Service, Wildlife Leaflet no. 342, Oct. 1952.

Section on Wildlife Investigations on Public Lands Cont.
1 p. and 2 double p.

Includes a section on species most endangered and lists woodland caribou (25 only in Idaho.)

Seton, E. T.
Lives of the game animals.

New York, Doubleday, Doran & Co., Inc. 1929, vol. 3, pp. 53-151.

Describes the woodland, mountain, Dawson, and barren-ground caribou, including size, range, numbers, food, behaviour, diseases and history.

Shaffer, M. T. S.
Old Indian trails of the Canadian Rockies.

New York, Putnam, 1912.

Shattuck, C. H.
Value of grazing management on the Caribou national forest.

American Forests, Sept. 1917, vol. 23, pp. 536-38, illus.

Sheldon, W. G.
Mammals collected or observed in the vicinity of Laurier Pass, B. C.

Journal of Mammalogy, 1932, vol. 13, pp. 196-203.

An annotated list of mammals which includes a reference to Rangifer osborni. About 40 caribou were counted.

Shoho, C.
Some questions around the identry of the worms of the genus Setaria and their host-parasite relationship.

Journal of Parasitology, 56 (4, Sec. II, Pt. 1), 1970, 317-318.

Simmons, N.
Big game in the Mckenzie Mountains.

Federal-Provincial Wildlife Conference, Transactions, 32 (1968), 35-40.

Siniff, D. B., and Skoog, R. O.
Aerial censusing of caribou using stratified random sampling.

Journal of Wildlife Management, 1964, vol. 28, no. 2, pp. 391-401, tables, graph, map, photo.

Describes an aerial census of the Nelchina caribou herd in Alaska in February, 1962, using stratified random sampling. The population estimate for the Nelchina herd was 71,000 animals.

Skoog, R. O.
The caribou, nomad of the north.

Alaska Sportsman, April 1962, vol. 28, no. 4, pp. 18-21, illus.

Describes the habits, migration, food, breeding and predators of the barren-ground caribou in Alaska.

Skoog, R. O.
Ecology of the caribou (Rangifer tarandus granti) in Alaska.

Berkeley, University of California, Ph. D., thesis, 1968, 2 vol., tables, maps.

Discusses Alaskan caribou based on 12 years of field work with emphasis on the Nelchina herd.

Skoog, R. O.
Management studies of Alaska caribou - herd composition surveys - Nelchina herd.

U. S. Fish and Wildlife Service, Project Completion Report.

Skoog, R. O.
Method for estimating caribou herds.

Alaska Dept. of Fish and Game, Informational Leaflet, no. 20, 1962, 6 pp.

Discusses how the herds of Rangifer tarandus granti were inventoried in 1961. It was based on the observation of parturient cows on the calving grounds. The method is relatively accurate and a minimum of time and money is required.

Skoog, R. O.
A method for estimating current size and status of caribou herds.

Paper presented at the 13th Alaskan Science Conference, Juneau Alaska. August 24, 1962, 6 pp.

Skoog, R. O. Cont.
Presents a technique for assessing the status of a caribou herd which is acceptably accurate and requires a minimum of time. Aerial reconnaissance over calving areas divides up the area by identifiable landmarks.

Skoog, R. O.
Range, movements, population, and food habits of the Steese-Fortymile caribou herd.

University of Alaska, College, Alaska. M.Sc. Thesis, 1956, tables, photos, maps.

The management studies on Alaska caribou began in 1949. Discusses the range, vegetation (plant communities, range distribution) movements, population (size, breeding, mortality) and food habits.

Soper, J. D.
Mammal notes from the Grande Prairie - Peace River region, Alberta.

Journal of Mammalogy, 1948, vol. 29, pp. 49-64, map, photos.

A description of the abundance and distribution of birds and animals in west central Alberta. An annotated list which includes reference to the woodland caribou and its range (p. 63).

Soper, J. D.
The mammals of Manitoba.

Canadian Field-Naturalist, Oct.-Dec. 1961, vol. 75, no. 4, pp. 171-219, photos.

An annotated list which includes comments on the locations where barren-ground and western woodland have been seen.

Soper, J. D.
Mammals of the northern Great Plains along the international boundary in Canada.

Journal of Mammalogy, May, 1946, vol. 27, no. 2, pp. 127-153.

An account of the native mammals along the boundary from Manitoba to Alberta. Includes mention of Rangifer caribou sylvestris.

Soper, J. D.
Mammals of Wood Buffalo Park, northern Alberta and District of Mackenzie (see pp. 142-43 Rangifer caribou sylvestus).

Journal of Mammalogy, 1942, vol. 23(2), pp. 119-145.

Describes the Western Woodland caribou in Wood Buffalo Park and where they were located within the park.

Soper, J. D.
Status of caribou (Rangifer arcticus) along the Yukon- Alaska boundary. January, 1951.

CWSC - 262 , 1951 .

Southesk, Earl of
Saskatchewan and the Rocky Mountains.

Edinburgh, Edmonston, and Douglas, 1875, 448 pp.

Spreadborough, W.
Notes on some of the more common animals and birds of the Canadian Rockies.

Canadian Alpine Journal, 10(1919), 51-68.

Stelfox, John G.
Caribou abundance and distribution in northwestern Alberta and proposed 1966 season.

Alberta Fish and Wildlife Division, Wildlife Investigations Progress Report, W-3-66, 17 pp.

Evaluates the caribou populations, distributions, reproduction, herd sizes, harvests and anatomical differences in northwestern Alberta.

Stelfox, John G.
Caribou populations in Biological District 3 (Northwestern Alberta), 1965.

Alberta Fish and Wildlife Division, 1965a, File no. 400-8, D-408.

Stelfox, John G.
Mountain big game trophy harvest and measurements in northwestern Alberta for 1965 of bighorns, Rocky Mountain goats, caribou, bear and cougar.

Alberta, Fish and Wildlife Division, 1965 b, File no. 400-34, D-408.

Stonehouse, Bernard
Thermoregulatory function of growing antlers (deer, caribou, goat). NATURE (LONDON) 213(5144): 870-72. 1968. --Thermoregulatory horns and antlers are only present in ruminants. With respect to evolution, they may primarily be associated with a need to dissipate heat safely from the body during the strongly exothermic process of rumination.

Stonehouse, Bernard Cont.
Their absence in females of most cervid and many bovid genera may be due to a secondary development and elaboration of heat dissipating mechanisms elsewhere on the body. In males, their retention and evolutionary diversification must reflect both the special thermo-regulatory needs imposed by metabolic fluctuations in the annual cycle, and the additional functions they have acquired as weapons, tools and possibly as social signals.

Strecker, R. L. et al.
Notes on mammals from Alaska.

Journal of Mammalogy, November 1952, vol. 33, no. 4, pp. 476-480. map.

Briefly mentions large game animals seen in Alaska. Includes caribou and gives the location where sighted (p. 480).

Swarth, Harry S.
Mammals of the Atlin region, northwestern British Columbia.

Journal of Mammalogy, 1936, vol. 17, pp. 398-405.

An annotated list which includes Rangifer caribou (Gmelin). Author states that it has been many years since caribou were seen in the area. Were there prior to 1924.

Sweatman, Gordon K.
The significance of the artificial introduction of reindeer (Rangifer tarandus) and moose (Alces alces) in the spread of hydatid disease (Echinococcus granulosus). ANN TROP MED PARASITOL 58(3): 307-314. Map. 1964. --Various species of deer have been introduced by man into parts of the world beyond their normal range. Two of them, reindeer and moose, are particularly important hosts of Echinococcus granulosus in the regions where they occur naturally. A report is made on the significance of the artificial introduction of these mammals in the spread of the tapeworm. Hydatid infections were very probably introduced with reindeer some years ago into north-western Canada and possibly also into Alaska. During the past 2 decades no fewer than 6 introductions of reindeer have been made into Greenland, Scotland, Austria, Argentina, the Kerguelen Islands and some localities of the U. S. A. The introduction of reindeer into Greenland is likely to be the most serious in regards to the spreading of hydatid disease. Conditions are not suitable for the perpetuation of hydatid infections in reindeer and moose introduced into the Southern Hemisphere.

Symington, Fraser
Tuktu, the caribou of the northern mainland.

Ottawa, Canadian Wildlife Service, CWSC-1367, 1965, 92 pp., photos, map.

Symington, Fraser Cont.
Discusses the caribou - its physical characteristics, habits etc. Includes caribou management; research on the caribou and the caribou's relationship to man.

Taconis, K.
Fight for the caribou.

Imperial Oil Review, Dec. 1968, vol. 52, pp. 16-19.

Tener, J. S.
The present status of the barren-ground caribou.

Canadian Geographical Journal, 1960, vol. 60, no. 3, pp. 98-105, illus.

Thomas, D.
Caribou calves caught during June, 1959.

Canadian Wildlife Service, CWSC - 945, 1959.

Discusses the diet of captive calves.

Thomas, D. C.
Caribou tagging at Contwoyto Lake, August, 1960.

Canadian Wildlife Service, CWSC - 858, 1960, preliminary report, 8 pp., tables.

Describes day-by-day the tagging of caribou at Contwoyto Lake.

Thomas, Donald C.
Population estimates and distribution of barren-ground caribou in Mackenzie District, N. W. T., Saskatchewan, Alberta - March to May, 1967.

Canadian Wildlife Service, Report Series 9, 1969, 44 pp., figs.

An estimated total population of 322,500 animals is given. Methods used for obtaining the data were: total counts, strip censuses, photographic counts and a ratio method.

Thomas, D. C., G. R. Parker, J. P. Kelsall, and A. G. Loughrey
Population estimates of barren-ground caribou on the Canadian mainland from 1955 to 1967. CAN WILDLIFE SERV PROGR NOTES 3. 1-4. Map. 1968.

Tillenius, Clarence
Big game of Canada

Beaver, Dec. 1953, Outfit 284, pp. 13-20, illus.

Gives a brief description and text on animals including barren-ground and woodland caribou. Also briefly noted are breeding habits, feeding habits, and physical characteristics.

Trippensee, Reuben E.
Wildlife management. Upland game and general principles.

New York, McGraw-Hill Inc. 1948, 479 pp., illus.

Describes upland game and its management - including elk and woodland caribou. The habits and management of each species are described, under such headings as: geographic distribution, longevity, movements, population density, cover requirements, food, and census methods.

Ulke, Titus
Occurence and distribution of mammals in Yoho Park, British Columbia.

Canadian Field-Naturalist, April 1923, vol. 37, Page 63.

Mentions Rangifer montanus as having been recorded in the park in the Geological Survey Memoir no. 55, Ottawa, 1914. The caribou have not been seen recently in the park but are probably in the area north and west of the park.

U. S. Congress House Committee on Public Lands
Protection of Dall sheep, caribou and other wildlife, native to Mt. McKinley National Park area, and for other purposes.

Hearings before the Committee on the Public Land, House of Representatives, Seventy-ninth Congress, second session, on H. R. 5004 and H. R. 5401, July 23, 1946, U. S. Government Printing Office 1946, ii, 55 pp., illus.

Reports on bills letters and statements to make mandatory the reduction of predatory animals, in particular, wolves. Two points of view given are: (1) the park as a theatre for natural selection and biological balance, (2) the need to bring wolves close to extermination.

Vogt, William
North American animals threatened with extinction.

Transactions of North American Wildlife Conference 13, 1948, pp. 106-12.

Vogt, William Cont.
Lists the woodland caribou as being in danger of extinction. There were a "few" in Kaniksu National Forest near the Idaho-Washington boundary.

Ward, J. C.
Analysis of warden's Wildlife Observation Cards, Jasper National Park.

Canadian Wildlife Service (Edmonton), Typewritten report in files, 1956, 6 pp.

Watson, G. W.
Caribou movements, abundance, and distribution.

in: Federal Aid in Wildlife Restoration Quarterly Progress Report, 1954, vol. 9(2), pp. 43-60.

Watson, G. W. and Scott, R. F.
Aerial censusing of the Nelchina caribou herd.

Transactions of the North American Wildlife Conference, 1956, vol. 21, pp. 499-509, photo, map.

Describes the use of aerial censusing for caribou in 1955, the census count and the estimates in herd size. The sources of error are also discussed.

Webb, R.
Alberta's big game resources.

Edmonton, Queen's Printer, 1959, Alberta Fish and Wildlife Division, 31 pp.

Why the caribou has a brow tine.
Animals (London), 10(1), 1967, 18.

Wilber, Charles G.
Notes on the lipids in some wild animals.

Journal of Mammalogy, February 1952, Vol. 33, no. 1 ,p. 105, table.

The Alaskan caribou and muskrat have more blood fatty acids than the Missouri oppossum and the phospholipid was lowest in the caribou.

Wilk, A. L.
Caribou studies - weather records, 1958.

Canadian Wildlife Service, CWS - 514 29 pp maps, tables.

Wilk, A. L. Cont.
Describes the author's observations on caribou from September - December 1958, in the Northwest Territories and Saskatchewan.

Wilk, A. L.
Report on caribou studies Sept. 22 to Dec. 15, 1958.

Canadian Wildlife Service, Report Manuscript.

Williamson, V. H. H.
Determination of hairs by impressions.

Journal of Mammalogy, February 1951, vol. 32, no. 1, pp. 80-84, table, illus.

A report on a method of avoiding the transparency of the scalelike structure of hair for identification purposes. Includes moose, elk, deer, and caribou.

Wilson, Joseph F., Albert C. Diddams, and Robert L. Rausch
Cystic hydatid disease in Alaska. A review of 101 autochthonous cases of Echinococcus granulosus infection. AMER REV RESP INS 98(1): 1-15. Illus. 1968. (Fr. and Span. sum.)--The clinical experience with 101 cases of indigenous cystic hydatid disease occurring in Alaskan aborigines is presented. E. granulosus of Alaska and Canada has a natural wild animal (sylvatic) cycle; the wolf is the chief natural primary host and moose, caribou, and reindeer the intermediate hosts. Dogs and man are often also infected with the parasite. The clinical response of man to the Alaskan or Canadian parasite differs in all parameters from the response to the classic form of the disease. Differences are observed. Because sylvatic E. granulosus causes a very benign disease in man, conservative management seems clearly justified. The classic form of E. granulosus, in contrast to the sylvatic form of Alaska or Canada, causes a highly symptomatic, hazardous disease in man for which aggressive surgical treatment is unanimously recommended. In areas of the world where both the sylvatic and the classic forms of the disease may occur, such as in North America, it is important to differentiate the one form from the other before determining management.

Winters, Richard P.
Observations on the influence of the rut upon caribou meat palatability.

Proceedings of the 14th Alaskan Science Conference Anchorage, Alaska, August 27-30, 1963, January 1964, p. 69.

Most animals are not affected by the rut, but it is known that some rutting animals do become strongly flavoured or unpalatable at this time.

Wolfgang, R. W., and Poole, J. B.
Distribution of Echinococcus disease in northwestern Canada.

American Journal of Tropical Medicine and Hygiene. 1956, vol. 5(5), pp. 869-71.

Moose, elk, caribou, and reindeer in northern Canada have been recorded with hydatid cysts.

Wood, A. J., Nordan, H. C., and Cowan, Ian McTaggart
The care and management of wild ungulates for experimental purposes.

Journal of Wildlife Management, 1961, vol. 25, pp. 295-302.

Describes facilities for handling and caring for ungulates. Includes diet.

The word "Caribou".
Journal of Mammalogy, 1929, vol. 10, pp. 353-56.

Discusses early references to caribou in relation to the origin of the word.

Young, H. A.
Education can help save the caribou, commissioner says.

News of the North, 1950, vol. 6, no. 27, p. 2.

The Commissioner of the Northwest Territories discusses the causes of the decline and possible conservation measures for the caribou population.

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Report on elk slaughter, 1953-54, Banff National Park, 1954.

Canadian Wildlife Service, CWSC-152.

Banfield, A. W. F.
Aerial big game survey of Banff and Jasper Parks.

Ottawa, Typewritten report to Chief, Canadian Wildlife Service, 1953, 7 pp.

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Aerial survey of game winter ranges, Banff and Jasper National Parks, 1953.

Canadian Wildlife Service, CWSC-280, photos.

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Banfield, A. W. F.
Range studies Banff National Park, 1950-52.

Canadian Wildlife Service, CWSC-5.

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Report on elk, Banff National Park, 1950.

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Cowan, Ian McTaggart
General report on wildlife conditions in the Rocky Mountain National Parks Bureau.

Ottawa, 1946, 19 pp.

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Report on wildlife studies in Jasper, Banff, and Yoho National Parks, in 1944.

Ottawa Dept. Mines and Resources, National Parks Branch, 83 pp.

Flook, D. R.
Appraisal of elk situation, Waterton Lakes National Park, October, 1955.

Canadian Wildlife Service, CWSC - 188.

Flook, D. R.
Big game survey south-east Jasper Park, summer, 1955.

Canadian Wildlife Service (Edmonton), CWS-20-56, tables, photos.

Discusses the decline in big game in particular sheep and elk in Jasper Park.

Flook, D. R.
An appraisal of the elk situation in the Athabasca Valley of Jasper National Park, November 18, 1955.

Canadian Wildlife Service, CWSC - 43.

Flook, D. R.
Big game survey southeast Jasper park, summer, 1956.

Canadian Wildlife Service (Edmonton), Typewritten report in files, 1955, 33 pp.

Flook, Donald R.
Causes and implications of an observed sex differential in the survival of wapiti (Cervus canadensis). CAN WILD SERV REP SER 11. 5-71 Illus. Maps. 1970. (Fr. sum.)--This study was conducted to seek the causes of an apparent unbalanced sex ratio favouring females, observed in wapiti populations in the National Parks in western Canada and reported from elsewhere. In the mountain parks the sex ratio of wapiti older than calves counted in Oct. and Nov. was 37 males: 100 females. However, as the distribution of females coincided more closely with areas of low elevation and ready access to observers than did that of males, data on sex ratios from those areas are believed biased in favor of females. More reliable population data were obtained from an enclosed 50-mi^2 area of uniformly low elevation in Elk Island National Park where wapiti were harvested at an average rate of approximately 21% over a 19-yr period. During that period the sex ratio in the net production, calculated from the sum of the total harvest and net population change, was 85 : 100. The sex ratio of fetuses from all parks in winter was 113 : 110, and losses of males did not appear greatly to exceed those of females before 1 $\frac{1}{2}$ yr. of age. The composition of harvests by park wardens instructed to shoot non-selectively indicates an abrupt decrease in the number of males at low elevations in the mountain parks between 1$\frac{1}{2}$ and 2$\frac{1}{2}$ years of age. This decrease is believed to be caused by dispersal to other areas. This dispersal makes males less observable and probably also contributes to mortality of males by taking some of them into unfavorable

Flook, Donald R. Cont.

habitats. A marked decline in the number of males after 7 yr of age and continuing to 14 yr, the oldest represented, is believed due to increased mortality. In contrast, the number of females in successive age classes declined less rapidly, the oldest examined being 21 yr of age. Males grew more rapidly in absolute rate, and for about 1 yr longer than females. In 3 of the 4 parks, tooth wear was more rapid in males and would thus adversely affect them at a younger age. Those findings suggest that males have a greater food intake and greater food requirement. Seasonal comparisons on adrenal weights and zona glomerulosa widths showed no evidence that males were subject to more stress than females as a result of the rut. However, fatty infiltration of the liver and decreasing perinephric fat deposits showed that during the rut adult males rapidly depleted their stored fat, in contrast to females, which did not. That was particularly marked in males older than 7 yr., the age group in which the most intensive breeding activity apparently occurs. Males older than calves, particularly those older than 7 yr., entered the winter, a period of potentially critical energy balance, with smaller fat reserves than females, and during the winter exhausted their fat reserves earlier than females. Therefore males, particularly older ones, are more vulnerable than females to death in late winter and spring, caused primarily by an inadequacy of energy. Two factors are involved in unbalanced sex ratios observed in wapiti in the parks: firstly, a sex difference in distribution related to the dispersal of males; secondly, the natural mortality of males at a younger age than females, as substantiated by the data from Elk Island National Park. The removal of males from the population foci by these 2 agents leaves more food and space for females and young. This is believed to contribute to the ability of wapiti to sustain a high rate of increase. The extent to which this phenonenon occurs in other ungulates warrants further attention in view of its significance to the ability of a species to increase its abundance and distribution.

Flook, D. R.

Elk and bighorn sheep, Waterton Lakes National Park, Alberta, 1952-53

Canadian Wildlife Service, CWSC-187.

Flook, D. R.

Range relationships of some ungulates native to Banff and Jasper National Parks, Alberta.

in: Grazing in Terreotrial and Marine Environments, Blackwells Scientific Publications, 1964, pp. 119-128.

Flook, D. R.

Range relationships of some ungulates native to Banff and Jasper

Flook, D. R. Cont.
National Parks, Alberta, 1962.

Canadian Wildlife Service, CWSC - 992.
Paper presented at symposium on grazing held by British Ecological Society, at Bangor, North Wales, April 11-14, 1962.

Discusses the habitat of elk in Banff and Jasper Parks (p. 8-9).

Flook, D. R. (Can. Wildl. Serv., Edmonton) and J. E. Stenton
Incidence and abundance of certain parasites in wapiti in the national parks of the Canadian Rockies. CAN J ZOOL 47(5): 795-803. 1969.
-One hundred and seven wapiti Cervus canadensis, collected at different seasons of the year in Banff and Kootenay Parks, and the Ya Ha Tinda Ranch near Banff Park, were examined for helminth and arthropod parasites. Additional data was obtained by inspecting lungs and livers in 1380 wapiti shot in early winter for population control in Jasper, Banff, and Waterton Lakes National Parks. Species commonly found in some areas were Fascioloides magna, Thysanosoma actinoides, Echinococcus granulosus, Dictyocaulus viviparus, and Dermacentor albipictus. Incidence and abundance of these species are compared between wapiti of different age and sex. Seasonal and spatial distributions of parasites are also discussed.

Green, H. V.
Elk census, Banff National Park, Fall, 1951.

Canadian Wildlife Service, CWSC -350, tables.

Gives data derived from the fall elk census from September 15 to October 15.

Green, H. U.
Elk census report of the Bow, Spray and Cascade Ranges, Banff National Park, for the Spring of 1948.

Canadian Wildlife Service, CWSC - 848, tables.

Gives the data derived from the annual spring elk census of the Bow, Spray, and Cascade ranges between April 15 and June 4.

Green, H. U.
Elk of the Lower Bow and Cascade Valley Ranges, Banff National Park, 1950.

Canadian Wildlife Service, CWSC - 363.

Describes the range areas involved and discusses the winter elk utilization of the areas.

Green, H. U.
The occurence, distribution and population of mammals in Banff National Park, Alberta, 1951.

Canadian Wildlife Service, CWSC - 847, maps, tables.

An analysis of Wildlife Observation Cards for the past 4 years in Banff Park.

Green, H. U.
The productivity and sex survival of elk, Banff National Park, Alberta, 1949.

Canadian Wildlife Service, CWSC - 651, tables.

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Mair, W. W.
Elk reproduction, Banff National Park, 1949.

Canadian Wildlife Service, CWSC - 6.

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Moose-elk relations and competition in the Banff National Park, June 1949.

Canadian Wildlife Service, CWSC - 10.

Mair, W. W.
Report on investigations into moose-elk relations in Banff National Park, October, 1949.

Canadian Wildlife Service, CWSC - 11.

Mitchell, K. B.
Banff National Park elk slaughter, 1947-48.

Canadian Wildlife Service, CWSC - 557, tables.

Gives the ages and sex composition of the kill.

Pfeiffer, E. W.
Some factors affecting the winter game ranges of Jasper National Park. Vancouver, University of B. C. Abstract of M. S. thesis, 1948 46 pp.

Tanner, H. C.
Elk-sheep competition in the Cascade Valley, Banff National Park, 1950

Canadian Wildlife Service, CWSC - 845, 1950. (Note: Restricted. This report not prepared by C.W.S.).

Describes the interaction of the elk and sheep. Recommends that effort be made to regulate the elk-sheep competition in the Cascade Valley by removing the elk and wolves. This would allow the sheep herd to develop to a minimum of 200-300 animals.

Tener, J. S.
Analysis of warden's wildlife observation cards, Jasper National Park.

Canadian Wildlife Service (Edmonton), Typewritten report in files 1953, 17 pp.

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