United States
Department of
Agriculture

Forest Service

**Intermountain
Research Station**

General Technical
Report INT-242

April 1988

Beaver in Western North America: An Annotated Bibliography, 1966 to 1986

Dean E. Medin
Kathryn E. Torquemada

THE AUTHORS

DEAN E. MEDIN is a research wildlife biologist with the Intermountain Research Station at the Forestry Sciences Laboratory in Boise, ID. He earned a B.S. degree in forest management from Iowa State University in 1957, an M.S. degree in wildlife management from Colorado State University in 1959, and a Ph.D. degree in range ecosystems from Colorado State University in 1976.

KATHRYN E. TORQUEMADA is a biological technician with the Intermountain Research Station at the Forestry Sciences Laboratory in Boise, ID. She earned a B.S. degree in wildlife management from Humboldt State University in 1982.

RESEARCH SUMMARY

This annotated bibliography of published literature on the beaver (*Castor canadensis*) contains 206 references to both technical and popular articles and covers a period from 1966 to 1986. Emphasis is on the Western United States and Canada. A subject index is keyed to an alphabetical list of authors. The purpose of the bibliography is to provide a working tool for natural resource specialists, land-use planners, and others charged with managing beavers and their habitats.

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Intermountain Research Station
324 25th Street
Ogden, UT 84401

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INTRODUCTION

Of the wild mammals associated with riparian-aquatic habitats, beavers (*Castor canadensis*) bring about the most extensive changes in their environment. Their activities have pronounced effects upon the ecology and management of not only the immediate area but of downstream habitats as well. In some cases the status of the beaver is unclear; activities may at the same time be both beneficial and detrimental. Because of this duality, the beaver in some areas presents difficult management challenges.

This annotated bibliography is a review of literature on the beaver in Western North America published from 1966 to 1986. Emphasis is on the Western United States and Canada in recognition of regional differences in beaver habitats and regional problems in beaver management. Inclusion of references solely on the basis of geography was somewhat arbitrary. This bibliography was compiled to provide a working tool for use by natural resource specialists, land-use planners, and others charged with managing beavers and their habitats.

Only published information that is generally available is included in this bibliography. References range from technical reports to popular articles and include both methodological and substantive papers. The annotations provide a general idea of the information and results contained in each publication. Some annotations provide only that information contained in broad-based articles that are relevant to this bibliography. The annotations are not intended to be abstracts.

The organization of the bibliography was purposely kept simple. It is arranged alphabetically by author with a number assigned to each entry. To make the bibliography more useful, a subject index is provided. The alphabetical subject index lists the numbers of references, keyed to author, for each subject heading.

The method of citation is in general accordance with the style recommended by the American National Standards Institute (ANSI Z39.29-1977). Preface pages and references to illustrative materials have been omitted. Authors' names are listed as they appear on the original copy of the reference.

Several abstracting publications, books, periodicals, monographs, and bibliographies were useful in locating reference material. Some of these and other important sources for locating additional or earlier references on beavers are listed below.

Avery, Ed L. 1983. A bibliography of beaver, trout, wildlife, and forest relationships with special references to beaver and trout. Tech. Bull. 137. Madison, WI: Wisconsin Department of Natural Resources. 23 p.

Biological Abstracts. 1966-1986. Philadelphia, PA: Biosciences Information Service.

Black, Hugh C.; Taber, Richard D. 1977. Mammals in western coniferous forest ecosystems: an annotated bibliography. Bull. 2. Seattle, WA: University of Washington, U.S./International Biological Program, Coniferous Forest Biome. 199 p.

Canadian Journal of Zoology. 1966-1986. Ottawa, ON: The National Research Council of Canada.

Hill, Edward P. 1982. Beaver. In: Chapman, Joseph A.; Feldhamer, George A., eds. Wild mammals of North America: biology, management, and economics. Baltimore, MD: Johns Hopkins University Press: 256-281.

Hodgdon, Harry E.; Larson, Joseph S. 1980. A bibliography of the recent literature on beaver. Res. Bull. 665. Amherst, MA: University of Massachusetts, Agricultural Experiment Station. 128 p.

Jenkins, Stephen H.; Busher, Peter E. 1979. *Castor canadensis*. Mammalian Species 120. Provo, UT: The American Society of Mammalogists. 8 p.

Journal of Mammalogy. 1966-1986. Provo, UT: The American Society of Mammalogists.

Journal of Wildlife Management. 1966-1986. Bethesda, MD: The Wildlife Society.

Wildlife Abstracts. 1966-1986. Fort Collins, CO: U.S. Department of the Interior, Fish and Wildlife Service.

Yeager, Lee E.; Hay, Keith G. 1955. A contribution toward a bibliography on the beaver. Tech. Bull. 1. Denver, CO: Colorado Game and Fish Department. 103 p.

BIBLIOGRAPHY

1. Aleksiuk, Michael. 1968. Scent-mound communication, territoriality, and population regulation in beaver (*Castor canadensis* Kuhl). Journal of Mammalogy. 49(4): 759-762.

After observations on the Mackenzie Delta, Northwest Territories, Canada, Aleksiuk hypothesized that scent mound systems function as a means of communication among beaver from adjacent colonies and between established colonies and the floating population. The system appears to be a mechanism of self-regulation that limits the population before food becomes a major limiting factor.

2. Aleksiuk, Michael. 1970. The function of the tail as a fat storage depot in the beaver (*Castor canadensis*). Journal of Mammalogy. 51(1): 145-148.

The author discusses the seasonal pattern of tail fat and its role as a storage of energy reserves on specimens collected on the Mackenzie Delta, Northwest Territories, Canada.

3. Aleksiuk, Michael. 1970. The seasonal food regime of arctic beavers. Ecology. 51(2): 264-270.

This study on the Mackenzie Delta, Northwest Territories, Canada, examined the seasonal variation in food of the beaver. Leaves and growing tips of willows were the main food items in July and August. The remainder of the year beaver preferred a diet of willow bark, poplar, and alder. The northern beaver has adapted to seasonal variation in protein availability by utilizing high-protein willow leaves almost exclusively when they are available.

4. Aleksiuk, Michael; Cowan, Ian McTaggart. 1969. Aspects of seasonal energy expenditure in the beaver (*Castor canadensis* Kuhl) at the northern limit of its distribution. Canadian Journal of Zoology. 47(4): 471-481.

The study in the Mackenzie Delta, Northwest Territories, showed that a winter weight loss characterized immature animals. Fat was deposited in the autumn, maintained during the winter, and mobilized in the spring. Thyroid gland weights were high in the summer and low in the winter. Metabolic energy expenditure was high during the summer and low during the winter. This annual pattern is an inherent property of northern beavers.

5. Aleksiuk, Michael; Cowan, Ian McTaggart. 1969. The winter metabolic depression in arctic beavers (*Castor canadensis* Kuhl) with comparisons to California beavers. Canadian Journal of Zoology. 47(5): 965-979.

No major seasonal changes occurred in California beavers kept under Vancouver climatic conditions, but arctic beavers kept under the same conditions showed a growth cessation, a 40 percent reduction in food intake, and a depression in the 131PBI conversion ratio during the winter. The authors concluded that northern beavers possess a winter metabolic depression induced by decreasing light intensity in the autumn.

6. Allen, Arthur W. 1983. Habitat suitability index models: beaver. Fort Collins, CO: U.S. Department of the Interior, Fish and Wildlife Service. 20 p.

Habitat preferences are described along with a mathematical model designed to provide information for use in impact assessment and habitat management activities. This updates the model in the original publication dated September 1982.

7. Allred, Morrell. 1980. A re-emphasis on the value of the beaver in natural resource conservation. Journal of the Idaho Academy of Science. 16(1): 3-10.

The author looked at sedimentation, storage of water, and increased diversity of beaver ponds and communities on three tributaries of the South Fork of the Snake River near the Idaho-Wyoming border. Water impoundments by beavers provided increased surface area, water current deceleration, regulation of stream flow, a water reservoir, filter for low density particulates, and a greater diversity of wildlife habitat.

8. Allred, Morrell. 1981. The potential use of beaver population behavior in beaver resource management. Journal of the Idaho Academy of Science. 17(1): 14-24.

Allred discusses the ratio of transient to resident beavers, mortality within populations, and effects of high water on their movement on two tributaries of the South Fork Snake River in western Wyoming.

9. Allred, Morrell. 1986. Beaver behavior. Happy Camp, CA: Naturegraph Publishers, Inc. 110 p.

The author discusses beaver history, physical characteristics, life history, behavior, and management.

10. Apple, Larry L. 1983. The use of beavers in riparian/aquatic habitat restoration in a cold desert, gully-cut stream system: a case history. In: Whaley, R., ed. Proceedings, 18th annual meeting Colorado-Wyoming Chapter, American Fisheries Society; 1983 March 2-3; Laramie, WY. [Publisher and city unknown]: 29-35.

This study sought to use "natural" systems and beaver reintroduction to restore riparian habitat on two perennial streams in southwestern Wyoming. The newly built dams were trapping sediment, reducing stream velocity, and locally elevating the water table, thus allowing reestablishment of willow and other riparian plants.

11. Apple, Larry L. 1984. Riparian habitat restoration in cold desert, gully-cut stream systems: an innovative, cost effective, ecological approach. In: Transactions of the 49th North American wildlife and natural resources conference; 1984 March 23-28; Boston, MA. Washington, DC: Wildlife Management Institute [Unpaged]. Poster Session.

Study areas in overgrazed areas in the Rock Springs, WY, district helped determine if beaver could assist the riparian recovery process. Beaver activity reduced the ability of the stream to transport sediment by reducing the effective slope of the stream channel.

12. Apple, Larry L. 1985. Riparian habitat restoration and beavers. In: Johnson, R. Roy; Ziebell, Charles, D.; Patton, David R.; Ffolliott, Peter F.; Hamre, R. H., tech. coords. Riparian ecosystems and their management: reconciling conflicting uses: first North American riparian conference; 1985 April 16-18; Tucson, AZ. Gen. Tech. Rep. RM-120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 489-490.

This study in southwestern Wyoming sought to determine if both materials and beaver could be supplied or relocated into marginal habitats with resulting habitat improvement. At the end of 3 years, results showed promise.

13. Apple, Larry L.; Smith, Bruce H.; Dunder, James D.; Baker, Bruce W. 1984. The use of beavers for riparian/aquatic habitat restoration of cold desert, gully-cut stream systems in southwestern Wyoming. In: Proceedings, American Fisheries Society/Wildlife Society joint chapter meeting; 1984

February 8-10; Logan, UT. [Publisher and city unknown]: 123-130.
Several study projects in the Rock Springs, WY, district resulted in development of techniques for restoring and reestablishing degraded riparian and aquatic habitats. Beaver were reintroduced to fenced study areas and returned on their own to unfenced areas. The newly built beaver dams are trapping sediment, reducing stream velocity, locally elevating the water table, and reducing the effects of seasonally fluctuating water table levels.

14. Avery, Ed L. 1983. A bibliography of beaver, trout, wildlife, and forest relationships with special references to beaver and trout. Tech. Bull. 137. Madison, WI: Wisconsin Department of Natural Resources. 23 p.
Emphasis is on the Midwestern and Eastern United States, but other important references are included.

15. Bailey, Theodore N. 1981. Characteristics, trapping techniques, and views of trappers on a wildlife refuge in Alaska. In: Chapman, J. A.; Pursley, D., eds. Proceedings, worldwide furbearer conference; 1980 August 8-11; Frostburg, MD. Frostburg, MD: Worldwide Furbearer Conference, Inc.: 1904-1918.
Questionnaires given to persons wishing to trap on Alaska's Kenai Penninsula asked about their experience, techniques and views of trapping on the refuge, and any impacts it might have. Outdoor experience was the main reason for trapping, and most trappers trapped for land as well as aquatic furbearers. The majority of trappers indicated they would support additional regulations or closed areas to protect furbearers.

16. Bailey, Theodore N. 1981. Factors influencing furbearer populations and harvest on the Kenai National Moose Range, Alaska. In: Chapman, J. A.; Pursley, D., eds. Proceedings, worldwide furbearer conference; 1980 August 8-11; Frostburg, MD. Frostburg, MD: Worldwide Furbearer Conference, Inc.: 249-272.
Discusses the impact that natural factors have on furbearers, such as the 1964 earthquake, wildfires, overbrowsing of aspen by moose, and increased lynx harvest. Two methods were used to document changes in population levels and harvest rates: comparison of annual furbearer harvests and success rates per trapping permit holder; and comparison of beaver population estimates for different periods and habitats. Factors affecting beaver harvest on the refuge include fur prices, local economic conditions, and trapper experience and technique. Predation on beaver does not appear to be significant.

17. Bartlett, Des; Bartlett, Jen. 1974. Nature's aquatic engineers: beavers. National Geographic. 145(5): 716-732.
A husband-and-wife team studied beaver habits on Granite Creek in Wyoming. They discuss beaver life history.

18. Baskin, Jon Alan. 1974. Small vertebrates of the Bidahochi Formation, northeastern Arizona. Journal of the Arizona Academy of Sciences. 9(Suppl.) :35.
Beaver fossils were one of many small vertebrates found in middle Pliocene sediments from White Cone, Navajo County, AZ.

19. Baxter, R. M. 1977. Environmental effects of dams and impoundments. Annual Review of Ecological Systems. 8: 255-283.
Baxter covers morphology and physical and chemical limnology of artificial lakes, biology of reservoir ecosystems, and downstream effects of impoundments.

20. Bergstrom, Dorothy. 1985. Beavers: biologists "rediscover" a natural resource. Forestry Research West. [Fort Collins, CO]: U.S. Department of Agriculture, Forest Service; October: 1-5.
Researchers and land managers are looking at the beneficial role of beavers in regulating water movement, sediment, and streamside vegetation within watersheds in the Pacific Northwest.

21. Beschta, Robert L. 1979. Debris removal and its effects on sedimentation in an Oregon Coast Range stream. Northwest Science. 53(1): 71-77.
The removal of large organic debris resulted in accelerated downcutting of previously stored sediments. As a result, turbidity and suspended sediment levels increased during several storms. Streamflow eroded more than 5,000 m^3 of sediment along a 250-m reach the first winter after debris removal.

22. Best, Troy L. 1971. Notes on the distribution and ecology of five eastern New Mexico mammals. Southwestern Naturalist. 16(2): 210-211.
Two beaver skulls were collected in Union County, NM, in March 1967. This was the first record of occurrence in the Cimarron River of New Mexico.

23. Bilby, Robert E. 1981. Role of organic debris dams in regulating the export of dissolved and particulate matter from a forested watershed. Ecology. 62(5): 1234-1243.
In an experimental approach, all organic debris dams were removed from a 175-m section of second-order stream, just above a gauging weir. Dam removal brought about a 6 percent increase in the export of dissolved matter and a 500 percent increase in the export of both fine particulate and coarse particulate matter.

24. Bilby, Robert E.; Likens, Gene E. 1980. Importance of organic debris dams in the structure and function of stream ecosystems. Ecology. 61(5): 1107-1113.
Organic debris dams are extremely important components of the small-stream ecosystem. They retain organic matter within the system, thereby allowing it to be processed into finer size fractions in headwater tributaries rather than transported downstream in a coarse particulate form.

25. Black, Hugh C.; Taber, Richard D. 1977. Mammals in western coniferous forest ecosystems: an annotated bibliography. Bull. 2. Seattle, WA: University of

Washington, U.S./International Biological Program, Coniferous Forest Biome. 199 p.
The bibliography contains references on beaver.

26. Blair and Ketchums Country Journal. 1983. Beavers enlisted by BLM. Blair and Ketchums Country Journal. 10: 35.

The U.S. Department of the Interior, Bureau of Land Management, has enlisted beavers to help restore eroded banks along Muddy Creek and its tributary streams in Wyoming. The effects of the beavers' work are already evident. Erosion has been reduced, new vegetation is appearing along streams, the water table is rising, new marsh areas are developing, and fish and wildlife habitat is improving.

27. Boddicker, Major L. 1978. Trapping in the footsteps of mountain men (part 1). Colorado Outdoors. 27(1): 32-35.
Boddicker talks about his beaver trapping experiences in Colorado.

28. Boddicker, Major L. 1978. Trapping in the footsteps of mountain men (part 2). Colorado Outdoors. 27(2): 30-33.
The author discusses trapping techniques he uses.

29. Boddicker, Major L. 1978. Trapping in the footsteps of mountain men (part 3). Colorado Outdoors. 27(3): 36-37.
The author relates what happened to his trapping grounds and the beaver lodges after 3 months of drought and cold.

30. Boyce, Mark S. 1981. Beaver life-history responses to exploitation. Journal of Applied Ecology. 18(3): 749-753.
Boyce studied an exploited beaver population along the Chena River near Fairbanks, AK, and an unexploited beaver population on Birch Creek in the Yukon River drainage. He was testing the theory on the evolution of life histories that optimal reproductive effort varies with changing survivorship schedules. He compared the demographic structure and life history characteristics of these two populations.

31. Boyce, Mark S. 1981. Habitat ecology of an unexploited population of beavers in interior Alaska. In: Chapman, J. A.; Pursley, D., eds. Proceedings, worldwide furbearer conference; 1980 August 8-11; Frostburg, MD. Frostburg, MD: Worldwide Furbearer Conference, Inc.: 155-186.
The spacing pattern of beaver colonies along Birch Creek (Yukon River drainage) was studied relative to the habitat surrounding each colony site. The author used discriminant analysis, multiple regression, and canonical correlation.

32. Brayton, D. Scott. 1984. The beaver and the stream. Journal of Soil and Water Conservation. 39(2): 108-109.
Beaver were introduced to two severely eroded streams in southwestern Wyoming to help restore riparian habitat, stabilize streambanks, and collect sediment. The results after 3 years were proving favorable.

33. Brazell, Ricky E.; Workman, Gar W. 1977. A preliminary survey on beaver (*Castor canadensis*) in Canyonlands National Park, Utah. Encyclia. 54(1): 25-27.
A survey in 1976 examined current abundance and distribution of beaver in the park and the use beaver made of tamarisk (*Tamarix pentandra*). No evidence of tamarisk use was found. Beaver do not appear to be threatened by the tamarisk invasion of willow (*Salix* spp.)

34. Buech, Richard R. 1985. Beaver in water impoundments: understanding a problem of water-level management. In: Knighton, M. Dean, compiler. Water impoundments for wildlife: a habitat management workshop; 1982 August 31-September 2; Bemidji, MN. Gen. Tech. Rep. NC-100. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 95-105.
Reviews the natural history of beaver, their habitat requirements, the problems they cause in impoundments, and why those problems occur. The author offers some potential solutions.

35. Burris, Oliver E.; McKnight, Donald E. 1973. Game transplants in Alaska. Wild. Tech. Bull. 4. Juneau, AK: Alaska Department of Fish and Game. 57 p.
Beaver transplants have occurred since 1925, usually resulting in harvestable populations.

36. Bush, Albert O.; Samuel, W. M. 1978. The genus *Travassosius* Khalil, 1922 (Nematoda, Trichostrongyloidea) in beaver, *Castor* spp.: a review and suggestion for speciation. Canadian Journal of Zoology. 56(7): 1471-1474.
Beaver collected in east-central Alberta were infected with a species of *Travassosius*. One suggestion is that *T. americanus* in *Castor canadensis* is the ancestral stock and that *T. rufus* has evolved following allopatric evolution of *C. fiber*.

37. Bush, Albert O.; Samuel, W. M. 1981. A review of helminth communities in beaver (*Castor* spp.) with a survey of *Castor canadensis* in Alberta, Canada. In: Chapman, J. A.; Pursley, D., eds. Proceedings, worldwide furbearer conference; 1980 August 8-11; Frostburg, MD. Frostburg, MD: Worldwide Furbearer Conference, Inc.: 678-689.
An examination of 86 beaver from Alberta, Canada, for helminth fauna was compared to that of beaver from other Nearctic (*C. fiber*) and Palearctic regions.

38. Busher, P. E. 1983. Interactions between beavers in a montane population in California. Acta Zoologica Fennica. 174: 109-110.
Dominant-submissive and neutral interactions between members of a beaver population in the central Sierra Nevada were studied between 1977 and 1980. Kits had the highest frequency of interactions, while adults had the

lowest. Older animals of both sexes received more interaction than they initiated. Interaction was generally directed from younger animals toward older.

39. Busher, P. E.; Jenkins, S. H. 1985. Behavioral patterns of a beaver family in California. Biology of Behavior. 10(1): 41-54.

Behavioral patterns of beavers were studied at Sagehen Creek, Nevada County, CA, from 1977 to 1979. A cluster analysis revealed age class, sex, and seasonal differences in behavior between individual family members.

40. Busher, Peter E.; Warner, Randall J.; Jenkins, Stephen H. 1983. Population density, colony composition, and local movements in two Sierra Nevadan beaver populations. Journal of Mammalogy. 64(2): 314-318.

Beaver were trapped from May through September 1974 and 1975 at Little Valley and from May through September at Sagehen Creek, CA. The authors demonstrate that social organization of beavers may be more variable than is often assumed.

41. Call, Mayo White. 1966. Beaver pond ecology and beaver-trout relationships in southeastern Wyoming. Laramie, WY: University of Wyoming; Wyoming Game and Fish Commission. 296 p.

The author presents findings on the effects of beaver on water storage, trout habitat, and the water table on the Pole Mountain District of the Medicine Bow National Forest in southeastern Wyoming. Field investigations conducted between 1960 and 1964 show that beaver are of prime importance to the brook trout fishery.

42. Clifford, Hugh F. 1978. Descriptive phenology and seasonality of a Canadian brown-water stream. Hydrobiologia. 58(3): 213-231.

The maximum impounding effect of beaver dams in September is one of the important phenological events of the three ice-free seasons in a brown-water stream in west-central Alberta.

43. Collins, Thomas C. 1976. Stream flow effects on beaver populations in Grand Teton National Park. In: Proceedings, first conference on scientific research in the National Parks; 1976 November 9-13; New Orleans, LA. Arlington, VA: American Institute of Biological Sciences: Series 5, Vol. 1: 349-352.

The objectives of this study (part of a larger investigation) were to assess the influence of stream flow regimes on beaver population abundance, distribution, and movement. Dramatic population movements occurred at low water levels. Dwelling abandonment at high water was not uncommon.

44. Cowell, Daryl W. 1984. The Canadian beaver, *Castor canadensis*, as a geomorphic agent in karst terrain. The Canadian Field-Naturalist. 98(2): 227-230.

In areas underlain by carbonate bedrock such as limestone or dolomite, surface waters may be captured by underground stream channels creating special problems for the beaver.

45. Craun, Gunther F. 1979. Waterborne outbreaks of giardiasis. In: Jakubowski, W.; Hoff, J. C., eds. Waterborne transmission of giardiasis: Proceedings of a symposium; 1978 September 18-20; Cincinnati, OH. Cincinnati, OH: U.S. Environmental Protection Agency, Health Effects Research Laboratory: 127-149.

Beavers may have been the source of a *Giardia* spp. outbreak in the Uinta Mountains of Utah. Three beavers were found to be infected with *Giardia* cysts at an outbreak in Camas, WA.

46. Crawford, John S. 1978. The subarctic beaver. Alaska. 44: 40-41.

The author observed a beaver family preparing for winter in a remote area of Mount McKinley National Park, AK.

47. Crouch, Glenn L. 1979. Long-term changes in cottonwoods on a grazed and an ungrazed plains bottomland in northeastern Colorado. Res. Note RM-370. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 4 p.

Numbers of cottonwood trees declined between 1961 and 1978. Water management, grazing by livestock and deer, plant competition on the ungrazed area, and beaver-felling of young trees all contributed to the lack of regeneration that appears responsible for the general decline in overstory vegetation.

48. Culver, David A.; Vaga, Ralph M.; Munch, C. Susan; Harris, Sandra M. 1981. Paleoecology of Hall Lake, Washington: a history of meromixis and disturbance. Ecology. 62(3): 848-863.

The lake has experienced major changes in productivity in the past 350 years due to disturbance in the watershed from lumbering, road construction, and probably periodic use by beaver colonies.

49. Cutright, Warren J.; McKean, Tom. 1979. Countercurrent blood vessel arrangement in beaver (*Castor canadensis*). Journal of Morphology. 161(2): 169-176.

The vascular anatomy of five beavers was studied by dissection and the injection of vinyl acetate into arteries and veins.

50. Dagg, Anne Innis. 1972. Research on Canadian mammals. Canadian Field-Naturalist. 86(3): 217-221.

The author includes Canadian mammal literature from the past 40 years. Journals referenced, dates of publication, authors, region of study, means of funding, and subject matter are presented in tables.

51. Dahm, Clifford N.; Sedell, James R. 1986. The role of beaver on nutrient cycling in streams. Journal of the Colorado-Wyoming Academy of Science. 18(1): 32. Abstract.

Beaver activity affects the cycling of nutrients in streams by increasing the deposit and retention of organic material and by creating zones of anaerobiosis in the sediments.

This increase in overall ecosystem productivity, coupled to the increased and more diverse aquatic habitat, helps make streams with beaver highly productive areas for the rearing of fish.

52. D'Aulaire, Emily; D'Aulaire, Ola. 1973. The beaver is back. National Wildlife. 11(4): 10-13.

The authors cite a few Western United States repopulation programs and discuss the beaver's life history and importance as a much-sought-after furbearer during the mid-1800's.

53. Davies, Robert B.; Hibler, Charles P. 1979. Animal reservoirs and cross-species transmission of *Giardia*. In: Jakubowski, W.; Hoff, J. C., eds. Waterborne transmission of giardiasis: Proceedings of a symposium; 1978 September 18-20; Cincinnati, OH. Cincinnati, OH: U.S. Environmental Protection Agency, Health Effects Research Laboratory: 104-126.

During 1975 to 1977, a survey of people and wild and free-ranging domestic animals for *Giardia* was completed in several areas of Colorado. Fecal samples were examined by a zinc sulfate centrifugation technique. Of 744 samples from 33 species of vertebrates, 44 of 244 beavers (18 percent) were found to be positive for *Giardia*.

54. Davis, Jerry W. 1986. Options for managing livestock in riparian habitats. In: Transactions of the 51st North American wildlife and natural resources conference; 1986 March 21-26; Reno, NV. Washington, DC: Wildlife Management Institute: 290-297.

Caution should be exercised in introducing beavers to enhance riparian habitat. In some cases, beaver can be detrimental to meeting specific objectives.

55. DeByle, Norbert V. 1985. Wildlife. In: DeByle, Norbert V.; Winokur, Robert P., eds. Aspen: ecology and management in the Western United States. Gen. Tech. Rep. RM-119. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 135-152.

Beaver affect aspen stands from cutting and dam building behavior. Sucker regrowth of aspen in flooded areas around beaver dams is not fast enough to sustain beaver populations for long.

56. Deems, Eugene F., Jr.; Pursley, Duane, eds. 1978. North American furbearers: their management, research and harvest status in 1976. College Park, MD: International Association of Fish and Wildlife Agencies; Maryland Department of Natural Resources, Wildlife Administration. 171 p.

This report details the general status of 27 of North America's major terrestrial and semiaquatic furbearers.

57. Denney, Ralph. 1982. Oregon's furbearers. Oregon Wildlife. 37(8): 10-13.

The author reviews the history of Oregon's furbearer management and harvest.

58. Dennington, Malcolm; Johnson, Brian. 1974. Studies of beaver habitat in the Mackenzie Valley and northern Yukon. Report 74-39. Ottawa, ON: Canadian Wildlife Service, Department of the Environment. 172 p.

In determining if there were specific areas or habitat components that would be altered, to the detriment of beaver populations, through construction of a pipeline, the authors concluded that if care was exercised to maintain water regimes, beaver populations on or near the proposed pipeline route should not be adversely affected.

59. Dimock, Edward J., II; Black, Hugh C. 1969. Scope and economic aspects of animal damage in California, Oregon, and Washington. In: Black, H. C., ed. Wildlife and reforestation in the Pacific Northwest. Corvallis, OR: Oregon State University: 10-14.

Included are estimates of timber volumes lost, those animals chiefly responsible, and how land managers assess the damage. Animal damage within California, Oregon, and Washington is probably costing the timber industry several million dollars each year.

60. Dubey, J. P. 1983. *Toxoplasma gondii* infection in rodents and insectivores from Montana. Journal of Wildlife Diseases. 19(2): 149-150.

Rodents and insectivores near Bozeman, MT, were tested for the prevalence of *Toxoplasma gondii*. The disease was isolated in mice inoculated with tissues of one of 27 beavers. The six mice inoculated with pooled tissues of infected beaver developed an antibody titer of >1:256, and *T. gondii* cysts were found in the brains of three of six mice killed.

61. Duncan, Sally L. 1984. Leaving it to beaver. Environment. 26(3): 41-45.

Stresses the role of the beaver "as a regulator rather than a passive inhabitant of streams; an innovator and modifier of riparian vegetation rather than a mere consumer."

62. Dykes, Aubert C.; Juranek, Dennis D.; Lorenz, Rodney A.; Sinclair, Susanne; Jakubowski, Walter; Davies, Robert. 1980. Municipal waterborne giardiasis: an epidemiologic investigation: beavers implicated as a possible reservoir. Annals of Internal Medicine. 92(2, part 1): 165-170.

Beavers were implicated as the most probable source of *Giardia* organisms that produced an epidemic in March 1976 in Camas, WA. Laboratory and epidemiologic evidence is provided, although somewhat incomplete.

63. Emry, Robert J. 1972. A new species of *Agnotocastor* (Rodentia, Castoridae) from the early Oligocene of Wyoming. American Museum Novitates. 2485: 1-7.

A new fossil species of beaver (*Agnotocastor galushai*) was found in early Oligocene deposits of the Flagstaff Rim area, Natrona County, WY.

64. Farrar, Gerald B. 1971. The beaver: the conservationist! Defenders of Wildlife News. 46(2): 205-206.

At Willow Creek, ID, beaver were introduced to a severely eroded stream, resulting in stabilization and lushness surrounding their dam site.

65. Feist, C.; Nice, P. O. 1982. Prevalence of *Giardia* infections among inhabitants of four Alaskan villages. In: Proceedings, 82nd annual meeting of the American Society for Microbiology; 1982 March 12; Atlanta, GA. Washington, DC: American Society for Microbiology: 319. Abstract.

Large beaver populations lead to amplification of contamination of surface waters with *Giardia* cysts.

66. Feldhamer, G. A.; Chapman, J. A. 1984. Other furbearers. In: Mason, Ian L., ed. Evolution of domesticated animals. New York: Longman: 293-297.

Contains information on the distribution, reproduction, and potential for domestication of seven species of furbearers, including the beaver.

67. Ffolliott, Peter F.; Clary, Warren P.; Larson, Frederic R. 1976. Observations of beaver activity in an extreme environment. Southwestern Naturalist. 21(1): 131-133.

Beaver were observed adjacent to small perennial pools formed in normally dry drainages dissecting desert scrub and riparian hardwood vegetation types on Dry Beaver drainage in north-central Arizona. Climatic conditions associated with these pools are often semiarid, which may be considered severe in terms of beaver habitat.

68. Fidler, Vera. 1972. Grey Owl: a man ahead of his time. Canadian Geographic Journal. 84(5): 152-157.

This is a personal history of Grey Owl who, in his later years, resided in Prince Albert National Park, Saskatchewan. Grey Owl was one of the first to carry out an experiment to restore beaver to an area.

69. Finch, Robert. 1984. Silent parables. The Canadian Forum. 64: 40-42.

The history of how the beaver and maple leaf came to be official emblems for Canada.

70. Fisher, Philip H. 1986. Keeping beavers from plugging culvert inlets. Engineering Field Notes. Washington, DC: U.S. Department of Agriculture, Forest Service; 18: 9-13.

The San Dimas Equipment Development Center tested four methods for keeping beavers from plugging culvert inlets: the perforated pipe method, the perforated culvert method, the downspout method, and the baffler method. The downspout approach showed the greatest promise.

71. Fletcher, Colin. 1966. Un-eager beaver. Field and Stream. 71: 53, 100-109.

This life history of beavers includes observations by the author and others who have had contact with them.

72. Foreyt, W. J.; Leathers, C. W. 1984. Mite (*Schizocarpus mingaudi*) infestations of ranch-raised beavers. Journal of the American Veterinary Medical Association. 185(11): 1414-1415.

In April and May 1981, at a commercial ranch near Kimberly, ID, approximately 50 beavers of all ages and both sexes died. Investigators found numerous adult mites attached to hair shafts on the preserved skin. Treatment of nest boxes was carried out using 50 percent wettable diazinon powder.

73. Francis, Margaret M.; Naiman, Robert J.; Melillo, Jerry M. 1985. Nitrogen fixation in subarctic streams influenced by beaver (*Castor canadensis*). Hydrobiologia. 121(3): 193-202.

The authors measured nitrogen fixation in four subarctic streams substantially modified by beaver in Quebec, Canada. The authors estimated that total nitrogen accumulation in sediment, per unit area, is enhanced nine to 44 times by beaver damming a section of stream.

74. Frost, Floyd; Plan, Byron; Liechty, Bill. 1980. *Giardia* prevalence in commercially trapped mammals. Journal of Environmental Health. 42(5): 245-249.

A *Giardia* outbreak in Camas, WA, prompted the Washington State Health Services Division to survey wild beaver and muskrat for prevalence of *Giardia* infection to determine if animal contamination of other water supplies could occur. Surveys were conducted in 1976-77, 1977-78, and 1978-79. Annual percentages of beaver contaminated were 6.3, 6.8, and 19, respectively.

75. Fuller, Todd K.; Keith, Lloyd B. 1980. Wolf population dynamics and prey relationships in northeastern Alberta. Journal of Wildlife Management. 44(3): 583-602.

Wolf population studies from October 1975 through June 1978 on two study areas in northern Alberta showed that beaver populations were directly related to beaver occurrence in wolf scat. Consumption of beaver varied greatly between packs.

76. Gainer, Robert; Smith, Kirby. 1985. Mineralization of subcutaneous tissue in beaver, *Castor canadensis*. The Canadian Field-Naturalist. 99(4): 535-536.

The subcutaneous surface of the hides of two yearling kits, shot by a local trapper in the central Alberta foothills, had a white, 0.5 to 2 mm thick, meshlike layer of a stiff and fibrous material that covered most of the anterior dorsal portion of the hides.

77. Gerhart, Bill. 1979. The land along the water: riparian zones are critical for wildlife survival. Wyoming Wildlife. 43(11): 20-23.

The beaver is one of many mammals dependent on riparian habitat for all or part of their life cycle.

78. Gill, Don. 1972. The evolution of a discrete beaver habitat in the Mackenzie River Delta, Northwest Territories. The Canadian Field-Naturalist. 86(3): 233-239.

This study traced through time the sequence of physical and biological events that create a discrete beaver habitat, conducive to the colonization of a poplar (*Populus balsamifera*) seral community.

79. Gill, Don. 1978. Some ecological and human consequences of hydroelectric projects in the Mackenzie

River drainage system, northwestern Canada. Occas. Publ. 14. Edmonton, AB: Boreal Institute for Northern Studies, University of Alberta: 73-82.
This paper called attention to the ecological alteration that can and has already occurred below large hydroelectric projects on northern rivers. Northern floodplains and deltas are most subject to downstream regulation-caused damage. Beaver use floodplains and deltas as their primary habitat. If flooding and siltation were to no longer take place, the riparian community would be replaced by a white spruce (*Picea glauca*) climax forest, virtually unusable by beaver.

80. Gordon, Kenneth. 1966. Mammals and the influence of the Columbia River Gorge on their distribution. Northwest Science. 40(4): 142-146.
This paper deals with the Columbia River to the confluence of the Snake River and the latter stream to the point where it flows around the north end of the Blue Mountains, and considers these streams as they were before dams were built. The Columbia River is a barrier for many mammals, and the gorge lets many mammals breach the Cascade Mountain barrier that cannot go over an unbroken range. Beaver are one of 14 members found in the Columbia River vicinity that have transgressed the stream.

81. Grover, Jerry. 1984. Don't drink the water. Oregon Wildlife. 39(7): 10-11.
Beaver are involved in the transmission of *Giardia* spp. Their aquatic habits ensure a steady supply of the parasite to the water. *Giardia lamblia* is probably the most common intestinal parasite in the United States.

82. Guenther, Keith; Kucera, Thomas E. 1978. Wildlife of the Pacific Northwest: occurrence and distribution by habitat, B.L.M. District and National Forest. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region. 128 p.
The authors review the relationship of regularly occurring vertebrates to plant communities and their successional stages, and dependency upon and use of aquatic and special and unique habitats. They include a checklist with relative abundance, residence status, and classification by State for all vertebrates found in Oregon and Washington.

83. Hall, H. A.; Pritchard, G. 1975. The food of larvae of *Tipula sacra* Alexander in a series of abandoned beaver ponds (Diptera: Tipulidae). Journal of Animal Ecology. 44(1): 55-66.
Larvae of the cranefly living in abandoned beaver ponds in the Kananaskis Forest Reserve, AB, ingest diatoms, filamentous algae, mineral particles, and detritus from the benthic sediments.

84. Hartman, Alan M. 1975. Analysis of conditions leading to the regulation of water flow by a beaver. The Psychological Record. 25: 427-431.
A young beaver was selected for observation and experimentation and for evaluating the bases of water-regulation behavior. Rates and timing of activities were examined against variation in water flow, temperature, level, time of day, and ambient as well as water-specific sounds.

85. Hawkes, Fredrick W. 1973. Elk, moose, and beaver. Pacific Discovery. 26(3): 12-15.
Hawkes describes the "valuable ecological consequences" that beaver have on elk and moose habitat by their swamp-building ability and resultant growth of food-producing shrubs and small trees.

86. Hawley, Vernon D. 1971. Furbearers of the Mackenzie Delta. 1971 Report. Ottawa, ON: Canadian Wildlife Service: 51-52.
Hawley summarizes part of Michael Aleksiuk's 1968 thesis on how the energy regime of northern beavers fluctuates. Information also includes the composition, distribution, and density of beaver populations in the study area.

87. Herb, Gene. 1986. Urban wildlife habitat – can it be maintained? Oregon Wildlife. 41(2): 4-7.
Herb discusses the importance of wetlands as wildlife habitat and the need to protect them. Large numbers of wildlife use the areas because of the abundance of water, food, cover, and nesting areas. Beaver depend upon wetlands for survival.

88. Hill, Edward P. 1982. Beaver. In: Chapman, Joseph A.; Feldhamer, George A., eds. Wild mammals of North America: biology, management, and economics. Baltimore, MD: Johns Hopkins University Press: 256-281.
The author discusses the distribution, physiology, reproduction, ecology, behavior, mortality, economic status, and management of beaver throughout its present range in North America.

89. Hill, E. P.; Novakowski, N. S. 1984. Beaver management and economics in North America. Acta Zoologica Fennica. 172: 259-262.
The authors discuss management (season, traps, damage) and economics (markets, supply and demand, prices, harvest trends) of beaver in North America.

90. Hodgdon, H. E.; Lancia, R. A. 1983. Behavior of the North American beaver, *Castor canadensis*. Acta Zoologica Fennica. 174: 99-103.
The authors attempt to synthesize data on North American beaver into a general scheme. Discussion is limited to intensive studies of individually marked animals of known sex and age class.

91. Hodgdon, Harry E.; Larson, Joseph S. 1980. A bibliography of the recent literature on beaver. Res. Bull. 665. Amherst, MA: University of Massachusetts, Agricultural Experiment Station. 128 p.
The authors have supplemented and updated earlier bibliographies on beaver.

92. Hodkinson, I. D. 1975. A community analysis of the benthic insect fauna of an abandoned beaver pond. Journal of Animal Ecology. 44(2): 533-551.

Subjects of the study were the feeding biology, distribution relative to substrate type, and adult phenology of benthic insects associated with a shallow, abandoned beaver pond in Kananaskis Valley, AB, Canada. The insect fauna of beaver ponds differ markedly from streams, rivers, and lakes. Larvae of Diptera, especially Tipulidae, are the major faunal components.

93. Hodkinson, I. D. 1975. Dry weight loss and chemical changes in vascular plant litter of terrestrial origin, occurring in a beaver pond ecosystem. Journal of Ecology. 63(1): 131-142.

This study, part of a larger project, assessed the role of allochthonous detritus in an abandoned beaver pond ecosystem in the Kananaskis Valley, AB, Canada. All five litter types (*Salix* sp., *Pinus contorta, Juncus tracyi, Deschampsia cespitosa, Picea glauca*) differed significantly in their rate of breakdown over the 18-month study.

94. Hodkinson, I. D. 1975. Energy flow and organic matter decomposition in an abandoned beaver pond ecosystem. Oecologia. 21(2): 131-139.

During 1973 inflow and outflow of energy were measured independently for one spring-fed pond in the Kananaskis Valley, AB, Canada. Of the total yearly energy inflow, 18 percent was exported, 26 percent was respired, and 56 percent accumulated in the sediments. The author concluded that the beaver pond is a highly accretive heterotrophic ecosystem.

95. Hoover, W. H.; Clarke, S. D. 1972. Fiber digestion in the beaver. Journal of Nutrition. 102(1): 9-15.

Levels of dry matter, acid detergent fiber, lignin, protein, and volatile fatty acids were determined in the ingesta at several locations in the gastrointestinal tract. Average cellulose digestion was estimated at 30 percent and protein at 44 percent. Total volatile fatty acids were highest in the cecum and upper colon.

96. Horstman, Louise P. 1979. Evaluation of beaver depredation and control in the Edmonton Fish and Wildlife Region, 1979. Edmonton, AB: Alberta Energy and Natural Resources, Fish and Wildlife Division. 36 p.

This study evaluated the characteristics and economic loss resulting from beaver depredation and the cost and effectiveness of beaver control programs.

97. Howard, Rebecca J.; Larson, Joseph S. 1985. A stream habitat classification system for beaver. Journal of Wildlife Management. 49(1): 19-25.

Documentation over 28 years of beaver (*Castor canadensis*) habitat use on the Prescott Peninsula, New Salem, MA, permitted development and testing of two models to predict maximum density of active beaver colonies on streams. In mixed coniferous-deciduous forest habitat, the percentage of hardwood vegetation, watershed size, and stream width had significant positive effects on active colony density. Increasing stream gradient and progressively well-drained soils had negative effects. The models were 80 and 75 percent reliable in predicting active colony density.

98. Hudson, J. E. 1978. Canada's national mosquito? Mass-resting of *Anopheles earli* (Diptera: Culicidae) females in a beaver lodge in Alberta. Canadian Entomologist. 110(12): 1345-1346.

In May 1976, researchers collected 1,362 mosquitos (*Anopheles earli*) from a beaver lodge near George Lake, AB; 39.2 percent were blood-fed and 3.1 percent were gravid.

99. International Wildlife. 1983. Behind the scenes; the American beaver. International Wildlife. 13: 24D.

Beavers may be more important to aquatic ecology and to the formation of prairies and wetlands than biologists had realized. When the animals dam streams they begin a process that causes ponds to spread and later evolve into watery meadows.

100. Jeffress, Jim. 1975. The beaver (*Castor canadensis*). Nevada Outdoors and Wildlife Review. 9(4): 1-6.

Beavers were planted in many parts of Nevada primarily as a means of creating upstream water storage and improving the fisheries resources, rather than for the monetary value of the furs.

101. Jenkins, Stephen H. 1979. Seasonal and year-to-year differences in food selection by beavers. Oecologia. 44: 112-116.

From September 1972 through April 1974 beavers exhibited seasonal and year-to-year differences in preference for certain genera of trees in central Massachusetts.

102. Jenkins, Stephen H. 1980. A size-distance relation in food selection by beavers. Ecology. 61(4): 740-746.

Jenkins found that for most tree genera, beaver cut a smaller range of sizes far from shore than close to shore and more smaller trees and fewer large trees at greater distances. His study was conducted in a deciduous forest of central Massachusetts.

103. Jenkins, Stephen H. 1981. Problems, progress, and prospects in studies of food selection by beavers. In: Chapman, J. A.; Pursley, D., eds. Proceedings, worldwide furbearer conference; 1980 August 8-11; Frostburg, MD. Frostburg, MD: Worldwide Furbearer Conference, Inc.: 559-579.

Beavers exhibit strong selection for particular types of plants under certain circumstances. If herbaceous vegetation is available, beavers appear to prefer it to woody vegetation during all seasons.

104. Jenkins, Stephen H.; Busher, Peter E. 1979. *Castor canadensis*. Mammalian Species 120. Provo, UT: American Society of Mammalogists. 8 p.

The authors summarize information on the life history and ecology of the North American beaver.

105. Johannsen, Neil. 1970. About beavers. Pacific Search. 5(3): 8.

Johnannsen has written a brief life history of the North American beaver.

106. John, Rodney T. 1971. Utah furbearers: harvest report and management recommendations 1970-1971. Publ. 71-8. Salt Lake City, UT: Utah Department of Natural Resources, Division of Wildlife Resources. 15 p.
The author summarizes beaver harvest by counties, fur sales, harvest summary, statewide trend of harvest, population status, and nuisance complaints.

107. Johnson, Donald R.; Chance, David H. 1974. Presettlement overharvest of upper Columbia River beaver populations. Canadian Journal of Zoology. 52(12): 1519-1521.
This study looked at beaver population fluctuations between 1835 and 1850 as shown in fur harvest reports.

108. Johnson, Johnny. 1981. Leave it to beaver. Natural History. 90: 44-47.
The author looks at the techniques that beavers use in coping with the dangers and difficulties of winter in Alaska's Mt. McKinley National Park.

109. Johnson, Phillip. 1984. The dam builder is at it again! National Wildlife. 22(4): 8-15.
Johnson reviews some of the current studies done on eroded trout streams in Montana and Wyoming using beaver for habitat recovery.

110. Journal of the Arizona Academy of Sciences. 1974. Late Pleistocene fossils from Glendale, Clark County, Nevada. Journal of the Arizona Academy of Sciences. 9(Suppl.): 34.
Vertebrate samples were collected in 1937-38 by the National Park Service. *Castor* kit fossils suggest they may have been deposited in the backwater of a beaver dam.

111. Karsten, Peter. 1983. Displaying natural rearing of beaver (*Castor canadensis*). Zoologische Garten. 53(6): 404-408.
A look-in lodge display was built for beaver at the Calgary Zoo. In 1978 the first reproduction and successful raising of young occurred.

112. Kebbe, Chester E. 1969. Fashions and furs. Oregon State Game Commission Bulletin. 24(11): 3, 5-6.
Changing trends in the world of fashion strongly influence the cropping of fur animals. Therefore, in fur-bearer management, two main variables must be considered: the population status and demand for the fur of each species.

113. Kebbe, Chet E. 1975. Fur trapping – a half million dollar business. Oregon Wildlife. 30(10): 10-11.
Oregon's fur trapping industry shows signs of continuing for many years. This article discusses the 1974-75 fur take by trappers.

114. Kelsall, John P.; Telfer, E. S.; Wright, Thomas D. 1977. The effects of fire on the ecology of the boreal forest with particular reference to the Canadian north: a review and selected bibliography. Occas. Pap. 32. Ottawa, ON: Canadian Wildlife Service. 58 p.
The authors concluded that fire is the most important factor influencing the ecology of the northern boreal forest. The beaver is best adapted to early stages of forest succession because it depends primarily on deciduous trees for food and building supplies.

115. Kindschy, R. R. 1985. Response of red willow to beaver use in southeastern Oregon. Journal of Wildlife Management. 49(1): 26-28.
Kindschy documents the effect of beaver use on red willow (*Salix lasiandra*) in an area unused by domestic livestock.

116. Klebenow, Donald A.; Oakleaf, Robert J. 1984. Historical avifaunal changes in the riparian zone of the Truckee River, Nevada. In: Warner, Richard E.; Hendrix, Kathleen M., eds. California riparian systems: ecology, conservation, and productive management. Berkeley, CA: University of California Press: 203-209.
Beaver harvest of mature trees, along with overgrazing by cattle, has contributed to some of the historical avifaunal changes that have been observed since 1868.

117. LaBastille, Anne. 1979. The best dam builder around. National Wildlife. 17(3): 26-33.
The author briefly reviews beaver life history, nuisance complaints, and management.

118. Lang, Bruce Z. 1977. Snail and mammalian hosts for *Fasciola hepatica* in eastern Washington. Journal of Parasitology. 63(5): 938-939.
Various mammalian hosts were infected with *Fasciola hepatica*, beaver among them. Of 53 hosts checked from 1968 through 1975, three of 12 beaver had mature worms in the hepatic and common bile ducts. Ten mature flukes were recovered from infected beaver.

119. Langford, E. V. 1972. *Pasteurella pseudotuberculosis* infections in Western Canada. Canadian Veterinary Journal. 13(4): 85-87.
Langford reported 20 incidents of infection with *Pasteurella pseudotuberculosis* over a 14-year period in western Alberta and British Columbia. One beaver was infected with the organism.

120. Larson, J. S.; Gunson, J. R. 1983. Status of the beaver in North America. Acta Zoologica Fennica. 174: 91-93.
Mail surveys of biologists in North America and reports and contacts with Canadian biologists provided the information for this report. Figures and tables present beaver harvest trends for the United States and selected areas of Canada.

121. Leege, Thomas A. 1968. Beavers on the move. Idaho Wildlife Review. 20(5): 14-16.
Beaver were live trapped and tagged from National Forest lands adjacent to problem areas of southeastern Idaho during the summers of 1962 and 1963. Movements were then recorded for those tagged animals that were retrapped.

122. Leege, Thomas A. 1968. Natural movements of beavers in southeastern Idaho. Journal of Wildlife Management. 32(4): 973-976.
Data from 192 live trapped and tagged beaver helped determine the origin of troublesome beaver on private lands. The yearling age class and males of all groups migrate the most frequently.

123. Leege, Thomas A.; Williams, Roger M. 1967. Beaver productivity in Idaho. Journal of Wildlife Management. 31(2): 326-332.
The authors gathered data on sex and age ratios, litter size, and rate of pregnancy from live-trapping and fur-trapping operations in 1953-56 and 1962-64. Males consistently outnumbered females in kit and yearling age classes, while females were more abundant among the adults. The sex ratio of 352 beavers examined was 113 males per 100 females. A disturbed population had a lower percentage of kit and yearling beavers than did an undisturbed
population.

124. Lindsey, E. H. 1972. Small mammal fossils from the Barstow Formation, California. University of California Publications in Geological Sciences. 93: 34-35.
Describes the fossil remains of the family Castoridae collected from the Barstow formation.

125. Lulman, P. D. 1974. Moose and muskeg, birch and beaver, natural environment and wildlife. Occas. Publ. 12. Edmonton, AB: University of Alberta, Boreal Institute for Northern Studies: 23-32.
Lulman described what early explorers and trappers might have seen on a journey of the Athabasca River before human pressures changed the face of the land through fire, clearing, and mining.

126. Mace, Robert U. 1970. Oregon's furbearing animals. Wild. Bull. 6. Portland, OR: Oregon State Game Commission. 82 p.
The author summarizes descriptions and distributions of the various furbearing mammals found in Oregon.

127. Martin, Pete. 1977. Furbearers on the Yellowstone. Montana Outdoors. 8(2): 36-38.
Major flow reductions of the Yellowstone Basin could encourage beaver to build more dams, thus triggering the following: reduced food supply because of extensive additional cuttings of cottonwood and willow; banks with weakened resistance to erosion during peak flows; and habitat loss for other wildlife species that use cottonwoods and willows for nesting, perching, and protective cover.

128. Martin, Peter R. 1977. The effect of altered streamflow on furbearing mammals of the Yellowstone River Basin, Montana. Tech. Rep. 6. Helena, MT: Water Resources Division, Montana Department of Natural Resources and Conservation. 79 p.
Martin discusses the potential physical, biological, and water use impacts of water withdrawals and water development on the middle and lower reaches of the Yellowstone River Basin on migratory birds, furbearers, recreation, and existing water users. Increased winter flows could wash away food caches, forcing beaver to constantly expose themselves to the elements and predators. Low flows in early fall would stimulate dam building, thus decreasing available food supply, weakening bank resistance to erosion, and reducing habitat for other wildlife species.

129. Mayse, Charley. 1980. A beaver trapper's tale. Alaska. 46: A2-A5; A28-A31.
The author shares his actions, problems, and thoughts as he goes about, alone, trapping beaver in the wilderness of Alaska.

130. McDowell, Robert A. 1975. A study of the Pole Mountain fishery: beaver pond, artificial impoundment and stream investigations. Completion Report, Dingle-Johnson Project F-44-R-01. Laramie, WY: Fish Division of the Wyoming Game and Fish Department. 174 p.
The waters of concern in the Pole Mountain area are almost entirely composed of beaver ponds that are not static and therefore are subject to change. Consequently, the fishery is in constant flux. McDowell concluded that high beaver population densities result in short-term, unstable pond conditions due to rapid habitat losses. Balanced management for beaver in relation to available food supply will provide continued aquatic habitat for trout.

131. McGinley, Mark A.; Whitham, Thomas G. 1985. Central place foraging by beavers (*Castor canadensis*): a test of foraging predictions and the impact of selective feeding on the growth form of cottonwoods (*Populus fremontii*). Oecologia. 66(4): 558-562.
In testing theories of central place foraging among beaver along the San Juan River in southern Utah, the authors found that large branches were favored at all distances. This differed from patterns observed in previous studies.

132. McIntre, Rick. 1981. Death of a beaver pond. Alaska. 47: 50.
Grizzlies and wolves succeeded in killing or forcing a beaver colony to abandon its lodge in Denali National Park. This eventually led to the death of the pond and its replacement by a huge mud flat and meandering stream.

133. McKean, Tom. 1982. Cardiovascular adjustments to laboratory diving in beavers and nutria. American Journal of Physiology. 242(2): R434-R440.
Beavers were anesthetized and prepared for monitoring (by immersion in 15-20 °C water for 4 minutes) of regional distribution of blood flow; cardiac output, oxygen consumption, arterial and venous blood gases, and pH. Rate of decline of oxygen stores during diving decreased by 93 percent, regional blood flow decreased to all organs except the adrenals, heart, and lungs, and blood flow to the brain increased during dives.

134. McKean, Tom; Carlton, Candy. 1977. Oxygen storage in beavers. Journal of Applied Physiology. 42(4): 545-547.

Ten wild beavers were live trapped and taken to the laboratory at the University of Idaho, Moscow. They were anesthetized with pentobarbital, and then the researchers determined total lung capacity, hemoglobin, blood volume, and myoglobin. These measured values were used to calculate total oxygen storage capacity.

135. McKelvey, Richard W.; Dennington, Malcolm C.; Mossop, David. 1983. The status and distribution of trumpeter swans (*Cygnus buccinator*) in the Yukon. Arctic. 36(1): 76-81.

The presence of a breeding population of trumpeter swans was established from previous summer records of swans and by data from extensive aerial surveys. Beaver activity is an important influence in the development of ponds used by swans.

136. McKern, John L. 1978. Inventory of riparian habitats and associated wildlife along the Columbia and Snake rivers. Summary Rep. 1. Walla Walla, WA: U.S. Army Corps of Engineers, North Pacific Division. 100 p.

The Wildlife Working Group (composed of various fish and game personnel from Oregon, Washington, and Idaho) assessed the impact of controlled water level fluctuations on riparian and associated upland habitat, vertebrate species using these habitats, and proposed river regulation impacts upon these habitats.

137. Michelmore, Peter. 1984. The amazing beavers of Currant Creek. Reader's Digest. 124(4): 109-113.

Beavers were used to help restore severely eroded trout streams of southwestern Wyoming.

138. Miller, James E. 1983. Beavers. In: Timm, Robert M., ed. Prevention and control of wildlife damage. Lincoln, NB: Institute of Agriculture and Natural Resources, University of Nebraska: B1-B11.

The author focuses primarily on damage prevention and control methods, such as repellents, traps, and shooting.

139. Miller, L. Keith. 1967. Microclimate of northern beaver: a constructed habitat. In: Fourth international biometerological congress; 1966 August 26-September 2; New Brunswick, NJ. New Brunswick, NJ: Rutgers University: 288.

Temperatures measured in the walls and living chambers of four beaver lodges near Fairbanks, AK, over 1 year, showed that body heat was a significant factor in maintaining inner lodge temperatures.

140. Miller, L. Keith. 1967. Caudal nerve function as related to temperature in some Alaskan mammals. Comparative Biochemistry and Physiology. 21(3): 679-686.

This study compared peripheral nerve function at low temperature in a variety of mammals, including beaver, from interior Alaska.

141. Miller, L. Keith. 1970. Temperature-dependent characteristics of peripheral nerves exposed to different thermal conditions in the same animal. Canadian Journal of Zoology. 48(1): 75-81.

In beavers from the vicinity of Fairbanks, AK, nerves accustomed to tissue temperatures approaching 0 °C were compared with nerves that encounter less severe cooling and nerves that are accustomed only to deep body temperature. Conduction velocity-temperature slopes of the three nerves were different, and absolute refractory periods in the cold-adapted nerves were significantly shorter at low temperatures.

142. Molini, John J.; Lancia, Richard A.; Bishir, John; Hodgdon, Harry E. 1980. A stochastic model of beaver population growth. In: Chapman, J. A.; Pursley, D., eds. Proceedings, worldwide furbearer conference; 1980 August 8-11; Frostburg, MD. Frostburg, MD: Worldwide Furbearer Conference, Inc.: 1215-1245.

The researchers developed a mathematical model of the growth phase of an unexploited beaver (*Castor canadensis*) population in Massachusetts. The rate of pair formation between dispersed individuals varied as a function of the number of occupied colony sites within an area containing a fixed number of suitable sites.

143. Moore, Tommy D.; Spence, Liter E.; Dugnolle, Charles E. 1974. Identification of the dorsal guard hairs of some mammals of Wyoming. Cheyenne, WY: Wyoming Game and Fish Department. 186 p.

This is intended as an aid in ecological and food habit studies and in law enforcement investigations.

144. Muchmore, Duane. 1975. Beaver, if you will. Wyoming Wildlife. 39(1): 16-21, 34.

Muchmore reviews beaver life history, trapping, reintroduction, management, and habitat preference in Wyoming.

145. Munther, Greg L. 1982. Beaver management in grazed riparian ecosystems. In: Peek, J. M.; Dalke, P. D., eds. Wildlife-livestock relationships symposium: proceedings 10; 1981 April 20-22; Coeur d'Alene, ID. Moscow, ID: University of Idaho: 234-241.

Stream reach evaluations were conducted on 20 livestock allotments within the Deerlodge and Lolo National Forests of Montana to assess compatibility of cattle with riparian resources.

146. Munther, Greg L. 1983. Integration of beaver into forest management. In: Proceedings, annual meeting Colorado-Wyoming Chapter American Fisheries Society; 1983 March 2-3; Laramie, WY. [Publisher and city unknown]: 73-80.

Munther discusses the impacts of beaver on wildlife, water quality and quantity, fish habitat and populations, recreation, livestock, forest vegetation, and condition of transportation facilities.

147. Naiman, Robert J.; Melillo, Jerry M. 1984. Nitrogen budget of a subarctic stream altered by beaver (*Castor canadensis*). Oecologia. 62(2): 150-155.

The authors constructed a nitrogen budget for a section of a second order stream in eastern Quebec and a beaver dam in that stream. The beaver-modified section accumulated approximately 1,000 times more nitrogen than before

alteration. The ecosystem implications of beaver activity suggest that current concepts of patterns and processes in running waters require modification.

148. Naiman, Robert J.; Melillo, Jerry M.; Hobbie, John E. 1986. Ecosystem alteration of boreal forest streams by beaver *(Castor canadensis)*. Ecology. 67(5): 1254-1269.
Effects of beaver activity were considered on several major ecosystem components and processes in boreal forest drainage networks in Quebec, Canada. Results suggest that current concepts of the organization and diversity of unaltered stream ecosystems in North America should recognize the keystone role of beaver because drainage networks with beaver are substantially different in their biogeochemical economies from those without beaver.

149. Navin, Thomas R.; Juranek, Dennis D.; Ford, Michael; Minedew, David J.; Lippy, Edwin D.; Pollard, Robert A. 1985. Case-control study of waterborne giardiasis in Reno, Nevada. American Journal of Epidemiology. 122(2): 269-275.
An outbreak of *Giardia lamblia* gastroenteritis occurred in Reno, NV, in 1982. *Giardia* cysts were recovered from the water supply and a beaver infected with *Giardia* was found in one of the reservoirs. Corrective measures included the removal of the infected beaver.

150. Nelson, Lewis, Jr.; Hooper, J. K. 1976. California furbearers and their management. Leaflet 2721. Berkeley, CA: University of California Cooperative. 22 p.
The authors discuss the value, history, management, and future of California's furbearers.

151. Novakowski, N. S. 1967. The winter bioenergetics of a beaver population in northern latitudes. Canadian Journal of Zoology. 45(6, part 1): 1107-1118.
In a study in Wood Buffalo National Park of Alberta and the Northwest Territories, Novakowski found that energy deficits are a product of the winter behavior of the animals and that energy conservation and an increase in fur insulation and fat deposition provide the necessary mechanisms for survival.

152. Novakowski, N. S. 1969. The influence of vocalization on the behaviour of beaver, *Castor canadensis*. American Midland Naturalist. 81(1): 198-204.
This is an analysis of a group of sounds made by 14 beaver kept in confinement on the University of Saskatchewan campus. The study related sound production to age in beaver and also to behavior and survival. Because beavers are an herbivore and a prey species, vocalization while foraging would seem to have no survival value. Vocalization primarily occurs within the lodge.

153. Novakowski, N. S.; Solman, V. E. F. 1975. Potential of wildlife as a protein source. Journal of Animal Science. 40(5): 1016-1019.
This study examined the present potential of wildlife as a protein source. Beaver have been a source of protein for many years.

154. Oertli, Erwin F. 1976. The beavers of Kananaskis Forest. Nature Canada. 5(1): 3-8.
Oertli describes his various methods of observation along with the behavioral patterns of beaver in the Rocky Mountains of Alberta, Canada.

155. Olterman, James H.; Verts, B. J. 1972. Collections containing mammals from Oregon. Special Report 362. Salem, OR: Oregon Agricultural Experiment Station. 28 p.
This current record of collections containing beaver and other mammals from Oregon lists the numbers of each species on deposit in each collection.

156. Oregon Department of Fish and Wildlife. 1977. Furtaking continues as a mini-industry. Oregon Wildlife. 32(11): 10.
Furtaking is Oregon's oldest industry. Furs taken in 1977 brought nearly $1.2 million to approximately 1,500 licensed furtakers.

157. Owen, Carlton N.; Adams, Danny L.; Wigley, T. Bently. 1984. Inefficacy of a deer repellent on beavers. The Wildlife Society Bulletin. 12(4): 405-408.
This study, conducted in the bottomland and mixed pine-hardwood forests of Bradley, Clark, Cleveland, and Dallas Counties, AR, evaluated the effectiveness of Magic Circle as a potential beaver repellent. Contrary to previous reports, Magic Circle did not discourage beavers from repairing dams.

158. Parker, Michael. 1986. Beaver, water quality, and riparian systems. In: Proceedings, Wyoming water 1986 and streamside zone conference; 1986 April 28-30; Casper, WY. Laramie, WY: University of Wyoming, Agricultural Extension Service: 88-94.
A complex of beaver dams can improve the quality of water flowing through them, according to studies on a section of Currant Creek in southwestern Wyoming during May-August 1984 and April-June 1985.

159. Parker, Michael; Wood, Fred J., Jr.; Smith, Bruce H.; Elder, Robert G. 1985. Erosional downcutting in lower order riparian ecosystems: have historical changes been caused by removal of beaver? In: Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; Hamre, R. H., tech. coords. Riparian ecosystems and their management: reconciling conflicting uses; first North American riparian conference; 1985 April 16-18; Tuscon, AZ. Gen. Tech. Rep. RM-120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 35-38.
A simple model is proposed to measure the potential of beaver to resist perturbations of lower order streams.

160. Payne, N. F. 1984. Population dynamics of beaver in North America. Acta Zoologica Fennica. 172: 263-266.
Payne looked at density, colony size, reproduction, and mortality of beaver populations in North America.

161. Payne, Neil F.; Munger, Garet P.; Matthews, John W.; Taber, Richard D. 1976. Inventory of vegetation and wildlife in riparian and other habitats along the upper Columbia River. Walla Walla, WA: U.S. Army Corps of Engineers, North Pacific Division. 560 p.

This study aims: to identify, delineate, and describe the riparian and associated upland habitats; to identify wild vertebrates, excluding fish, using these habitats; to establish indices and population estimates where possible; and to make preliminary assessments of river regulation impacts upon these habitats and their associated populations.

162. Peterson, Steven R.; Low, Jessop B. 1977. Waterfowl use of Uinta Mountain wetlands in Utah. Journal of Wildlife Management. 41(1): 112-117.

Adult waterfowl preferred beaver ponds larger than 0.4 ha over natural catchment basins of the same size.

163. Pritchard, G. 1976. Growth and development of larvae and adults of *Tipula sacra* Alexander (Insecta: Diptera) in a series of abandoned beaver ponds. Canadian Journal of Zoology. 54(2): 266-284.

Conducted in the Kananaskis Valley of Alberta, this study examined the role of crane flies in energy and nutrient turnover and tested certain ideas concerning life history strategies in aquatic insects.

164. Pritchard, G.; Hall, H. A. 1971. An introduction to the biology of craneflies in a series of abandoned beaver ponds, with an account of the life cycle of *Tipula sacra* Alexander (Diptera; Tipulidae). Canadian Journal of Zoology. 49(4): 467-482.

The authors describe five beaver ponds that were abandoned for about 10 years in an area of white spruce-lodgepole pine forest in the Kananaskis Forest Reserve in the eastern foothills of the Rocky Mountains in Alberta. They also describe the life cycle of the cranefly. Craneflies are clearly important in terms of energy flow, and there are some interesting relationships between their distribution and abundance and habitat conditions.

165. Pritchard, G.; Leischner, T. G. 1973. The life history and feeding habits of *Sialis cornuta* Ross in a series of abandoned beaver ponds (Insecta; Megaloptera). Canadian Journal of Zoology. 51(2): 121-131.

Alderflies were studied in abandoned beaver ponds in the Kananaskis Forest Reserve of Alberta.

166. Rabe, Fred W. 1970. Brook trout populations in Colorado beaver ponds. Hydrobiologia. 35(3/4): 431-448.

Habitat inventory and evaluation of brook trout populations from 57 beaver ponds in Colorado permitted comparisons of stunted and nonstunted populations of fish and the environmental conditions under which the populations occurred.

167. Ray, Arthur J. 1975. Some conservation schemes of the Hudson's Bay Company, 1821-50: an examination of the problems of resource management in the fur trade. Journal of Historical Geography. 1(1): 49-68.

Hudson's Bay Company tried to introduce beaver conservation schemes in western Canada between 1821 and 1850. This study looks at the lands that lie within the company's northern department.

168. Rea, Amadeo M. 1983. Once a river: bird life and habitat changes on the Middle Gila. Tucson, AZ: University of Arizona Press. 285 p.

Overtrapping of beaver and subsequent loss of their dams is one of the multiple causes for watershed deterioration of the Gila River and its tributaries in New Mexico.

169. Reilly, Phil. 1978. Review of progress in development and testing of humane animal traps. Canadian Wildlife Service, Progress Notes. 86: 1-5.

The Canadian Wildlife Service was involved in the development and testing of traps. Results showed that a trap, if it is to kill humanely, should be designed to avoid impacts in the abdominal region.

170. Robinson, David. 1978. Beaver builders: sturdy dams shaped our land and history. Defenders. 54(3): 153-160.

Beavers have the power to change both the history and the topography of the land by their way of life.

171. Rowe, J. S,; Scotter, G. W. 1973. Fire in the boreal forest. Quaternary Research. 3(3): 444-464.

Fires in some parts of the boreal forest have proven to be beneficial to beaver populations by replacing the coniferous forest with aspen and willow.

172. Science '83. 1983. Beavers: a dam site better on erosion. Science '83. 4(9): 7.

For 6 years beavers helped the U.S. Department of the Interior, Bureau of Land Management to combat soil erosion in southwestern Wyoming. Projects are now under way to help curb erosion near Salt Lake City, UT.

173. Science Digest. 1984. New faith in beaver ecology. Science Digest. 92(7): 36.

The introduction of beaver by the U.S. Department of the Interior, Bureau of Land Management on Wyoming's Currant Creek to help control erosion has succeeded in slowing stream flow and reducing sediment transport. Rye grass and willow have returned to the banks and spring flooding has been regulated.

174. Scott, Lauren B. 1984. Economic values of three furbearers inhabiting California riparian systems. In: Warner, Richard E.; Hendrix, Kathleen M., eds. California riparian systems: ecology, conservation, and productive management. Berkeley, CA: University of California Press: 731-738.

The author makes an effort to establish some basic information on the economic value of sustained harvest of California's beaver, mink, and muskrat.

175. Sedell, James R.; Swanson, Frederick J.; Gregory, Stanley V. 1985. Evaluating fish response to woody debris. In: Hassler, Thomas J., ed. Pacific Northwest stream habitat management workshop; 1984 October 10-12; Arcata, CA. Arcata, CA: Humboldt State University: 222-245.

The authors evaluated the role of coarse woody debris in the geomorphology of streams, specifically: longitudinal profiles, channel patterns and positions, channel geometry, sediment and organic matter storage, and channel dynamics. They also examined the fisheries implications of coarse woody debris, including blockage to migration, water quality, and summer and winter rearing habitat.

176. Shay, Ron. 1978. Oregon's beaver. Oregon Wildlife. 33(2): 3-5.

Shay relates the history of beaver trapping in Oregon.

177. Silovsky, Gene D.; Pinto, Carlos. 1974. Forest wildlife inventories: identification of conflicts and management needs. In: Black, H. C., ed. Wildlife and forest management in the Pacific Northwest. Corvallis, OR: Oregon State University, School of Forestry: 53-61.

Wildlife and their preferred habitats were inventoried on the Suislaw National Forest of the Oregon coast in 1973 and 1974 to determine general changes in wildlife habitats resulting from timber management. Timber management activities were not expected to have a serious impact upon beaver.

178. Skinner, Quentin D.; Speck, John E., Jr.; Smith, Michael; Adams, John C. 1984. Stream water quality as influenced by beaver within grazing systems in Wyoming. Journal of Range Management. 37(2): 142-146.

During the summers of 1979 and 1980 on a mountain rangeland near Laramie, WY, streams were tested for bacteria as indicators of pollution, and were studfied for differences between grazing treatments and streams. Variation in counts of fecal coliform and streptococci could not be fully accounted for by differences in grazing management, but the variation is partially explained by beaver damming of stream flow.

179. Slough, B. G.; Sadleir, R. M. F. S. 1977. A land capability classification system for beaver (*Castor canadensis* Kuhl). Canadian Journal of Zoology. 55(8): 1324-1335.

The authors provide a model of the relationship of beaver to their habitat, a means of beaver inventory, a basis for beaver management, a land capability methodology, and the development of a land capability classification system for beaver.

180. Slough, Brian G. 1978. Beaver food cache structure and utilization. Journal of Wildlife Management. 42(3): 644-646.

Observations were made at 115 colony sites within a 100-km radius in the northern interior of British Columbia, May through August 1974 and 1975 and October 1974. Raft constituents are selected both for their availability and their ability to submerge and secure the cache. Because preferred foods are frequently used for this purpose, the beaver does not attempt to conserve the food resource by using nonfood and low preference food species in the raft.

181. Slough, Brian; Jessup, Harvey. 1983. 1982-83 furbearer inventory, habitat assessment and trapper utilization of the Yukon River Basin. In: Proceedings of the Alaska science conference; 1983 September 28-October 1; Whitehorse, Yukon Territory. Fairbanks, AK: American Association for the Advancement of Science, Arctic Division: 164.

Yukon Department of Renewable Resources conducted an inventory in the Yukon River Basin in 1982 and 1983. Beaver food cache and colony site surveys were analyzed in conjunction with an ongoing trapper questionnaire and historical fur harvest data. The authors discuss the fur resource capability and problems and issues associated with impacts on furbearer populations, habitats, and user groups.

182. Smith, Bruce H. 1980. Not all beaver are bad; or, an ecosystem approach to stream habitat management, with possible software applications. In: Whaley, R., ed. Proceedings, 15th annual meeting Colorado-Wyoming Chapter, American Fisheries Society; 1980 February 27-28; Fort Collins, CO: [Publisher and city unknown]: 32-37

Smith looks at the feasibility of using computer software to help improve stream habitats for beaver.

183. Spieth, Herman T. 1979. The *virilis* group of *Drosophila* and the beaver *Castor*. The American Naturalist. 114(2): 312-316.

Species of the *virilis* group, except the primitive *D. virilis,* are semiobligatory commensals of the beaver. The decimation of the beaver population during the 18th and 19th centuries resulted in a drastic reduction of the *virilis* species group populations.

184. Stock, A. Dean. 1970. Notes on mammals of southwestern Utah. Journal of Mammalogy. 51(2): 429-433.

A beaver specimen (*Castor canadensis repentinus* Goldman) was collected from southwestern Utah, showing an extension of range.

185. Suk, Thomas J. 1983. Investigation of animal hosts for *Giardia* spp. in California's Sierra Nevada Mountains. Tech. Rep. 11. Davis, CA: Cooperative National Park Resources Studies Unit. 21 p.

During the summer of 1982 mammalian fecal samples were collected in the Sierra Nevada Mountains in an attempt to clarify the epidemiology of the disease giardiasis by identifying potential host-reservoirs.

186. Suttkus, Royal D.; Clemmer, Glenn H.; Jones, Clyde. 1978. Mammals of the riparian region of the Colorado River in the Grand Canyon area of Arizona. Occas. Pap. 2. New Orleans, LA: Tulane University, Museum of Natural History. 23 p.

The authors provide some basic information on the mammals that occur along the Colorado River in the Grand Canyon and identify locations of materials and related information for use by biologists and others. Float trips to collect the data occurred periodically from September 1970 to September 1976.

187. Svendsen, Gerald E. 1980. Seasonal change in feeding patterns of beaver in southeastern Ohio. Journal of Wildlife Management. 44(1): 285-290.
The author analyzed data collected between 1974 and 1977 to determine beavers' use of woody and nonwoody vegetation for food and to quantify seasonal changes in use of different types of vegetation.

188. Swenson, Jon E.; Knapp, Stephen J.; Martin, Peter R.; Hinz, Thomas C. 1983. Reliability of aerial cache surveys to monitor beaver population trends on prairie rivers in Montana. Journal of Wildlife Management. 47(3): 697-703.
Aerial surveys proved to be unreliable in indicating beaver population size or trend but were accurate in locating caches and were constant among years and areas.

189. Taylor, David. 1971. Beaver population studies at Sagehen Creek. In: Transactions California-Nevada Section, The Wildlife Society; 1971 January 29-30; Sacramento, CA. Smartsville, CA: The Wildlife Society: 18-19.
Taylor, briefly discussing the history of beaver introduction at Sagehen Creek in the Sierra Nevada from 1945 through 1970, shows that periods of rapid growth and high population were dependent upon standing crop of aspen.

190. Taylor, K. P. 1983. Factors influencing beaver management in rural Alaska - northern Bristol Bay. Acta Zoologica Fennica. 174: 127-128.
Factors that influence harvest levels include the economic success or failure of the commercial salmon fishery in Bristol Bay prior to the trapping season and changes in weather conditions as they affect trapper mobility. The author explains how current trapping practices effectively prevent maximum sustained yield management, and reviews management alternatives.

191. Thomas, Allan E. 1986. Riparian protection/enhancement in Idaho. Rangelands. 8(5): 224-227.
Beaver moved into part of the Summit Creek study area, thus providing increased habitat for trout and waterfowl. Some of the original brushy species were killed by flooding from beaver dams, but new willows and birch plants appeared at the edges of the marshes about as fast as old plants were destroyed.

192. Thomas, Jack W.; Maser, Chris; Rodiek, Jon E. 1979. Wildlife habitats in managed rangelands - the Great Basin of southeastern Oregon: riparian zones. Gen. Tech. Rep. PNW-80. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station. 18 p.
Wildlife use riparian zones more than any other plant community. Of the 363 terrestrial species known to occur in the Great Basin of southeastern Oregon, 288, including the beaver, are either directly dependent on riparian zones or use them more than other habitats.

193. Thorne, E. T.; Williams, E. S.; Anderson, S. L. 1984. Diagnosis of diseases in wildlife. Job Performance Report, Research Project Segment. Cheyenne, WY: Wyoming Game and Fish Department. 32 p.
Researchers examined 126 specimens, diseased animals, eggs and tissue samples from July 1983 to June 1984. They found bacterial abscesses in two trapper-killed beaver. One also had extensive muscular fibrosis, and *Staphylococcus aureus* was recovered from the other.

194. Thorniley, Mike. 1972. The dam builders. Pacific Search. 7(3): 4-5.
The author looks at the beaver's dam construction habits.

195. Todd, Arlen W. 1981. Ecological arguments for furtrapping in boreal wilderness regions. Wildlife Society Bulletin. 9(2): 116-124.
The author presents arguments for the ecological benefits of maintaining optimal beaver populations versus the disadvantages of overpopulation.

196. Todd, Arlen W.; Geisbrecht, Lori C. 1979. A review of Alberta fur production and management, 1920-21 to 1977-78. Edmonton, AB: Alberta Energy and Natural Resources, Fish and Wildlife Division. 64 p.
The report includes statistics on fur production and the fur industry in Alberta from 1920-21 to 1977-78. Beaver harvests in Alberta are inadequate today, and beaver are considered overabundant in many agricultural and suburban areas.

197. Toweill, Dale E.; Maser, Chris. 1985. Food of cougars in the Cascade Range of Oregon. The Great Basin Naturalist. 45(1): 77-80.
Animal and nonanimal items were identified in the digestive tracts of 61 cougars (*Felis concolor*) collected between 1978 and 1984. Beaver in the diet may have represented opportunistic feeding.

198. Vogt, Bill. 1981. What ails the river otter? National Wildlife. 19(2): 25-28.
The river otter often depends upon the beaver because the beaver's dam is a haven for fish, the otter's main food. Widespread efforts aimed at restoring beaver populations have also benefited the otter.

199. Wagner, Hugh M. 1983. The cranial morphology of the fossil beaver *Dipoides smithi* (Rodentia: Mammalia). Contributions in Science, Natural History Museum of Los Angeles County. 346: 1-6.
In 1974 a well-preserved skull was recovered from north-central Oregon. The cranial morphology was compared to that of other fossil beavers (*Eucastor* and *Castoroides*) and to present day *Castor* skulls.

200. Wallis, P. M.; Buchanan-Mappin, J. M. 1985. Detection of *Giardia* cysts at low concentrations in water using nuclepore membranes. Water Research. 19(3): 331-334.
Giardia cysts taken from the rectum and large intestine of a beaver, trapped commercially near Ribbon Creek in the Kananaskis Valley of Alberta, were added to 100 L of untreated stream water and recovered by filtration. Recovery efficiencies averaged 53 percent at cyst concentrations between 0.5 and 45 cysts per liter. Maximum cyst recovery was observed at filtration pressures of 40-60 kPa. This method results in higher recovery efficiencies at low cyst concentrations and simpler, more rapid laboratory procedures.

201. Wallis, P. M.; Buchanan-Mappin, J. M.; Faubert, G. M.; Belosevic, M. 1984. Reservoirs of *Giardia* spp. in southeastern Alberta, Canada. Journal of Wildlife Diseases. 20(4): 279-283.
A survey of potential hosts of *Giardia* spp. was carried out during 1982 and 1983 in the Kananaskis Valley and Banff National Park, AB, Canada. Positive samples were found from two of 58 beavers sampled.

202. Wallis, P. M.; Zammuto, R. M.; Buchanan-Mappin, J. M. 1986. Cysts of *Giardia* spp. in mammals and surface waters in southwestern Alberta. Journal of Wildlife Diseases. 22(1): 115-118.
Researchers conducted a survey of animal feces and surface water supplies from 1983 to 1984 to evaluate the potential for zoonotic transmission of giardiasis by surface waters in the Kananaskis-Banff area. Initial results showed that 3.5 percent of beaver fecal samples contained *Giardia* spp. cysts.

203. Watson, G. H.; Prescott, W. H.; de Bock, E. A.; Nolan, J. W.; Dennington, M. C.; Poston, H. J.; Stirling, I. G. 1973. An inventory of wildlife habitat of the Mackenzie Valley and the northern Yukon. Task Force on Northern Oil Development Report 73-27; Environmental-Social Committee Northern Pipelines. Edmonton, AB: Department of the Environment, Canadian Wildlife Service. 152 p.
The authors seek to place in perspective the kinds of factors associated with beaver populations within the study area. Identification of habitat and descriptions of habitat types provide information for land-use planning programs or for more detailed research.

204. Wilson, H. S. P.; Stauffer, S. J.; Walker, T. S. 1982. Waterborne giardiasis outbreak - Alberta. Canada Diseases Weekly Report. 8(20): 97-100.
Beaver fecal samples were tested for giardiasis along Forty-Mile Creek in Banff, AB, Canada in March 1982. All of the fecal samples tested positive for *G. lamblia*.

205. World Wildlife Illustrated. 1970. The American beaver (*Castor canadensis*). World Wildlife Illustrated. 2(1): 4-6.
The report briefly discusses the life history and seasonal activity of the North American beaver.

206. Youngman, Phillip M. 1975. Mammals of the Yukon Territory. National Museum of Natural Sciences, Publications in Zoology. 10: 77-79.
The author describes the distribution of *Castor canadensis* Kuhl.

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Medin, Dean E.; Torquemada, Kathryn E. 1988. Beaver in Western North America: an annotated bibliography, 1966 to 1986. Gen. Tech. Rep. INT-242. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 18 p.

This annotated bibliography of 206 references is provided as a working tool for natural resource specialists, land-use planners, and others charged with managing beavers and their habitats. References include both technical and popular articles. Emphasis is on the Western United States and Canada.

KEYWORDS: *Castor canadensis*, management, ecology, life history

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