

Factors influencing beaver management in rural Alaska — northern Bristol Bay

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Beaver (*Castor canadensis* Kuhl) is the primary fur resource in the northern Bristol Bay region of Alaska. It is important both economically and as a major source of fat and protein for rural residents in winter months. Harvest levels have fluctuated between 637 and 3 721 beavers taken annually since 1959. Factors influencing harvest levels are discussed, including the economic success or failure of the commercial salmon fishery in Bristol Bay prior to the trapping season and weather conditions as they affect trapper mobility. Harvest information and population data based on stream surveys conducted since 1968 and annually since 1974 on up to 1 000 km of stream, are presented which indicate excessive harvests in the early 1970's. Current trapping practices effectively preventing maximum sustained yield management are explained. Management alternatives are considered.

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1. Introduction

Beaver (*Castor canadensis*) is the primary fur resource in the northern Bristol Bay region of Alaska which includes the drainages of the Nushagak, Wood, Mulchatna, and Togiak Rivers. It is an essentially roadless area approximately 45 000 km² composed chiefly of tundra and taiga vegetation interspersed with numerous ponds and streams. Elevations range from sea level to 1 400 m in the Wood River Mountains.

Trade between the Russians and local natives for beaver pelts was established early in the nineteenth century, expanded rapidly through the region and led to the near extinction of beavers in this area during the 1820's (VanStone 1967). Few data on the status of beaver from the 1820's to the 1900's are available. Trapping activity declined after the development of the salmon canning industry in the 1880's and increased again in the early 1900's when overharvests, particularly in the Wood and Nushagak River drainages, resulted in periodic closures of the season. Annual harvests approached 4 000 beavers in this region in the late 1950's and are currently between 1 500 and 2 000.

Trapping is most appropriately classified as a recreational subsistence activity in this area of the State. Other game is scarce in most of the inhabited portions of the region, and beavers are a major source of fat and protein in the winter diet of local residents. Since most residents are commercial fishermen and derive the bulk of their annual income during the 2 month salmon fishery, trapping income is of importance only after

poor commercial fishing years. Many trappers are not aware of current fur prices until they sell their hides.

2. Management

Alaska's trapping regulations prohibit: taking beaver by any means other than steel traps or snares (with some local exceptions for the use of firearms), disturbing or destroying beaver houses, and taking beaver by persons under 11 years of age. Pelts must be sealed by a department representative within 30 days after the close of the season. There are no limits to the number of traps one may set at a house nor any specified radius around a house where trapping is prohibited. Beaver management is based primarily on annual harvest records for each management area in the State. Sealing beaver pelts with individual seals or tags to record harvests began in 1923 (Burris 1966). Measurements of stretched pelts were included in the sealing process in 1957 (Burris 1971) in an attempt to separate the harvest into age classes after Libby (1955) determined that in interior Alaska any pelt measurement (length plus width) less than 135 cm represented kits. He proposed that any area having 25 % or more kits in the harvest with less than 20 % of the trappers catching their full limit could be overharvested. This general rule has since been modified, and presently any area of Alaska having more than 20 % kits in the harvest is investigated more thoroughly. In areas of the State where trapping pressure is intensive, aerial surveys are conducted annually in early fall to determine current

beaver population status. Up to 1 000 km of selected streams have been surveyed in the northern Bristol Bay region since 1968 when substantial overharvests in areas adjacent to villages became apparent.

Present trappings practices are confined to localized and recurrent overharvests of the beaver population. The trapping season is in February when snow depths and river ice are optimum for snow machine travel. Trappers are presently limited to 10 beavers per season, but since trapping is a family activity (women and children do the skinning and stretching) most trappers take a limit for each licensed member in his family. While trappers historically often traveled in excess of 100 km from their homes to their trapping cabins, they are presently concentrating their efforts within a 40 km radius of each village. Villagers often trap together, as many as 6 per group, and may make 6 to 10 sets at each house. Resulting harvests often contain up to 40 % kits, and overexploited areas are readily apparent during stream surveys the following September.

3. Discussion

Although the northern Bristol Bay region has the highest recorded beaver density in Alaska (0.9 food caches per km stream surveyed in 1981, $N = 593$ km), it has the shortest season and smallest bag limit in the

State. Management efforts from 1968 through 1978 were directed towards avoiding overharvests in areas adjacent to villages. During this time the bag limit was reduced from 15 to 10 beavers, the season was shortened from 62 to 15 days, and between 1974 and 1978 the season was totally closed in the southern half of the region. While reducing the season and bag limit lessened the potential for overharvest on a regional scale, the 4-year compoured the problem on the local level, and the 4-year closure was subsequently necessary to increase populations to their former level of abundance.

Since 1978, management intensity has increased in an effort to encourage trappers to disperse more uniformly throughout the area. The season in the upper half of the region has been lengthened to 28 days and opens earlier to make it more attractive to trappers to disperse from heavily trapped locales. Management by river drainage is the next logical step towards dispersing trapping pressure. From his studies in northcentral Alaska, Boyce (1974) concluded that a management system which would allow trapping out individual colonies while leaving adjacent colonies undisturbed would produce a higher sustained yield than the usual practice of taking a few beavers from each house. While our management may be slowly evolving in this direction, such a system would require substantial changes in trapper attitudes and ethics in northern Bristol Bay where conservation principles are, at best, poorly understood.

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