

## BEAVER MANAGEMENT IN THE SOUTHEASTERN UNITED STATES: A REVIEW AND UPDATE <sup>1</sup>

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Beaver populations in primitive times have been estimated at 60 million animals distributed across the North American continent where adequate food and water existed (Seton 1900). History books document well the exploitation of this resource by trappers in the settling of the new world. The search for beaver was so efficient that by the beginning of the twentieth century only small numbers of animals remained in remote areas. During the early 1900's however, beaver populations began to increase for a variety of reasons. Foremost among these were trapping restrictions, but the absence of natural predators, reversion of abandoned farms to timberlands, natural dispersal, and active transplanting programs by both public and private interests greatly enhanced the return of beaver to formerly occupied habitats.

In no other region has the expansion of beaver populations been as successful or as controversial as in the southeastern United States during the last 40 years. Estimates of economic damage (including the potential value of finished wood products) have exceeded 4 billion dollars on over 400,000 ha during this period (Arner and Dubose 1982). In contrast to more northern regions of the United States and Canada where beaver are eagerly sought each trapping season, the pelts of southern animals receive values too low to interest the majority of trappers, resulting in overpopulations of beaver in many areas. Currently, this economically and environmentally important animal remains of concern both to persons directly affected by its activities and to those public officials charged with devising effective management programs.

Few mammals have been as intensively studied as the beaver, throughout its range. During the last century there have been thousands of documented observations and published studies concerning this animal (Yeager and Hay 1955, Hodgdon and Larson 1980). Much of this information has related to the natural history of beaver and the diverse ways in which they affect the environment. Population dynamics, food habits, construction activities, habitat requirements, and behavior are just a few examples of the types of data that have been collected. In the southeastern United States, initial investigations that recorded the ecology and range expansion of beaver progressed

rapidly to the assessment of benefits and damages, and toward devising methods for control and utilization of this resource.

Whether the presence of beaver in any particular locale is regarded as beneficial, detrimental, or having some aspects of both, evaluations depend upon prevailing human values and opinions (Hill 1982). These, in turn, may be influenced by factors such as the length of time beaver have been present, the amount and types of vegetation impacted by feeding and/or flooding activity, the amount and manner in which water flow has been affected, the density and vocation of landowners in the area, and whether the impacted site is in public or private ownership. Owners of large acreages are often surprised to learn that beaver have dispersed throughout their bottomlands and are not fully aware of all the changes the animal will make over time if left undisturbed. Some of these changes are beneficial; others are not.

On the plus side, the activities of beaver in and adjacent to urban centers can provide aesthetic and recreational opportunities for environmental education, nature study and wildlife photography. Other documented benefits from beaver have included erosion control through silt entrapment, maintenance of a higher and more stable water table than would be usual during drought and the utilization of beaver ponds for crop irrigation, livestock watering, and forest fire suppression. As beaver ponds age, increases often occur in the density and diversity of both floral and faunal species, when comparisons are made to surrounding habitats. For example, much of the recent increase in wood duck and otter populations in the southeast may be directly attributed to the range expansion of beaver. In addition, it has been shown that the management and leasing of beaver ponds to sportsmen for hunting, fishing, and trapping can bring significant monetary returns to enterprising landowners (Hill 1976, Arner and Dubose 1982).

It is not necessary to detail the varied problems caused by beaver and their activities. Simply stated, it is the animal's innate behavior to raise water levels to a depth in which it feels secure in traveling to feeding sites and adequate for the movement of construction materials. Where this water level differs from that desired by humans, problems result. Even on human-made impoundments such as fish ponds and reservoirs, the felling of aesthetic or commercially valuable timber, extensive bank tunneling, and impairment of water-level control structures are common occurrences. Obviously, beaver activities cannot be tolerated where the safety and health of humans is of concern, as when culverts are blocked with subsequent flooding of roads and rail lines or where public water

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supplies become contaminated by beaver carrying *Giardia lamblia*, an intestinal parasite affecting humans. Similarly, beaver populations must be controlled in areas of intensively managed agribusiness and forest resources.

Over the past 20 years, extensive efforts have been made by diverse groups of people and agencies throughout the southeastern United States to devise methods and products that would control widespread overpopulations of beaver in an effective and cost efficient manner. Unsuccessful techniques have included fencing (both electrical and mechanical), explosives, burning, shooting, habitat alteration, repellents, scare devices, toxicants, bounty payments and even predation from alligators. One or more of these methods may be temporarily successful in a local situation, but widespread use has proven not to be economically or biologically feasible. In 1977, a Beaver Cooperative Association located in Starkville, Mississippi was formed to improve the marketability of southern beaver products (Wesley 1978). Plans involved the harvesting of nuisance beaver by licensed trappers from the lands of shareholders buying stock in the Cooperative. The Cooperative, in turn, would process and market the beaver pelts (in addition to other species of furbearers) and provide a fair return to participating trappers. Unfortunately, this innovative approach to a serious management problem was unsuccessful for a number of reasons, one of which has been the continuing depression of southern beaver pelt values in worldwide markets.

In order to determine the current status, harvest economics and management programs for beaver, furbearer biologists from 15 southeastern states were contacted in a telephone survey. Comparisons were made to similar data compiled in 1979 by Arner and DuBose (1982) (Table 1). Results showed beaver populations continue to increase in 13 of the 15 states surveyed, although some differences from the earlier study were noted. Specifically, Missouri, which was not surveyed in 1979, currently is experiencing expanding beaver numbers as are Alabama and Virginia, the only southeastern states that previously reported stable populations. In addition, sections of certain states (i.e., central and southern Georgia, western Kentucky, Louisiana, Mississippi, and eastern Oklahoma) have shown a saturation of available habitat, with beaver populations attaining stable levels. The only state reporting a decrease in beaver numbers was Oklahoma; this was in its panhandle region, an area with relatively few animals historically.

Even though 2 additional states were contacted in the present survey, harvest levels were still lower than in 1979, with totals of 38,660 and 51,965 beavers taken, respectively. The principal reason for the difference apparently has been the continuing low pelt prices received for southeastern beaver (avg. = \$5.00, range \$3.00-\$8.77) (Table 1). Although final harvest data and average pelt prices for the 1983-1984 trapping season were not available at the time of the present

survey, several biologists reported increased remuneration to trappers for short-haired furs and expressed belief that demand would be stronger for beaver and other aquatic furbearers in the near future. Management strategies for beaver throughout the southeast have a common denominator in that each state wildlife agency provides information, demonstrations and on-site inspection of problem situations by biologists and/or enforcement personnel. Those states without year-round harvest of beaver allow nuisance animals to be controlled through depredation permits. Arkansas, Louisiana and Missouri support distinct animal damage control sections wherein control of nuisance beaver and coyote are a major responsibility. In Oklahoma, the U.S. Fish and Wildlife Service provides beaver control services as part of their Animal Damage Control program for landowners.

Several innovative programs have been initiated by both public and private concerns throughout the southeast to address the increasing controversy surrounding beaver overpopulation. In Starkville, Mississippi, a successful fur tanning and garment manufacturing plant has recently been established which utilizes pelts obtained from southern beaver. During the last 2 years in South Carolina, proceeds from a state waterfowl stamp have been used to buy materials for the construction and maintenance of over 2,000 wood duck boxes, many of which have been placed in beaver ponds (D.A. Shipes, pers. comm.). Excellent brochures have been produced in Alabama (Hill 1974) and Tennessee (Byford 1974) detailing the life history, control techniques and pelt preparation of southern beaver. A unique 16 mm film entitled "Beaver Control" is available from the Alabama Cooperative Extension Service, Auburn, Alabama. This informative, 28 minute, color film produced by the Extension Service and the Alabama Cooperative Wildlife Research Unit briefly describes the history of beaver populations in the southeastern United States, discusses the benefits and damages beaver can bring to the landowner and shows the most effective techniques for trapping beaver and handling their pelts.

The 1 method that has proven effective in economically controlling beaver populations has been trapping by the licensed public. Investigations of trapping techniques on small watersheds in Alabama revealed that beaver could be trapped out over a 2 week period during 2 successive winters (Hill 1982). The key element is to allow the trapper to harvest, within legal limits, other species of resident furbearers on the landowners' property, to compensate for the depressed prices currently received for southern beaver. A program recently initiated in North Carolina allows the names of licensed trappers to be provided to landowners with beaver problems through the cooperative efforts of the N.C. Trappers Association, the N.C. Wildlife Resources Commission, and the N.C. Agricultural Extension Service (R.B. Hazel, pers. comm.). Close cooperation between landowners, organized trapper associations and the respective state wildlife agency can help to ensure a successful and biologically sound control operation. Other southeastern states have developed

Table 1. Information collected in a telephone survey of furbearer biologists from 15 southeastern states concerning the current status and harvest characteristics of beaver.

State	Population Status 1979 <sup>a</sup>	Population Status 1984	Harvest 1977-1978 <sup>a</sup>	Harvest 1982-1983	Mean Pelt Price (\$) 1982-1983	Year-round Trapping
Alabama	Stable	Increasing	13,765	5,503	4.00	Yes
Arkansas	Increasing	Increasing	5,000	5,554	4.25	Yes
Florida	Increasing	Stable	250	252	3.00	Yes
Georgia	Increasing	Stable/increasing	5,550	1,298	3.41	Yes
Kentucky	Increasing	Stable/increasing	382	1,940	6.00	No
Louisiana	Increasing	Stable/increasing	273	2,106	6.00	No
Maryland	Increasing	Increasing	153	269	-	No
Mississippi	Increasing	Stable/increasing	18,071	7,955	5.00	Yes
Missouri	-	Increasing	-	5,000	6.50	No
North Carolina	Increasing	Increasing	446	518	4.50	No
Oklahoma	-	Stable/increasing	-	1,512	4.01	Yes
South Carolina	Increasing	Increasing	383	579	-	No
Tennessee	Increasing	Increasing	656	850	4.50	Yes (West of Hwy 56)
Virginia	Stable	Increasing	6,224	4,603	-	No
West Virginia	Increasing	Increasing	862	721	8.77	No

<sup>a</sup>Data obtained from Arner and DuBose (1982).

similar multi-agency approaches in an effort to help landowners make educated and environmentally-responsible decisions concerning their beaver populations.

In summary, it is apparent that overpopulations of beaver will continue to occur in many areas of the southeastern United States until demand becomes stronger for short-haired furs and for beaver, in particular. During the interim, utilization of the total beaver resource should be stressed. Depending on local conditions and attitudes, this utilization can often take the form of promoting both consumptive and nonconsumptive multi-use educational, environmental, and recreational benefits. Conversely, where potential exists for economic and safety thresholds to be exceeded, population suppression and control should be encouraged through intense trapping programs. Allowing the harvest of more valuable furbearer species by the licensed trapping public can provide the necessary incentive toward alleviating many nuisance beaver complaints.

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