

MUSKRAT AND BEAVER MANAGEMENT IN WETLANDS

PLANNING AHEAD FOR WILDLIFE SURVIVAL

Managed wetlands attract many forms of wildlife including a variety of furbearing mammals. Muskrats and beavers are of particular interest in these areas because they are extremely dependent on wetland habitats and because their activities can have either beneficial or damaging effects on the wetland itself. In some situations, these animals can enhance the value of wetlands for other wildlife. Yet, populations of both must be closely monitored and occasionally controlled to avoid problems associated with their over-abundance.

Muskrats

Muskrats feed primarily on aquatic plants. In marsh environments their feeding and lodge construction can aid wetland managers in obtaining desired amounts of open water and vegetation. In some portions of their range, muskrats can become excessively abundant and actually destroy the aquatic vegetation upon which they and other wildlife are dependent. Fortunately such "eat outs" are not common in Missouri.

Muskrat populations vary each year depending on their relative reproduction success. Muskrat reproductive capacity is great, thus populations respond quickly to favorable water and habitat conditions. Conversely, drought, disease and excessive animal densities will limit production of this generally stress intolerant species. Muskrats in most aquatic environments can be heavily harvested by man. Muskrat trapping should be an important aspect of integrated wetland management programs. Muskrat trapping makes sense not only because managers can alter harvest pressures to create desired habitat conditions, but also because the fur resource represents a renewable and valuable product of the land.

Muskrats can create problems particularly during periodic populations highs. Perhaps the most troublesome muskrat activity is their digging and burrowing. Many marsh-dwelling muskrats live in lodges. However, some chose the periphery of the marsh and actively excavate bank burrows for protection. In lakes, ponds, creeks and rivers, bank burrowing is a normal activity. Burrowing represents the greatest problem in diked wetlands and pond or lake dams not constructed according to minimum agricultural specifications. Fluctuating water levels aggravate the problem by forcing the animals to continually dig to keep their living quarters above the water level. Vehicles or livestock can cause the burrows to collapse further damaging the dike or dam. Periodic trapping may necessary to control muskrat damage in severe burrowing situations. If animals are removed from bank burrows, it is important to fill the burrow and the den itself with soil to minimize the chance of another muskrat occupying the site. A vacated, but suitable den site is attractive to other passing muskrats and will likely be reoccupied unless the burrow and den are made unattractive.

Trapping with steel traps is the most efficient way of removing muskrats. The small size "conibear-type" instant killing trap is an effective control device when set at den entrances. If done during the open season, the pelts

can be sold. However, if damage requires immediate action, any landowner or his agent may trap the animals in his pond at any time, without permit, provided he does not use any part of the animal for food or profit and notifies the conservation agent of his action.

Various chemicals have been tried to keep muskrats out of ponds or to drive them out. Creosote or carbide dropped in the dens through holes opened (with a rod) in the roof has worked in some cases, failed in others.

The same is true of other repellents. The most effective removal is still by trapping; the best insurance against damage is still good construction and management.

Beaver: Economic Importance

The beaver has been called the original flood control engineer. By building series of dams across small water courses he has helped to control water levels and reduce floods on those streams. Beaver keep dams in constant repair and the dams withstand the ravages of minor fluctuations in stream flow.

By building dams, beaver aid materially in reducing soil erosion in certain areas. The running water that enters a beaver pond slows down and automatically drop its load of silt. In time, the pond fills up with silt, forms a meadow and thus keeps the soil there. Otherwise, fine silt suspended in running water would be carried far downstream.

The invasion of a stream by beaver usually results in an ecological succession that provides habitats where increased numbers of plants and animals can exist. The water in beaver ponds provides fish of many kinds with spawning places and/or over-wintering sites. The water is utilized by stock, deer, waterfowl, muskrat, raccoon, mink, quail, pheasant, and many other kinds of wildlife.

The increased variety and amount of vegetation that normally grows around a biologically balanced beaver pond furnishes habitats for various insects, many of which are used as food by fish in the pond. Shrews, meadow mice, and other small mammals invade the area and become established. Ducks and other waterfowl find nesting sites around the ponds.

As a result of flooding, some trees die; their limbs soon break off and fall from the dead trunks and allow the entrance of moisture and fungus, which form holes. Woodpeckers drill other holes in the dead trunks. Those holes provide essential nesting sites for tree swallows, crested flycatchers, bluebirds, titmice and other kinds of birds.

Even after beaver have abandoned a pond, their burrows become homes for other kinds of wildlife. Sometimes well-built beaver dams remain long after the beaver have left and the permanent pond continued to serve the needs of other species of animals.

In places where the water is deep enough to meet the needs of beaver without their having to build dams, the beaver affect plants and other animals less than in areas where dams have to be built. The activities of beaver may in some such places be detrimental to man.

Beaver: Colony Organization and Behavior

The supposition that the beaver family consists of the parents, yearlings and kits is widely accepted by most

authorities. A colony consists of one or more families. The number of individual animals per colony varies from 1 to 12 or more, depending upon conditions. Researches agree that five is near the average number of individuals per colony. Because of the natural tendencies of beaver to disperse, newer colonies consist of smaller numbers.

An established and active colony may consist of only one individual beaver. These beaver were referred to by early trappers as "bachelor beaver."

The weight of the individual beaver gives a fair indication of its age. Beaver weighing 12 pounds or less are no more than one year old, 12 to 25 pounds two years old, and 26 to 40 pounds three or more years old. After gaining weights up to 30 pounds, the rate of increase and the weight both depend to a great extent upon the individual characteristics of the animal.

Beaver mate and have young when three years old. Breeding takes place in January and February. The period of gestation is thought to be between three and four months. The young are born in May and June. The average number of young per litter is four. Older females tend to produce larger litters than young females.

At birth a young, termed a kit, weighs one pound or slightly less. Kits have downy fur, open eyes, and are able to swim a short time after birth. Although the young are able to swim at once, they seldom come out of the den until about 1 month old. Then they swim with their mother who often carries them on her back in the water. The female takes entire care of the kits until this time, but the male soon returns to the family. The young are weaned when about 6 weeks old and weigh 4 pounds.

They remain in their parents' den for at least one year and then continue to live in the colony but inhabit a different den. The two-year-old young are driven from colonies containing younger animals. On this forced migration beaver do not always follow water courses. One beaver in Kansas was obtained nine miles away from a water course. The distance traveled by a migrating beaver is governed by the availability of unoccupied areas having necessary habitat. Beaver generally disperse in late spring and early summer. Once the wandering beaver finds a suitable area and a mate, the pair establishes a new colony.

Beaver are thought to communicate by several methods. One is by slapping their tails against the water when danger is near. Castor mounds sometimes found along the banks of beaver ponds serve as a communication function. The mounds are constructed of mud and small sticks, usually are dome shaped, and are four to eight inches across at the base. Onto these mounds beaver secrete castor which usually is dark red or maroon and has a strong odor. Feces ordinarily are deposited in the water.

After a colony is established it may have several bank burrows. One principal type of bank den has a tunnel leading from a submerged entrance up to an underground chamber located anywhere from six to fifty feet back in the bank above the water level. The tunnel varies from twelve to thirty inches in diameter.

In winter, beaver bring food into the chamber and debris collects on the floor. The beaver enlarge the room by further excavating from the ceiling and walls especially in spring. The chamber often becomes so large that the roof caves in, leaving a large hole in the ground. When this happens the beaver occupying the den are forced to dig another chamber, but when the cave-in is not too extensive the beaver often repair the hole by covering it with limbs and plastering the cracks shut with mud.

Beaver continue to dig new tunnels and openings until some old bank burrows may have several adjoining

tunnels each leading to a living-chamber and such dens may have many openings both at the water level and below.

Near a food cache beaver sometimes dig a feeding den, which is merely a pocket under the bank where the beaver feed in concealment.

Beaver seldom construct lodges. Most beaver live in bank dens.

A third type of shelter in which beaver sometimes live is a combination of the ledge and the bank burrow. This false lodge is a dome-shaped structure built by piling limbs and poles on or against the shore of the stream. The beaver tunnels through the sticks and into the bank where the den is located. This type of false lodge may originate from the repairs of a bank burrow that has caved in.

The method of construction which beaver use in building dams always appears to be the same. Branches of cottonwood and will or whatever species of usable plant is most available are cut and placed on the bottom with the larger ends upstream. Mud and gravel, and stones if available are put against the branches. Then other layers of brush are placed upon the first, each in turn weighted down by mud and gravel until the dam reaches the desired height. Most beaver dams are less than four feet high.

At first the water leaks through the loosely constructed dam, but as the current brings down sediment and the beaver bring up more mud from the stream bed and place the mud on the upper side and crest, the dam soon begins to hold water and the pond fills. The dam is kept in constant repair by the beaver. Old dams can sometimes be found with willow trees and other vegetation growing on the the top and downstream side.

A colony of beaver may build several dams depending upon their needs. Dams and ponds are abandoned usually because the food supply becomes exhausted. The time lapse before beaver occupy the same area again depends upon the growth of a new food supply.

From October to December members of a colony engage in a combined effort to cut and store food for the winter. They cut trees that are usually less than six inches in diameter than often fall in the direction of the stream as if planned that way by the animals. This is probably because most trees naturally lean downhill toward the water, and therefore fall that way. Wind may influence the direction in which the trees fall. Trees sometimes wedge against one another and are left as waste although a wedge tree is often saved by cutting the adjacent tree. Beaver have been found trapped or killed by trees that they had cut.

To fell a tree, the beaver stands on its hind legs and grips the bark with the sharp curved nails on its front feet. It spreads its hind feet wide and braces itself with its tail. While the front teeth drive into the wood like a holding fork, the lower teeth cut a deep notch about three inches below. Then the beaver tears out the chunk of wood between.

Beaver generally cut through a tree by working on one side. A single beaver generally works on one tree, but it does not always work on the same tree that it started on and it may cut nearly through a tree and then abandon it.

After a tree is felled the branches are cut into suitable lengths for transportation to the storage pile. The food is stored from four to ten feet beneath the surface of the water and near the shore and den entrance. The beaver forces the first layer into the bottom and entangles the other layers with the first. The green wood being heavy

tends to stay in place.

The size of the food cache varies with the number of individuals in the colony and the amount of food available. During warm spells in winter when their pond is free from ice, the beaver often ventures onto the bank and cut trees. When ice covers the pond the beaver spend most of the time in the dry chambers and their activity in general is greatly reduced.

If the water of a beaver pond is clear a person can often find dens in which beaver are living by watching for the discarded limbs in front of the entrances. These limbs are light yellow having had the bark recently stripped from them.

In areas where there are large numbers of springs or fast moving streams, beaver sometimes store no food and rely on food that they obtain as needed from the shore. Feeding in this fashion may be more common where the normal winter temperatures remain high enough to permit a stream to maintain an ice-free flow all year long.

In spring and summer beaver seem to depend less upon bark for food and utilize aquatic plants and the tender green shoots of terrestrial plants. Plants of this kind found cut by beaver are as follows: Ragweed, Pigweed, Sunflower, Smartweed, Cattail, Bulrushes, Sedges, Corn, Maize and others found growing near the water's edge. Cornfields bordering beaver colonies often have well-worn trails over which the beaver drags the corn stalks into the water. Non-woody vegetation is estimated to constitute three-fifths of the beaver's annual food.

Large trees are sometimes gnawed on by beaver in summer. Gnawing wears away the ends of the evergrowing incisor teeth that otherwise would grow so long as to cut into the lower jaw, block the mouth, and cause the beaver to starve.

Evaluation of a habitat for beaver should be based upon the supply of suitable food within 200 feet of deep water -- the nearer to the water the better. Danger of predation increases with distance the beaver has to travel to obtain food. Beaver tend to utilize small trees more completely than larger trees and those with smooth bark are eaten more completely than those with rough bark.

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