The Trustees of Reservations

Beaver Management Guidelines

Guidelines for Beaver Management on Trustees' Properties

The Trustees believes that beavers are an important natural component of the Massachusetts landscape and that beaver activity produces highly-productive ecosystems that benefit many species of plants and animals. The Trustees' position in regard to beaver activity is one of tolerance.

1) Beaver activity on The Trustees' properties should not be interrupted unless (a) it becomes a threat to public health and safety as defined by the Department of Public Health (*see p.3*); (b) the properties of abutters are severely affected by beaver activity on a Trustees property; or (c) roads, buildings or other structures (e.g. septic systems, driveways, etc.) are threatened.

2) In the event of one of the three scenarios above, The Trustees will engage in non-lethal forms of beaver control, including the installation of water-flow devices or beaver bafflers. The use of such measures will be assessed on a case-by-case basis and the most appropriate form of control will be utilized.

3) The trapping of beavers will only occur as a last resort when all other viable options have proven unsuccessful. The Trustees will fully adhere to the permitting process as regulated by the Division of Fisheries and Wildlife and the Department of Public Health.

4) In the event that a trail on a Trustees reservation becomes flooded by beaver activity, The Trustees will work to provide continued safe access for the public. Alternative solutions to be discussed shall include relocating the trail to higher ground, constructing boardwalks or footbridges, or closing the affected trail.

5) Any proposed trails, at either new or existing reservations, that traverse wetland areas should be considered in light of water level rise from possible future beaver activity. Any boardwalks or footbridges should be designed to accommodate a future rise in water level.

6) The Trustees will work to set appropriate visitor expectations in regard to flooding from beaver activity. This will include informing visitors at property entrances or trailheads of any trails that may be temporarily closed while alternative access is being sought.

7) Interpretive information about beavers and their effects on ecosystems will be made available at properties containing active beaver colonies. Efforts will be made to educate the public about The Trustees' position on beaver management.

8) In the event that a rare species is threatened by beaver activity, The Trustees will evaluate on a case-by-case basis and implement controls as deemed appropriate.

I. Introduction

The history of human interaction with the beaver (*Castor canadensis*) in Massachusetts dates back thousands of years. Native Americans in New England actively trapped beaver for their valuable pelts and for meat and medicine. By the time the first European settlers arrived in North America, the European beaver (*Castor fiber*) had been extirpated from much of Europe due to the high demand for beaver pelts. With the demand continuing, Native Americans utilized the beaver trade as a means of procuring goods from the earliest settlers. During the peak of the fur trade, some 200,000 pelts a year were sold from New England to European markets.[10] In Massachusetts, a trading post whose main commodity was beaver pelts had been established in 1636 along the Connecticut River Valley. By the 1650s, beaver numbers within New England were in severe decline. Trappers moved further north and west to find untapped populations. By the early part of the 19th century, beaver had been extirpated from southern New England and much of the United States.

In 1928, a colony of beavers was discovered by fishermen on State Line Brook in West Stockbridge. Four years later, three beaver were acquired from New York and released in Yukon Brook in Lenox. That same year saw the adoption of the Beaver Protection Bill, which made it a punishable offense to kill or molest a beaver. These were the first in a series of events that led to the restoration of beaver throughout most of Massachusetts. In 1947, following a preliminary study that solidified its necessity, a full blown research and management project on the beaver was launched in Massachusetts.

Today, the Division of Fisheries and Wildlife (DFW) estimates that beaver populations within the state have risen to more than 70,000.[5] During the beaver's 200-year absence, humans have developed and severely altered much of the landscape. As beavers return to the areas they once inhabited, conflicts between humans and beavers are increasing in frequency throughout many areas of the state.

II. Ecosystem Effects of Beaver Activity

Beavers have played an important role in New England's ecology for thousands of years. Acting as "engineers" of the landscape, they turn small streams into ponds and wetlands, thereby altering ecosystem composition and processes. Because of the impact they have on ecosystems, beavers are considered a "keystone species," one that has a disproportionate impact on the community relative to its abundance.[2,6,10] There are a number of positive ecological effects that result from beaver activity.

Positive Effects of Beaver Activity

Creation of Wetlands

Since the time of European settlement, it is estimated that Massachusetts has lost between 28 and 40 percent of its wetlands.[3] Human development and the extirpation of the beaver were two of the contributing causes. By damming small streams, beaver help to create new wetlands. Along rivers and streams, wetlands help to control

downstream flooding by storing and slowly releasing floodwater. This slow release of water also serves as drought control, lessening the impact of low water conditions to downstream users. Areas flooded by beaver dams serve as recharge areas, places where surface water slowly infiltrates and replenishes the groundwater supply. Beaver ponds improve water quality by removing or transforming excess nutrients, storing sediment and trapping large amounts of silt that would otherwise pollute streams and rivers.

In addition to creating wetlands, beaver also enhance wetland quality. Wetland fertility is increased by the retention of organic matter and sediment behind beaver dams. In addition, beavers add new sources of organic matter in the form of fecal matter and the plant material they haul or fell into the pond for use as food or building material. The retention of organic matter and the addition of new organic matter both contribute to an increase in nutrients available to aquatic plants and invertebrates.[8]

Ecosystem engineering by beavers resulting in the creation of wetlands can also have positive effects on vegetation. These newly created wetlands are capable of supporting herbaceous plants not found elsewhere in riparian zones. In the central Adirondacks in New York, beaver activity increased the number of species of herbaceous plants by over 33%.[11]

Creation of Wildlife Habitat

In creating habitat for themselves, beavers also create or enhance habitat for numerous other species. A study conducted in south-central New York found that wetlands occupied by beaver contained significantly more bird species and a greater average number of species than wetlands of comparable size lacking beaver activity.[1] Beaver ponds provide foraging and "nursery" areas for waterfowl and marsh birds such as bitterns, moorhens, rails and grebes. With aquatic invertebrate densities up to five times higher than stream sites, beaver ponds provide the protein food base so important to laying females and to growing ducklings.[8]

Reptiles, amphibians, and small mammals like mink and muskrat also thrive in beaver-created habitats. Trees that are killed by flooding in areas of beaver activity provide valuable nesting sites for birds including wood duck, herons, tree swallows and hooded mergansers. Beaver ponds also provide nursery habitat for many species of fish and generally enhance stream habitat quality for many fishes.[7]

Supporting Biological Diversity at the Landscape Scale

Numerous studies have shown that conservation of *groups* of wetlands, in different stages of development, together with the intervening terrestrial habitat, is critical to the protection of a variety of animals, such as Blanding's and spotted turtles, and a host of amphibian species. For example, through the course of a year, spotted turtles may rely on pools for spring activity, wet meadows or swamps for overwintering, and upland forests for periods of dormancy and travel between wetlands.[4] Furthermore, researchers have shown that the genetic health of regional populations of many amphibians relies on a network of wetlands where individuals can move about and share

genetic material.[9] The cyclical nature of beaver activity ensures both the temporal and geographic diversity of wetlands at the landscape scale, thus supporting landscape level biodiversity.

Aesthetics, Recreational and Educational Values
Beaver ponds provide opportunities for wildlife viewing, nature study and photography. They are regularly used by canoe and kayak enthusiasts and fishermen. There are many educational opportunities existing also, including the study of plants, wildlife tracking, collection and identification of aquatic invertebrates, or pond studies exploring predator-prey relationships and food webs.

Negative Effects of Beaver Activity

Along with the positive aspects of beaver activity come some negative aspects that are generally deemed nuisance activities. Perhaps the most frequent nuisance resulting from dam building activity is the clogging of culverts and drainage ditches. This can have serious economic impact as roadways often become flooded and damaged. Private property owners are often impacted by beaver activity when their properties become flooded or their septic systems fail. Beavers cut trees for materials to build dams and lodges, and for food. The removal of streamside trees leads to increased erosion of the banks and can decrease the amount of shade, leading to increased water temperatures that may affect aquatic organisms.

III. Massachusetts Regulatory Framework for Beaver Control

When beaver activity is deemed a nuisance by landowners, there are options available for managing impacts of such activity. These options include trapping beavers, installing water-flow devices or breaching dams. The following information outlines the regulatory framework for beaver control in the Commonwealth.

Trapping regulations

From November 1st through April 15th of each year it is legal for licensed trappers to trap beavers. Landowners may hire a licensed trapper at any time during these dates to remove beavers from their property. The DFW regulations permit only the use of box- and cage-type traps. Trappers who have been properly trained in their use may utilize Hancock or Bailey traps. Conibear traps (which are lethal to beaver) are prohibited, but a permit may be issued for their use in certain circumstances. To receive a permit for the use of Conibear traps or to alleviate beaver nuisance activity outside of the trapping season, a property owner must follow the procedure enumerated below.

Beaver damage that may be a threat to public health and/or safety:

Any private landowner who feels that beaver activity on his property may be a threat to the public health and/or safety may apply to the local Board of Health for an emergency permit to immediately alleviate the threat. If the Board of Health determines that such a threat exists, it will issue a 10-day emergency permit which authorizes the applicant to remedy the threat in one of three ways:

- use of Conibear or box- or cage-type traps (subject to DFW regulations)

- breaching of dams, dikes, berms (subject to conditions of local Conservation Commission)
- use of any non-lethal management or water-flow devices (subject to conditions of local Conservation Commission)

If the problem is not remedied before the 10-day permit expires, the applicant may apply (in conjunction with the Board of Health) to the DFW for a 30-day extension permit. If the extension is granted, the DFW shall develop, with the assistance of the applicant, Board of Health and Conservation Commission, a plan to abate the beaver problem using alternative, non-lethal management techniques in combination with water-flow devices, and if necessary, box- and cage-type traps. While waiting for the 30-day permit to be issued, the applicant may, in the meantime, apply to the Board of Health for a second 10-day emergency permit.

If the initial application to the Board of Health is denied, the applicant may appeal to the Massachusetts Department of Public Health for a determination of the existence of the threat, or to the DFW.

What constitutes a threat to public health and/or safety?
Threats to human health and safety shall include, but shall not be limited to:

- beaver occupancy of a public water supply;
- beaver-caused flooding of drinking water wells, well fields or water pumping stations;
- beaver-caused flooding of sewage beds, septic systems or sewage pumping stations;
- beaver-caused flooding of a public or private way, driveway, railway or airport runway;
- beaver-caused flooding of electrical or gas generation plants or transmission or distribution structures, telephone or communications facilities or other utilities;
- beaver-caused flooding affecting the public use of hospitals, emergency clinics, nursing homes, homes for the elderly or fire stations;
- beaver-caused flooding affecting hazardous waste sites or facilities, incineration or resource recovery plants;
- the gnawing, chewing, entering or damage to electrical or gas generation, transmission or distribution equipment, cables, alarm systems or facilities by any beaver; or
- beaver-caused flooding or structural instability on property owned by the applicant if such animal problem poses an imminent threat of substantial property damage or income loss, limited to:
  1) flooding of residential or commercial buildings
  2) flooding of or access to commercial agricultural lands
  3) reduction in the production of an agricultural crop
  4) flooding of residential lands in which municipal board of health or state department of health has determined a threat to human health exists.

Beaver damage that does not constitute a threat to public health and/or safety:

For situations not involving public health and safety, a landowner should contact the DFW who will advise of available solutions. Permission is needed from DFW and the local Conservation Commission for dam breaching or the installation of water-flow devices. If, after trying recommended solutions for 15 days, the problem is not alleviated the landowner may apply to DFW for a 30-day permit to use lethal Conibear traps.

References Cited

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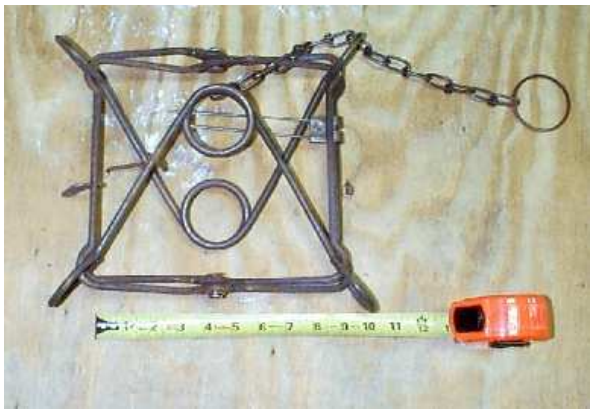
APPENDIX

An example of a cage-type trap that may be legally used to trap beaver in Massachusetts.

Bailey traps (left) and Hancock traps (above) may be utilized only by licensed trappers who have received proper training in their use.

The use of Conibear traps (right) are restricted in Massachusetts. They may only be used with a permit issued by the Board of Health or the DFW. These traps are lethal to beaver.



Two devices, generally referred to as “beaver bafflers’” used to prevent beavers from flooding culverts.

Below: A “Beaver Deceiver™” designed by Maine biologist Skip Lisle.