

Nuisance & Invasive Species

Nuisance Species

While people usually enjoy having wildlife around, problems sometimes arise when the activities of people and wildlife clash. We have provided links to sources of information that will help you better understand wildlife and their habits and suggest things you can do to prevent and control wildlife damage. Please note that most wildlife is protected by state and federal law, and some control activities may require permits. For help with wildlife nuisance or damage, check the Yellow Pages for licensed nuisance wildlife control operators under "Pest Control Services." Further information is available from your [regional wildlife office](#).

Invasive Species

Invasive species are non-native species that can cause harm to the environment or to human health. As a threat to our biodiversity, they have been judged second only to habitat loss. Invasives come from all around the world; the rate of invasion is increasing along with the increase in international trade that accompanies globalization.

Invasive species have caused many problems in the past, are causing problems now, and pose threats to our future. A wide variety of species are problematic for many sectors of our world: our ecosystems, including both all natural systems and also managed forests; our food supply, including not only agriculture but also harvested wildlife, fish and shellfish; our built environments, including landscaping, infrastructure, industry, gardens, and pets. Invasive species have implications, too, for recreation and for human health.

The links on this page provide further information on invasive species and describe the Department's various programs and efforts to combat this serious problem in New York State

More about Nuisance & Invasive Species:

Nuisance Black Bear

In New York State people and black bears often find themselves living in the same areas. With frequent encounters nearly inevitable, it's good to know how to keep those encounters safe and enjoyable for you and the bears. The links on this page lead to information about techniques that we recommend to prevent attracting bears around your home and while camping.

More about Nuisance Black Bear:

Bears and Bird Feeders

Although many people find it difficult to believe, an animal as large and powerful as black bear is readily attracted to bird feeders as a source of food. Black bears are for the most part vegetarians, and bird seed, even in minute quantities is a highly desirable food for them. In many cases, it is **the** food of choice and will be sought out over other natural foods. Bear nuisance complaint records from the Region 3 DEC office in New Paltz reveal that at certain times of the year, bird feeders are involved in over 80% of the bear problems around houses. First and foremost, bears are readily attracted to back yards because of the presence of bird feeders. The problem often escalates to other food sources such as garbage cans, barbecue grills and compost piles as bears become bolder and more acclimated to people. Such activities are not in the best interest of either the bears or the homeowners. Bears that learn to approach one house will approach other houses and invariably result in concern from non suspecting people.

What to do?

It is important to break the pattern of black bears coming to houses for food. Fortunately, most bird feeding activities occur during the winter when bears are in their dens. When bears emerge their dens in March, natural foods are not abundant and bird feeders represent a readily abundant food source. It is highly recommended that bird feeding activities cease at that time if you live in bear country. It is also important to remember that residual seed remaining on the ground will also be attractive to the bears. It should either be removed or treated with a covering scent such as ammonia. Some people start feeding again during early summer and closely monitor their feeders. If any bears return, they immediately cease their operation.

Many people feel they can out-smart the bears by taking their feeders in at night. This may offer some relief, however there is usually enough residual feed from daytime feeding to continue to attract bears. Others attempt to place the feeder high and out of reach of the bear. A bears sense of smell is so keenly developed that the feeder will continue to attract the bear. This often does not discourage the bear from spending considerable time near the bird feeder trying to figure out how to reach it. Some people have had success by mixing cayenne pepper with the bird seed to make it less palatable. This practice has some value with individual bears who will learn to avoid specific feeders, however in bear country, every bear that finds the feeder will have to knock it down to learn that it contains pepper and is not a good source of food. Removal of the attraction is the only long term solution.

Some homeowners receive much satisfaction from their bird feeding activities and are reluctant to stop feeding. Keep in mind that any feed placed out for wildlife is not species specific....it is impossible to pick and choose which animals will be attracted and which animals will not. The choice is up to the individual, however any activity which results in attracting black bears close to homes should be carefully considered. The resulting presence of bears affects their neighbors also, and in the long run does more harm to the bears than good. Bears that become accustomed to approaching houses and people often

become chronic nuisances. It is highly likely that they will end up hit by cars, shot illegally by people who misunderstand their intentions and suffer diet deficiencies from continued improper foods.

As is the case with almost all bear human conflicts, *if you take away the food you will take away the bear*. Black bears, like all wildlife, are best appreciated at a distance.

Discouraging Black Bears Around Home and Camp

"Good housekeeping" is a requirement in black bear country. Simple sanitation measures can be the key to preventing bears around houses and in camp areas. The following list contains techniques that we recommend to prevent attracting bears.

- Discontinue the practice of feeding suet and/or bird seed to birds for the entire summer. Bird feed is a very strong attraction even if they can't reach it.
- Do not leave garbage outside of houses or garages. (Grease, fat, bacon and other meats are extremely attractive to bears. These items should be disposed of in sealed containers.)

Note: Burning makes garbage more attractive.

- Clean garbage cans and other refuse containers frequently with ammonia, bleach or Lysol.
- Place camphor disks (available from some drug stores) in garbage cans to mask food odors. Other items may work as well, e.g. mothballs, air fresheners, Lysol and ammonia-soaked rags.
- Use plastic bags inside garbage cans to help hide odors.
- Store garbage cans in a secure place such as a garage, rather than storing them on a porch.
- Empty garbage dumpsters at camping areas after dinner to decrease the chance of attracting bears. Construction of a garbage storage facility may be necessary when dump facilities are not open daily.
- Remove the grease can from gas and charcoal grills after every use. Turn the grill on "High" for several minutes after you are done cooking.

- Clean barbeque pits and grills thoroughly before leaving them outside. (We recommend using aluminum foil and cleaning these items with an ammonia cleaner.)
- Do not place food outside to attract raccoons, squirrels or other wildlife.
- Clean old refrigerators and other insulated containers that are left outside.
- Turn off kitchen exhaust fans that vent to the outside when not in use. Make sure the vent screen is cleaned regularly.
- Do not feed family pets outside. An empty dish can attract a bear.
- Leave outdoor lights on, or a radio playing, all night.
- Do not hand-feed bears from cars at campgrounds and dump sites.

Note: A bear is a wild animal and should be respected. We discourage feeding practices of all types.

- Do not leave dirty diapers or diaper pails outside.

Remember: Bears are attracted by smells....With the exception of ammonia, Lysol, camphor and other strong smells, everything smells like potential bear food.

- Remove the Food Attractant and You'll Remove the Bear.

Nuisance Beaver

Control Techniques Manual

Introduction

The purpose of this manual is to provide information on the most effective techniques available for resolving beaver/human conflicts. It integrates a wide range of topics and issues pertinent to beaver damage control and serves as a valuable reference tool for members of the public who have beaver damage. Information on the history of beaver management in New York State, the natural history and habits of beavers, definition of beaver damage, liability concerns, permit requirements, importance of good landowner/DEC relations, standard procedures for handling beaver nuisance complaints, and the methods/options presently available to resolve beaver damage concerns will be addressed.

Beaver Management In New York

The North American beaver (*Castor canadensis*) has a long and interesting history of management in New York. Nearly extirpated in the early 1800s, beaver populations made a spectacular recovery during the 1900s. This was made possible through trap and transfer, harvest restrictions and habitat recovery. By the early 1940s beaver had reoccupied New York. Beaver/human conflicts increased as a result. In response, New York established a nuisance focused beaver management policy in 1944. Beaver populations were purposely held at low levels by long fur-trapping seasons. This approach, which lasted through the 1970s, minimized the benefits as well as the costs of beavers.

During the 1960s and 1970s, New York's wildlife biologists examined the wetland-wildlife benefits provided by beaver impoundments. Study findings led to major changes in beaver management. It was determined that the habitat and

other benefits of beaver balanced many of the costs. Beaver population objectives for ecologically based management units were established with measures of human tolerance and habitat potential being the key factor in objective setting. The result was higher beaver population objectives. During the 1980s, beaver populations increased throughout much of New York State. Beaver populations were maintained at desirable levels by regulating the trapping seasons. The goal was to provide more wetland-wildlife benefits to New Yorkers.

Since this time, however, the Bureau of Wildlife's ability to manage beaver populations at objective levels has been severely impacted. This has been brought about by a combination of factors. Chief among these has been increased beaver habitat due to changes in land use patterns across New York State. In 1880, 75% of New York State was actively farmed and less than 25% was forested. By 1980, 60% of the State had returned to forests. This continuing trend toward less agriculture and general farmland abandonment has resulted in the creation of more available beaver habitat.

A significant decline in trapping interest has been the other major factor contributing to higher beaver populations. This decline can be attributed to low pelt prices, increasing average trapper age and decreased recruitment of new trappers, as well as changes in social attitudes toward the utilization of wild furs. The result of all this is that presently many of our wildlife management units are at or above the management objectives set for beavers. As legalized trapping becomes less effective as a method of control, beaver populations will continue to increase, resulting in greater beaver/human conflicts. In 1993, it was estimated that there were 17,579 active beaver colonies in New York. This was 3,579 more than the statewide goal of 14,000 and an increase of 19% since 1990. Beaver damage was reported at 2,113 of the sites, resulting in 5.5 million dollars worth of property damage. An additional \$330,000 was spent by the State to handle these complaints. With the limited applicability and high cost of the current beaver damage control technology, the installation of water level control devices alone

will not be enough to resolve the majority of beaver damage problems. It is therefore important to take a more comprehensive approach to resolving beaver damage complaints. By integrating current beaver damage control technology with in season trapping, permit issuance, standardized operation procedures and sound technical advice, we should become more effective in serving our public.

Biology and Behavior of Beaver

The beaver is the largest rodent in North America with adults ranging from 35 to 46 inches long (including a flattened 12-18 inch tail) and weighing from 45 to 60 pounds. Beaver weighing over 100 pounds have been recorded. The hind feet are very large with 5 long webbed toes. Front feet are small and dexterous, which allows the beaver to carry dam construction material such as stones and sticks.

Both sexes of beavers breed at 21 months of age from December through February. Females ovulate 2 to 4 times at 7 to 15 day intervals during each mid-winter breeding season. There are no records of beavers breeding as first year kits. Development of the fetuses requires 120 days with the young being born between April and July. Litter sizes range from 1 to 9 with an average litter size of 4. The heavier the female, the larger her litter, also the number of young a female bears is inversely related to her family size at the time of breeding. Adult females will breed every year regardless of the habitat quality.

The occupants of a beaver pond or group of ponds is a family consisting of two adults and their offspring of two breeding seasons. Beavers mate for life; however, if one of the adult breeding pair is removed from the population, the remaining member will readily accept a new mate. The kits remain with the parents until they are two years old and then are driven off to find their own territories. This dispersal of juveniles can contribute greatly to the total number of property damage complaints.

As a food source, beavers prefer aspens and willows but will eat the leaves, twigs and bark of most species of woody plants found along the water's edge.

During the growing season beavers will also consume large quantities of non-woody plants such as grasses and cattails. During the fall, they will stockpile their woody food supply in the water near their house for use during the winter months. The presence of these fresh cut feed piles is an important indicator of an active beaver lodge. During the ice covered winter months beavers are generally inactive with regard to tree cutting and dam building.

Beavers construct dams which result in the formation of ponds within which the lodge and winter food cache are located. It is believed to be a combination of water flow sensation and the sound associated with running water that stimulates this dam building activity. Within and around the pond the beavers construct canals for security and for the transport of food and building materials. Beavers are primarily active at night with regard to their dam building and tree cutting activity.

The beaver's dam and lodge are constructed of sticks and mud, with some beavers utilizing bank burrows along streams or ponds. Lodges consist of one or more compartments with each compartment having two underwater openings for exit or entry. These are also important for escape from potential predators. Their aquatic habitat and instinctive behavior minimizes the adult beaver's susceptibility to predators. Domestic dogs, coyotes, bears and bobcats are among the larger predators in New York State that will prey on beavers if the opportunity arises. However, since beavers rarely travel far from water, they are relatively safe from most predators. Young beavers are more susceptible, with predatory mammals such as otter and mink occasionally preying on kits. Overall, natural predation probably has little effect on beaver populations in New York State.

The impoundments created by beavers provide valuable wildlife habitat for assorted furbearer and waterfowl species. In this way, the beaver provides valuable ecological benefits to the public at large. On the other hand, the beaver's dam building activity can result in widespread flooding of woodlands and

agricultural land and cause numerous complaints by plugging road culverts, flooding roads, railroad tracks and causing general property damage concerns.

Status of Beaver Under the Environmental Conservation Law

Article 11 of the New York State Environmental Conservation Law is commonly referred to as the Fish and Wildlife Law. Sections 11-0505 and 11-0521 of Article 11 defines the legal status of beaver and their dams within New York State.

Section 11-0505 states that no person is allowed at any time to disturb a beaver's dam, house or den without written permission from the DEC. This permit will be issued to the person or organization which is being damaged or affected or may potentially be affected. If the permittee (affected party) does not own or legally control the site where the beaver's dam is located, it is the permittee's responsibility to obtain permission to go on lands he/she does not own or legally control to carry out the permitted actions.

Section 11-0521 authorizes the DEC to issue permits for the removal of nuisance beavers. This permit will be issued to the landowner upon whose land the problem is occurring, an adjacent landowner upon whose land the beaver resides or either landowner's agent. The permittee may designate in writing an agent who will kill the beaver.

There is also interaction between beaver's dam removal (Article 11) and freshwater wetland (Article 24) permits. Article 24 of the Environmental Conservation Law, known as the Freshwater Wetlands Act, deals with the preservation and protection of freshwater wetlands within New York State. Section 24-0701 of this Article outlines situations requiring permits for removal of beaver dams within the protected areas of freshwater wetlands. Regulations governing implementation of Article 24 (Part 663) list "removing or breaching beaver's dams" as an activity requiring a permit both within a regulated wetland and its adjacent area. Certain activities, however have been identified as being exempt from Article 24 permit issuance. These include removal of beaver's dams

impacting on agricultural activity and removal of beaver's dams causing flooding of existing structures.

Article 15 of the Environmental Conservation Law pertains to the protection and conservation of the water resources of New York State. Section 15-0501.1 of this Article states that, with certain exceptions, no person or public corporation shall change, modify or disturb the course, channel or bed, or remove any sand, gravel or other material from the bed or bank of any stream which has been designated by DEC as being Class C(T) water or higher class without a permit. If removal of beaver's dams in these protected streams will result in any of these type disturbances an Article 15 permit is required.

To accommodate this requirement for Article 15/24 permit issuance, a general Article 15/24 permit for beaver's dam removal has been developed. Where applicable this general Article 15/24 permit should be issued for beaver's dam removal in freshwater wetlands and protected streams.

For additional information contact your [Regional Wildlife Office](#).

The Definition of Beaver Damage

Problem beaver situations (whether real or perceived) may include: an impoundment threatening downstream property, upstream flooding of land, trees or crops killed or damaged by flooding, flooding of homes, flooding of highways or railroads, contamination of water supplies, impairment of drainage systems, damage to wildlife habitat or landowner distress.

Perceived is the key word. Though the DEC field technician may not agree that the problem is valid, the distress is in fact real if the landowner or manager perceives it. Therefore, appropriate action should be taken to solve the problem or to alleviate the apprehension of the complainant. This particularly applies to complaints in WMU's where beavers are above the management objective density.

Legal Responsibilities and Liability Concerns

In *Barret vs. State of New York (1917)*, the State Court of Appeals found that the State was not liable for property damage caused by wildlife. This landmark decision reversed an earlier judgement in a lower court which had awarded Barret compensation for damage to his property caused by beaver. The DEC is, therefore, not legally liable for wildlife damage.

While it is ultimately the responsibility of the landowner to resolve the problem, the DEC will assist the public in finding appropriate solutions to problems caused by beavers. This will be done within the limits of DEC's legal responsibility, fiscal capabilities and priorities. It is important for the DEC to provide this assistance in order to minimize costly damage and generate public acceptance for beaver populations at sufficient levels to provide desired amounts of wetland/wildlife habitat.

Those assigned the task of assisting property owners with their beaver problems should understand that they are responsible for personal injury or property damage caused by their negligence. The State will, however, provide for their defense if, while carrying out their responsibilities, they incur a civil action and will also compensate them in the amount of any such judgement.

The initial breaching of a beaver's dam can create a hazardous situation. To avoid washouts, water levels above and below beaver's dams should be equalized by slow and partial breaching before the entire dam is removed. Road culverts immediately downstream of a beaver's dam should also be inspected for size and condition prior to dam removal. Furthermore, water level control devices or guards should not be installed that restrict the water flow from the original culvert design unless a safe overflow is provided. This overflow potential can be created by placing tubes through dams or deep water fencing located upstream from road culverts. In this way, excess flood water will flow over the dam or deep water fencing and through the original road culvert. When giving technical advice, property owners and road maintenance personnel should be advised of the consequences of restricting designed water flows.

It would also be advisable to refrain from physically altering the beaver's site location in any way that might produce a hazard or danger. For example, caution should be taken when excavating deep water trenches adjacent to public road right-of-ways for control installation unless suitable barriers or guard rails are installed for protection. This should be discussed and agreed upon with the governmental agency responsible for maintenance of the road right-of-way. Beaver's activity in man made ponds and marshes also present a special area of concern. The dikes of many such impoundments are often constructed of topsoil through which a pipe or water control box regulates water levels. Some of these dikes are also built with emergency spillways cut below the rim of the dike. These are designed to prevent washouts in the event the control box should become plugged. When both the primary water control and emergency spillway become, plugged by beavers, water levels will rise possibly resulting in overtopping and washout of the dike. The degree of hazard resulting from such a situation is dependent upon the height and stability of the dike, the acreage and depth of the pond and the proximity of roads or property immediately downstream of the dam site. With this in mind, water levels should not be maintained above the designed height of the emergency spillway or the top of the water control box or pipe. It would be best to consult with an engineer when asked for advice or service in controlling the level of a beaver pond involving an artificial dike.

Standard Procedures for Handling Beaver Problems

1. The DEC Regional Wildlife Unit (Unit) in whose region the problem occurs will receive reports of beaver problems.
2. Whenever possible, a Fish and Wildlife staff person will contact the affected party within five working days (or less) of receiving the report.
3. The Unit will determine if beavers are the cause of the situation creating a problem for the affected party (a site visit may be necessary). If beavers are not the cause, no further action by the Unit is needed.

4. When a problem occurs at a site where the recent history is unknown to the Unit, a site visit will be made. If possible, arrangements will be made to meet the affected party at the site. If the recent history at the site is known, a site visit will be made at the Unit's discretion.

5. If beavers are the cause, the report will be logged on a standard complaint record and permit form from which the data will be entered into a computer database.

6. The Unit will discuss the problem with the affected party and whenever possible satisfy his or her concerns through information and advice only. The affected party may decide that there is no problem or that the situation is tolerable. Or, that solving the problem does not require further action by the Unit (e.g., affected party waits until fur-trapping season to have beaver removed by a trapper, affected party protects trees from damage with wire fencing).

7. The Unit will issue permits to kill beavers to landowners (under ECL 11-0521) and to disturb beavers' dams to affected parties (under ECL 11-0505) on request after informing the permittee of a) the positive value of beavers and beavers impoundments (where appropriate), b) whether the requested permit action will solve the problem and c) of the alternatives for solving the problem (e.g., waiting for trapping season to have beavers removed by a fur-trapper, accepting situation, etc.). **UNLESS:**

a. the beaver population in the Wildlife Management Unit is below the population objective. (If the population is below the objective, the Unit will weigh the seriousness of the problem against the value of the impoundment for meeting fish and wildlife management goals when deciding whether or not to issue the desired permit.) or

b. there are other landowners with an equal or greater stake in the outcome (e.g., landowners belonging to a lake association). In these cases, a permit will not be issued without consensus of the stakeholders in support of the requested permit action.

At or above the population objective, there are enough beaver impoundments, associated wetlands and wildlife to meet program objectives. There is no resource reason to deny permits. To do so would create bad feelings toward beavers and DEC. Intolerance of beavers would ultimately yield fewer beavers and impoundments. Arbitrary permit denial could also lead to a loss of permit authority and management opportunity.

8. When the Unit issues beaver's dam disturbance permits, the permittee will be the person or organization which is being damaged or affected or may potentially be affected (i.e., affected party). However, if the permittee (affected party) does not own or legally control the site where the beaver's dam is located, it is the permittee's responsibility to get permission to go on lands he/she does not own or legally control to carry out the permitted actions. A DEC permit to disturb a beaver's dam does not authorize the permittee to trespass upon private property. DEC is not responsible for any personal or property damage caused by the actions of a permittee or his/her agent.

9. When the Unit issues a beaver's dam disturbance Permit to lower the impoundment level and an Article 15 and/or Article 24 permit is required by law, these permits will be issued at the same time as the Article 11 permit.

10. When the Unit issues beaver kill permits the permittee will be the landowner upon whose land the problem is occurring, an adjacent landowner upon whose land the beaver resides or either landowner's agent. The permittee may designate in writing an agent who will kill the beaver.

11. When a beaver kill permit is issued, the Unit will offer the names of beaver trappers to permittees. The Unit will provide beaver trappers with lists of permittees. *It is the trapper's responsibility to obtain permission to enter and trap.*

12. The Unit may offer as a beaver kill permit condition the option of commercial sale of nuisance beavers.

13. The Unit will not usually allow the relocation of problem beaver. The Unit may consider doing so *only* if the beaver population is below the population objective or, if the population is above this threshold, only under extraordinary

circumstances. In any case, the decision to allow relocation by the permittee or his/her agent will be made by the Regional Wildlife Manager. If a permit is issued to relocate the beaver, the Unit will specify the release site location as a special permit condition.

14. The Unit will explain the use of any permits issued and, when necessary, will tell the permittee how to comply with any special permit conditions.

15. The original permit will be given or forwarded to the permittee, a copy kept for Unit records and a copy sent to the local Environmental Conservation Officer and/or regional law enforcement administration.

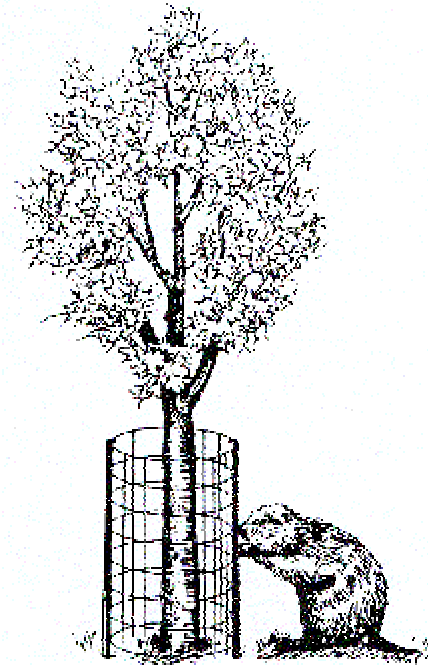
16. The Unit will explain to the permittee the need for any other agency permits or permission that may be required.

17. The Unit may provide assistance beyond issuing permits and advice (e.g., labor and/or materials to assist in water level Control device installation) within the limits of available resources when:

- a. the affected party desires assistance;
- b. the desired assistance will solve or help solve problem;
- c. providing desired assistance helps achieve fish and wildlife goals (e.g., producing wetland habitat, minimizing threat of washouts).

Preventing Beaver Damage

Protect Trees and Shrubs



(Note. No permit is required.) Individual shrubs and trees can be protected by loosely wrapping to a minimum height of 36 inches with welded wire fencing, zinc or plastic coated, or roofing felt held in place with string or wire.)

Groups of shrubs or trees can be protected with 36 inch high fences made of welded wire, woven wire or 12 inch high tensile electrified wire with a minimum of 3 strands of wire spaced at 4 inch intervals.

(Note: Fencing may not be effective in late spring where deep late snow persists.)

Protect Road Culverts Against Blocking

(Note: It is not safe to constrict the flow of water through a road culvert. Culvert guards must be as open as possible, regularly inspected and cleared of debris. It is also extremely hazardous to stand in the water in front of a culvert while unblocking it or to crawl into one to open it.)

Pitchfork-shaped Guard

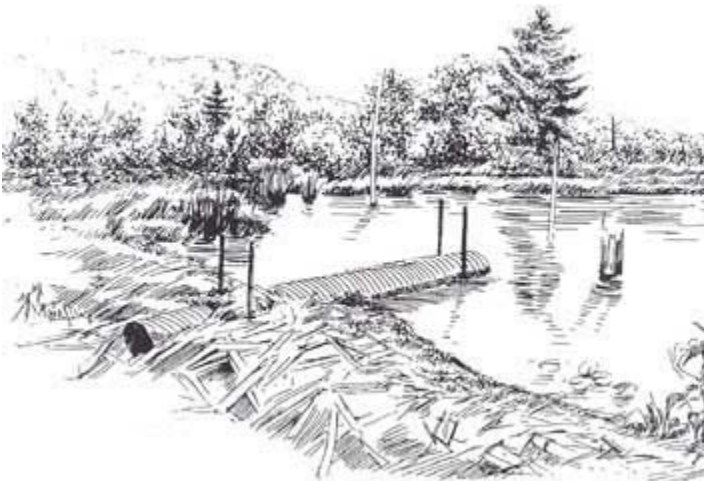
([Handout #3](#)). This is made of heavy steel rods, welded 6" apart to 2 horizontal braces or a piece of 3 to 4 inch channel iron. This device is pushed into the bottom to hold it in place in front of the culvert. It is a preventive measure to keep wandering beaver from getting inside a culvert and plugging it.

Deep Water Fence

([Handout #4](#)). These D-shaped or square fences, 10' to 20' on each side, made of 6" by 6" reinforcing steel mesh held by 6' steel fence posts. These are placed above intakes to prevent floodwater debris or beavers from blocking a culvert. If beavers place material against the fence, the resulting dam becomes a temporary emergency spillway which must be removed or modified because road grades should not be used as dikes. If a Water Level Control Device (WLCD) is to be used in a culvert, it should be used in conjunction with a deep water fence.

Special Concerns Regarding Water Level Control Devices

Caution: Water Level Control Devices (WLCD's) work in a very limited number of applications! Many important details must be considered.



As mentioned above, a few beaver problems (three percent in 1993) can be solved with a Water Level Control Device (WLCD) in New York State. Therefore, it is important to choose a site carefully because a lot of time and money is

required to build, install, and maintain it. Even where one can be successful, a complainant must be committed to the concept and it is likely to fail if not regularly inspected and maintained. More importantly, a failed water control device is not only a loss of time and money, but also causes a loss of public confidence in the effectiveness of BOW staff members to provide relief from beaver damage. Therefore, consider the following before installing a WLCD:

How does a WLCD function?

- a. By excluding and regulating. The best devices keep beavers away from their intakes and regulate the water level in the pond. Some devices only delay the beaver from getting to the intake of the device and merely delay their plugging it.
- b. The best devices muffle the sound of escaping water and make the sensation of flow undetectable. An example would be the Clemson tube or combination deep water fence and tubing. If the pond is drawn too low and the beavers are unable to neutralize the device, the beaver must build another dam upstream or downstream or abandon the pond.
- c. The level at which a beaver pond may be held and have the beaver remain varies. The depth of the lodge or burrow entrance may be used to gauge this level.

Why should a WLCD be installed?

- a. To prolong the life of a desirable beaver wetland. However, few sites can support beavers for more than a few years if young beavers are not harvested each year.
- b. To resolve a dispute between adjacent property owners affected by the same beaver family. But one or both owners must agree to purchase materials and to assemble, install, and maintain the device.

Where can a WILCD be used?

- a. Only in a beaver's dam that does not directly involve a water control box, dike, culvert, or man-made structure. Structures for retaining or passing water must handle runoff of severe storms and partial obstruction of these can be disastrous. **Never** restrict flow capacity from the original design. (Note: See *Handout #6*.)
- b. Only in beaver's dams where temporary flooding will do little harm. A WLCD should not be installed where flooding to the original level cannot be tolerated. It is important not to underestimate the flow rate when installing tube style WLCDs. Inadequate size tubing will result in persistent flooding problems.
- c. In areas where there is minimal opportunity for beavers to neutralize their effectiveness. A drainage that provides countless dam sites should be avoided. A WLCD should not be installed in a dam if there is a constriction in the topography downstream of the site.
- d. In beaver ponds with pool depth of 4 feet or more. A WLCD can be installed in less water than this if the device disguises the flow of water into the intake and/or the intake is protected by an enclosure.
- e. In ponds with clay or gravel bottoms. Soft mucky or silty bottoms allow beaver material for blocking WLCD intakes. This is especially true for WLCDs that have intakes that are not protected by enclosures or do not disguise the flow of water.
- f. If Only in accessible sites. People must get to the site easily for construction, inspection, and maintenance.

Water Level Control Device Materials

Polyvinylchloride (PVC) pipe is quieter than most other suitable materials but is limited to diameters of 10" or less because of weight. The Clemson tube, made with this material, is especially effective.

Corrugated Flexible polyethylene tubing must be protected from beavers chewing by wrapping with chicken or welded wire, and tends to float so it must be staked up every 5 to 10 feet. It is also limited to diameters 10" or less but is the cheapest material available.

Corrugated galvanized steel pipe is limited to small diameters (less than 8") because of weight and high cost. It's more likely to attract beavers plugging because water causes excessive noise when passing through it.

Welded wire cylinders must be reinforced to prevent crushing by beavers and are seriously weakened by corrosion. They often become non-degradable litter because they are very difficult to remove. However, they are cheap, easily carried to remote sites and can be used for quick relief until a more suitable device can be assembled.

Water Level Control Devices (WLCD)

(Note: Prior to installing a WLCD in a beaver's dam, the pond level should be lowered to the installation height. Large amounts of water flowing through a narrow opening in a dam not only make installation more difficult, but can be dangerous as well. Depending on the physical characteristics of the pond, the length of time needed for drawdown may vary from a few hours to overnight.)

Combination Deep Water Fence/Ribing ([Handout #7](#)). This is a 10 foot square or larger rectangle made of heavy reinforcing mesh or welded wire fencing placed out in the deepest water of a beaver pond. A length of solid tubing is extended from the fence through the dam at the desired water level. The fence prevents the beaver from plugging the intake of the pipe, but sometimes they build a dam around it if they hear or feel the flow of water.

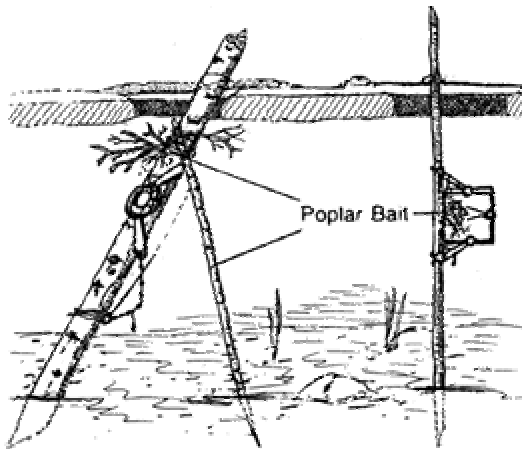
Clemson Pond Leveler ([Handout #8](#)). This is a perforated PVC tube within a welded wire tube and is installed so that the inlet is always submerged. It is designed so that the beaver cannot feel or hear the flow of water into the WLCD and don't try to block the intake. This device is suitable only for small watersheds and intermittent streams.

Pond Drain Tubes ([Handout #9](#) and [Handout #10](#)). These WLCDs do not disguise the flow of water. They are usually suspended on posts (Y to 4) above the bottom of the pond. This helps to delay the beaver from building a dam around the intake. The harder the bottom, the longer the delay. These WLCDs

are less expensive and lightweight, but require more maintenance than other WLCDs.

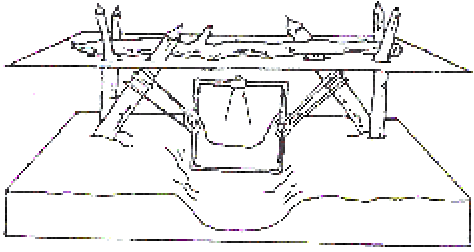
Electric breach guard ([Handout #11](#)). This is a charged smooth wire fence with dangling bobs built in front of a dam to keep beavers away from a breach or away from a previously blocked culvert. This device provides a wide range of water level control. An expensive energizer and battery is required. The battery can be completely drained by prolonged contact between a water-soaked log and the fence. Both it and the energizer are often stolen. For these reasons, this device is often ineffective if not inspected and serviced once each week.

Removing Beaver



Open Season--The trapper/landowner partnership is undoubtedly the best long-term solution for minimizing beaver damage. A trapper can solve a landowner's problem by trapping beavers during the open season. Beaver pelts are at their prime during these winter seasons. The Bureau of Wildlife maintains a list of active beaver trappers in your region. Trapping methods include the use of foot-hold and body-gripping traps.

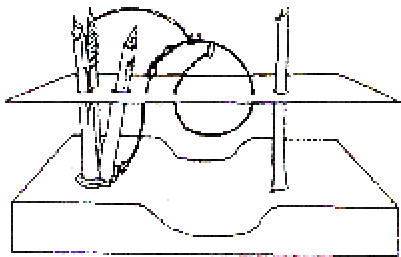
Closed Season--Complainants must obtain an Article 11 permit from the Bureau of Wildlife to destroy beavers and/or their structures. Fees may be incurred to have trappers remove beavers during the closed season. Pelts are of no value at this time of year.



Methods of Take During the Closed Season--(Note: Complainants or their agents land owned or leased by the complainant, do not require trapping or hunting licenses).

Foothold Traps--Catch target animals by one foot. Drowning sets are recommended.

Body Gripping (Conibear Type) Traps--Strike and hold target animals on the neck or chest.



Snaring--(Note: These methods are lawful ONLY under authority of an Article 11 permit.) Loops of light cable are suspended in channels or in front of burrows to catch beavers swimming through. Snares can be set to drown or hold beaver alive.

Snare clusters of four or more small loops of wire are extended from a pole which can serve as bait and anchor. Beavers attracted to a freshly cut aspen pole become entangled in the loops.

Shooting--Bullets or shot discharged over water are likely to ricochet beyond the target. Firearms may not be lawfully discharged within 500 feet of a farm, building, or dwelling, without the consent of the owner, or within 500 feet of any school or playground, over any public highway or in a municipality with a law forbidding it.

A nuisance beaver can usually be attracted to a breach in its dam, where shooting will be safe. A shotgun with number four buck is recommended.

Beavers are more likely to inspect a breach early in the morning or late in the evening. If the shooter misses, the beaver seldom provides another chance.

Relocation of Problem Beaver--DEC will not authorize relocation of problem beaver except under extraordinary circumstances and then only after there has been careful consideration of all other options. This decision to relocate will be made by the Regional Wildlife Manager. If a permit is issued to live trap, transfer and release beaver, DEC will provide the release site location as a special permit condition.

Removing Beaver Dams

(Note: Except under authority of an ECL Title II Permit, it is unlawful to disturb any structure made by a beaver. A complainant or agent who breaches a beaver's dam under such permit authority is personally liable for any flooding damage done to downstream property.)

If the beaver is not killed, dam removal is a very short-term solution. Beavers usually rebuild dams quickly and sometimes in larger volume. Beavers are most active at night, therefore, dams should be breached in the morning to allow water to flow all day.

The draining of beaver ponds is more successful during the dry summer months when there is less available water to resupply ponds that are being drained.

Ponds that are supplied by seasonal runoff can sometimes be drained during dry periods so as to discourage beavers and cause them to relocate.

After beavers are removed and the water has been drained from the pond, it is advantageous to remove as much of the dam as possible. A narrow notch in the dam of an abandoned pond is very easily plugged by wandering beavers.

Hoeing by hand--Potato hoes or stone hooks are the best tools. Shovels and spading forks are ineffective. Good water control is possible if the breach is kept shallow and broad so that the water level falls slowly. In the case of a large blocked culvert (2' diameter or greater) it is very unsafe to stand in the water in front of it or crawl into it from the other end.

Power Excavating--Tractor *or* truck mounted excavators are often used by town, county or state highway employees to remove large amounts of material from beavers' dams and can inadvertently cause down-stream flooding.

Blasting--like hand tools, explosives are easily carried to inaccessible sites (Caution: Users of explosives must be licensed). Using explosives to breach a beaver pond is, unfortunately, almost certain to cause down-stream flooding and excessive siltation and is seldom justified. Neighbors should be told where, when, and why this is going to be done. If this method must be used, it is best to do it in mid-summer when the water is low.

Removing Beaver Lodges

This is sometimes done in the hope of driving beavers out or to discourage other beavers from occupying the pond site in future years. (Note: It is unlawful to disturb a structure made by a beaver, EXCEPT under a permit which clearly gives authority for this action.) Destroying an occupied lodge seldom causes a beaver family to leave. However, after the beaver have been removed and the pond drained, it may be advantageous to destroy the lodge so that the site is less of an attractant.

(Note: Abandoned beaver lodges have some value as habitat for other wildlife.)

Feeding Waterfowl

Some people enjoy feeding waterfowl. They visit lakes, ponds, and town parks to toss bread, corn, popcorn, or table scraps to the ducks and geese that congregate in these places. Some people say that it makes them feel good to help the ducks . . . that it brings the ducks closer for their kids to see . . . that it's an escape from the daily grind.

Is it good to feed waterfowl?

No, artificial feeding is actually harmful to waterfowl.

Artificial feeding of waterfowl can cause:

- Poor nutrition
- Increased hybridization
- Water pollution
- Delayed migration
- Concentrations at unnatural sites
- Overcrowding
- Spread of disease
- Costly management efforts
- Unnatural behavior
- Cumulative effects
- Devaluation of the species

Read on to explore this issue and decide for yourself whether you want to continue feeding waterfowl.

Nutrition

It would seem that providing food for ducks and geese would make them healthier. However, this is not the case. Waterfowl at artificial feeding sites are often found to suffer from poor nutrition. In natural settings, waterfowl seek and feed on a *variety* of nutritious foods such as aquatic plants, natural grains, and

invertebrates. Many of the items commonly used to feed waterfowl (bread, corn, popcorn, etc.) are low in protein and are very poor substitutes for natural foods. Natural foods are also widely scattered. Ducks and geese are able to find these foods and eat them in relative seclusion. At artificial feeding sites, competition for each scrap or kernel is high. Some ducks and geese (usually the youngest) are unable to compete for handouts.

Visible symptoms of poor nutrition and advanced stages of starvation are often seen at artificial feeding sites. For example, waterfowl may have drooping wings or may lose their ability to fly.

Disease

When ducks and geese feed on scattered corn or bread, they eat in the same place where they defecate. Not healthy. In addition, large concentrations of waterfowl would facilitate the spread of disease. Also not healthy. Diseases generally not transmissible in a wild setting find overcrowded and unsanitary conditions very favorable.

Most waterfowl die-offs in the past 10 years have involved artificial feeding:

- 2,000 mallards and black ducks were killed in an outbreak of *Duck Virus Enteritis* in Central New York.
- Another fatal disease, *Aspergillus*, occurs when food is scattered too liberally. It piles up and becomes moldy.
- In Cheektowaga, New York, hundreds of ducks were killed in an outbreak of *Avian Botulism* at a feeding site. A local ordinance was later passed to prohibit the feeding of waterfowl. An added bonus . . . rat populations that fed well on waterfowl handouts have since declined.
- In some cases, humans have been affected by disease transmitted by waterfowl. In Skaneateles, New York, swimmers contracted *Swimmer's Itch*, caused by a parasite that was emitted from ducks attracted to artificial feeding at the town park.

Overcrowding

Feeding attracts birds in unnatural numbers, beyond natural food and water supplies, and frequently in numbers beyond what people will tolerate. Over-

grazed and badly-eroded lawns, golf courses, and school playing fields are often the result of overcrowding. Grassy areas such as ball fields and golf courses can become unsanitary and unusable. In Dutchess County, New York, recreational areas have been forced to close down until goose droppings could be cleaned up.

Delayed Migration

Feeding alters normal migration patterns of waterfowl by shortening or even eliminating them. Ducks, reluctant to leave in the winter, may not survive sudden cold. If the artificial feeding is stopped in time, ducks and geese can quickly adapt to finding natural foods and will follow their companions south. In West Haven, Connecticut, 30 swans died from starvation at an artificial feeding site during the harsh winter of 93–94. Meanwhile, over 800 swans survived nearby on natural food.

Unnatural Sites

Artificial feeding often attracts birds to *human habitats*—parking lots, fast-food restaurants, and retention ponds—where they are more subject to accidental death. Natural cover, which can provide protection from bad weather and predators (even dogs and cats), is often lacking at these feeding sites.

Unnatural Behavior

Waterfowl can rapidly become conditioned to, and dependent on, handouts. Fed ducks and geese behave differently. They become more aggressive and eventually lose their wariness of humans. Some will not survive because they can't compete. Many will lose the quality which endears them to most New Yorkers, their *wildness*.

Increased Hybridization

At many feeding sites, domestic ducks have interbred with mallards, further compromising the wild population.

Water Pollution

Excess nutrients in ponds caused by unnatural numbers of waterfowl droppings can result in water-quality problems such as summer algal blooms. And where waterfowl congregate to feed, E-coli counts can swell to levels that make the water unsuitable for swimming.

Costly Management Efforts

Many damage-avoidance techniques such as chemical repellents, fencing, or noise makers are costly and may even be useless once animals lose their fear of humans. At times, it is necessary to destroy nuisance waterfowl because of the damage they cause.

Devaluation

From treasure to nuisance . . . wildlife managers recognize that the public's perception of the value of wildlife is often reduced when numbers swell. When any wildlife population exceeds the number that can be naturally supported by available habitat, this can polarize the public and exaggerate conflicts between landowners who suffer damage and those who visit the site to feed the geese and ducks.

Cumulative Effects

It may be hard to imagine that a handful of bread or a stray french fry could contribute to such a growing problem. Compound that, though. In most cases where artificial feeding occurs, one well-intentioned feeder leaves and another soon arrives.

New Yorkers Love Waterfowl

- A birdwatcher searches wetlands for hidden sightings and travels cross-country to see different species.
- A farmer pauses from his chores to gaze skyward and take in the sights and sounds of a “V” of geese.
- A hunter pats the head of his trusted hunting dog for quickly returning a bird to the blind.
- Parents take their children to see ducks at the town park or wildlife refuge.

Yes, New Yorkers love waterfowl and care about their well-being! Please consider the effects of feeding waterfowl, and do what's right.

Each person that cares enough to become educated about the effects of artificial feeding *can* make a difference. This problem requires cooperation from everyone, but the solution starts with each individual. One person may choose to discontinue feeding. Another person may decide to put up a laminated sign (PDF, 24kb) to discourage others from feeding.

Alternatives

If everyone stops feeding waterfowl, the waterfowl won't disappear. Families can still visit sites to enjoy viewing ducks and geese. A child can still be encouraged to learn more about waterfowl and their *natural* habits. And some zoos offer feeding of captive waterfowl.

Clearly, you do not need to feed waterfowl in order to enjoy them. In fact, it should be apparent now that the best thing you can do for the overall benefit of waterfowl is to stop artificial feeding.

Sea Lamprey

Lake Champlain Sea Lamprey Control



Events

2007 Lake Champlain Sea Lamprey Control Schedule

Sea Lamprey Trapping - April through June 2007

- Trapping and removing adult sea lamprey as they migrate up tributaries to spawn.

Lampricide Treatments - September/October 2007

- Two tributaries and one delta are currently scheduled for lampricide treatments.
- Permit application is under review for the treatment of one other tributary.
- Treatments on two deltas have been canceled.

Select the SEA LAMPREY EVENTS link at the bottom of the page for more information on these and other events related to sea lamprey control.

Biology



The sea lamprey (*Petromyzon marinus*) is one of four lamprey species found in the Lake Champlain Basin. Lamprey are eel-shaped fish with a skeleton made of

cartilage and they belong to a relic (primitive) group of jawless fishes called Agnathans. The sea lamprey has smooth, scaleless skin and two fins on its back (dorsal fins). The sea lamprey is parasitic; it feeds on other fish, using a suction disk mouth filled with small sharp, rasping teeth and a file-like tongue. These are used by the sea lamprey to attach to a fish, puncture its skin, and drain its body fluids.

Life cycle

Sea lamprey have a complex life cycle. The first four years of their life are spent as ammocoetes [am-mah-seats] - a blind worm-like larval stage - in the soft bottom and banks of waters that flow into Lake Champlain. They then transform into the parasitic adult stage and enter the lake to feed on landlocked Atlantic salmon (salmon), lake trout and many other fish species; which they prefer due to their small scales and thin skin. After twelve (12) to twenty (20) months in the lake the adults migrate back into the streams flowing into the lake to spawn, after which the adults die.

Lampreys in Lake Champlain

Moderate numbers of sea lampreys were first noted in Lake Champlain in 1929. The sea lamprey has been considered a non-native invasive species that entered Lake Champlain during the 1800s through the Hudson/Champlain Canal. Recent genetic studies indicate that the sea lamprey may be native to Lake Champlain. Three other lamprey species are found in the Lake Champlain Basin. Two species are non-parasitic, and while the third species is parasitic, it does not have a significant impact on the Lake Champlain fish community. Whether the sea lamprey is native to Lake Champlain or not, it is having detrimental impacts on the Lake Champlain fisheries, ecosystem, and human residents that are very significant. Select the [SEA LAMPREY BIOLOGY](#) link at the bottom of the page for more information on sea lamprey biology.

Impacts

Sea lamprey have a major detrimental impact on the Lake Champlain fish community, the Lake Champlain Basin ecosystem, the anglers that fish Lake Champlain, and the many people throughout the watershed whose livelihood is directly or indirectly supported by the fishing and tourist industry.



Adult sea lamprey attach to a host fish, rasp and puncture its skin, and drain its body fluids, often killing the host fish. Their preferred hosts are salmon, lake trout and other trout species, however they also feed on other fish species, including lake whitefish, walleye, northern pike, burbot, and lake sturgeon. The lake sturgeon is listed as a threatened species in New York and an endangered species in Vermont and it is likely that sea lamprey are affecting their survival.

Impacts on Host Fish

Most sea lamprey hosts are native fish species that have been part of the Lake Champlain Basin ecosystem for thousands of years. Additionally many of these fish species are important sportfish, highly prized and sought after by local and visiting anglers.

Prior to any control measures, angler catches of lake trout and salmon in Lake Champlain were a fraction of catches in similar lakes, despite intensive stocking efforts. High wounding rates indicated that sea lamprey were having a significant

impact on the lake trout and salmon populations, and were preventing the restoration of these native fish species to Lake Champlain.



Studies on the Great Lakes show a 40 to 60 percent mortality rate for fish attacked by sea lamprey. Other studies found that a single sea lamprey can kill 40 or more pounds of fish during its adult life. The abundance of sea lamprey were obviously having significant impacts on Lake Champlain's fishery and ecosystem.

Impacts on Local Economy

Poor fishing caused many anglers to seek fishing opportunities elsewhere. A study estimated that 29.4 million dollars in economic benefits to businesses and residents of the Lake Champlain Basin were lost due to the impacts of sea lamprey.

Select the [SEA LAMPREY IMPACTS](#) link at the bottom of the page for more information on the sea lamprey's impact on the fish and people in the Lake Champlain Basin.

Control



Due to the severity of the impacts that sea lamprey have on the Lake Champlain fishery and ecosystem, and the social and economic impacts on the people who live in the Lake Champlain Basin, it has been determined that sea lamprey populations should be controlled. The federal and state governments, the agencies that manage Lake Champlain, the various organizations that are concerned with Lake Champlain and the people that live in the Lake Champlain Basin generally agree that it would be irresponsible not to control the sea lamprey population.

The New York State Department of Environmental Conservation, the Vermont Department of Fish and Wildlife and the United States Fish and Wildlife Service formed a cooperative and began an integrated control program to reduce the sea lamprey population in Lake Champlain to an acceptable level. The program is not attempting to eliminate the sea lamprey from Lake Champlain, but rather to reduce the impacts of sea lamprey on the lake's fishery and restore balance to the ecosystem.

Control Efforts

Physical methods of control include the use of barriers to prevent adult sea lamprey from migrating up waterways to spawn and traps to capture adult sea lamprey before they can spawn.



However, the most significant and effective form of control has been the treatment of tributaries and deltas with lampricides - TFM in tributaries and Bayluscide on deltas. The lampricides target the larval sea lamprey, killing them before they can transform into their parasitic adult form.

It should be noted that after years of study in Lake Champlain, the Great Lakes, and other places where sea lamprey are controlled by using lampricides, fisheries managers have concluded that the lampricides have little or no known permanent effect on populations of non-target species present in the treatment areas.

Control Program

Evaluation of an eight year experimental sea lamprey control program that took place in Lake Champlain in the 1990s documented significant benefits for fish and anglers. These benefits included decreases in wounding rates on trout and salmon, increases in weight and survival rates of lake trout, increases in angler catch rates of lake trout and a benefit to cost ratio of 3.5 to 1.

At the end of the eight year experimental sea lamprey control program, a limited, three-year interim sea lamprey control program was undertaken from 1998 to 2000. After a thorough environmental review, a long term sea lamprey control program began in 2002.

Fish sampling programs, salmon returns to fish ladders, angler surveys and sampling of larval sea lamprey are used to measure the effectiveness of the control program. The control program may be expanded to other streams and delta areas if significant sea lamprey populations develop in them.

Assessments



Assessments of sea lamprey populations are made before any control measures are undertaken and afterwards to assist in determining the effectiveness of the controls. Field staff, using a variety of capture methods, sample both adult and larval sea lamprey from streams and deltas to determine the presences and density of sea lamprey populations. This information is used to determine which streams or deltas are in need of control measures and which control measures to use.

Scientists and fish managers have considered, and continue to consider, other methods to reduce sea lamprey impacts. These include the use of pheromones (chemical attractants naturally produced by lamprey) to capture adult sea lamprey, the release of sterile males to disrupt spawning, and the stocking of lamprey-resistant strains of fish.

Invasive Insects

Invasive Species - A Threat to New York's Forests



Gypsy Moth

Photograph credit: Louis-Michel Nageleisen,
Département de la Santé des Forêts - France,
www.forestryimages.org

Often arriving as stowaways in the holds of ships, harmful insects and plant seeds may hide amid a variety of trade goods. As global trade and travel increase, we must strive to keep out new invasive species and better manage those already here.

DEC's Forest Health and Protection staff use many tools to fight invasive species threatening our forests:

- Survey and detection
- Assessing invasive threats
- Working with landowners
- Control and eradication
- Replanting and restoring affected areas
- Public education and outreach

Use Local Firewood!

When you transport firewood, you could be spreading invasive forest pests

More about Invasive Insects:

Asian Longhorned Beetle

Asian Longhorned Beetle - *Anoplophora glabripennis*



Asian Longhorned Beetle

Photograph credit: Kenneth R. Law,
USDA APHIS PPQ,

<http://www.forestryimages.org/>

On September 13, 1996, the Systematic Entomology Laboratory of the Agricultural Research Service confirmed a specimen sent to them for identification as *A. glabripennis*. This pest was collected on maple and horse chestnut trees by the New York City Parks and Recreation Department at Green Point in northern Brooklyn County. It was initially identified by E. Richard Hoebeke of Cornell University. The Longhorned beetle is a pest found in China, Japan and Korea. This was the first detection of this pest in the United States. The larvae of this beetle feed on the heartwood of mature trees, inhibiting the tree's vascular system and ultimately killing it. Adults emerge through three-quarter-inch holes in the bark. Recorded in the literature are the following hardwood hosts in Asia: *Ulmus parvifolia* (elm), *Salix babylonica* (willow), and *Populus* species (poplar). Hosts found in Brooklyn include *Aesculus* (horsechestnut) and *Acer* species (Norway, sugar and silver maples).

Emerald Ash Borer

Emerald Ash Borer - *Agrilus planipennis*



Emerald Ash Borer

Photograph credit: David Cappaert,
www.forestryimages.org

This Asian beetle, discovered in 2002 in southeastern Michigan and Windsor, Ontario, infests and kills North American ash species (*Fraxinus* sp.) including green, white, black and blue ash. Thus, all native ash trees are susceptible. Damage is caused by the larvae, which feed in tunnels (called galleries) in the phloem just below the bark. The serpentine galleries disrupt water and nutrient transport, causing branches, and eventually the entire tree, to die. Adult beetles leave distinctive D-shaped exit holes in the outer bark of the branches and the trunk. Adults are roughly 3/8 to 5/8 inch long with metallic green wing covers and a coppery red or purple abdomen. They may be present from late May through early September but are most common in June and July. Signs of infection include tree canopy dieback, yellowing, and browning of leaves. Most trees die within 1 to 4 years of becoming infested, unless treated. The Emerald Ash Borer has already destroyed 6 million ash trees in southeastern Michigan.

Hemlock Woolly Adelgid

Hemlock Woolly Adelgid - *Adelges tsugae*



Hemlock Woolly Adelgid

Photograph credit: Chris Evans,

The University of Georgia,

<http://www.forestryimages.org/>

The Hemlock Woolly Adelgid is native to parts of Asia and was first discovered in New York in 1985. It is in the family Adelgidae, which is related to aphids. The Adelgid uses long mouthparts to extract sap and nutrients from hemlock foliage, this prevents free growth, causing needles to discolor from deep green to grayish green, and to drop prematurely. The loss of new shoots and needles seriously impairs tree health. Infestation is usually fatal to the host after several years. Valued plantings of the shade-loving Eastern hemlock (*Tsuga canadensis*) can be ravaged by the Hemlock Woolly Adelgid, and the natural stands of hemlock in the forests and parks in upstate New York would be greatly affected if the pest spreads to those locations. The wind, birds, other wildlife and the movement of infested host material by humans are all factors in the dispersion of the adelgid. Currently 20 NY counties are infested with the Hemlock Woolly Adelgid.

Sirex Woodwasp

Sirex Woodwasp - *Sirex noctilio*

New York State Department of Environmental Conservation (DEC) Commissioner Denise M. Sheehan and New York State Department of Agriculture and Markets (DAM) Commissioner Patrick Brennan have announced a comprehensive program to help limit the spread of a serious forest health pest, the Sirex woodwasp, which can harm pine forests.



Sirex Woodwasp

Photograph credit: David R. Lance,
USDA APHIS PPQ,

<http://www.forestryimages.org/>

The Sirex woodwasp, *Sirex noctilio*, a Eurasian native, was first discovered in New York in 2004, in the City of Fulton, Oswego County. This was the first North American discovery of this dangerous, exotic, invasive pest that is one of the top 10 most serious forest insect pest invaders worldwide. This pest has caused extensive losses to (non-native) pine plantations across the Southern Hemisphere, in Australia, New Zealand, Chile and South Africa, and has no known, native natural controls.

The female Sirex woodwasp injects a toxic mucus and a fungus while she is laying her eggs in the bark of susceptible pine trees. This typically occurs mid-bole (10-30+ feet up) on pole-sized and larger trees (6-8" in diameter and up).

Trees that are already suppressed or stressed, due to other site or environmental conditions, seem to be preferred by the female wasps. The mucus quickly kills tree cells from the egg-laying site upwards. The fungus feeds on the killed wood, and the insect larva actually feed on the fungus. As they grow, the larvae bore galleries deep into and through the wood, unlike bark beetles, which typically confine themselves to the cambium layer, just under the bark. This makes them more difficult to detect and more difficult to eliminate. These trees are often used to make solid wood packing material. Since the life cycle can take a year or more, the insect is easily transported in pallets or other wood packing material. Based on its native range in Europe and Asia, it could establish itself in any climate zone of North America where pine occurs.



DEC Forester checking a trap for Sirex Woodwasps

All pine species are believed to be at risk, particularly stressed Scots (or Scotch) pine and red pine, as well as Eastern white pine. Literature indicates the Sirex woodwasp will also attack virtually all our other native softwood species. While there is potential for serious losses to softwood stands in New York, the far greater concern nationally, is if this invasive, exotic pest makes its way into the vast plantations of susceptible pine species found across the Southern US region. The pine resource in that region is much more homogeneous, in large,

commercial plantations, which is far different (and far more susceptible to serious mortality) than our New York forest conditions, which are more varied, with highly susceptible pines comprising a smaller, and more scattered component of our forests.