Beaver Management Toolkit

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This report was prepared for the Central Algoma Freshwater Coalition by Grant Robinson and David Euler, March 15, 2016.

About Us

The Central Algoma Freshwater Coalition (CAFC) is an incorporated not-for-profit organization dedicated to the protection, restoration and improvement of watersheds throughout the Central Algoma Region, stretching from the eastern boundaries of Sault Ste. Marie to the Municipality of Huron Shores and including St. Joseph Island. A vision of healthy sustained watershed guides our work.

Canada is home to 25% of the world's remaining wetlands and here in Central Algoma, we are fortunate to have our watersheds contain many wetlands, some of which have been designated as locally and provincially significant.

Wetlands can prevent flooding during periods of high water flow. By holding back water when levels are high and reducing the rate of flow, there will be a more gradual release of water over an extended period of time allowing for the protection of properties downstream. Wetlands can reduce erosion and nutrient loading since the vegetation helps to trap soils with its roots, thereby stabilizing the shorelines. Wetlands recharge groundwater by slowing and collecting surface water, allowing it to percolate through the soil and rock and into the water table. This helps to conserve water resources during periods of decreased precipitation.

Wetlands provide habitat including food, shelter, breeding and safe havens for plants, mammals, birds, reptiles, amphibians, fish and invertebrates. And if all that wasn't enough, wetlands play a role in both tourism and culture through recreational uses.

Some wetlands are created by beavers and from time to time conflicts with human needs. These needs should be mitigated while maintaining biodiversity.

The purpose of this toolkit is to provide Central Algoma residents with some ideas of how best to mitigate conflicts with beavers while maximizing biodiversity in Central Algoma. This document is an introduction to some best practices that will help to mitigate human conflict with beavers.

In 2015, CAFC received funding to create a beaver management toolkit for the Central Algoma Region.

In order to accomplish this, a large number of interviews were conducted with groups in Central Algoma including farmers, cottage and home owners, trappers, forestry companies, local First Nations, electrical generation and distribution companies, conservation groups, transportation companies, local parks and conservation reserves, local municipalities, and several branches of the Provincial and Federal Governments. In these interviews, the current issues with beavers and the

methods that are being used to control them were reviewed and discussed.

After the issues were identified, a literature review was conducted to determine the best way to deal with the wide variety of concerns that are unique to this region. This review included consultation of management plans for other areas, research into scientific beaver literature from around the world, discussions with beaver experts, and exploration of beaver management techniques and designs. The most practical and successful designs were agreed upon and included in the toolkit.

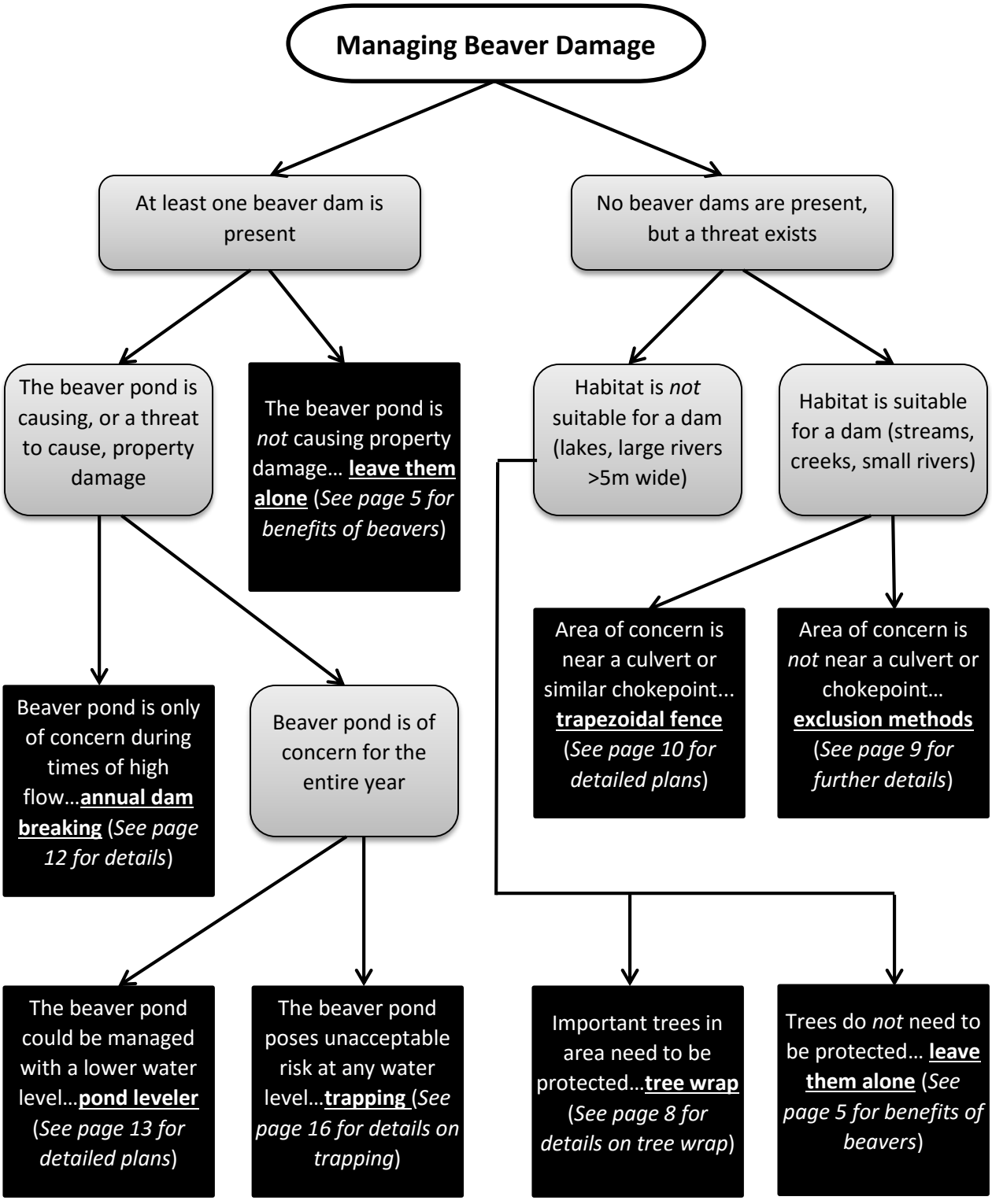
In addition to the management techniques themselves, relevant legislation and case law was studied to determine how to best implement these best practices, while also adhering to the law. The Ministry of Natural Resources and Forestry and local Conservation Officers were also consulted to ensure that any confusion would be minimized. This information is included in the separate "Beaver Management and the Law" paper, found on CAFC's website.

How to Use This Toolkit

This toolkit contains seven distinct options for managing beaver. These include leaving the beavers alone, pond levelers, trapezoidal fences, exclusion methods, annual dam breaking, tree wrapping, and trapping**.** Each section contains the pros and cons of each technique, building and installation instructions (if applicable), and references and links to alternate methods that are not covered in as much depth.

Before taking any action to control beaver on your property, you are obliged by common law to take appropriate care to ensure that your activities will not cause any damage to your neighbours' property. Also consult with the staff of your local Ministry of Natural Resources and Forestry (MNRF) office to ensure that your plans will not violate regulations under the Canada Fisheries Act, Endangered Species Acts, the Fish and Wildlife Conservation Act, and the Migratory Birds Convention Act.

To determine the correct course of action for your unique situation, begin with the flow chart found on page 4. Of the two options presented, select the more applicable one until you reach a black square. Proceed to the page indicated and begin managing your beavers. If you are unsure, explore all of the management techniques and select what works best for your circumstances. Information regarding alternate designs and strategies are provided in each section, if available.


Managing Beaver Damage
At least one beaver dam is present
No beaver dams are present, but a threat exists
The beaver pond is causing, or a threat to cause, property damage
The beaver pond is *not* causing property damage… **leave them alone** (*See page 5 for benefits of beavers*)
Habitat is *not* suitable for a dam (lakes, large rivers >5m wide)
Habitat is suitable for a dam (streams, creeks, small rivers)
Beaver pond is only of concern during times of high flow…**annual dam breaking** (*See page 12 for details*)
Beaver pond is of concern for the entire year
Area of concern is near a culvert or similar chokepoint… **trapezoidal fence** (*See page 10 for detailed plans*)
Area of concern is *not* near a culvert or chokepoint… **exclusion methods** (*See page 9 for further details*)
The beaver pond could be managed with a lower water level…**pond leveler** (*See page 13 for detailed plans*)
The beaver pond poses unacceptable risk at any water level…**trapping** (*See page 16 for details on trapping*)
Important trees in area need to be protected…**tree wrap** (*See page 8 for details on tree wrap*)
Trees do *not* need to be protected… **leave them alone** (*See page 5 for benefits of beavers*)

Benefits of Beavers

Biological

Introduction

Beavers are a keystone species, meaning that their influence on their ecosystem is disproportionately large when compared to their abundance. No other non-human animal manipulates its environment to the extent that beavers do. While interactions with humans can be difficult to manage, the benefits of beavers and their ponds are virtually unparalleled in the animal kingdom.

Wetlands

Perhaps the most obvious benefit of beavers is that they create wetlands. Freshwater wetlands are the most productive land-based ecosystem in the world, including rainforests. Nearly half of the endangered species in North America rely on wetlands and their associated beaver populations. Many areas in the United States and other countries spend a great deal to import beavers and create what is found naturally all over Algoma.

Riparian Zone

Transition areas between land and water are known as riparian zones. These habitats are home to a great number of unique species and are both created and enhanced by the presence of beaver ponds and canals. A healthy riparian zone can intercept harmful runoff and sediment from farms, homes, and roads and protect water quality.[1] It can also act as a sponge, recharging aquifers and reducing flood damage. Riparian zones provide shelter and nesting sites for a wide variety of birds as well as food for invertebrates, which in turn, feed birds, mammals, and fish.

Birds

Beaver ponds and their associated habitats are essential for an enormous number of bird species. Some, such as the wood duck (*Aix sponsa*), are found exclusively in wetlands where beavers are present.[2] One reason for their presence is that beavers prune willow and poplar trees, allowing them to grow thicker, an activity known as 'coppicing'. This creates ideal nesting habitat, free from most predators. Dead-standing cavity trees also produce habitat for a different groups of birds. A great number of bird species in the past were extirpated as beavers were over-trapped, only to recover as beavers were reintroduced. Popular local viewing species,

[1] An excellent summary of the importance of riparian zones to plants, fish, and wildlife.
Dececco, J. A., & Brittingham, M. C. (n.d.). Riparian Buffers for Wildlife. Retrieved January 4, 2016, from http://extension.psu.edu/natural-resources/wildlife/habitat-management/pa-wildlife-16-riparian-buffers-for-wildlife

[2] Grover, A. M., & Baldassarre, G. A. (1995). Bird species richness within beaver ponds in south-central New York. Wetlands, 15(2), 108-118.

such as the wood duck (pictured), great blue heron (*Ardea Herodias*), belted kingfisher (*Megaceryle alcyon*, American bittern (*Botaurus lentiginosus*), pileated woodpecker (*Hylatomus pileatus*), and osprey (*Pandion haliaetus*, are present in much greater abundance near beaver ponds.[2]

Amphibians and Reptiles

Beaver ponds can provide a significant net benefit to amphibians and reptiles in the area. They are especially important during dry periods, where amphibians can experience large die offs. Studies have shown that local Species at Risk[3], such as the snapping turtle and local frog species such as the leopard frog and pickerel frog see increased abundance on streams with beaver dams.[4] A robust frog population is an especially strong indicator of a healthy environment, as they require nearly pristine conditions.

Fish and Invertebrates

Beaver ponds change the makeup of most streams from a lotic (flowing water) environment to a lentic (standing water) environment, which also changes the type of invertebrates associated with that area. Studies have shown that this can decrease the number of mosquitoes and blackflies, while increasing mosquito predators such as dragonflies and diving beetles.[5] Although ponds can be an impediment for fish migration, the coarse woody debris provides an ideal habitat for young trout and they can often be found in much higher numbers in the streams near beaver ponds.

Eutrophication

Although beavers are commonly blamed for phosphorus increases in in the Central Algoma watershed, much of the available scientific literature finds that beaver ponds do not add phosphorus to downstream sites.[6] Beaver ponds, in fact, reduce flow and increase absorption of phosphorus into the surrounding soils and ecosystem, thereby removing it from the stream. In Desbarats Lake, unique calcareous soils are likely exacerbating the problems associated with anthropogenic phosphorus. Calcium produces alkaline conditions, which reduce the ability of plants and soils to uptake phosphorus.

Removing or leaving beaver dams may have no discernable effect on phosphorus concentrations.

Beaver Meadows

After a dam has been abandoned and is broken, an extremely productive habitat known as a beaver meadow will remain for many years. These areas are extremely rich in nutrients due to the leftover from the sediment from the pond. They also have increased light penetration, and can be home to a unique array of species.

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[3] As designated under the Species at Risk Act and the Endangered Species Act

[4] Metts, B. S., Lanham, J. D., & Russell, K. R. (2001). Evaluation of Herpetofaunal Communities on Upland Streams and Beaver-Impounded Streams in the Upper Piedmont of South Carolina. *The American Midland Naturalist, 145*(1), 54-65.

[5] Means, R.G. (1979) Mosquitos of New York, Part 1. The Genus Aedes Meigen. State Science Service, New York State Museum, Albany.

[6] Muskopf, S. A. (2007). The Effect of Beaver (Castor canadensis) Dam Removal on Total Phosphorus Concentration in Taylor Creek and Wetland, South Lake Tahoe, California (Unpublished master's thesis). Humboldt State University.

Financial

Water resources

While the ability of beaver dams to retain water is well known, the effect that they can have on downstream water is less known. Beaver ponds can reduce upstream sediments by up to 90% and allow more time for natural microorganisms to break down organic matter and pollutants. This extra time also allows for unwanted elements to be absorbed into the surrounding ecosystem. The result is much cleaner water downstream from the dam. A common misconception is that beavers cause certain diseases. While it is possible for beavers to carry giardia [*Giardia sp.* (a.k.a. beaver fever)], scientific studies have shown that humans are, in fact, the primary source of giardia and that waterborne transmission is the least common vector for the sickness.[7]

Another benefit of the beaver ponds is simply the amount of water available. In many areas with seasonal streams that are prone to drying up, beavers can provide a permanent source of water for things such as livestock, irrigation, and for fire emergencies. Droughts have become much more common in recent decades and that trend will only continue to increase as the climate changes. New agricultural techniques that are being introduced to the area, such as keyline subsoiling, can potentially make use of the water in beaver ponds to irrigate crops. Keyline subsoiling is a plowing technique, which creates channels that direct water from wet areas to dry areas.

Waterfowl

Hunting of gamebirds is a common practice in Central Algoma. Beaver ponds have been shown to increase the population sizes of many of the preferred game species, such as mallard, wood duck, goldeneye, ruffed grouse, wild turkey, and American woodcock.

[7] Song, T. (n.d.). Beaver Fever - The Truth about Giardia. Retrieved January 4, 2016, from http://archive.tamaracksong.org/view.html?page=Beaver Fever - The Truth about Giardia.htm

Beaver Management Techniques

Best Practice - Tree Wrap

Effectiveness

In some cases, beavers do not build a dam at all or the pond isn't a concern. Despite this, they can still cause damage to large trees that are ecologically or aesthetically important.

Trees that grow near water, especially larger ones, can provide important stability to the shoreline. The loss of these trees can result in significant erosion and property damage. They can also provide nesting habitat for birds or mammals that live near water.

Beavers will cut down trees of any size and species, but have a strong preference for species of willow, birch, and poplar. They are not limited to trees near the water and can travel as much as 30 m (100 ft.) inland to find the right tree.

If done properly, tree wrapping is 100% effective in protecting important trees from beaver damage.

Method

The first method of protecting trees is by placing a wire fence around the tree as a barrier to beavers. Designs for this fencing can vary, but they all share several common elements.

The best fencing to use is a 14 gauge 2"x4" (5x10 cm) welded wire mesh (pictured), as it can stand on its own without being supported by the tree. This allows the tree room to grow without being girdled by the wire. For this reason, the use of 'chicken wire' is not recommended.

Fencing should be placed 12-15 cm (5-6") from the tree and the height should be no less than 60 cm (2 ft.) above the average height of the snow. Although beavers are less active in the winter, they do not hibernate and may continue to cut trees on warm days.

The second method is to paint an abrasive material directly onto the trees in order to discourage beavers from cutting them. This is accomplished by mixing 150-200 grams of fine sand into one quart of latex paint. Clear paint can be used to avoid any change in colour. Although this method may not be as successful as wrapping the trees with wire fencing, it has proven to be very effective in some communities. It is also less expensive and can be more aesthetically pleasing than the wire fencing.

Chemical deterrents are available to spray on trees, but are not recommended because they may be either ineffective or harmful to the environment.

Beaver Management Techniques

Best Practice - Exclusion Methods

Effectiveness

A common problem in the Central Algoma region is that new beavers will continue to return to the same area even after several other beavers have been trapped. This is because suitable habitat usually remains and young beavers are looking for a new home every spring. An area with a partially broken dam, a lodge, and a food supply is usually too good for them to pass up.

In this scenario, the habitat needs to be made less desirable by implementing exclusion methods and not allowing them to reach their preferred food. If beavers do not have access to food or building materials, they will quickly move on from an area.

Method

The two methods that will be outlined in this paper are both types of fencing, one traditional and one electric.

The traditional fencing can be made out of any kind of metal as long as it is at least 60 cm (2 ft.) high and follows the contours of the land. Beavers cannot climb or jump, but they can dig and squeeze under any fencing that is not in contact with the ground. The best place to put this fencing is parallel to the stream near the existing dam or lodge. In the absence of such structures, beavers are attracted to riffle areas, where the stream is narrow and the sound of flowing water can be heard. They are also attracted to stands of young poplar, willow, and birch. Young beavers will colonize new areas in the spring, so it is often best to be observant and place the fence accordingly.

Single strand electric fencing is also a very effective deterrent for beavers, though it can be expensive and require periodic maintenance. This fencing can be powered with batteries or solar panels and should be placed 10-15 cm (4-6”) off of the ground for best results. The solar panels and fence can be purchased at most hardware stores in the area. The location of the fence follows the same criteria listed above.

Beaver Management Techniques

Best Practice - Trapezoidal Fence

Effectiveness

Properly constructed trapezoidal fences are the most effective beaver management technique, with a success rate close to 100%. They can be used either as a preventative measure or after problem beavers are trapped. The shape and structure of the fence operates on three simple principles in order to deter beavers.

First, the perimeter of the fence (variable depending on stream size), will be longer than the width of the stream. Beavers are attracted to narrow portions of streams, such as culverts and riffle areas, and will usually move elsewhere if additional work is required.

Second, the angled portions of the fence force the beavers to dam in an upstream direction, which they are unaccustomed to doing. In nature, dams are almost always built perpendicular to the flow of the water and beavers will typically avoid trapezoidal fences for this reason alone.

Lastly, the nature of the trapezoidal shape serves to reduce damming stimuli. Beavers will always start constructing dam at the noise of the culvert. As they do so, they widen the intake of the culvert and also move away from it, reducing the sound of flowing water in both respects. Without the obvious stimulus of flowing water, beavers will construct their dams elsewhere.

Exclusion fences should always be built in a trapezoidal shape. Rectangular fences or screen caps often attract beavers by creating additional sound and make it easier for them to construct dams by providing a foundation on which to build.

Trapezoidal fences can require occasional maintenance, but the large squares in the fencing allow most debris and fish to pass through without getting caught. They are largely unaffected by storm events and ice.

Construction

The construction of a trapezoidal fence is a relatively cheap and simple process, which requires few tools and $200 to $300 worth of building supplies.

First, the shape of the fence should be plotted to determine the length of fencing and number of posts required. The culvert forms the narrow end of the trapezoid and the two equidistant sides should be placed at an angle between 30° and 45°. The final side, the ‘mouth’ of the trapezoid, should be no more than 2/3 of the width of the stream. The most effective fences will have a perimeter of at least 9 m (30 ft.), but the length and angle must be tailored to fit the size of the stream. The depth of the stream must also be determined, as the fence should extend no less than 30 cm (1 ft.) above the high water mark. An additional 30 cm to form a lower barrier is ideal, but not essential. As an example, a stream depth of

60 cm (2 ft.) would require a piece of fencing that is at least 120 cm (4 ft.) wide. Posts should be placed at intervals of no more than 1 m (39”).

The best fencing to use is a 6 or 9 gauge welded wire mesh with 6”x6” (15 cm) squares. The 6 gauge wire is more rugged, but can be difficult to work with. At the time of this report, 4’x8’ pieces of 9 gauge fencing can be purchased for approximately $14 and a 50’x5’ roll can be purchased for between $70 and $80 at local construction stores.

Posts can be steel T or U-posts or sharpened wooden posts constructed out of cedar or pressure treated lumber, which the beavers will not chew. They must be long enough to ensure that they are properly anchored [usually at least 60 cm (2 ft.) and reach the top of the fence. The fencing can be attached to wooden posts using fencing staples and to steel posts using wire.

Once the fencing is cut to the correct dimensions using bolt cutters, 1 foot (or 2 squares) of fencing on the lower side should be bent into an ‘L’ shape to provide a deterrent to digging. The fencing can then be adhered to the outside of the posts, ensuring that the lower barrier is on the outside of the trapezoid and cut at the corners to allow flexibility. This barrier can be covered with stones after construction to increase stability. Check that any sharp edges on the fencing are cut off to mitigate any potential harm to wildlife.

Beaver Management Techniques

Best Practice - Annual Dam Breaking

Effectiveness

In many cases, beaver ponds only cause damage during a portion of the year, usually in early spring and autumn. This can include flood damage and decreased drainage of farm fields due to the higher water table.

In this scenario, water is maintained at a suitable level during the summer months through natural processes. The first of these processes is water flowing directly through the beaver dam. Construction materials are naturally permeable and water is always passing through to the downstream area, albeit at a fairly slow rate. The second process is reduced flow due to decreased precipitation and increased evaporation.

By creating a partial breach in the dam when water levels are too high, people can mitigate damage without the need to remove the dam and the wetland. The beavers will repair the dam immediately, but not before the water level in the pond has been reduced to a manageable level.

Method

Before tampering with a dam, it is important to carefully read and understand any relevant legislation and to consult with MNRF.

Creating a breach involves removing a few pieces of wood and allowing the flow of water to wash away the mud and small debris. Tools necessary for this job will vary, but pitchforks and shovels are commonly used. As beavers are nocturnal, this task works best when done in the morning. This will allow the water more time to flow out of the pond before the beavers repair the breach.

If it is necessary to breach a dam in the fall, it is essential not to lower the water level enough to damage the beaver's food cache. Typically beavers can survive in any level above 1.5 m (5 ft.). Loss of food stored for the winter can easily result in the death of the beavers. In addition, turtles hibernate from September to May and a change in water depth at this time may result in turtles freezing. Most turtle species in Ontario are Species at Risk.

Beaver Management Techniques

Best Practice - Pond Leveler

Effectiveness

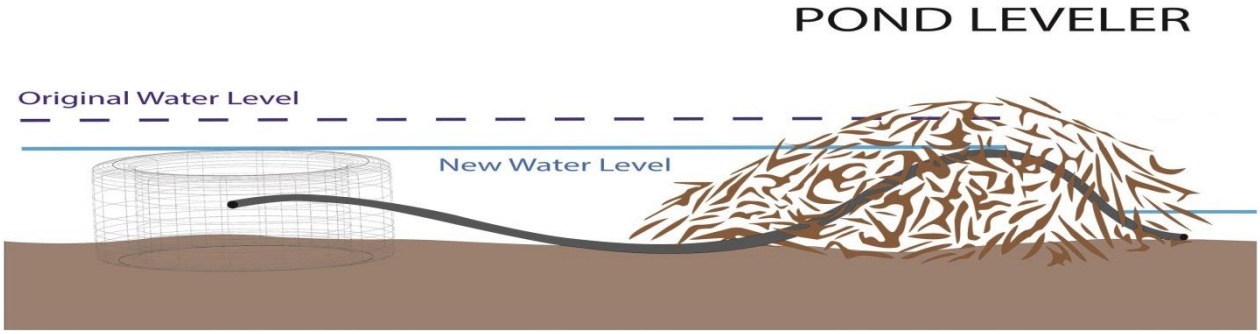
A properly constructed pond leveler is the most effective means to reduce water levels, while also allowing a beaver pond and the associated wetland, to remain. Despite their advantages, pond levelers are not ideal for every situation and can sometimes fail to be effective, even if constructed properly. There are three main reasons why pond levelers can fail. First, beavers will naturally leave areas for periods of time if their food source becomes depleted or they become vulnerable to predators. This process can be accelerated if water levels are lowered too much. Second, pond levelers may require periodic maintenance and can become plugged if neglected for a long period of time. Finally, they cannot always convey all of the water through the dam during periods of extreme flow.

Ideal locations for pond levelers are areas in which maintaining wetlands is important and where some flow over the top of the dam can be accommodated during early spring and fall. It is also important that they be inspected at least once per year for potential maintenance needs. One last aspect to consider is the history of the site. Although beavers typically avoid them, some streams are subject to extreme flood events and dams can break on an annual basis. In areas where any potential breakage or flow over the top of the dam cannot be tolerated and may result in flooding or damage, please refer to the trapping section of this toolkit for an alternative method to control beavers.

Function

In a typical beaver pond, the sound of running water over the top of the dam is what stimulates beavers to increase the size of a dam. A pond leveler instead conveys this water through the dam without the beaver's knowledge and removes the damming stimuli while also reducing the height of the pond to a suitable level. Although water may still flow over the dam during spring and fall, depending on the size of the pipe and amount of flow, beavers will usually ignore it as they are busy gathering food at these times.

There are many variations on the design of the leveler, but they all include the same basic elements. A cage at the intake stops debris from entering the pipe and prevents beavers from accessing a possible source of noise. A flexible drainage pipe, anchored to the bottom in some manner, carries water



from the intake to the other side of the dam. The height of the pipe within the dam dictates where the new water level will be and can be adjusted to suit changing needs. It is essential that the water level not be lowered any more than is absolutely necessary or the beavers may be harmed or leave. The entire unit is ideally contained entirely under the surface of the water to reduce any potential noise, but the top part of the cage can be above water.

Construction

Before undergoing any type of construction on a beaver dam, consider the time of year. Beavers begin storing food for the winter as early as August and a disruption in the water level can result in them starving. Ideal times for construction are late spring and early autumn. It is also important to consider turtle hibernation, fish migration, and bird nesting when choosing an appropriate time. This will vary from year to year.

There are countless variations on the pond leveler, all with varying levels of effectiveness. This report will outline a simple and effective design that has been shown to work in multiple regions. Links to additional designs will be included at the end of this section.

Materials necessary for this design include:
- Two 20 foot (6 m) lengths of flexible black corrugated pipe
- One split band coupler to connect the pipes together
- A suitable amount of 6 or 9 gauge 6”x6” (15 cm) wire mesh, usually no less than 18m^2 (200 ft^2)
- Two roughly 6 mm (¼”) diameter steel rods no less than 60 cm (24”) in length.
- One coil of galvanized steel wire (9 or 12 gauge)
- Four to six cinder blocks

These materials are available at most local hardware stores and can cost as little as $400, depending on the brand and store.

Tools that will be necessary include:
- Pitchfork and/or shovel (to break dam)
- Drill and bits
- Bolt cutters
- Pliers
- Waders and gloves

The first thing to determine is the size of pipe that will be necessary. There is no easy way to determine this, but a diameter of no less than 8 inches (20 cm) is recommended. For streams with more substantial flows, 10 or 12 inch (25 or 30 cm) diameter pipes may be used. A matching sized split band coupler will be needed to connect the two pipes.

Next, the cage can be constructed from the wire mesh. A height of 1.2 m (4’) and a diameter of at least 1.5 m (5’) is recommended, but not essential to the operation of the leveler. The wall of the cage should be formed into a circle with the desired diameter. The necessary length can be determined by multiplying the diameter by π (ex. 1.5m x π = 4.71m). After the circle is formed, the top and bottom should be formed, ensuring that there is at least one square of overlap on all sides. The outside edge of each square can then be cut off,

leaving wires every 6 inches. These will be wrapped around the circular section with pliers in order to secure them together. If this isn't possible, galvanized steel wire can also be used.

The next step is to adhere the pipe to the cage. Leaving at least one square at the bottom, cut a hole that is 4 squares in area in the cage. This will accommodate a pipe up to 30 cm (12") in diameter. Next, drill holes approximately 30 cm (1') from the intake end of the pipe so that the 6mm diameter steel rods can be inserted vertically on each side. These holes should be as close to the outside edge as possible so that flow through the pipe is not obstructed. The sections of the rod that extend above and below the pipe will be used to attach it to the hole in the cage using steel wire.

The next step is to create a breach in the dam where the leveler will be attached. Do not proceed with this step until you have carefully read all of the relevant legislation and consulted MNRF. While creating the breach, note that the bottom of the pipe within the dam is where the new water level will be. It is essential that this not be lower than is absolutely necessary or the chances of success will drop. The pipe can be adjusted in the future if necessary, so be conservative at first. While creating the breach, be sure to lay the sticks to the side, as they will be needed later.

After a breach has been created, the leveler can be laid in place. The pipe will sit on the stream bed and will follow the contour of the dam as shown in the diagram on the first page. Starting at the intake end, slowly fill the pipe with water and attach cinder blocks every 3-5 feet until reaching the dam. Small holes can be drilled in the side of the pipe to facilitate sinking. The output end of the pipe must extend slightly past the dam and lay on the bottom of the stream bed. The further underwater it is, the more successful the pond leveler will be. The section at the dam can then be covered with sticks that were removed during the initial breach. The beavers will cover the pipe immediately, so don't be too meticulous.

Once the beavers successfully repair the breach and water levels begin to rise, the leveler will begin to function and maintain the new water level. If this level proves insufficient, the portion of the pipe within the dam simply has to be lowered.

A detailed video describing this construction can be found at:
http://www.apnm.org/campaigns/beavers/training_video_pt1.php
(Last accessed March 3rd, 2016)

Instructions for the more complex 'Clemson Pond Leveler' can be found at:
http://www.clemson.edu/psapublishing/PAGES/AFW/AFW1.PDF
(Last accessed March 3rd, 2016)

A scientific paper detailing the success and failures of pond levelers can be found at:
http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1020&context=icwdm_wdmconfproc
(Last accessed March 3rd, 2016)

Beaver Management Techniques

Grant Robinson and David Euler

Best Practice - Trapping

Background

Trapping can be used as a standalone management technique or in conjunction with the other methods in this toolkit. Some techniques can be successful without the need for trapping, but there are other areas where trapping is the only option.

On Crown land, licensed trappers are assigned areas of land called registered traplines, for the exclusive use of the head trapper and his/her helpers. They are then given a quota for the number of beavers they should trap, which is based on the trapper's knowledge of their trapline and their annual beaver house count. The goal of these quotas is to manage the population so that it is not over or under-harvested. If beavers are under-harvested or not harvested at all, habitat and food supplies can be destroyed and dense populations can be susceptible to diseases such as tularemia.

Private Land

On private land, the decision to trap is up to the discretion of the land owner. If it is done between the dates of October 15th and April 30th, beavers may be trapped for free by a licenced trapper because the pelts are in prime condition and can be sold. There may be a fee if trapping is done outside of this season.

Private land owners are permitted to break dams, but only if the ponds are currently causing damage and the dams are currently located on their property. Other circumstances that require dam breaking, such as the installation of a pond leveler, require authorization from the MNRF.

Live Trapping

Although live trapping is used successfully in other areas of the world where beaver populations have been extirpated, it likely would not be a successful strategy in Central Algoma. Beavers are extremely territorial and will attack other individuals that have been relocated within their habitat. Current laws prevent beavers from being relocated more

Conibear trap

than 1 km, so it is extremely difficult to find unoccupied areas where relocated beavers will no longer be a concern.

Transporting beavers to other areas can also transmit disease between different communities of beaver.

For areas east of Bruce Mines, contact the Blind River Trappers Council: brtrapperscouncil@gmail.com

For other areas, contact Robin Horwath, President of the Ontario Fur Managers Federation: robin.horwath@eastlink.ca

Contact

Licenced trappers have managed beavers in this area for decades and have a wealth of knowledge on the subject. They are willing to answer questions regarding trapping or any of the management techniques discussed in this toolkit.

Final Thoughts

In reading and applying this toolkit, we hope that one or more of the solutions will prove effective in your particular situation. Although there are financial costs involved in some of the best practices and all require some labour, CAFC believes that is in everyone's best interest to implement these techniques wherever possible. Beavers and their wetlands are an integral part of the Central Algoma ecosystem and every effort should be made to assure their continued presence on our landscape. It is important to use all of the resources provided in this toolkit, including contacting CAFC and MNRF with any questions regarding the best practices themselves or the legal implications associated with their implementation.