



# Beaver Institute Inc.

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## **Self Help Information – Pond Leveler**

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## 1. Beaver Basics

The North American beaver, *Castor canadensis*, is a large semi-aquatic rodent. They only eat vegetation. They build dams from mud and sticks that create wetlands that are among the most biologically productive ecosystems in the world, comparable to coral reefs and rain forests. Beaver ponds:

- Create diverse habitats and ecosystems
- Increase biodiversity
- Promote salmon/trout recovery
- Regulate stream flows
- Improve water quality, act as the “Earth’s Kidneys”
- Replenish ground water
- Store surface water
- Repair eroded stream channels
- Restore watershed health
- Sequester carbon
- Reduce wildfire damage, and speed recovery after fires



And beaver ponds provide all these valuable ecological services for FREE!

A single beaver family can provide us with millions of dollars in ecological services every year! However, despite these valuable ecological services, beavers can cause humans significant damage. Fortunately though, cost-effective, long-term options exist to resolve most human-beaver conflicts and retain most of their wetland benefits. So while beaver removal is an option, removing the offending beavers should be used only as a last resort.

## **2. Introduction to Flow Devices**

**(a.k.a. Water Control Devices, Beaver Deceivers™)**

What is a flow device? A flow device controls beaver damming to prevent flooding issues with humans. They are typically made with fencing, pipes, or both. When properly built and installed, flow devices protect human properties and infrastructure from beaver dam flooding in a long-term, cost-effective, environmentally friendly, and humane manner. They allow the beavers to remain in place while protecting human interests and preserving valuable beaver-created wetlands.

### **Educational Links**

Intro to Flow Devices Video:

<https://www.youtube.com/watch?v=eCqaXLHyJco&t=9s>

Flow Device Testimonial Video:

<https://www.youtube.com/watch?v=SYXflMi9Wu4&t=1s>

Municipal Beaver Management Study:

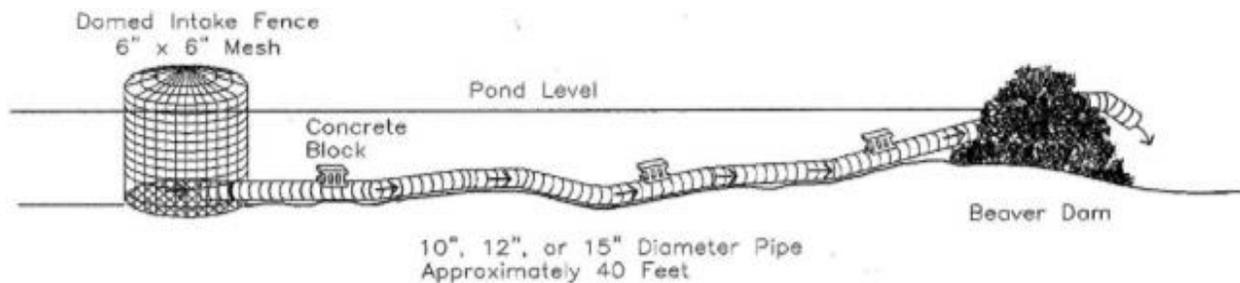
<https://www.beaverinstitute.org/wp-content/uploads/2019/02/Billerica-Beaver-Study-AMWS-2019.pdf>

Flexible Pond Leveler Pipe Instructional Video:

<https://www.youtube.com/watch?v=ofzMAaBJEdA&t=18s>

### **3. Flexible Pond Leveler Information**

When flooding from a beaver dam threatens human property, health or safety, a Flexible Pond Leveler pipe system can be a very effective solution. This flow device will create a permanent leak through the beaver dam that the beavers cannot stop. This eliminates the need for repeated trapping despite the presence of beavers.



For these pipe systems to be effective, they must be designed so that beavers cannot detect the flow of water into the pipe. The Flexible Pond Leveler does this by surrounding the submerged intake of the pipe with a large cylinder of fencing which is placed in a depth of at least 3 feet of water. This prevents the beavers from detecting the flow of water into the pipe. As a result, the beavers do not try to clog the pipe, and a safe water level can be maintained.

The height of the pipe in the dam determines the pond level (see diagram). Water will flow through the pipe unless the pond level drops below the peak of the pipe. It flows by gravity, not a siphon. The pipe is set in the dam at the desired pond level and can be adjusted up or down if necessary.

Unlike road culverts, Flexible Pond Leveler pipes do not need to be sized to handle catastrophic storm events because heavy storm runoff will simply flow over the top of the dam. Following the storm, the pipe will return the pond to the normal level.

When installing a pipe system, it is very important to lower a pond only enough to protect human interests. The more a pond is lowered the more likely it is beavers will build a new dam to render the pipe ineffective. Lowering a beaver pond by up to one vertical foot is usually not a problem.

Whenever a freestanding dam must be lowered by two feet or more, a single round of trapping may be needed prior to installing the pipe. Following trapping new beavers relocating into the area are more likely to tolerate the smaller pond without new problematic dam building because they do not have the memory of the larger pond.

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## **4. Beaver Dam Breaching and Permits**

Beaver dams create important ecosystems, acre for acre equal in quality to coral reefs or rain forests. Therefore, in most regions permits are required from local, county, state/provincial and/or federal agencies to open, disturb or remove a beaver dam. Prior to altering a beaver dam it is incumbent upon you to know what regulations you need to adhere to.

Beaver dams are typically constructed with mud, sticks and rocks. Always be aware of any potential hazards to avoid injury to yourself, others, or property.

### **Dam Breaching Procedures**

1. Determine what permits you need.
2. The tools (potato or clam rake) are hand carried to the site.
3. No heavy equipment will be used at any time. No significant damage is expected to any grassy, upland, wetland or other areas as a result of this manual work.
4. First, stand on the downstream side of the dam to remove sticks from the area to be breached. These sticks are piled on the top or side of the dam.
5. Once the loose sticks are removed, mud from the dam is manually dug out of the area to be breached with a potato rake and piled on top of the dam away from the moving water to reduce downstream siltation.
6. The width and depth of the breach are limited by the size of the stream channel and any downstream road culverts. At no time should a breach be made so large enough that water flows over the banks of the stream. All released water should remain in the channel and not exceed the volume of runoff from a large storm.
7. If beavers are living in the area to be drained, they will almost always repair the dam breach at night. If this occurs, breaching on successive days may be needed to reach the water level goal. Note, unless the beavers are removed from the area, dam breaching is almost always a short-term solution.
8. If the beaver dam is very old or very large, breach slowly, constantly assessing the dam integrity throughout the breaching process.
9. In cold climates, to prevent freezing deaths of beavers or hibernating turtles and other amphibians, ask the advice of a regional government wildlife biologist.

**Always breach dams in a safe and environmentally responsible manner.**

## **5. Tools and Materials List - Flexible Pond Leveler**

### **Required Tools List: Flexible Pond Leveler**

Cordless Drills  
Cordless Circular Saw  
Cordless Saws-All  
Cordless Batteries and Charger  
Fence Pliers  
Hog Ring Pliers  
Tool Belt Pouch with a Fence Plier Holder  
Bolt cutters  
Potato/Clam Rake  
Pruners and Loppers  
Pontoon  
Truck with Ladder Rack or Trailer

### **Additional Tools:**

Chain Saw w/ gas  
Highway Cones  
Pickax  
Scrap Bucket

### **Materials and Supplies List: Flexible Pond Leveler**

Non-Perforated HDPE Pipe  
Split Coupler(s) for the Pipes  
9 Gauge Galvanized Steel Hog Rings  
9 Gauge Galvanized Smooth Wire

6 Gauge Steel Concrete or Agricultural Mesh Panels

1.25 inch Galvanized Screws

4" x 8" x 16" Concrete Blocks

Safety Glasses

Work Gloves

First Aid Kit

### **Additional Supplies: Flexible Pond Leveler**

Hip Boots	Towels
Chest Waders	Sunblock
Fishing Boots	Bug Spray
Neoprene Socks	Maps
Hat	Notepad and Pen
Trappers Gauntlets (in cold climates)	Sanitizing Hand Wipes
Wet Suit (in cold climates)	Lunch Cooler
Change of Clothes	Water

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## **6. Risk Disclaimer**

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