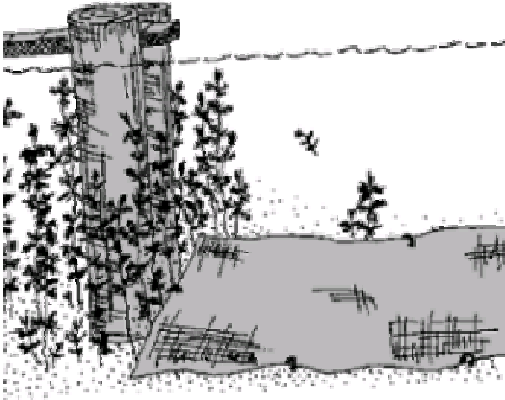


# Instructions for Building a Benthic Barrier: Wood Frame Construction



## FAQ

### What is a benthic barrier?

Benthic barriers, also known as benthic mats or bottom screens, are mats that are installed on the bottom of a lake to inhibit the growth of invasive aquatic plants. Barriers consist of dark, light-blocking fabric that is held at the bottom of the lake by weights.

### How does the barrier work?

Barriers prevent the growth of aquatic plants by acting as a sun block. Without sunlight, plants can not photosynthesize and consequently will not grow.

### Where can a barrier be used?

Benthic barriers are most appropriate for small areas, such as around docks or boat launches or in swimming areas. This technique is not suitable for controlling widespread invasive plant infestations.

### Is a permit required?

YES! To install a benthic barrier, you must apply for a permit from the NYS Department of Conservation (Region 7 Office: 426-7438).

### Can I make my own barrier?

Benthic barriers are easy to construct. This fact sheet describes how to build a benthic barrier that uses a wooden frame. Because barriers must be installed before May 1, the challenge lies in installation and SCUBA equipment may be needed.

## Materials Required for a 12' x 12' Benthic Barrier with Wood Frame

*\*Note: For larger areas, it is recommended that you build multiple 12x12 frames and then install them adjacent to one another. Building frames larger than 12x12 is not recommended because of difficulty maneuvering them.*

- Five 2" x 2"s, each twelve feet long (2" x 4"s can also be split)
- Screws 2" long
- 1/4" plywood for making gussets. Sixteen gussets are required for bracing, top and bottom of the frame. Approximately four square feet of plywood is required.
- Screening material (Roll must be at least 6-feet wide, 30 feet long). Black landscaping fabric is suitable. \*Note that the fabric must be gas permeable to prevent gas bubbles from collecting.
- Staples
- Six to ten polypropylene bags (such as those used for sandbags). Bags will be filled with rocks and used as weights.
- Rope to tie the bags shut and attach the weight bags to the frame.

## Tools Required

- Hammer
- Saw
- Utility knife or heavy scissors for cutting fabric
- Staple gun
- Measuring Tape

## **Approximate Cost: \$60 (for a 12' x 12' barrier)**

DEC Permit: FREE, Lumber: ~\$15-20, Landscaping Fabric (6'x50' roll): \$27, 1/4" plywood (4 sq. ft.): ~\$7, screws: \$6

### **\*Note on Construction Materials\***

-Material should be opaque (to block the sunlight) and relatively sturdy so that it will not tear easily.

-Woven materials that are gas permeable are ideal and will facilitate the release of gases that are naturally generated by the lake bottom.

-Suitable materials include burlap, woven synthetics, perforated black mylar, landscaping fabrics, and geotextiles. Keep in mind that some fabrics, such as burlap, will deteriorate more rapidly than others.

-Do not use any pressure-treated or chemically-treated lumber or plywood.

*This fact sheet gives instructions for building a benthic barrier with a wooden frame. After trying this technique, Cornell Cooperative Extension expressed to the NYS DEC some of the difficulties associated with sinking a wooden frame. As a result, the DEC may consider the allowance of non-floating frames in the future (such as metal/rebar). Before getting started on any construction or installation, check for any updates regarding improved construction techniques & designs, and always submit your permit application/construction plan to the NYS DEC for approval.*



# Instructions for Building a Benthic Barrier: Wood Frame Construction

1



Lay out the 2" x 2"s. Four sides, plus middle brace. Use the measuring tape to ensure that the middle brace is in the center.

2



Measure and cut the gussets from the 1/4" plywood. These will be triangular pieces with each side 5" long. Sixteen gussets are needed for one frame.

3



Use screws to secure gussets at each corner of the frame and at both ends of the center brace on the top of the frame.

4



Carefully turn the frame over and lay the screening fabric on top. Note: A 6-foot wide roll will cover from one edge to the center brace.

5



Once the screening fabric is in place and pulled relatively tight—use the staple gun along the entire length of each of the 2" x 2"s. Trim excess material even with the outside of the frame.

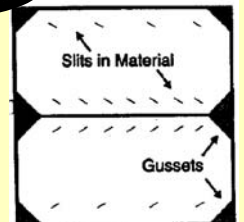
6



Screw the remaining 8 gussets onto the corners, over the fabric, to help secure the frame and hold the fabric in place.

7

Cuts slits about one inch long in the fabric, similar to the pattern shown in the sketch. This will allow bubbles to escape, making it easier to sink the screen to the bottom.



8



Fill each "sand bag" with native lake cobbles or rocks. Do NOT use sand. If insufficient native rocks can be found on site, clean rocks may be used. Tie each bag closed with rope and tie a loop in the end of the rope.

9

Partially drill screws into the frame at each corner, so that the screws can be used to attach the weighted bags during installation.

## Instructions for Building a Benthic Barrier: Wood Frame Construction

### INSTALLATION

*Installation requires someone to be in the water. In shallow water it may be possible to use only a wet suit and snorkeling equipment. In deeper water, a SCUBA diver is likely to be needed.*

1. Remove any sticks or large stones from the lake bottom to be covered, especially where the edges of the frame will lie. \* *Reminder: barriers may NOT be installed within 50 feet of any private or public water intakes.*
2. Slide the frame into the water. This can most easily be done with a few people on shore and a few people in a boat. The frame will float.
3. Once aligned in the position you want, attach a weight bag to the corners of one side of the barrier. Use the loop in the rope to fasten the bag to the protruding screws. The frame will begin to sink. If the water is less than 12 feet allow one side of the frame to touch the bottom before attaching weight bags to the opposite corners. If in deep water, attach the weight bags to all 4 corners to allow the frame to sink.
4. Once submersed, a diver will need to position additional weight bags over the center brace.
5. If multiple frames are being installed, diver(s) should push the submerged frames together. Make sure the frames are parallel and that there are no gaps between the frames. Concentrate the remaining weight bags where the frames meet. Overlap the bags so that they rest partly on each frame.
6. To prevent the spread of invasive plants, collect any plant fragments that are created as result of installation.
7. If barrier is installed in shallow water (less than 6 feet) and could potentially effect navigation, mark the area with buoys. If the barrier is installed in an area where boaters may anchor, post a warning sign (e.g. Do Not Anchor Here) to avoid mat damage or fouling of anchors.
8. Once installed, monitor the barrier regularly to make sure it is staying in place and that air bubbles do not collect underneath. If air bubbles form, the barrier will need to be "burped" or additional slits may need to be cut in the fabric.

