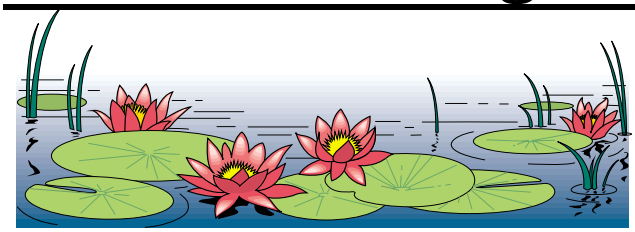
Instructions for Building and Installing Bottom Screens



Many lake-front residents have problems with aquatic plants growing in swimming areas or alongside docks. Bottom screening provides an inexpensive and effective means of controlling these plants. This document provides instructions for building and installing bottom screens.

A bottom screen is a cloth-like material that covers the lake bottom like a blanket. Bottom screens block light, preventing the growth of aquatic plants. Bottom screening (bottom barriers) can be an excellent method of controlling aquatic plants at swimming beaches and in boat mooring areas.

Most aquatic plants can be controlled with bottom screens. Waterlilies are controlled well, although installation and maintenance difficulties can be created by their large roots and the mucky sediments in which they sometimes grow. Plants such as coontail and bladderwort that do not root in the sediment, can not be controlled by bottom screening.

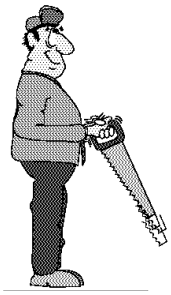
Bottom screens can be installed by the home owner. The material may be placed directly on the lake bottom or attached to frames to facilitate handling under water. The use of bottom screens is usually confined to shallow water, unless diving gear is available.

Materials Required for Three 12'x12' Bottom Screen Frames

- Fifteen 2" x 2"s, each twelve feet long.

  Note: Fir and cedar 2" x 2"s are suitable and may be more readily available, in twelve foot lengths, than pine.
- Nails (#6 Spiral) or screws, 2" long.
- Marine plywood, ¼" for making gussets. Forty-eight gussets are required for bracing, top and bottom of each of the three 12'x12' frames *(see sketch below)*. Approximately twelve square feet of plywood is required.
- Lath (if nails instead of staples are used for securing material to the frames). About 165 lineal feet required.
- Screening material, allowing for some selvage, about 440 square feet required.
- Twelve polypropylene bags 2'x2' for use as sandbags.
- Clean sand or gravel to fill twelve bags approximately ¾ full, about 1 cubic yard.

Tools Required



- Hammer
- Saw
- Utility knife or heavy scissors for cutting material.
- Staple gun (if staples are used instead of lath for securing material to the frames).

Building Instructions

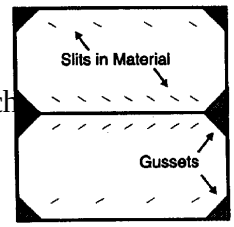
A. Screening Materials

Screening materials should be opaque and of a sturdy material that doesn't tear easily. Ideally these materials should be heavier than water and permeable to the gases that will be generated by rotting vegetation.

Materials suitable for screening include burlap, woven synthetics, perforated black mylar, landscaping fabric (sold in hardware stores and at plant nurseries), and geotextiles used in road construction. Keep in mind that some fabrics, such as burlap, will deteriorate more rapidly than others.

B. Screen Construction

1. Lay out the 2 x 2's for one frame - four sides, plus middle brace.
2. Measure and cut gussets from the ¼' marine plywood. These will be triangular pieces with each side 5" long. Sixteen gussets are required for each frame.



3. Nail or use screws to secure gussets at each corner of the frame and at both ends of the center brace on the "up" or visible side of the frame.
4. Carefully turn the frame over and lay the screening material on top.

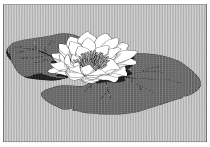
   Note: Screening material can be used in six *foot widths if it is more conveniently available.*
5. Nail gussets or use screws to secure them to one end of the frame with the screening material underneath.
6. From the opposite end of the frame, pull the material tight and nail or screw down gussets.
7. Staple the screening material to each of the 2 x 2's so that it is secured along the entire length (or nail down, using the lath).
8. Trim excess material even with the outside of the frame.

9. Repeat for other frames.

C. Sand Bags

Sand bags are used to anchor the bottom screens to the sediment. Even the most porous materials will billow due to gas buildup, sometimes causing the frame to "lift off " the bottom. Therefore, it is very important to anchor the bottom screen securely. Unsecured screens can create navigation hazards and are dangerous to swimmers. Anchors must be effective in keeping the material down and must be regularly checked.

1. Fill each bag about ⅔ full with <u>clean</u> sand or gravel (fill material containing dirt cloud the water as the bags are put into place). If the screen site has a soft or muck bottom try filling the bags only ½ full. The bags may cause the screens to sink if the sediment is very soft.
2. Tie the bags closed with string.



D. Placing Bottom Screens

Site Considerations:

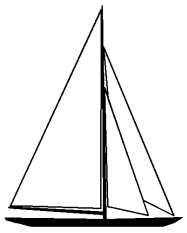
Installation is easier in the winter or early spring when plants have died back. In summer, it's desirable to cut or hand-pull the plants first.

Be aware that boat propellers may dislodge bottom screens in shallow areas. Also fish hooks can get caught in the material. If the screened area is to be used for boat mooring, swimming, fishing, or wading, it may be prudent to post a sign telling users that the bottom screen is in place.

1. Remove any sticks and stones from the area to be screened, especially where the edges of the frame will lie.
2. Slide the frame into the water. This can be more easily done with two people.
3. While the screens are floating on the surface, cut slits about one inch long in the material, in a pattern similar to that shown in the sketch shown above. This will allow the air trapped under the screen to escape, making it easier to lower the screen to the bottom. The slits will also allow gases generated by rotting vegetation to escape.
4. If you are installing the screen near a dock, line up the frame with the dock. Lower the frame into place by placing a sandbag on each corner and allowing the frame to slowly sink. Once it is on the bottom and in the position you want, add a sandbag to each end of the center brace.
5. Install the second and third frames adjacent to each other. If two people are working together, one can push while the other squeezes the frames together. Make sure there are no gaps between each frame and that the cross pieces are parallel with the other frames.

6. Place the remaining sand bags, concentrating the weight where the frames meet. Overlap the bags so that they rest partly on each frame. This will help to keep the frame in place.
7. Pull the aquatic weeds along the edge of the frames to keep them from growing over the screened area. Milfoil tends to "canopy" over adjacent areas.
8. If any mechanical harvesting is taking place on the lake, notify the equipment operator about the bottom screen and ask him/her not to harvest in this area.

D. Relocating Screens



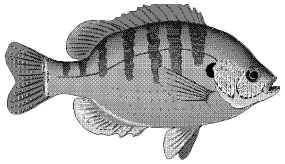
Bottom screens installed during the growing season will suppress the plants within about four weeks. The bottom screens can then be moved to a new location or be removed for storage. If bottom screens have been in place during the growing season, plant suppression will usually be effective for the remainder of the summer.

Screens are easily moved underwater by two people. They can be moved around the same dock or to an adjacent dock.

E. Maintenance

The duration of weed control depends on the rate that weeds can grow through or on top of the bottom screen, the rate that new sediment is deposited on the screen and the durability and longevity of the material. Regular maintenance can extend the life of most bottom screens.

1. Frequently check the bottom screen for gas bubbles. If gas bubbles are forming under the material, cut one or two additional slits on top of the bubble to release the gas.
2. If the screens are not removed from the water at the end of the season, they should be checked at the beginning of the new growing season for any accumulation of sediment This can be removed by sweeping or up-ending the screens. Check with the Department of Fish and Wildlife to determine if you need a permit to clean the bottom screens.



F. Fish Spawning Areas

Screens covering spawning beds should be moved in the early spring and not replaced until the spawning activity is over, usually sometime during the early summer.

Permits

Bottom screening requires a type of permit called a hydraulic approval, obtained free from the Washington State Department of Fish and Wildlife. In some counties, a shoreline permit may also be required. Check with your local jurisdiction to determine if a shoreline permit is required.

Contacts

Contacts are provided for your convenience. It is not our intention to endorse or promote specific vendors or products and this list may not be comprehensive.

The following companies install bottom screens and may sell bottom screening kits to home owners.

AquaZone
82 Foreman Rd.
McCleary, Washington 98557
(206) 495-3920

Resource Management, Inc.
2900B 29th Ave. SW
Tumwater, Washington 98512
(206) 754-3460

Allied Aquatics
4426 Bush Mountain Dr. SW
Olympia, Washington 98502
(206) 357-3285

Global Diving
2763 13th Ave. SW
Seattle, Washington 98134
(206) 623-0621

If you have special accommodation needs, please contact Kathy Hamel at (206) 407-6562 or (206) 507-7155, Telecommunications Device for the Deaf (TDD).

Acknowledgement: Tom Clingman of Thurston County Lakes Program for his help in preparing this Fact Sheet.