

Aquatic Plant Management: Benthic Mats

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What is a Benthic Mat and How Does it Work?

A benthic mat (also known as a benthic barrier/weed mat/bottom screen) is a mat that is installed at the bottom of a body of water to prevent or inhibit the growth of aquatic plants. It consists of a dark fabric or material that blocks sunlight and is held against the bottom by weights. Without sunlight, plants cannot photosynthesize and do not grow.

Benthic mats can be up to 100% effective in controlling aquatic plants. Both nuisance weeds and invasive plant species can be controlled with this method. Existing vegetation can be removed or new vegetation growth can be prevented. This method is not selective and will target any sediment dependent species including: native aquatic plants, invasive aquatic plants, and bottom dwelling organisms.

Benthic mats are one of the safest and ecologically sound physical weed control techniques. The materials are relatively inexpensive and are usually effective for several years. Installation should be in late May or early June after fish have spawned. The less plant material present before installation, the more successful the screen will be in staying in place. When mats are removed after 4-6 weeks, there is little to no plant growth for the rest of the season.

Types of Benthic Mats:

Framed

- +easily covers small areas
- +less fabric movement
- frames can be bulky and hard to store



Weighted Sheet

- +can cover large or small areas
- +easy to roll up and store
- may require more maintenance



Where Can I Use a Benthic Mat?

Benthic mats are most appropriate for areas of significant concern or intensive use, such as docks, beaches, and swimming areas. When using a benthic mat for weed control, it is important to carefully consider the type and size of benthic mat used. You will need to consider factors such as intended location of the mat, cost to purchase/build, installation time, and maintenance required after installation to determine the most appropriate mat for your use.

Benthic Mats.....

- Can be 100% effective in controlling aquatic plants
- Are one of the safest and ecologically sound physical weed control methods
- Can remove existing vegetation and prevent the growth of new vegetation

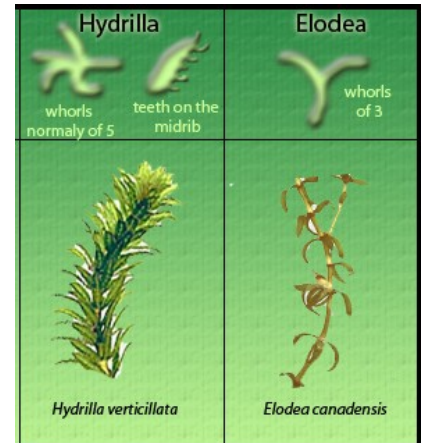
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What invasive aquatic plants can a benthic mat remove?

Hydrilla (*Hydrilla verticillata*)

- Pointed, bright green leaves about 5/8" long
- Leaves grow in whorls of 3-10 along stem, 5 whorls most common
- Leaves have small teeth on the edges
- Floating white flowers and small, white/yellow, potato-like tubers attached to the



Don't confuse invasive Hydrilla with native Elodea!

These are just a few common examples of invasive species that can be removed with a benthic mat. Remember, any rooted aquatic vegetation (native or invasive) can be removed.



Don't confuse invasive Eurasian water-milfoil (left) with native Northern water-milfoil (right)! They have different numbers of leaflet pairs on their stems.

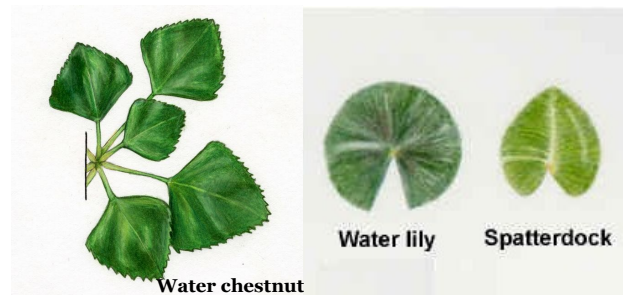
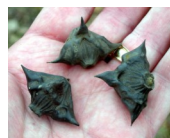
Eurasian Milfoil (*Myriophyllum spicatum*)

- 3-4 feathery green leaves whorled around stem with red-dish-brown tip
- 12-21 pairs of leaflets on a stem that branches near the surface (native leaflets have 7-10 pairs)
- Can be found in dense mats
- Leaflets will collapse when removed from water



Water Chestnut (*Trapa natans*)

- Annual floating leaf plant
- Bright green, triangular-shaped toothed leaves
- One rosette can produce up to 20 sharp, spiny pods with 12 seeds each that are viable for up to 12 years



Don't confuse invasive Water chestnut with native Water lily or Spatterdock! Their leaves have distinct shapes for identification.

How To Build a Benthic Mat

1

For a 10' x 40' mat, lay out 7 rebar spaced about 6' apart with 5 evenly spaced cable ties per rebar. Cable ties should start 8" from the side of the mat. Place a 4" strip of waterproof duck tape next to the rebar at each cable tie.



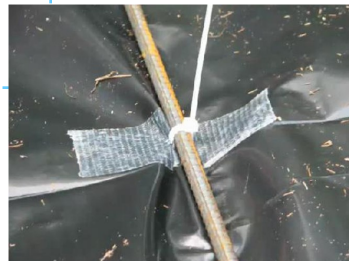
2

Punch a hole through each piece of tape and thread the cable tie through the hole.



3

Lay the rebar over the cable ties and secure the rebar to the mat.



4

At each end, wrap the plastic around the rebar before it is secured (this is to strengthen the ends).



5

Midway between each rebar, place 5 strips of waterproof duck tape, each 4" long. Cut a 1" slit in each piece of tape (this is for ventilation).

Note: ventilation is important for gas release, which can build under the mat and cause "tenting"



6

Roll up the mat until you are ready for installation.



Notes about construction materials

- This mat was built using a 6mm plastic sheet and 10' sections of 3/8" rebar. Other suitable screen materials include woven synthetics, landscaping fabric, geotextiles, plastics, nylon tarp, and burlap.
- Materials that are gas permeable are ideal and will facilitate the release of gasses that build up during plant decomposition.
- Do not use any pressure-treated or chemically-treated lumber.
- Visit <http://www.mainevlmp.org/wp/?p=842> to watch a full video on benthic mat construction

WAYNE COUNTY



For more information:
visit www.waynecountynysoilandwater.org
or call our office at (315) 946-7200

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Brief Overview of Benthic Mats

Advantages:

- Creates an immediate area of open water
- Easily installed around docks and swimming areas
- Properly installed screens can control up to 100% of aquatic weeds
- Inexpensive compared to other methods of weed control
- Effective and safe

Disadvantages:

- Must be regularly inspected and maintained
- Some mats are difficult to anchor in deep/muck sediments
- Can interfere with fish spawning and other bottom dwelling organisms
- “Ballooning” or “tenting” from gas build up can occur and the gas needs to be released

Watershed Management for Homeowners: What You Can Do to Improve Water Quality

Waterfront homeowners have a unique opportunity to contribute to the health of their local waterways. Many activities we conduct near the waterfront, in our lawns and gardens, and around our home impact water quality. These activities are even more critical to waterfront homeowners because runoff doesn't have far to travel before reaching the water.

When it rains or the snow melts, water runs off streets, driveways, and across the landscape and picks up various pollutants like oils, greases, nutrients, fertilizers and sediment. This contaminated runoff, known as non-point source pollution, flows without treatment into the nearest storm

water drainage system. If you live on a river, lake or stream, this runoff can travel directly into the adjacent waterway much faster. This is why it is so important to practice good watershed stewardship.

Your activities around your home can directly effect water quality. Here are a few things to keep in mind to reduce these nonpoint sources of pollution:

- Buy products labeled bio-degradable, non-toxic, or water soluble
- Service your car regularly—inspections and maintenance prevent leakage of oil, antifreeze, and other fluids
- Prevent erosion by planting cover on bare soils and maintain a buffer of trees, shrubs, and grasses on the shoreline—this will also help to filter runoff before it reaches the water body
- Maintain septic systems—inspect them every few years and pump them out as needed
- Limit your application of fertilizers and use of detergents containing phosphorous—this nutrient contributes to aquatic plant growth