



Manual Removal Method for Eurasian Water Milfoil

By Steve & Karen Fleming

Background

Manual removal of Eurasian watermilfoil (EWM) is a proven method of controlling EWM in lakes. The key to successful removal is:

1. The entire plant stem and root ball must be removed. If any portion of the plant or root remains after removal the plant will likely grow back.
2. Any and all plant fragments that break free from the plant must be captured. Any plant fragments that are not captured and fall to the lake bottom in some other location may start a new plant and eventually a new EWM colony.

It is best to utilize these manual removal methods within areas where the plants are at a depth less than 5 feet and the densities are small. (1 - 5 plants within a 3 - 4 foot diameter area is ideal). These methods can also be utilized for more dense areas but it can be hard to find all the plants and fragments due to the muddy water created. Multiple removal sessions will likely be needed for larger more dense areas.

Tools/Equipment

For the manual removal process we utilized 6 primary tools. A picture of each tool is shown with the description.

1. **Swimming pool skimmer nets.** We used two types of skimmer nets. We found the type on the right to be most effective since it contained the fragments better and fragments did not fall out as easily if the net was tipped over.





Tools/Equipment *(continued)*

1. **The skimmer nets** can be purchased at any store that sells swimming pool supplies. We found the best prices at Menards or Fleet Farm. Since the nets were sold without handles, we installed old broom handles on each one. The skimmer nets were used to catch EWM fragments in the water.
2. **5-tine pitch forks (2 of them) bolted together like a post hole digger to form a “Fork Scissors”**. The forks were 5 feet long and can be purchased at any garden store. This picture shows the two forks bolted together with a 1/4 x 20-3 inch long bolt through the metal portion of the handle. We used flat washers in the middle and outsides to make sure it operated easily and a self locking nut securing it on the end to keep it from loosening with use. The pitch forks were used to dig deep in to the substrate around multiple EWM stems and twist them out. (Twisting is important to make sure you get all the root ball and reduce fragmentation).





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Tools/Equipment *(continued)*

- 3. 4-Tine Cultivator.** This particular tool was purchased at Lowe's. The tool makes it very easy to dig the tines into the substrate below single EWM plants and remove them by twisting as it is pulled up. This cultivator was 5 feet long.



- 4. Fine mesh fishing net.** This particular net was purchased at Gander Mountain and was used to reach down into the water under either the fork scissors or cultivator to catch the root mass as it is brought up. We pulled it onto the deck to let the water drain out. This net helps to contain any fragments if they do break off.





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Tools/Equipment *(continued)*

- 5. Metal wash tub with a garbage bag.** We just happened to have the metal bushel basket but they can be purchased at Tractor Supply. It worked well because of the wide mouth. The bucket just holds the bag in place for filling so you don't need another person. The key is to have a way to contain the plants that are removed so they can be safely carried away from the lake.



- 6. Platform for standing on.** This could be a raft or a pontoon boat. In our case we do not have a pontoon boat so we used a raft with metal posts that could be lowered into the water in the corners to help hold it in place while removing plants.





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Criteria for manual removal

- This procedure works best on EWM colonies that have less than 5 plants and are less than 5 feet deep. Larger colonies can be removed but they may need additional people and additional pulling sessions. Deeper colonies will require longer tools or diving methods.
- The colonies should be no more than 3-4 feet in diameter. It is easy to use these methods to remove larger areas if the plant density is low. It just takes more time.
- You should have at least two people on the raft or pontoon boat. It is also helpful to have one person on each side of the area where plants are being removed in a kayak with skimmer nets to help catch any fragments that may break free.

Manual removal procedure

1. Positively identify the locations where EWM is to be removed. If needed, you can place buoys to mark each area so you can easily return to the location.
2. Be aware that EWM fragments very easily. Often times it fragments on its own for no apparent reason. Be ready at all times with the skimmer nets to catch any fragments. Fragments will not always float to the surface. They may be suspended 2-3 feet below the surface.
3. Once the platform or boat is within reach of the plant(s), determine which removal tools are most appropriate. You should anchor the platform or boat in two directions so it cannot move.
 - A. If there is a **single EWM plant growing** and there are no other plants of any type adjacent to the EWM plant to be removed, it is very easy to push the tines of the 4-tine cultivator into the substrate under the plant. It is best if you can push the tines in 4-6 inches under the plant. After the tines have been pushed into the substrate you can slowly raise the handle to a vertical position and twist the handle wrapping the plant stem around the handle as you twist. When the plant is completely wrapped around the handle you can lift the plant high enough to put the fishing net under the plant in the water and then lift the cultivator with the plant and the net out of the water at the same time.



Manual removal procedure

2. *Plant removal continued*

- A. Let the water drain out of the fishing net, remove the plant from the cultivator letting the plant fall into the net and dump the contents of the net into the garbage bag. Constantly watch for EWM fragments breaking free and catch them with the skimmer nets.
- B. If it is a **larger area with multiple adjacent EWM stems** the bolted fork scissors will work best. Again, get the boat or platform into position and open up the tines so the two forks are separated by about a foot at the tips. Push the fork tines 6-12 inches into the substrate around the plant and squeeze the handles together so you bring the tines together. With the forks still stuck in the lake bottom twist the fork handles so that you wrap the stems around the handles of the fork. You may need to gradually lift the forks slightly in order to spin them. When the stems are completely wrapped around the handles and the roots have loosened you can lift the root mass and the plants high enough so your partner can slip the fishing net under the fork scissors and plant mass. Since you are removing more mass this will be heavier and it may be necessary to lift the fishing net by the frame to keep from breaking it. Once the net is on the platform/boat, you can let the water drain out, remove all plant material from the fork tines and handle into the fishing net, and place the root mass and the stems into the garbage bag. As before, constantly watch for fragments so you can catch them with the skimmer nets.
- C. Make sure you don't put too much material into the garbage bag. It can get heavy fast and breaking the bag can be real frustrating, not to mention pretty messy. (experience talking here)



Manual removal procedure

3. EWM material disposal.

When all the plants have been removed and placed in bags the plant material should be disposed of. Either take the material to a dumping site away from the lake or put the materials in a compost pit that can be covered so animals or birds do not carry the plant parts back to the lake. A good location for dumping is a disposal site away from the lake, or on flat, vegetated ground so plants cannot be washed back into the lake with a heavy rain.

4. For larger or deeper EWM locations

If you find an EWM colony that is either larger or deeper than specified in this procedure or if you are not comfortable attacking a given area contact Steve Fleming to determine if it can be hand pulled with diving methods or if it needs to be chemically treated.

Please contact Steve Fleming if you have any questions or suggestions regarding this procedure.

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