

[Home](#) > [Water Quality](#) > [Non-native Invasive Freshwater Plants - Table of Contents](#) > General Information  
t Eurasian Watermilfoil

## Non-native Invasive Freshwater Plants

### Eurasian Watermilfoil

#### General Information

Eurasian watermilfoil (*Myriophyllum spicatum*) is an attractive plant with feathery underwater foliage. It was once commonly sold as an aquarium plant. Eurasian watermilfoil, hereafter called milfoil, originates from Europe and Asia, but was introduced to North America many years ago and is now found over much of the United States. This plant was introduced to the eastern United States at least as long ago as the 1940s, but it may have arrived as early as the late 1800s. The first known herbarium specimen of milfoil in Washington was collected from Lake Meridian near Seattle in 1965. By the mid 1970s it was also found in Lake Washington. During this same time period milfoil became established in central British Columbia and traveled downstream to Lake Osoyoos and the Okanogan River in central Washington. Now milfoil is found in the Columbia, Okanogan, Snake, and Pend Oreille Rivers and in many nearby lakes. In western Washington, the distribution of milfoil closely follows the Interstate 5 corridor. It is very apparent that milfoil has been spread from lake to lake on boat trailers.



#### Growth Habit

Because it is widely distributed and difficult to control, milfoil is considered to be the most problematic plant in Washington. The introduction of milfoil can drastically alter a water body's ecology. Milfoil forms very dense mats of vegetation on the surface of the water. These mats interfere with recreational activities such as swimming, fishing, water skiing, and boating. In eastern Washington milfoil interferes with power generation and irrigation by clogging water intakes. The sheer mass of plants can cause flooding and the stagnant mats can create good habitat for mosquitoes. Milfoil mats can rob oxygen from the water by preventing the wind from mixing the oxygenated surface waters to deeper water. The dense mats of vegetation can also increase the sedimentation rate by trapping sediments.

Milfoil also starts spring growth sooner than native aquatic plants and can shade out these beneficial plants. When milfoil invades new territory, typically the species diversity of aquatic plants declines. While some species of waterfowl will eat milfoil, it is not considered to be a good food source. Milfoil reproduces extremely rapidly and can infest an entire lake within two years of introduction to the system. Although milfoil produces many seeds, we do not believe that these seeds are important for milfoil reproduction in Washington waters. However, milfoil is able to reproduce very successfully and rapidly through the formation of plant fragments. In the late summer and fall the plants become brittle and naturally break apart. These fragments will float to other areas, sink, and start new plants. Milfoil will also grow from fragments created by boaters or other disturbances during any time of year. A new plant can start from a tiny piece of a milfoil plant. This is why milfoil can so easily be transported from lake to lake on boat trailers or fishing gear. Once established in its new home, water currents may carry milfoil fragments and start new colonies within the same

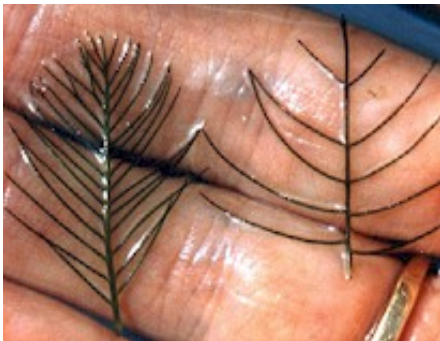
waterbody.

## Management

Once milfoil becomes well-established within a waterbody, it is difficult or impossible to remove. In smaller waterbodies (350 acres or less), we have had some success using an aquatic herbicide called Sonar® to remove milfoil and the selective herbicides 2,4-D and triclopyr-TEA show great promise in managing milfoil infestations. Other control methods include harvesting, rotovation (underwater rototilling), installation of bottom barriers, diver hand pulling, diver dredging, and in some very limited situations the use of triploid (sterile) grass carp. We are investigating other biological controls such as the milfoil weevil. Milfoil management costs the state and private individuals up-to-one million dollars per year.

## Identification

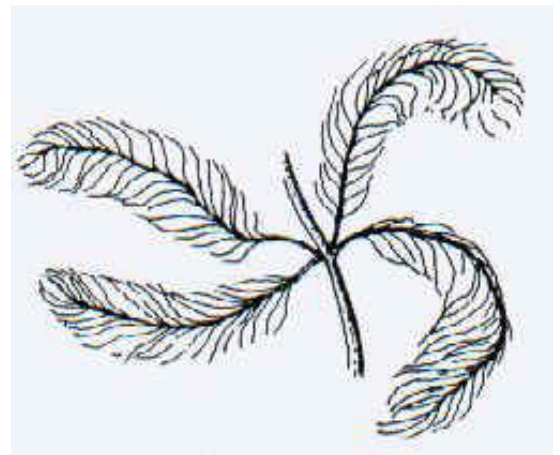
The genus is easy to identify because all milfoils have feather-like leaves arranged in whorls around the stem. Identifying individual species is much more difficult and even the plant experts rely on DNA analysis to tell some species from each other. There are several native milfoil species in Washington and some species like northern milfoil (*Myriophyllum sibiricum*) are commonly found in Washington lakes. In fact, for many years northern milfoil and Eurasian watermilfoil were classified as the same species. Currently botanists seem to be in agreement that the two are separate species, though often can look very similar. The milfoil leaflet to on the right is from a northern milfoil plant. The threadlike segments are very widely separated and there are few pairs per leaflet. The Eurasian watermilfoil leaflet (left side of the photo) has many pairs of closely-spaced segments. Note



also that the shape of each leaflet is different. Unfortunately not all northern and Eurasian milfoil leaflets look so differently from each other. Sometimes these two species look very similar and when that happens it is best to rely on DNA or pigment analysis for positive identification.

Here are some tips to identify Eurasian watermilfoil from the native milfoils.

- Count the pairs of leaflets. Eurasian watermilfoil usually has twelve or more pairs on each leaf.
- Eurasian watermilfoil leaves tend to collapse around the stem when removed from the water. Other milfoil species have thicker stems and are usually more robust.
- The mature leaves are typically arranged in whorls of four around the stem.
- Contact Jenifer Parsons, Ecology's botanist, at [jenp351@ecy.wa.gov](mailto:jenp351@ecy.wa.gov) for positive identification.



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Problems with this page, contact Kathy Hamel at [kham461@ecy.wa.gov](mailto:kham461@ecy.wa.gov)

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