

Characteristics and Invasion of Eurasian Watermilfoil

(*Myriophyllum spicatum*)

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Eurasian watermilfoil is a perennial, submersed aquatic plant that is native to Europe, Asia and Africa. It is believed to have become established in north America in the 1940's and has quickly spread across the continent and is found in most U.S. states and Canadian Provinces. Eurasian watermilfoil is capable of growth in a wide range of habitats (lake types) and spreads from lake to lake as plant fragments; boats and waterfowl are the most likely vector of dissemination.

Habitat Preference and Characteristics

Eurasian watermilfoil is commonly found on soft organic sediments but will colonize rocky and sandy substrates as well. It is capable of growing aurally in times of low water and in depths of more than 7 meters. It appears to be capable of growing in deeper waters and to be more shade tolerant than most native plant species. These characteristics, shade tolerance and the ability of this plant to grow in deep water, have assisted Eurasian watermilfoil in what has become its typical invasion pattern. Eurasian watermilfoil will generally colonize the deeper water where native vegetation is absent. It then displaces the native plants of the shallower waters by creating a canopy over the adjacent plants, shading and crowding them out. Eurasian watermilfoil is opportunistic and extremely aggressive. It is commonly found growing in areas that are not highly disturbed but seems to reach nuisance production levels more rapidly in disturbed areas created by inappropriately applied lake management strategies. These strategies include mechanical harvesting, recreational uses and other anthropogenic (human induced) ecosystems disturbances, such as accelerated sediment loading as a result of development and agriculture. It consistently demonstrates an ability to grow earlier and much faster than competing native plants in such disturbed areas.

Reproductive and Dispersal Characteristics

Eurasian watermilfoil is commonly known to crowd out native aquatic plant species. The reproductive characteristics and over-wintering habits help to ensure its predominance over more desirable native North American submersed plants. It over-winters a considerable amount of evergreen type biomass, providing this exotic with a formidable competitive advantage over many native plant species. By over-wintering biomass, it can hold growing space at the beginning of the growing season limiting native growth.

Eurasian watermilfoil is capable of explosive growth at the very beginning of the growing season, which provides it with another competitive advantage over native plants. Native plants typically begin growth later in the year.

Most experts agree that vegetative spread is its chief form of dispersal. A fragment, including a single node, is capable of producing a new plant, and any mechanical disturbances of this plant (i.e. boat motors, aquatic plant harvesting, etc.) will dramatically enhance its dispersal and dominance of native lake flora. Plant fragments are also known to withstand the rigors of desiccation, as might be encountered on a boat motor or trailer as it is transported from lake to lake.

Eurasian watermilfoil will also spread by means of stolons, which are specialized stems that "creep" over the bottom of the lake. This type of spread is commonly observed in the autumn through the early summer of each proceeding season.

Some Specific Impacts caused by Eurasian watermilfoil

1. Native plant beds provide twice as many invertebrates per square meter than Eurasian watermilfoil beds (Keast, 1983).
2. As Eurasian watermilfoil density increases, native plant diversity decreases. (Trebitz, 1993).
3. As plant densities increase beyond a certain threshold, water movement within the Milfoil bed is severely restricted and reduced light levels result in a curtailment of photosynthetic production oxygen. (Lillie & Budd, 1992).
4. Reduced levels of dissolved oxygen, the release or build up of nutrients, and other changes in water chemistry may provide unfavorable conditions for both micro invertebrates and fish. (Lillie & Budd, 1992).
5. Three to four times the number of fish was observed in native plant beds versus Eurasian watermilfoil beds. (Keast, 1993).

Management Strategies of Eurasian watermilfoil

Mechanical harvesting is not recommended for control of Eurasian watermilfoil for two reasons.

1. The potential for plant fragmentation by mechanical harvesters can serve to spread Eurasian watermilfoil beyond the management area(s) and intensify problems throughout an infested lake.
2. Eurasian watermilfoil will usually dominate the re-growth community and gain further advantages over native plant species because of its faster relative growth rate.

The use of selective, systemic aquatic herbicides has proven to be the best management tool to control Eurasian watermilfoil to date. 2,4-D and fluridone products have been the two top choices in this chemical category.

2,4-D has been used extensively for the management of Eurasian watermilfoil in many lakes and ponds for many years with a great deal of success. 2,4-D can also be used as a "spot-treatment" tool and has repeatedly been proven to be highly selective against Eurasian watermilfoil when used at a narrow range of application rates. Nearly all of the native submersed plant species are unaffected by 2,4-D when used at the rates required for the management of Eurasian watermilfoil.

Fluridone is highly mobile in surface water and therefore must be applied to achieve a volume or a targeted concentration throughout the entire lake. Fluridone is not commonly used as a "spot-treatment" herbicide. Unlike most aquatic herbicides, low water temperatures do not compromise the efficacy of fluridone. These three characteristics, Eurasian watermilfoil sensitivity, temperature tolerance and the early production of Eurasian watermilfoil along with the solubility of formulations and the systemic activity of this herbicide make fluridone another viable choice for the renovation and restoration of submersed flora communities.