

Water Fern

(*Azolla filiculoides*)



Family name: Azollaceae (Water Fern family)
Common name/s: Water Fern, Red Water Fern, Fairy Moss, Mosquito Fern



Water Fern (*Azolla filiculoides*) is a small, free-floating aquatic fern known for its rapid growth and ability to form dense mats. In Ireland, it is considered an invasive species, particularly in calm, nutrient-rich freshwater bodies, where it can outcompete native plants and alter ecosystems.

The plant spreads mainly through vegetative fragmentation, making management challenging.

Control strategies include mechanical removal, biological control using the Azolla Weevil, herbicide application, and preventative measures to limit its spread.

If left unmanaged, Water Fern can significantly impact biodiversity, water quality, and the usability of water bodies.

Description - Water Fern is noted for quickly forming dense mats on the surface of water bodies. It has spread to many temperate regions, including Ireland, where it can become invasive.

Azolla filiculoides is unique in that it forms a symbiotic relationship with nitrogen-fixing cyanobacteria, allowing it to thrive in nutrient-poor conditions.

Key characteristics include:

Size: Individual plants are small, typically 1-2 cm across, but can grow densely to form large mats covering the water surface.



Leaves: The leaves are overlapping and scale-like, with a feathery appearance. They are typically green but can turn reddish or purplish in colder weather or when exposed to full sun.

The leaves are arranged in two rows on the upper surface, with the lower row often submerged.

Stem: The plant has a branched stem that allows it to spread horizontally over the water's surface.



The stems are thin and delicate, easily breaking into fragments.



Roots: Has fine, hair-like roots that dangle into the water, absorbing nutrients directly from the water column. The roots are not anchored in the substrate.

Habitat - Water Fern is native to North and South America, where it grows in a variety of aquatic habitats. In its introduced range, it can thrive in:

- **Lakes, Ponds, and Slow-Moving Rivers:** Often found in calm, nutrient-rich freshwater, where it forms dense mats that cover the water surface.
- **Canals and Ditches:** Commonly grows in man-made water bodies, such as drainage ditches, canals, and reservoirs.
- **Wetlands:** Can establish in shallow, marshy areas and other wetland habitats with standing or slow-moving water.



The plant prefers nutrient-rich waters and can tolerate a range of temperatures, though it grows best in temperate to warm climates.

Status in Ireland - In Ireland, Water Fern is considered an invasive species, particularly in lakes, ponds, and canals, where it can outcompete native aquatic vegetation and significantly alter the ecosystem.

It is listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011, making it an offence to introduce, plant, or cause its spread.

Reproduction and Spread - Water Fern reproduces through both vegetative fragmentation and spore production:

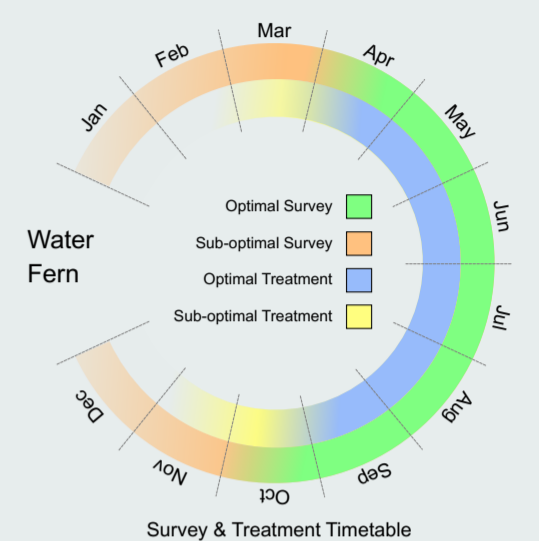
- **Vegetative Fragmentation:** The primary method of reproduction is through fragmentation, where even small pieces of the plant can grow into new colonies. This allows the plant to spread rapidly, especially through human activities such as boating and waterfowl movement.
- **Spore Production:** While the plant can also reproduce sexually via spores, this is less common than vegetative spread.

Management and Control - Controlling Water Fern is challenging due to its rapid growth and ability to regenerate from small fragments. Management strategies include:

- **Mechanical Control:** Manual removal or mechanical harvesting can help reduce the plant's biomass, but care must be taken to remove all fragments from the water to prevent regrowth.

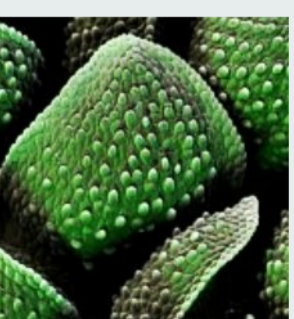
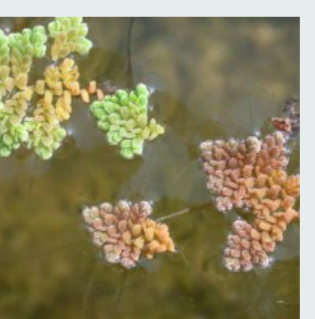
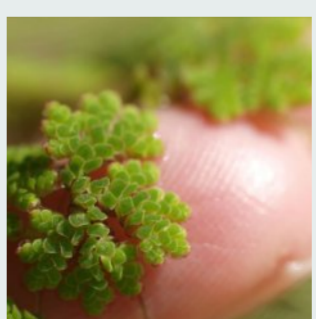
Covering affected areas with light-blocking materials, such as black plastic, can help reduce growth.

- **Biological Control:** The Azolla Weevil (*Stenopelmus rufinusus*) has been used in some regions as a biological control agent. The weevil feeds on the Water Fern, reducing its growth and spread.
- **Chemical Control:** Herbicides approved for aquatic use, such as those containing glyphosate or diquat, can be used to manage infestations, although chemical treatments may have impacts on non-target species.
- **Preventative Measures:** Avoid introducing Water Fern to ponds or water gardens, and clean boats, trailers, and fishing gear before moving between water bodies to prevent accidental spread.



Ecological Impact - Water Fern can have significant ecological impacts, particularly in areas where it becomes invasive:

- **Competition with Native Species:** Forms dense mats that block sunlight, reducing the growth of submerged aquatic plants and impacting the aquatic food web.
- **Alteration of Water Quality:** The dense mats can lead to reduced oxygen levels in the water, affecting fish and other aquatic organisms.
- **Interference with Water Use:** The mats can impede recreational activities, such as boating and fishing, and can clog irrigation canals and drainage systems.



For further information and free advice, please contact:
Japanese Knotweed Control Ltd.



Email: mail@jkc.ie
 Tel: +353 (0)86 250 8805
 Web: www.jkc.ie

