

# Giant Salvinia

Giant salvinia, *Salvinia molesta*, is an invasive aquatic weed from South America with the potential to do serious harm to U.S. waterways. A free-floating fern, *S. molesta* was first found in South Carolina in 1995. Although that outbreak was successfully eradicated, giant salvinia has now been observed in 24 watersheds in Texas, California, Arizona, Louisiana, Mississippi, Alabama, Georgia, and Florida. Giant salvinia can successfully winter over in some parts of the United States. Due to their temperate climate, Southern States are more susceptible to salvinia infestation. Its estimated range extends along the gulf and Atlantic coasts from Texas to Virginia, and west to California as far north as the Sacramento River delta.

The U.S. Department of Agriculture (USDA) listed *Salvinia molesta* as a noxious weed in 1983. Animal and Plant Health Inspection Service (APHIS) scientists are developing a strategy to control giant salvinia using a biological control agent—a host-specific weevil originally from southeastern Brazil. Overseas releases of this weevil have successfully suppressed salvinia in many countries.

## Description

*Salvinia molesta* varies in color from green to gold to brown. It is an aquatic fern with floating, oblong leaves. And, while the leaves of young plants lie flat



**Figure 1**—Giant salvinia has been known to cover entire lakes and can double its size every week or so in warm weather.

on the water's surface, the leaves of mature plants grow to be between 1/2 and 1 1/2 inches long (1.27 and 3.8 cm) and are forced upright. A long chain formation occurs as the plants grow together to form mats. Giant salvinia is very prolific and under favorable conditions can double the size of its mats in 7 to 10 days. As the mats continue to grow, they form thick layers of vegetation. Overseas, the layers have grown more than 2 feet thick.

The surface of the salvinia leaf has rows of cylindrical "hairs" topped with four branches that are joined at the tips to form a cage or eggbeater shape. These hairs give a plush appearance and repel water. In mature plants, underwater rootlike structures conceal stalks that can have egg-shaped spore cases attached. In the United States, these spore cases are not known to contain fertile spores. This weed overwinters and reproduces vegetatively.



**Figure 2**—In mature plants, underwater rootlike structures conceal stalks with egg-shaped spore cases attached. These spores are infertile; vegetative reproduction is the norm.

## Spread

Giant salvinia can spread in many ways. Plants can be carried overland by anything entering infested waters. Boats and other recreational craft can transport this invasive weed from one body of water to another. Younger ferns can follow the natural course of a moving body of water to establish colonies anywhere downstream. And because the public may not recognize the invasive nature of giant salvinia, the plants are still found for sale at some nurseries and in the catalogs of mail-order plant suppliers. Giant salvinia is often found as a contaminant in other aquatic nursery stock. Some aquatic-plant enthusiasts actually exchange it informally amongst themselves for use as a decorative specimen in outdoor ponds. As the salvinia ages, however, it chokes out other plantings and becomes a destructive plant pest.



**Figure 3**—This invasive weed can travel over land attached to gear and water craft. Boaters must make certain not to transport giant salvinia.

## Damage

*Salvinia molesta* can greatly alter aquatic ecosystems. As the mature plants weave themselves into a thick, floating mat, oxygen and light are blocked from the water. Native macrophytes and microscopic algae that form the base of the food chain may die off. The creatures that feed on these may die, too, and so on up the food chain.

The rapid spread of this pest threatens cultivated aquatic crops, and it can clog irrigation and drinking water lines and foul hydroelectric plants. Salvinia-infested waters cannot be used for boating or other recreational purposes.

## Control

The good news about managing giant salvinia is that control has been demonstrated without the use of toxicants. In tropical parts of Australia, India, Namibia, Papua New Guinea, and Botswana, introductions of the weevil *Cyrtobagous salviniae* suppressed populations of this aquatic weed. Eradication of big infestations generally requires the use of commercially available herbicides in addition to biological control organisms.

APHIS scientists are currently studying the success of *C. salviniae* and are developing plans for its use. Also, APHIS is working with other Federal and State agencies to prevent the spread of giant salvinia by educating the public on how this invasive, noxious weed fouls waterways and travels over land.

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