

# AIS

## Aquatic Invasive Species

### GIANT SALVINIA



**COMMON NAME:** Giant Salvinia

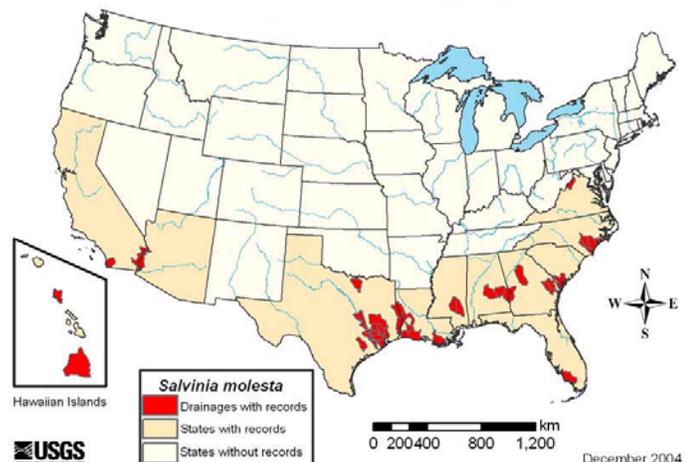
Some other common names for this species are Kariba weed, African pyle, aquarium watermoss, koi kandy, water velvet, water fern and salvinia.

**SCIENTIFIC NAME:** *Salvinia molesta*

Giant salvinia is in the family Salviniaceae, which are the water ferns. This species name *molesta* is Latin for troublesome or annoying. That could not be any more accurate; some have called this plant the world's worst weed.

**DISTRIBUTION:** Giant salvinia is native to Brazil. Its current range includes New Guinea, Australia, Mauritius, Africa, India, Sri Lanka, Ceylon, New Zealand and the United States. Just in the United States, giant salvinia can be found in the states of Alabama, Arizona, South Carolina, North Carolina, Texas, Louisiana, Mississippi, Georgia, Florida, Hawaii, California, and Virginia.

**Indiana:** Giant salvinia has not yet been detected in Indiana's waters but it is on our Aquatic Invasive Species Watch List.





**DESCRIPTION:** Giant salvinia is a floating aquatic fern. Because giant salvinia is actually a fern the leaves are referred to as fronds. They have a horizontal stem that floats just under the water's surface. Two floating fronds are produced at each node. These fronds are ovate, about ½ to 1 ½ inches long, and green in color. The top of the frond is covered with white bristly hairs. Each hair branches into 4 limbs that then rejoin to form a small eggbeater-type shape. The purpose of these hairs is to repel water. In the early stage of its life, the fronds will lie flat on the waters surface. When mature and because of increased crowding, the fronds will fold up and compress into chains. A third frond develops under water that is brown, highly divided, and sometimes is mistaken for a root, however the plant has no true roots. The underwater frond can grow very long and creates drag to stabilize the plant. This underwater frond also conceals stalks of round spores.

**LIFE CYCLE BIOLOGY:** Giant salvinia grows in tropical, sub-tropical, and warm temperate areas of the world. It likes ditches, ponds, lakes, slow moving rivers and irrigation canals. It will only tolerate freshwater and cannot grow in brackish or marine environments. It is able to withstand freezing air temperatures but will not survive under ice.

Giant salvinia reproduces through vegetative means. A small plant fragment is capable of growing into a whole new plant. Also, each node has several lateral buds. These buds can remain dormant through times of stress and drought and when conditions are right again they will grow. Giant salvinia produces fruiting bodies called spores but these spores are infertile. This plant is capable of rapid growth in times of optimal growing conditions. This species is capable of doubling in volume every 7-10 days quickly forming dense mats on the surface of the water.

**PATHWAYS/HISTORY:** The first appearance of giant salvinia in the United States was in South Carolina in 1995. While the initial population was eradicated, the plant showed up in two other private ponds in 2004. In 1998, giant salvinia was identified in Texas and Louisiana; both states are still dealing with new sightings of this weed. Florida, Alabama, Mississippi, Hawaii, Arizona, California and Georgia all reported initial infestations of giant salvinia in 1999. North Carolina first reported a population of giant salvinia in 2000. The latest state to report the presence of giant salvinia was Virginia in 2004.

**DISPERSAL/SPREAD:** It seem that the initial introduction of giant salvinia into the United States was through the aquarium trade. This plant has been widely used in aquariums and as a decorative plant in water gardens. It has most likely spread by the dumping of aquarium contents into waterways. Once in open water the plant is able to hitchhike on boats, trailers and other aquatic equipment from one body of water to another. Young plants may travel naturally in moving bodies of water.

**RISKS/IMPACTS:** The reproductive strategy of giant salvinia allows it to quickly form dense mats that can cover large areas of water. There is a safety risk for people and animals as they may become entangled in the root-like structures. Animals may have trouble finding drinking water if the surface is covered with salvinia. This plant will also impede the flow of water to irrigation pipes and other water intake pipes. When heavily infested, recreational activities will be impeded. Boats will be unable to maneuver, and it will make swimming and fishing impossible. The floating mats are havens for mosquitoes, which can pose a human health risk.

Giant salvinia causes many ecological problems as well. This plant may cause water loss in summer because of the high rate of transpiration. Studies have shown that water with giant salvinia cover could transpire 4 times more water than normal. When it covers a body of water, it blocks sunlight from reaching other aquatic plants causing them to die reducing biodiversity. As rooted plants get shaded out, habitat for fish and other aquatic life is lost. The mats of giant salvinia can become up to 3 feet thick making the water look more like land, which can affect use by water-loving birds. Giant salvinia provides no food for animals and relatively little aquatic habitat.

**MANAGEMENT/PREVENTION:** As a way to try to stop the spread of giant salvinia the U.S. Department of Agriculture listed the plant as a noxious weed in 1983. Plants determined to be noxious weeds are banned from sale or possession. Authorities are allowed to inspect shipments for noxious weeds, seize and destroy products, and to quarantine areas, if necessary to prevent the spread of such weeds.

If an infestation of giant salvinia is caught before it has a chance to get out of control, it can be managed. Small infestations can be treated with chemicals. Mechanical methods may also be used in this situation. This is tricky because giant salvinia reproduces by fragmentation. Removal by hand or by a machine can be useful but all remnants must be moved away from the water and disposed of properly.

A biological control mechanism has been found that controls giant salvinia. A weevil, *Cyrtobagous salviniae*, will live on the leaves. The female weevil will lay her eggs in a hole she makes in the leaf bud. The eggs then hatch and the young feed on the leaf base and the bud. Eventually the larvae will tunnel their way to the rhizome weakening the plant and reducing its ability to grow. The adult weevils also feed on the plant's buds reducing its ability to grow. After awhile the plant will turn brown, sink and die.

While there are some control methods available to eradicate or reduce a population of giant salvinia, it is more important to not allow the plant to become established in the first place. Here are some things you can do to help prevent the spread of giant salvinia and other aquatic invasive plants.

- ✓ Rinse any mud and/or debris from equipment and wading gear and drain any water from boats before leaving a launch area.

- ✓ Remove all plant fragments from the boat, propeller, and boat trailer. The transportation of plant material on boats, trailers, and in livewells is the main introduction route to new lakes and rivers.
- ✓ Do not release aquarium or water garden plants into the wild, rather seal them in a plastic bag and dispose in the trash.
- ✓ Consider using plants native to Indiana in aquariums and water gardens.
- ✓ Immediately report the sighting of giant salvinia to the Indiana Department of Natural Resources, Division of Fish and Wildlife.
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\*\*\*Photos compliments of the United States Geological Survey.