CASE STUDY: HYDRILLA (*Hydrilla verticillata*)

The introduction and spread of aquatic invasive species (AIS) poses a threat to lakes, rivers, and other water bodies throughout North America. One pathway that has been shown to contribute to AIS spread is seaplanes. This case study illustrates the role seaplanes can play in the spread of AIS and the negative impacts AIS establishment can have on the environment as well as seaplane safety and operations. These case studies also illustrate the important role seaplane pilots can play to prevent the spread of AIS.

FAA Geographic Region: Central

Hydrilla was first found in the United States in Florida in 1952 and has since spread to 27 states primarily in the South and East. In the Central Region, infestations of hydrilla are concentrated in Missouri and Oklahoma. Because of its limited distribution in the Central Region, it is possible that informed seaplane pilots can prevent further spread to other waterbodies.

What is Hydrilla?

Hydrilla verticillata, and its numerous subspecies, is a rooted aquatic plant that grows long stems to reach the surface to form dense mats. It can be found in freshwater lakes, rivers, ponds, and canals. Native to the Indian subcontinent, it is a popular aquarium plant that was initially introduced to waters of the United States as discards from aquarium dumping. Hydrilla fragments, root stem pieces, and its tubers can generate new plants. The tubers can survive multiple days out of water.

Why is Hydrilla a problem?

Once established, hydrilla can grow aggressively and spread in shallow areas forming thick mats. The thick growth can displace beneficial native plants and create anoxic conditions harming other species. Dense beds of hydrilla can also restrict boating, swimming, and general access to water. Recently, cyanobacteria—blue-green algae that can affect water quality and function—have been associated with hydrilla infestations, which has been linked to bald eagle, waterbird, and fish deaths.

How can Hydrilla be spread by seaplanes?

Hydrilla can be moved to new waterbodies as fragments clinging to floats and other seaplane surfaces. Plant fragments or tubers can become entrained and easily be transported on seaplane floats, mooring lines, wires and cables, and rudders. Seaplanes that take on water in their floats may contain plant fragments that can be transported to new waters.

Seaplane pilots can help prevent the spread of aquatic invasive species.

Examples of other aquatic invasive species you may encounter in your region:

- Brazillian Waterweed (*Egeria densa*)
- Brittle Waternymph (*Najas minor*)
- Common Salvinia (*Salvinia minima*)
- Curly-leaf Pondweed (*Salvinia minima*)
- Eurasian Watermilfoil (*Myriophyllum spicatum*)
- Flowering Rush (*Butomus umbellatus*)
- Purple Loosestrife (*Lythrum salicaria*)
- Water Hyacinth (*Eichhornia crassipes*)
- Water Primrose (*Ludwigia spp.*)
- Whirling Disease (*Myxobolus cerebralis*)

SEAPLANE PILOT BEST PRACTICES TO REDUCE THE SPREAD OF AQUATIC INVASIVE SPECIES

Follow these steps to improve your flying safety while preventing the spread of aquatic invasive species (AIS).
Why? AIS can take over waterbodies and crowd out native species, harming native fish and wildlife populations and potentially reducing seaplane access.

Planning a Flight

Familiarize yourself with AIS at destination water bodies, but recognize that not all water bodies are monitored for AIS— always assume a waterbody has AIS.

If you are departing from a waterbody that has confirmed high-risk AIS, before landing at another water body, consider landing at an airport first to fully inspect and clean your aircraft.

Before Entering the Aircraft

Inspect and remove any visible vegetation or other debris from the aircraft. Remove any plant growth on mooring lines and dispose of any plants or identified AIS in a container, which can then be disposed of properly upon returning to the base location. Inspect the following for AIS:

- Floats
- Hulls
- Rudders
- Wires and Cables
- Mooring lines
- Wheel Wells
- Crossmembers
- Exterior paddle
- Your footwear and gear

Visually inspect submerged parts of the aircraft and run your hands, or use a brush, along the surfaces to check for any AIS that may be attached, especially if the aircraft has been moored on a waterbody for more than a few hours.

Pump as much water as possible out of bilge compartments using a pump with an invasive species filter (e.g., Turbo Pump) to limit the possibility of transporting microscopic AIS.

Before Takeoff

Just prior to takeoff, **raise and lower your water rudders several times to remove aquatic hitchhikers**, which can cause cable stretch and affect steering.

Avoid taxiing through aquatic plants. If you must taxi through aquatic plants, stop once in open water and manually clear vegetation from floats, hull, and rudders.

After Takeoff

After takeoff at a safe altitude, if conditions permit, **raise and lower your water rudders numerous times while flying over the water body you are departing** to clear aquatic plants from the water rudders and cables. If aquatic plants remain visible on the plane, return and remove them.

Storage and Mooring

Thoroughly *Clean, Drain, Dry* the aircraft prior to flying to another waterbody. If the aircraft floats take on water, completely drain and dry if possible, and flush the floats with hot water. Allow to dry completely.

Report Invasive Species

Report any invasive species you see to your state AIS reporting system.

Spread the Word about Clean, Drain, Dry

Informed seaplane pilots can make a difference in preventing the spread of AIS. Talk with your colleagues and spread the word about the importance of *Clean, Drain, Dry* and the steps pilots can take to minimize the spread of AIS.

Expand your understanding of the types of AIS you might encounter in local and regional waterbodies by visiting https//nas.er.usgs.gov.

Become a Certified AIS-Trained Seaplane Pilot!

Click on the QR code to watch a video created by the Washington Seaplane Pilot Association. After watching the video, take a short test, and earn your annual certificate to become an AIS-trained seaplane pilot. This certificate is recognized by all of the Pacific Northwest states.