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CASE STUDY: ELODEA SPP.—CANADIAN WATERWEED AND NUTTALL’S WATERWEED (*Elodea canadensis*, *E. nuttallii*)

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: Alaska

Elodea spp. were the first freshwater AIS reported from the State of Alaska. First reported in 1982 from Eyak Lake, a large lake in Cordova, nearly half of the known infestations in Alaska have been in seaplane-accessible water bodies. In 2015, Lake Hood, home to the world’s busiest seaplane base, was the site of a successful extensive and costly *Elodea* spp. eradication project by the State of Alaska.

What are *Elodea* spp.?

Canadian waterweed and Nuttall’s waterweed, also known as *Elodea* spp., are closely related freshwater aquatic plants native to much of the contiguous United States and southern Canada. *Elodea* spp. are submerged aquatic plants that grow in lakes and streams and can form large, dense beds that grow from the bottom of a water body to the surface and then spread horizontally. Aggressive, weedy growth occurs in many types of water bodies, including nutrient-rich as well as clear, cold waters. This plant continues to grow under ice during the winter season when native plants cease to grow.

Why are *Elodea* spp. a problem?

Once established, *Elodea* spp. grow rapidly, compete with native plants for light and nutrients, and create a dense mat. These dense mats impair water bodies and reduce the quality of spawning and rearing habitat for salmon, whitefish, and grayling. The explosive growth and dense mats of *Elodea* spp. pose safety hazards for seaplanes, boats, and people. When *Elodea* spp. dieback, oxygen levels for fish and other organisms are reduced as the plants decompose. The relentless boom and bust of *Elodea* spp. may decrease property values while increasing management costs.

How can *Elodea* spp. be spread by seaplanes?

Known as oxygen weed in the aquarium trade, uninformed aquarium owners that dump their tank vegetation into water bodies contribute to the spread of *Elodea* spp. Once established, *Elodea* spp. spread easily. Fragments of *Elodea* spp. as small as two inches can root and establish a new population. These fragments, which can withstand both periods of freezing temperatures and drying, can easily be transported on seaplane floats, mooring lines, wires and cables, and rudders.

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

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

- Didymo (*Didymosphenia geminata*)
- Purple Loosestrife (*Lythrum salicaria*)
- Big-Eared Radix (*Radix auricularia*)



ALASKA 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, thoroughly inspect your aircraft for AIS.

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 properly (trash) upon returning to your base. 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. This is especially important if the aircraft has been moored on a water body 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. Dryland storage during an Alaskan winter will likely kill AIS attached to your plane or in your float compartments. However, some AIS, such as *Elodea* spp., can survive overwintering in wet float compartments.

Report Invasive Species

Report any invasive species you see to the Alaska Invasive Species Hotline, 1-877-INVASIV (1-877-468-2748). You can also [report online](https://www.adfg.alaska.gov/index.cfm?adfg=invasive.report) (<https://www.adfg.alaska.gov/index.cfm?adfg=invasive.report>), or send an email: dfg.dsf.invasivespecies@alaska.gov.

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 the Alaska Department of Fish and Game Invasive Species [website](https://www.adfg.alaska.gov/index.cfm?adfg=invasive.main) at <https://www.adfg.alaska.gov/index.cfm?adfg=invasive.main>.



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.