

Aquatic Invasive Species

A Lewis Creek Association Webinar



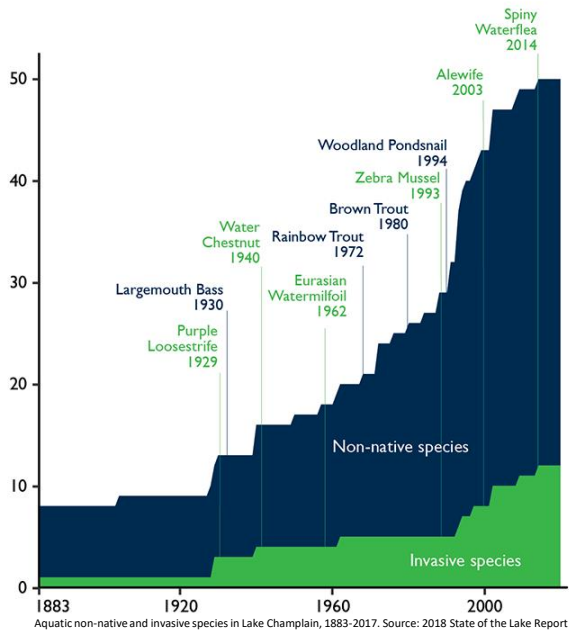
We Need Your Help!!!



Hello all. My name is Matthew Gorton and today we will be talking about Aquatic Invasive Species and some of the ways that Lewis Creek Association is working to eradicate them and to prevent their spread. I wanted to start the webinar off with a video showing LCA's successful European Frogbit harvest at Town Farm Bay and the lower LaPlatte River.

Aquatic Invasive Species

- What are Aquatic Invasive Species (AIS)?
 - AIS are non-native and cause damage to the environment, the economy, or human health
- The Lake Champlain Basin has around 51 non-native species
 - Around 12 of those non-native species are invasive



Aquatic Invasive Species

- AIS can choke out waterways
- Cause damage to infrastructure
- Prevent recreation



Aquatic invasive species can choke out waterways, killing off other species and prevent waterfowl from landing. The first photo was taken in the southern portion of Lake Champlain and is showing a dense Water Chestnut mat. AIS can also cause damage to infrastructure, leading to millions of dollars in repairs. The second photo is showing the impact of Zebra Mussels on water pipes. As you can see, the Zebra Mussels have formed a nearly impenetrable barrier to water movement through the pipe. Lastly, AIS often prevent recreational activities, such as swimming, fishing, and boating.

<https://atlas.lcbp.org/issues-in-the-basin/aquatic-invasive-species/water-chestnut/#>

https://esemag.com/wp-content/uploads/2016/05/Zebra_mussels_pipe.jpg

<https://stopaquatic hitchhikers.org/content/uploads/2016/10/hyrdilla-on-boat-e1487275402311.gif>

Biology of AIS

- Humans are responsible for the rapid spread of AIS via:
 - Introduction of non-native species
 - Disrupting the balance of native ecosystems
 - Spreading AIS through recreation



Humans are responsible for the rapid spread of AIS via the introduction of non-native species from other countries or regions into water bodies where they lack natural predators and competitors that would keep them in check. One example of humans unintentionally spreading invasive species is due to international trade. Zebra mussels were spread to the Great Lakes in the 1980s via the ballast water in cargo ships. Ballast water is water that is pumped into the ship after it is loaded with cargo, to offset the added weight of the cargo. This water is pumped into the boat from the water the ship is in. So, a cargo ship coming from the Black Sea region had pumped in water that contained zebra mussel veligers (i.e., the larval stage for zebra mussels). This cargo ship then crossed the ocean, unloaded its cargo in the Great Lakes region and pumped out the water that contained the zebra mussels. Governments have now made laws to ensure that cargo ships dump their ballast water in the ocean before coming into freshwater ports (where they also pump in salt water to replace the fresh water) and then they can safely release the salt water into the freshwater port without much risk of spreading AIS. This is due to the abrupt salinity change. Any freshwater organisms are killed in the ocean water, whereas the saltwater organisms are killed in the freshwater. Humans are also responsible for disrupting the balance of native ecosystems by changing environmental conditions, which makes it easier for invasive species to invade. Stream sedimentation, ditching, building roads, and

building dams disturb native species, making it easier for invasive species to invade those disturbed areas. The easiest way that AIS are spread from water body to water body is due to human recreation. This occurs by people not removing invasive plants or animals from their boat and releasing their unused bait into the water. It's also important to remember that even native species can become invasive if you transport them to an ecosystem where they don't naturally occur. Therefore, it is EXTREMELY important to remove all plants and animals, regardless if they are native or not, from your watercraft and equipment.

Biology of AIS

- AIS invasions result in a loss of biodiversity
- Lead to threatened & endangered species



Biodiversity is severely reduced after AIS invasions. Around 42% of the species on the federal threatened or endangered species lists are at risk primarily because of invasive species. All of the species shown in these pictures can be found in Town Farm Bay and the LaPlatte river and could be at risk of losing their habitat if AIS aren't stopped from spreading.

<http://fwp.mt.gov/fishAndWildlife/species/ais/impacts.html>

Biology of AIS

- AIS invasions result in a loss of biodiversity
- Lead to threatened & endangered species
- Function as “ecosystem engineers”

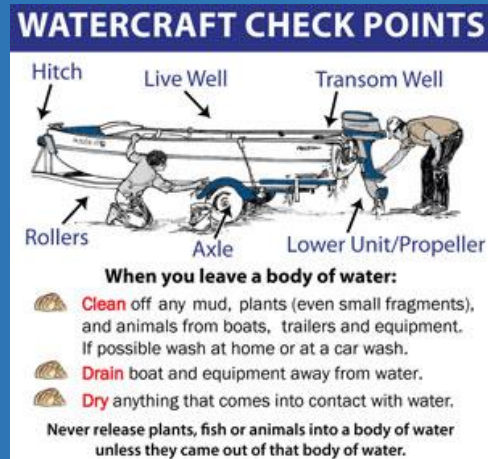


Many invasive species function as “ecosystem engineers,” meaning that they significantly alter the environment that they invaded. For example, zebra mussels are small organisms that rapidly reproduce and severely alter the food chain and clarity of the water. They do this by feeding on microscopic plants (plankton) and animals (zooplankton), significantly reducing the food supply for native organisms. Zebra mussels are also helping the spread of aquatic invasive plants by making the water clearer. The clearer water allows the sunlight to penetrate deeper into the water column, which allows plants to grow in deeper water. Zebra mussels have also been linked with enhancing conditions for cyanobacteria blooms.

<http://fwp.mt.gov/fishAndWildlife/species/ais/impacts.html>

Clean, Drain, Dry

- Always clean your boat
- Always drain your boat of water
- Always dry your boat



The most effective way to combat invasive species is to prevent their spread to other bodies of water. Therefore, always remember to clean, drain, and dry your boat, equipment, shoes, and lifejackets when you leave any body of water! Some organizations recommend waiting specific time periods before launching your boat into a new body of water. However, some AIS can survive for extremely long periods of time in very little water. For example, Zebra Mussel veligers or Spiny and Fishhook Waterfleas are able to survive for extended amounts of time in a single drop of water. Therefore, you should ensure that your boat and equipment is completely dry before launching into a new body of water.

Town Farm Bay

- A Vermont Natural Heritage Site and premier wetland
- Thorp and Kimball Brooks enter Lake Champlain
- Contains rare plants and natural communities



Town Farm Bay was designated as a Vermont Natural Heritage Site and premier wetland by the Vermont Agency of Natural Resources, the Nature Conservancy, and the Town of Charlotte. Thorp Brook and Kimball Brook form the large and diverse wetland complex as they enter Lake Champlain. Town Farm Bay is characterized by its large deep bulrush marsh, cattail marshes, shallow emergent marshes, and its state-rare buttonbush swamp. The wetland complex is surrounded by an intact floodplain forests that have stunningly beautiful mature silver maples, which make you feel like you are on an entirely different planet. Town Farm Bay also provides valuable habitat for many species of fish, birds, mammals, amphibians, reptiles, and invertebrates. Frogbit removal efforts began at Town Farm Bay in 2009. Initially, around 50% of the wetland was covered by Frogbit. Whereas now, less than 5% of the wetland is covered in Frogbit. This wouldn't have been possible without volunteer effort.

LaPlatte River

- “A riverside oasis” -TNC
- Important habitat for migratory birds
- Filters and cleans the water going into the Lake



LCA also harvests Frogbit at the LaPlatte River Marsh. The Nature Conservancy refers to the marsh as a riverside oasis for migratory birds in Shelburne. The LaPlatte River and marsh provide extremely important habitat for migratory waterfowl in an extremely fragmented landscape. The LaPlatte River Marsh, like other marshes, is essential to filter and clean the water that flows from the LaPlatte headwaters into Lake Champlain.

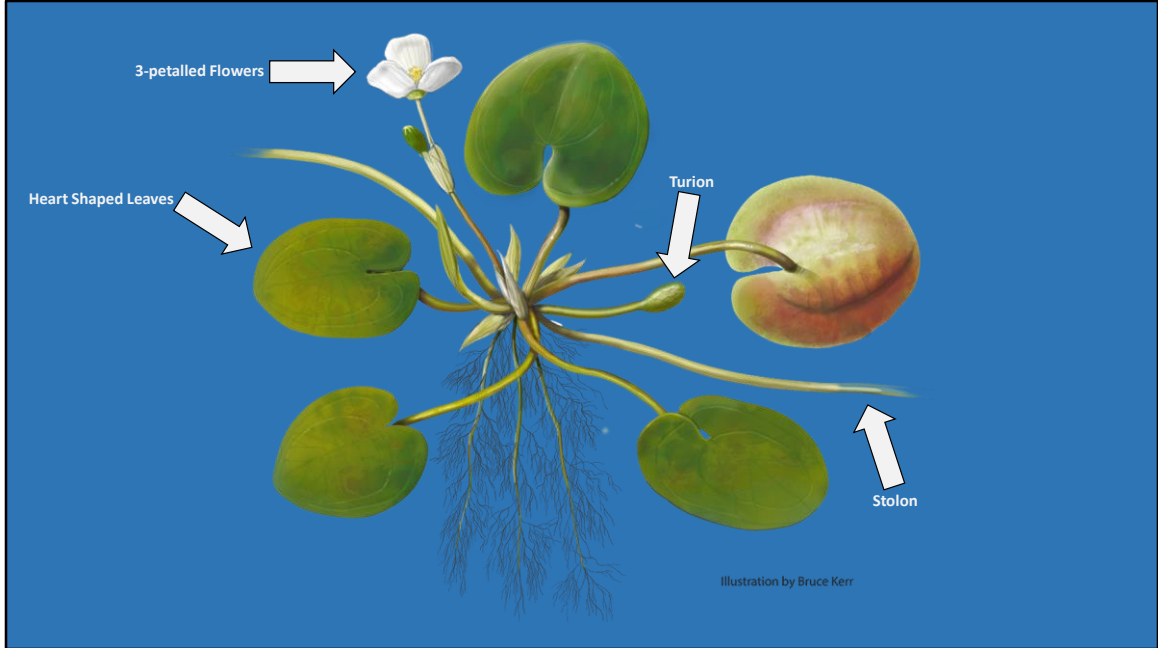
<https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/laplatte-river-marsh-natural-area/#:~:text=Every%20acre%20counts%20in%20this%20rivershore%20natural%20area,Champlain%20and%20drains%2034%2C137%20acres%20of%20Champlain%20lowlands.>

European Frogbit (*Hydrocharis morsus-ranae*)

- Forms thick mats in slow moving water that:
 - Decrease water oxygen levels
 - Negatively impact waterfowl and fish movement
 - Ensnare boat props



European Frogbit is native to Europe and Asia and was introduced to North America (Canada) in the 1930s. Frogbit forms thick mats in still, to slow moving water. These mats decrease water oxygen and light levels, killing native plants and animals; negatively impact waterfowl and fish feeding and movement; and ensnare boat props, making boating difficult and sometimes impossible.

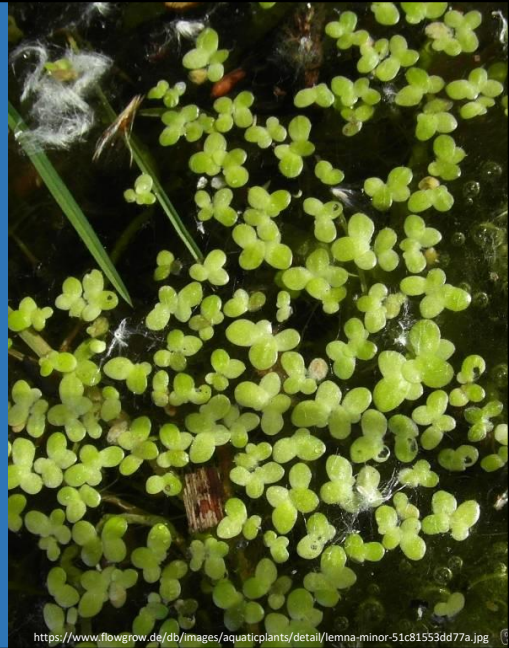


Frogbit is a fast growing, free-floating plant that is often found among native water lillies. Frogbit can be characterized by its small, leathery, heart shaped leaves that are between 0.5-2.25" across. When in bloom frogbit produces white, 3-petalled flowers. Frogbit spreads rapidly and easily by horizontal runners (stolons). These stolons form clones of the "mother plant". Frogbit is able to survive the winter by forming turions, which sink to the bottom of the lake or pond, and then rise to the surface in the spring, forming new plants. Therefore, it is extremely important to harvest frogbit before it's able to form turions.

Similar Native Plants

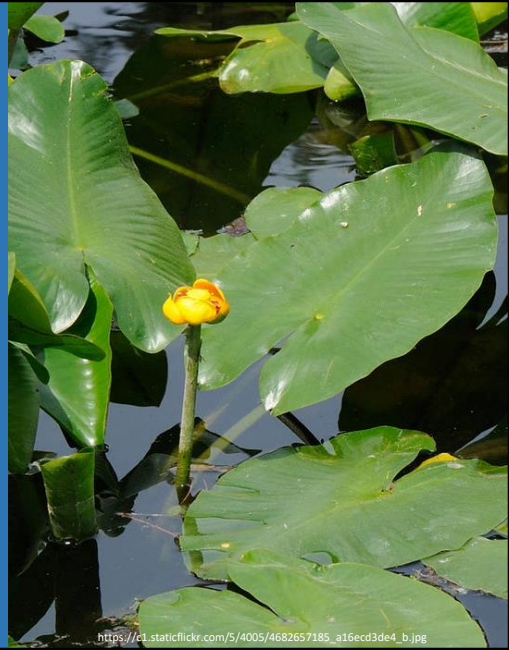
Duckweed (*Lemna minor*)

- Free-floating
- Small, oval leaves 1/16-1/8"



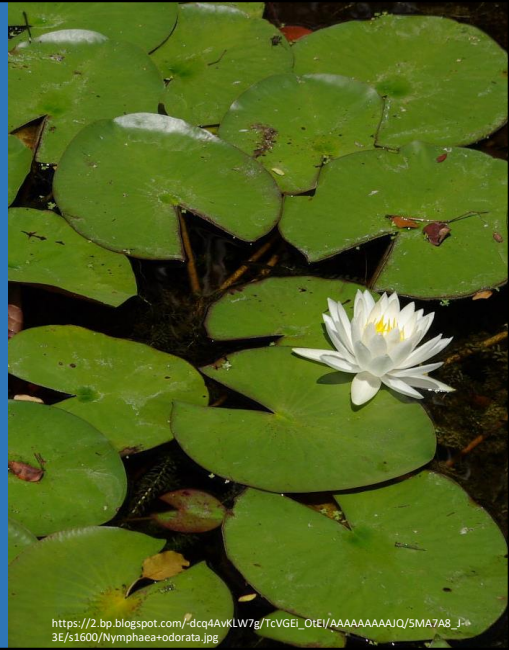
Spadderdock (*Nuphar advena*)

- Long stem that roots into substrate
- Large, floating leaves up to 16"
- Heart-shaped leaves with round lobes
- Yellow flower



White Water-lily (*Nymphaea odorata*)

- Long stem that roots into substrate
- Large leaves with pointed leaf lobes
- White many-petalled flowers



https://2.bp.blogspot.com/_dcq4AvKLW7g/TcVGEI_OtEI/AAAAAAAAAQ/5MA7A8_J-3E/s1600/Nymphaea+odorata.jpg

Other Common Aquatic Invasive Species

Yellow Iris
(*Iris pseudacorus*)



Yellow Iris outcompetes and replaces native Blue Flag Iris

Phragmites
(*Phragmites australis*)



Phragmites outcompetes native vegetation and provides very little, if any, food or shelter for animals depending on marshes. It can grow so thick, that large animals like deer are unable to penetrate.

Flowering Rush
(*Butomus umbellatus*)



Flowering rush grow densely along shoreland areas making it difficult to access open water and outcompetes native aquatic plants.

<https://www.dnr.state.mn.us/invasives/terrestrialplants/herbaceous/floweringrush.html>

Eurasian Watermilfoil
(*Myriophyllum spicatum*)



Thick mats of Eurasian Watermilfoil provide unsuitable shelter, food, and nesting habitat for native Vermont species.

<https://www.dnr.state.mn.us/invasives/aquaticplants/milfoil/index.html>

Curly-leaf Pondweed (*Potamogeton crispus*)

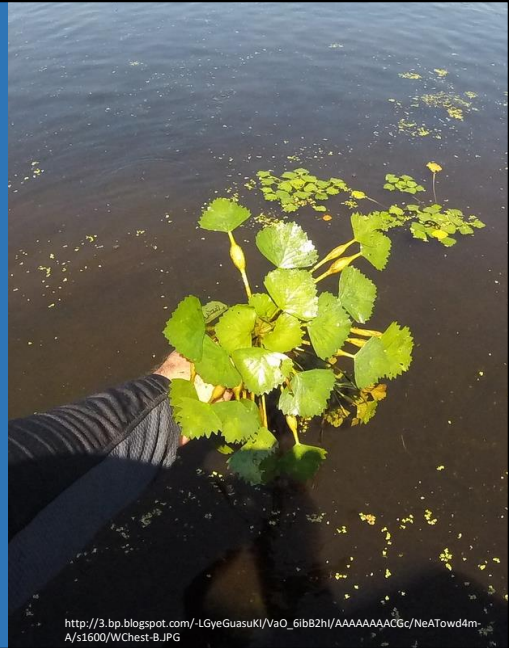


<http://www.walpa.org/wp-content/uploads/2017/06/curly-leaf-pondweed-c1497323171836.jpg>

Like Eurasian Watermilfoil, Curly-leaf Pondweed forms dense mats of vegetation. Midsummer die-offs of Curly-leaf Pondweed can litter the shoreline with dead plants.

https://www.dnr.state.mn.us/invasives/aquaticplants/curlyleaf_pondweed.html#:~:text=%20Description%20%201%20Appearance.%20Curly-leaf%20pondweed%20is,to%20about%20one%20inch%20tall%20and...%20More%20

Water Chestnut (*Trapa natans*)



Water chestnut forms dense mats of rooted vegetation that can be impossible to get through in a boat. They also form fruits that have sharp spines with barbs that can cause painful wounds when stepped on.

<https://www.dec.ny.gov/animals/109536.html#:~:text=Water%20chestnut%20is%20an%20aquatic%20invasive%20plant%20that,found%20growing%20in%20Collins%20Lake%20near%20Scotia%2C%20NY.>

Lewis Creek Association and AIS



Lewis Creek Association is a local non-profit watershed group that works with the towns of Shelburne, Charlotte, Hinesburg, Monkton, Starksboro, and Ferrisburgh (the middle Lake Champlain area) to improve water quality, among other goals. When local volunteers found Frogbit in Town Farm Bay and brought it to their attention, they developed a plan for control efforts, and implemented it with volunteer help and town funding. They also study and work to remove other aquatic invasive species (or prevent introductions, through their boat launch steward program this summer at Bristol Pond), sample water quality in our watersheds, plan for and implement water quality improvement fixes through their Ahead of the Storm program, and work to conserve and protect important wildlife habitat and ecosystems.

We Couldn't Do It Without You!



Now, I'm going to show you a quick video, showing how fun it is to volunteer for the Lewis Creek Association.

Thank You!



Thank you to our funders, in particular, the towns of Shelburne and Charlotte who fund our invasives removal work in their towns, and LCBP/NEIWPCC who funded the work to upgrade this presentation. Lastly, please consider volunteering with Lewis Creek Association. Its an extremely easy way to get out on the water and its something that you could do with your family and your friends. We always recommend signing up to volunteer with a group of your friends! There's no better feeling than making a meaningful difference while getting to hang out with your friends. Thank you so much for joining us tonight!