

Invasive plant Mitigation & Native plant restoration

Alewife Brook reservation

Contributors: Emma, Sabria & Aniyah

What are invasive species?

An **invasive species** is a non native species that is introduced into an ecosystem. Invasive species can cause **harm**, and can **damage** an existing ecosystem, threatening the survival and population of a native species. Invasive species are **not bad species**, they are just not where they should be and this is detrimental to **native environments**.



- Asian longhorned beetle



- Purple loosestrife



- Emerald ash borer

How do invasive species get introduced into new locations?

Whether it have been an accident or on purpose most invasive species today have been brought over by humans.

Some species have been brought over as pest control or to feed animals from the zoo.



Ex: The mosquitofish that was brought over to decrease the mosquito population by eating the larva. However they ended up harming the smaller fish around them and taking over the natural habitat.



STOP THE INVASION!

Zebra mussels, spiny water flea and other invading species are spread by boats. Before entering a waterbody, follow these steps to ensure you do not spread invading species.

✓ **Inspect** your boat, trailer and equipment. **Remove** visible plants or animals.

✓ **Drain** water from motor, live well, bilge or transom wells on land.



Spiny water flea Round goby

✓ **Do not** dump anything on land. **Never** release live bait.

✓ **Wash** your boat, trailer and equipment. Some species can survive out of water, so it is important to:

• **Wash** with hot water (>40 °C)

• **Use** high pressure water (250 psi)

• **Soak** equipment for at least five days before entering a waterbody.



Zebra mussel

• **Report** sightings. For more information call the:

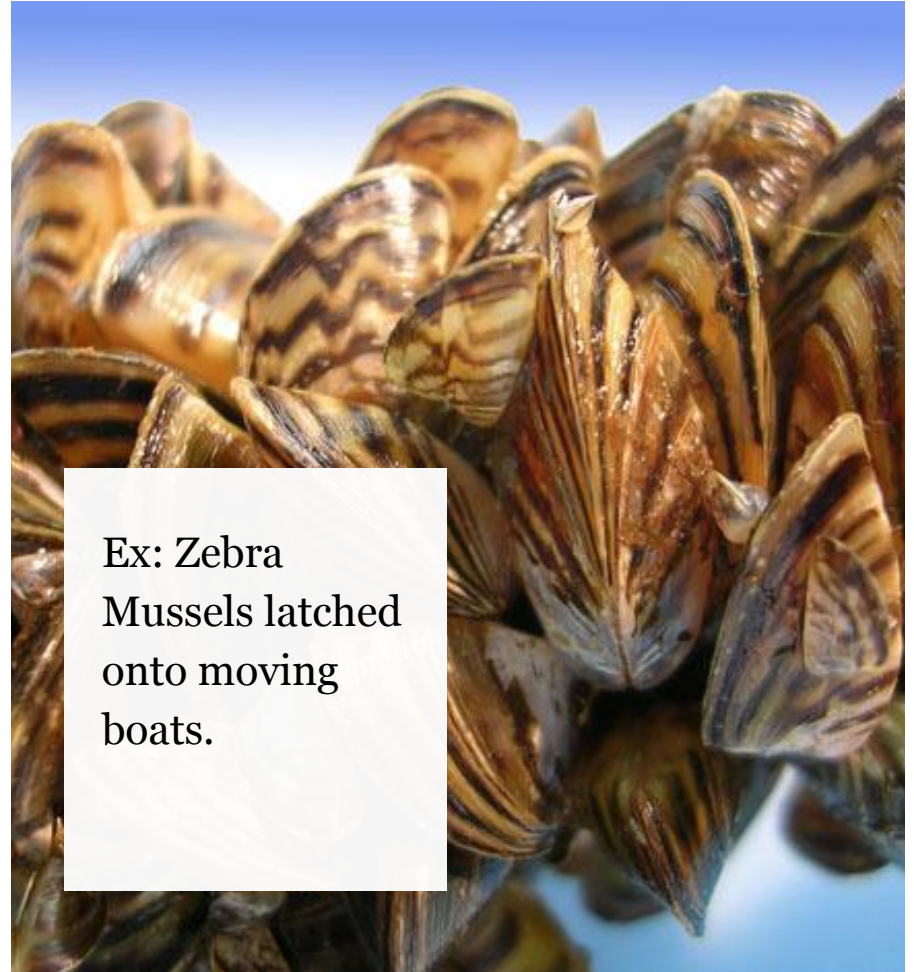
Invasive Species Hotline
1-800-567-7711



Clean boats mean clean water!

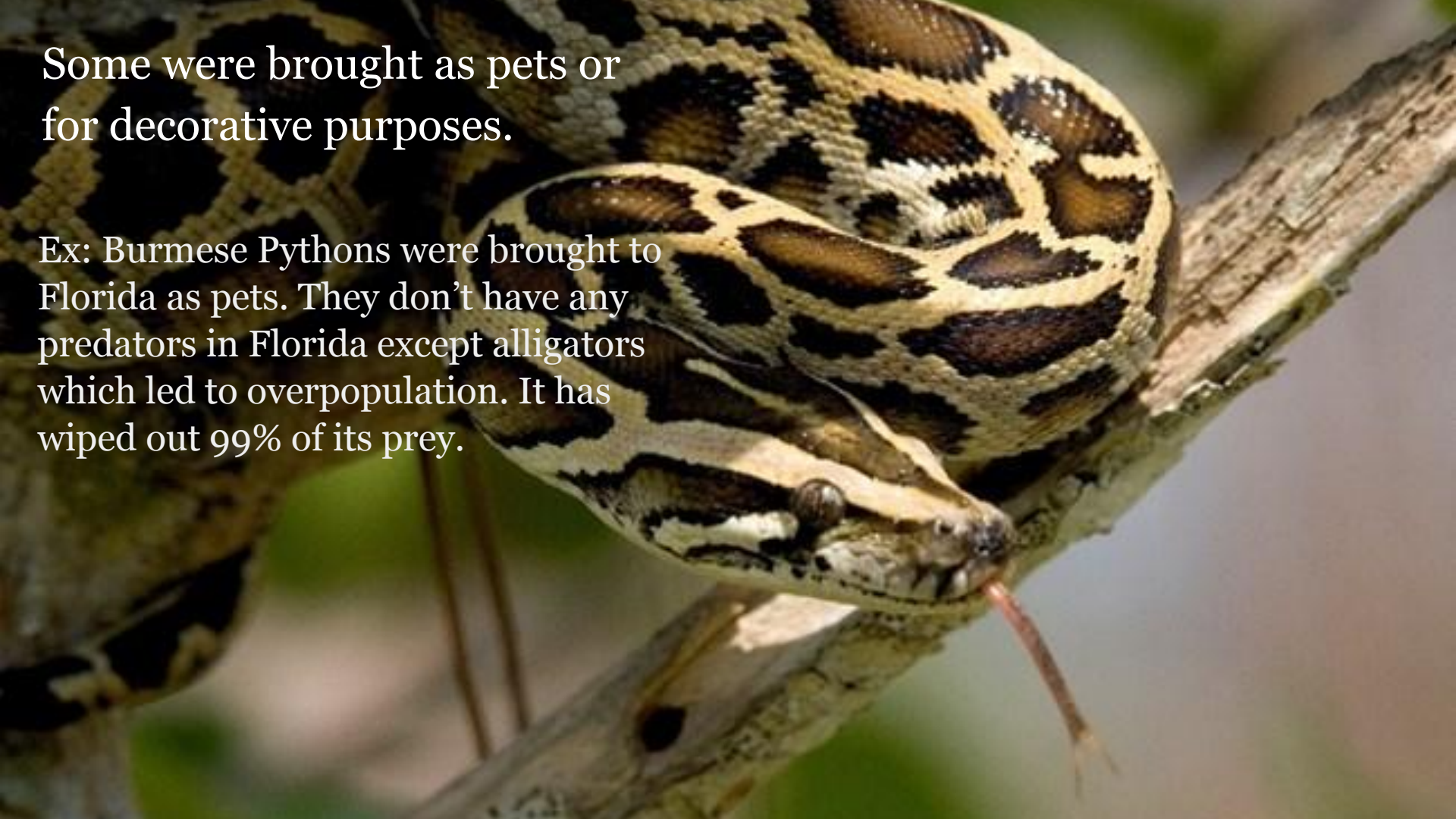
Other species have latched onto vehicles or clothing of people that were traveling.

Ex: Zebra Mussels latched onto moving boats.



Some were brought as pets or for decorative purposes.

Ex: Burmese Pythons were brought to Florida as pets. They don't have any predators in Florida except alligators which led to overpopulation. It has wiped out 99% of its prey.



How do invasive species affect native species/ the ecosystem?

Having native plants in a habitat is extremely beneficial and important in order for an ecosystem to properly function. The invasive species that are currently in parts of the reservation, are disturbing the food web and the overall productivity of the ecosystem. These invasive species compete with native ones, having no predators to mitigate them. They take up native species resources and add an unbalance to the ecosystem. These invasive plant species take up room where native species could be thriving.

There are many insects and herbivores that have co-evolved and depend on certain plant species. When taking these plants out of a habitat and replacing them with those that are non native, it can be detrimental to the habitat. In an ecosystem, different species depend on each other and when one of those species is removed or replaced or out competed, it can damage the interconnected web. This will overall harm the biodiversity.



What advantages do invasive species (ones at the alewife) have over native?

When an invasive species is introduced into an existing ecosystem, it will most always have an advantage over the native species; invasives do not have any predators that can control the population. This allows the invasive species to take native species resources and overall outcompete native species because of its advantages. Invasive species can even put a native species population at the endangered line because it has the ability to kill the other (plant) species.

Characteristics of Invasive Plants

- Lack natural enemies
- Non-native
- Fast growing
- Fast reproduction and effective dispersal
- Long-lived seeds
- Few habitat restrictions
- Able to form single-species stands

Invasive species we removed:

Some of the invasive species at the Alewife that were being removed include multiflora rose and bittersweet vine. The bittersweet began to wrap itself around native plant species, suffocating them. This plant can become really thick and heavy, possibly allowing it to uproot the tree. The multiflora rose spreads extremely fast and was present throughout the work site. Since it has no predators, there is nothing to stunt its growth, giving it the power to choke out other species that are native.



Bittersweet has wrapped itself around this tree.

How does taking out the invasive species affect the ecosystem?

Removing invasive species will make the ecosystem more productive and will allow native species to thrive once again. When the invasive species are removed, the native species will no longer have to compete for resources. In addition invasive species change the diversity of an ecosystem and shift the food web; when we remove those invasive species the ecosystem will be restored to a more healthier state. Overall removing invasive species will directly impact the ecosystem in a positive way.



How will these native plants added, positively affect the ecosystem?

Adding plant species native to New England, will result in a more diverse ecosystem and provide habitat for wildlife. The native plant species that were planted, were chosen because they will add productivity to the existing ecosystem, with the changing climate in mind. Some plants that are being added are sensitive ferns and red maple.

Throughout the whole restoration process, we were told not to remove any sensitive ferns. Ferns have an important role to play in a ecosystem. These plants have high tolerance and have a crucial role in filtering water with their substantial root system. Ferns also have strong relationship with the wildlife around it. For example, different insects and amphibians often rest on ferns and sometimes use them as shelter as well as hummingbirds using stem fuzz to line their nest.

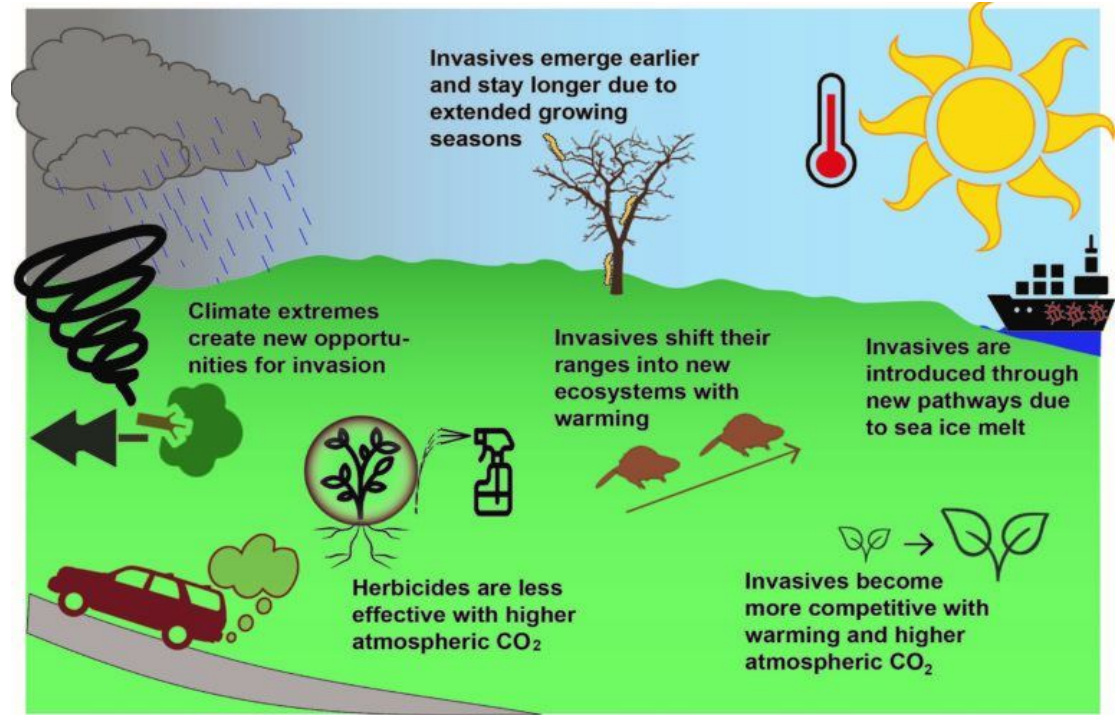
As stated previously, red maple trees are also being added to the plot of land. Red maple trees have high tolerance for different ranges of weather much like the sensitive fern. Red mapled provide resources and shelter for many different species like wood ducks which are around the alewife reservation. In addition, there are more species being planted besides the red maple and sensitive fern which will equally add to the diversity of the ecosystem.



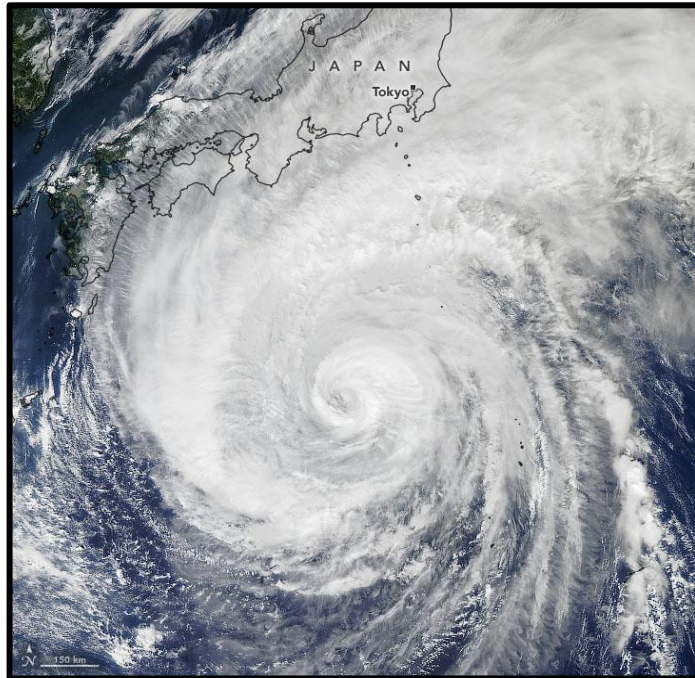
Emma

Extreme weather (tornadoes, hurricanes, floods) can carry invasive species to other places and spread their territory.

How does climate change affect invasive species?



Climate change weakens the native species therefore making it even easier for invasive species to take over.



Temperature Suitable for Pythons in the Present

Value



Temperature Suitable for Pythons in 2050

Value



Climate change forces other native animals to leave their habitat and the invasive species that prey on them start expanding their territory to find more food.

In the case of the Burmese Python, the increased flooding and raising of temperatures make more areas warm and wet which means more territory for them.

How does climate change affect invasive species?

Icebergs melting makes the journey from asia to europe shorter which means there is more chance for an uninvited species to survive the trip.



Many invasive thrive in the warmer climates and they harm the native species that are having more trouble adapting (ex: jellyfish).

Observation of Wildlife

Alewife brook reservation

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Observation day 1



These photos are of species we found when doing the restoration work, where there was a large bush of multiflora rose and bittersweet. As well as the tree that was swarmed with multiflora rose. The species on the left are western dusky slugs according to iNaturalist. These slugs were found near the wetter part of the land, near the cluster of multiflora roses and bittersweet. The species on the right is a *ormenoides venusta* according to iNaturalist; they are a part of the flatid planthopper family. There were masses of these planthoppers flying around, landing on everybody. They seemed to have come out of the area we were removing. We also learned that planthoppers don't have the best relationship with plants.



Observation day 2

These two caterpillars will soon turn into tiger moths. When put into iNaturalist, it concluded that both caterpillars are most likely a part of the tiger moth family, though we are not entirely sure which type of tiger moth. The white caterpillar was found towards the end of day and was seen heading to the water. These insects were found on the ground where we were removing some multiflora rose.

The top right image is of a spider, a part of the leiobunum genus, according to an inaturalist. This spider was found on the ground, scurrying through to dirt and leaves. Our first day working in the plot of land, we discovered there were white planthoppers. On our second working, we then discovered green planthoppers which could go be a green cone-headed planthopper according to an inaturalist.



Observation day 3

The images on the left are of the snapping turtles we saw around the reservation. The top photo is of a large/adult snapping turtle. The turtle was found on a dirt path and we were told it might have just laid its eggs. We also saw many baby snapping turtles swimming in the water and relaxing on lily pads.

The images on the right are of the canadian geese and mallard ducks seen at the reservation. The geese and ducks were walking around the whole reservation and were very curious. The geese were quite nosy, as they got very close to us, just lurking; while the ducks were much more polite. There were geese near the water where we were working and we would see them gliding in and relaxing.



Observation day 4

The top photo is of a land snail that was found in a pile of bittersweet and multiflora rose, which we removed. The bottom photo is of a European carp fish, according to iNaturalist. We have seen this fish numerous times in the Little River which is near where we're working.

The two photos here are of a frog and turtle were taken at the alewife reservation on bridge/dock. The little creatures are circled in red. As seen, they were both just relaxing on some lily pads.

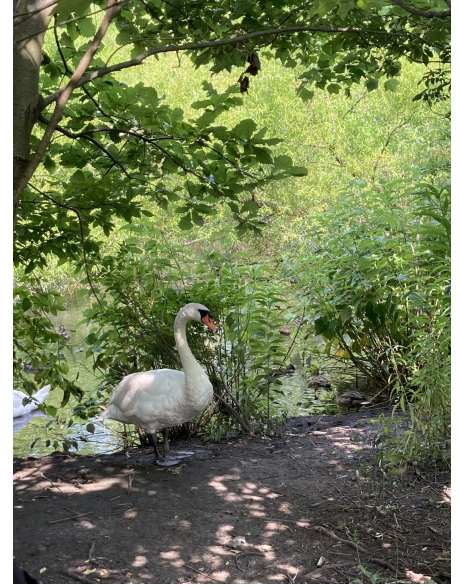


Observation day 5



The photo on the left is of a small monarch caterpillar on milkweed. We found this near the garden along the walk path.

The photo on the right is of a mute swan according to iNaturalist. It was our last day there and our first time seeing a swan near our work site. The swan was actually in the section where we enter, along with some ducks.





Sources used:

Slide 2:

Slide 3/4/5: <https://eandt.theiet.org/content/articles/2018/05/top-10-invasive-species-when-pest-control-goes-wrong/>
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Slide 6/8:

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Source:

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Slide 7:

Slide 9: <https://www.nwf.org/Educational-Resources/Wildlife-Guide/Threats-to-Wildlife/Invasive-Species>

Slide 10:

Source: <https://www.audubon.org/content/why-native-plants-matter>

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<https://www.iucn.org/resources/issues-briefs/invasive-alien-species-and-climate-change>