



AQUATIC SPECIES INFESTATIONS IN NEW HAMPSHIRE

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TOPICS TO COVER

- Overview on the status of infestations
- Why invasive species are a problem
- Prevention and early detection efforts
- Management of infestations
- Research
- What can you do?



Asian clam accumulating in fish beds in Cobbetts Pond, Windham



Water chestnut on the Nashua River in Nashua



THE PROBLEM OF INVASIVES

- They are easily transported as tag-alongs on recreational gear, and some forms can be microscopic, like animal larvae
- They are rapid growers, and can colonize in even less than desirable conditions (colder climate, deeper darker water, etc)



THE PROBLEM OF INVASIVES, CONT.

- They cause a host of problems for aquatic systems, affecting:
 - Biology- *food web impacts*
 - Ecology- *habitat changes, decreasing species diversity*
 - Chemistry- *pH, oxygen content, changes to nutrient cycles*
 - Physical- *dense canopies of plants can hold more heat, warming the water column, shading*
 - Recreation- *boating impacts, entanglement, cuts on sharp shells*
 - Aesthetics- *dense same-species stands are not diverse, can be dense, unappealing, odors*
 - Economics- *decreased shorefront property values, expensive to manage*



NEW HAMPSHIRE REGULATES SPECIES OF INVASIVE AQUATIC PLANTS AND ANIMALS

- NH DES has jurisdiction over the plant species, and regulates a number of activities related to 29 prohibited invasive aquatic plant species
- NH Fish and Game has jurisdiction of the animal species, and regulates activities related to the bait trade, mostly.





purple loosestrife



common reed

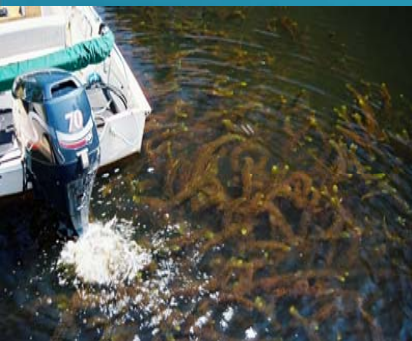


water chestnut

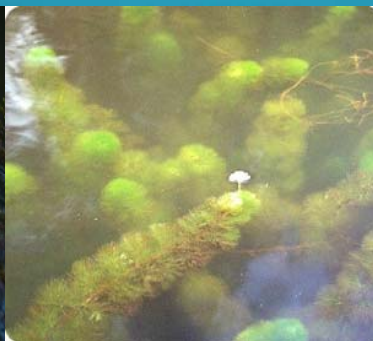


curly-leaf pondweed

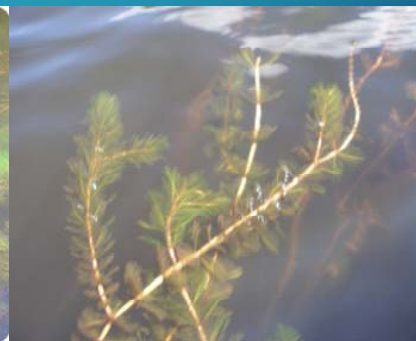
COMMON INVASIVE AQUATIC PLANTS



variable milfoil



fanwort



Eurasian milfoil

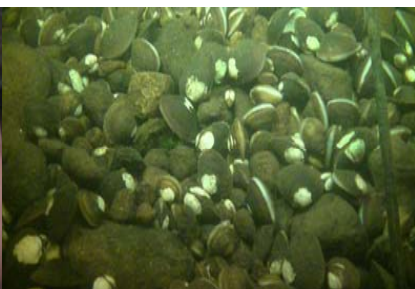


hydrilla (watch species)





Asian clam



Asian clam Merrimack River



Chinese mystery snail



Chinese mystery snail

COMMON INVASIVE AQUATIC ANIMALS

zebra mussel



Ohio Sea Grant

zebra mussel on sneaker

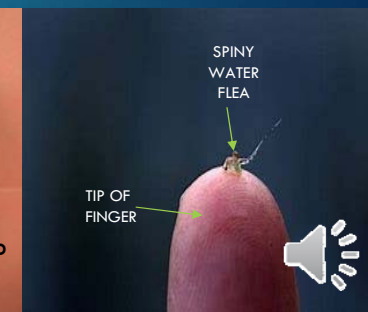


spiny water flea (several)



HARD
TO
SEE!

spiny water flea (single)



TIP OF
FINGER

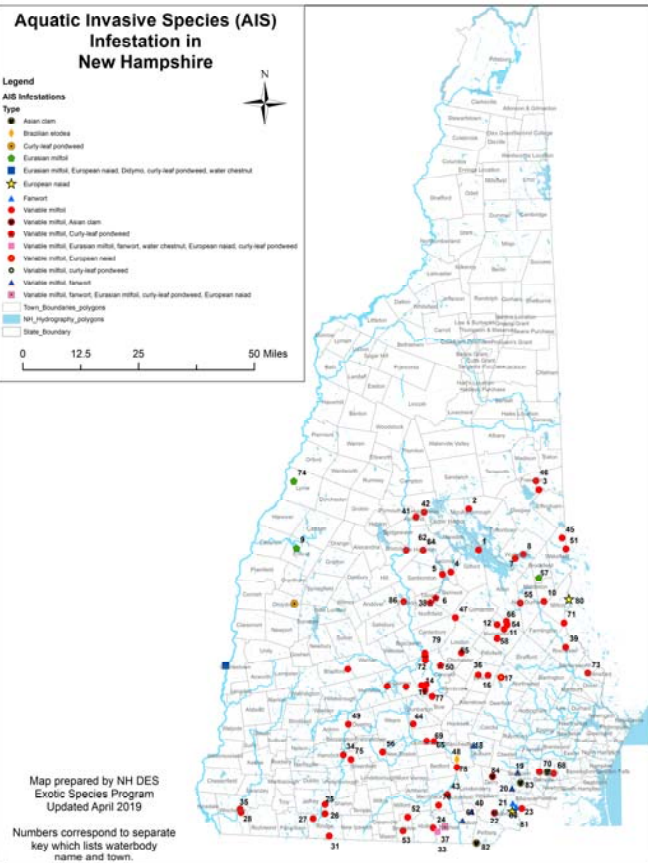
SPINY
WATER
FLEA



WATERBODIES WITH INVASIVES

- New Hampshire has about 950 lakes and ponds greater than 10 acres in size
 - About 8% of those waterbodies are infested with some type of invasive aquatic plant and/or animal (76 lakes and ponds)
- New Hampshire has about 11,000 miles of rivers and streams
 - 11 major river systems are infested with some type of invasive aquatic plant and/or animals
 - Actual infested river miles are unknown at this time

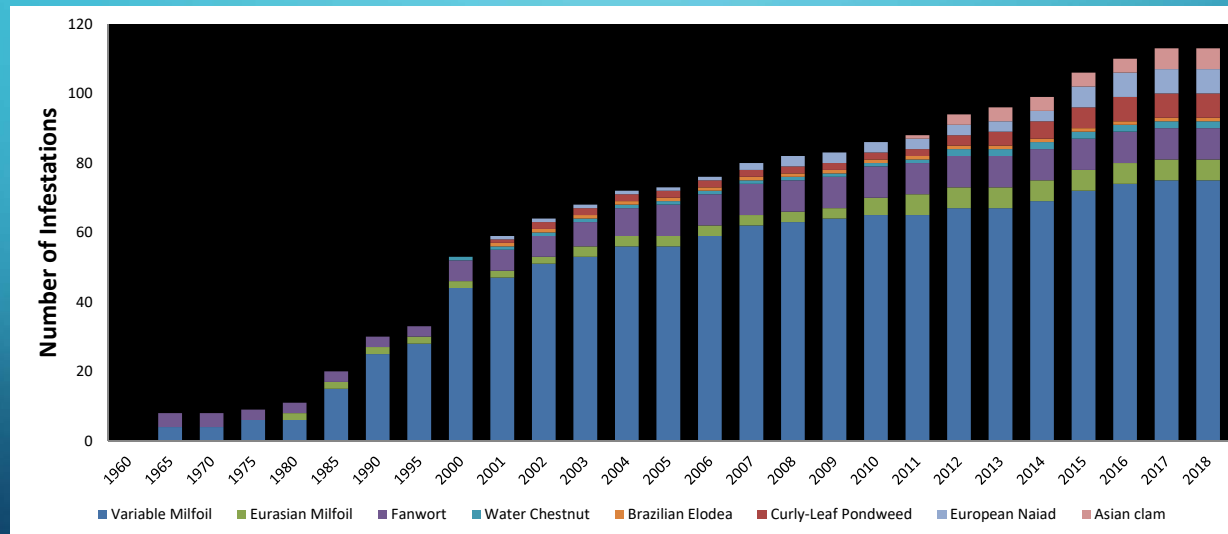




INFESTATIONS TO DATE

- 75 variable milfoil sites
- 7 curly-leaf pondweed sites
- 9 fanwort sites
- 6 Eurasian milfoil sites
- 7 European naiad sites
- 2 water chestnut sites
- 1 Brazilian elodea site
- 6 Asian clam sites

COUNTS OF INDIVIDUAL INFESTATIONS OVER TIME



PREVENTION AND EARLY DETECTION

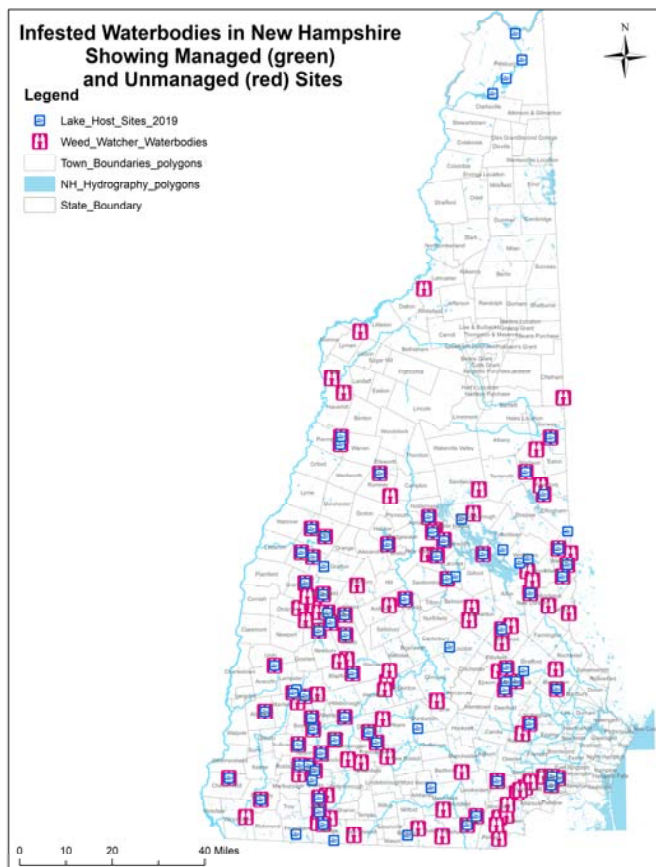
- Prevention

- Lake Host Program
- Signage at public access sites
- Kiosks
- Laws/rules/educational materials/etc

- Early Detection

- Weed Watcher Program
- General monitoring by anyone who recreates or works on a waterbody



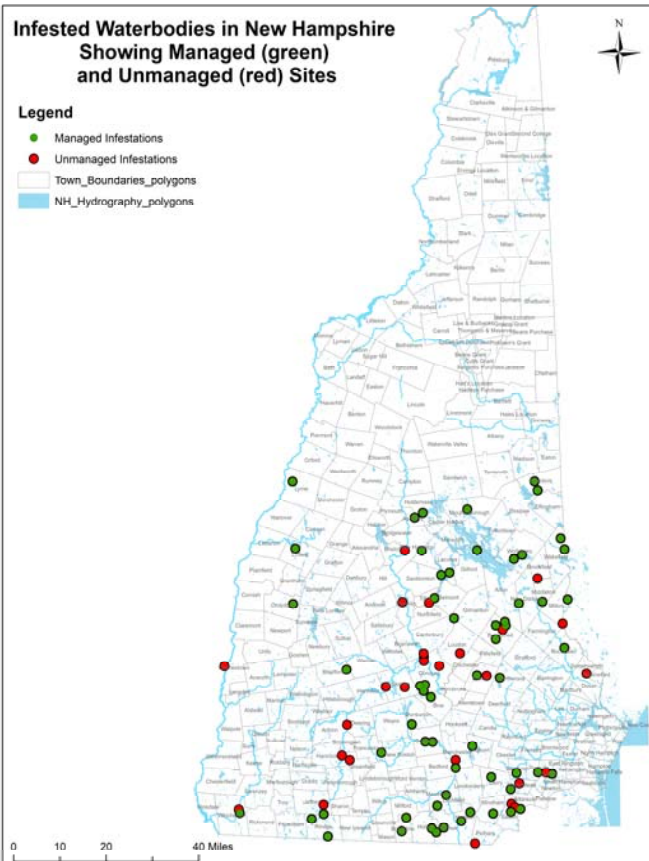


LAKE HOST SITES AND WATERBODIES WITH WEED WATCHERS

MANAGEMENT

- Management is determined based on site-specific conditions and the type of infestation in a waterbody
 - Management efforts for invasive aquatic plants are coordinated and grant funded by NHDES
 - Management efforts for invasive aquatic animals are under the prevue of the NH Fish and Game Department. Currently no funding is available, and no management activities or management plans exist.

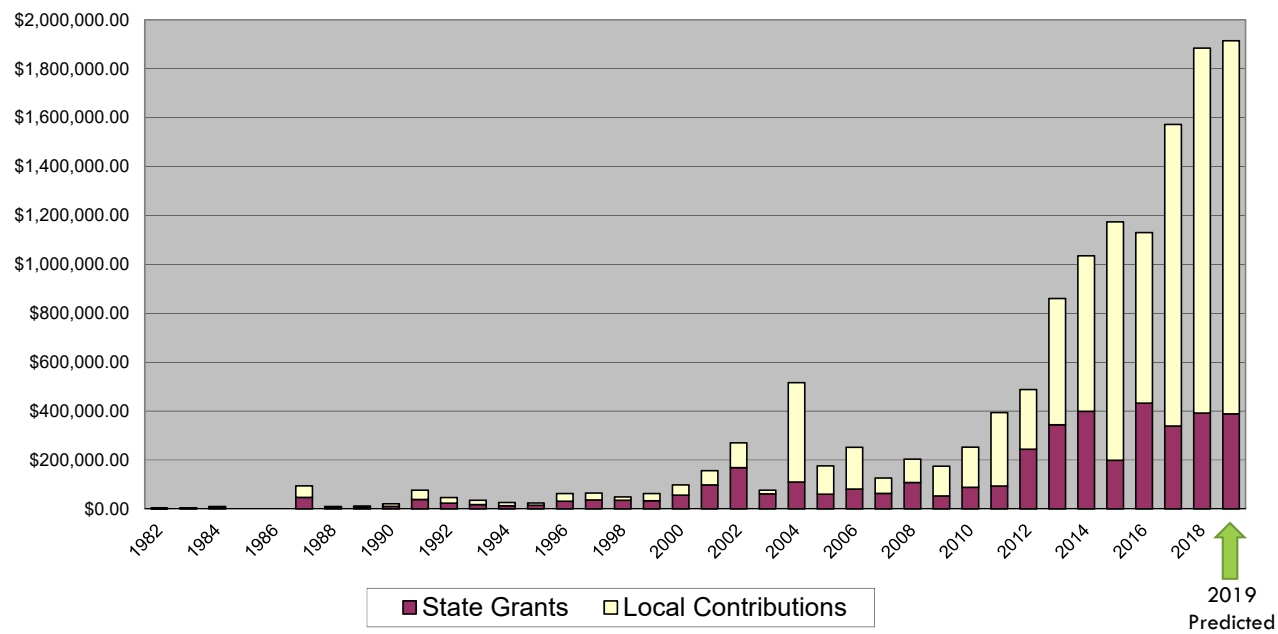




- Dots show waterbodies in New Hampshire with some type of invasive aquatic species infestation
 - **GREEN** dots show waterbodies where management actions are common and coordinated by DES.
 - **RED** dots show infested waterbodies where no management is done, or has ever been done.
 - Most of these are indicative of larger rivers, small ponds with few property owners, and waterbodies with invasive aquatic animals.



Annual Expenditures for Exotic Aquatic Plant Control Activities



INVASIVE AQUATIC ANIMAL CONTAINMENT AND MANAGEMENT

- Containment of invasive aquatic animal infestations is difficult due to microscopic life stages, so prevention and education activities are critical
- Early detection is important to warn waterbody users of possible infestations. Quarantines may be required in the future.
- Management and control of invasive animal infestations has been a challenge, and more work needs to be done to develop targeted control actions so that non-target species can be spared.



RESEARCH ACTIVITIES

- Over the years DES has initiated or partnered in research related to a number of areas:
 - Diver-Assisted Suction Harvesting methodology
 - Herbicide timing, dose, selectivity, new product evaluation
 - Biology, ecology, and spread of variable milfoil
 - Invasive aquatic animal Environmental DNA (eDNA) studies- NEW!
 - *This is a regional partnership with UNH and other Northeastern states to develop and evaluate a method for a rapid presence/absence test for invasive aquatic animals in our freshwater systems. Method development and testing in 2019, followed by usable technology in 2020, most likely.*

GAPS

- Slowing the rate of spread with establishment of decontamination/disinfection protocols and equipment at public access sites or other convenient locations, or through mobile units.
- Increased funding for prevention and management activities
 - On the state level- increasing grant amount for local communities
 - On the local level- establishing funding where there is none now (warrant articles, line item budgeting, donations, trust fund, etc)
- Better early detection of species, some infestations are still fairly large when first reported. This means more Weed Watchers and vigilant folks monitoring waterbodies and reporting infestations. Training is available upon request.
- Invasive aquatic animal monitoring, management, and general action. New Hampshire is falling behind other states due to lack of a coordinated program and lack of funding for invasive aquatic animal initiatives.
- More research and reliable control methods for invasive aquatic animals.



THANK YOU!

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