

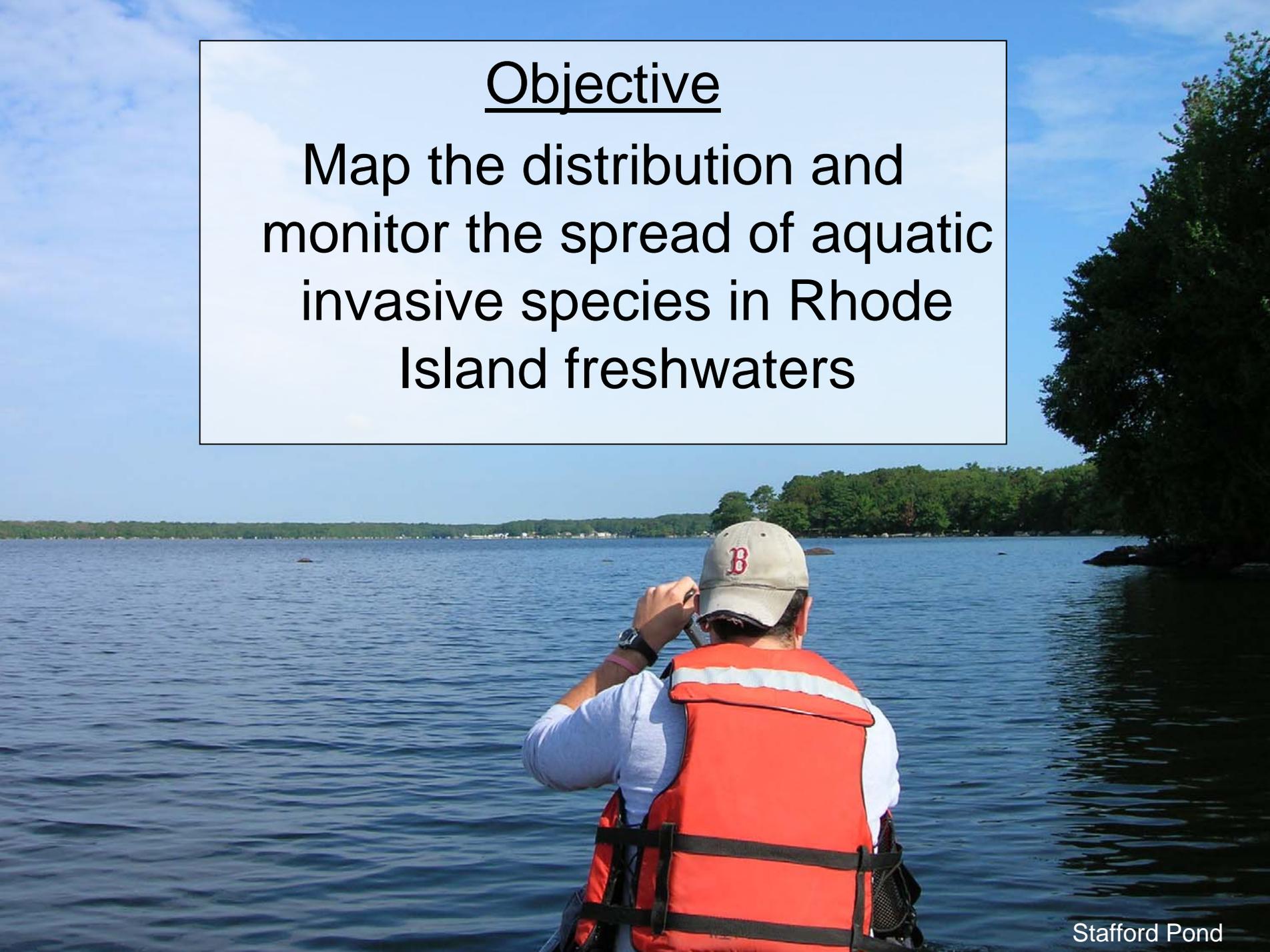
An underwater photograph showing a dense thicket of green aquatic plants, likely an invasive species, in a dark, murky water environment. The plants have thin, needle-like leaves and are growing in a tangled mass. The lighting is dim, highlighting the green color of the vegetation against the dark background.

Aquatic Invaders in RI

Current as of 12/18/2010

Objective

Map the distribution and monitor the spread of aquatic invasive species in Rhode Island freshwaters



What Do We Survey?

Primary targets have been flowing or standing waters

Flowing or Standing Waters



Vegetated Wetlands



Floodplains & Riverbanks



Where Do We Survey?



emergent
plants



floating plants

littoral zone

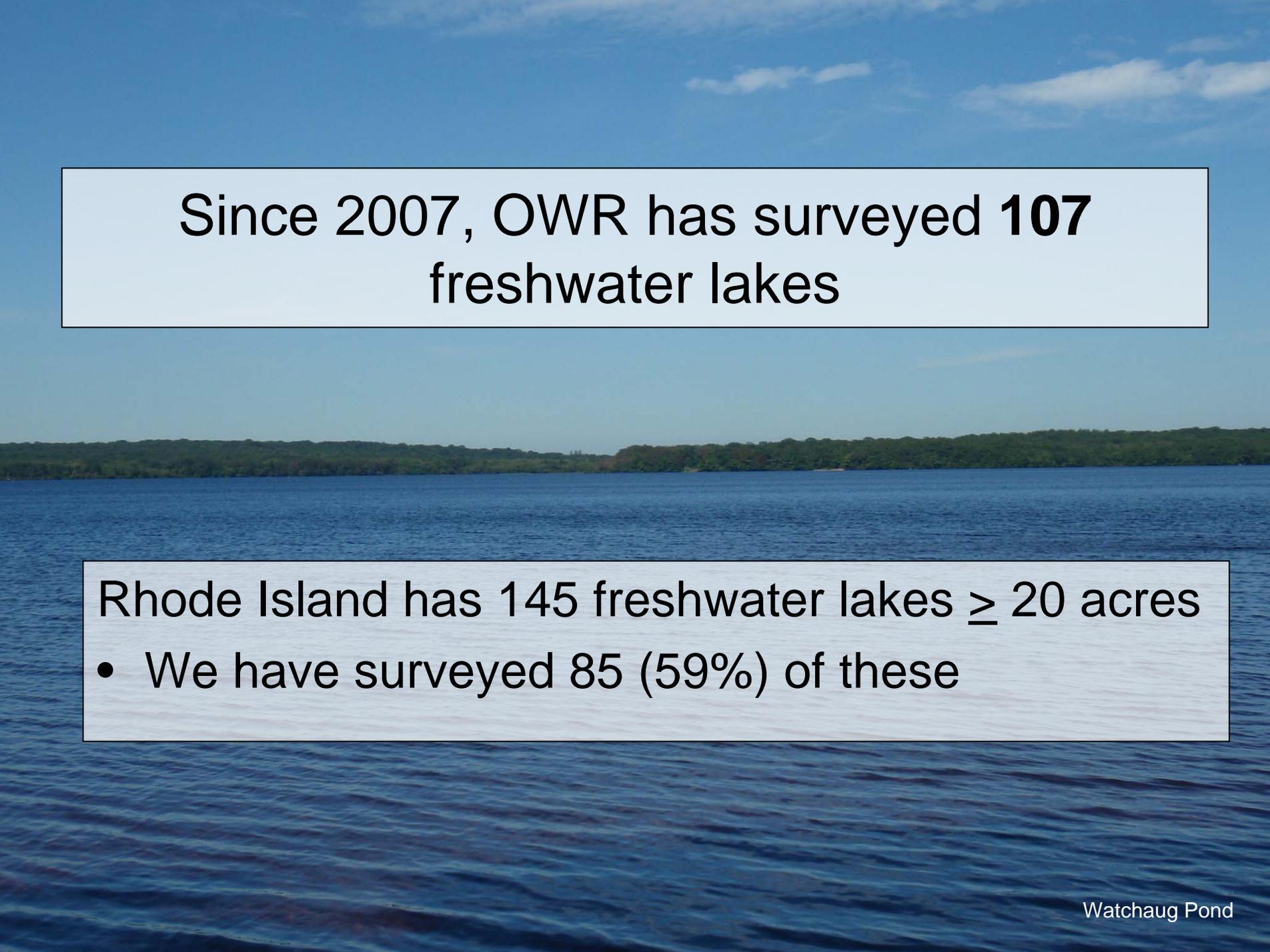


Submergent plants

photic zone

aphotic zone

Surveys focus on floating and submergent plants



Since 2007, OWR has surveyed **107**
freshwater lakes

Rhode Island has 145 freshwater lakes \geq 20 acres

- We have surveyed 85 (59%) of these

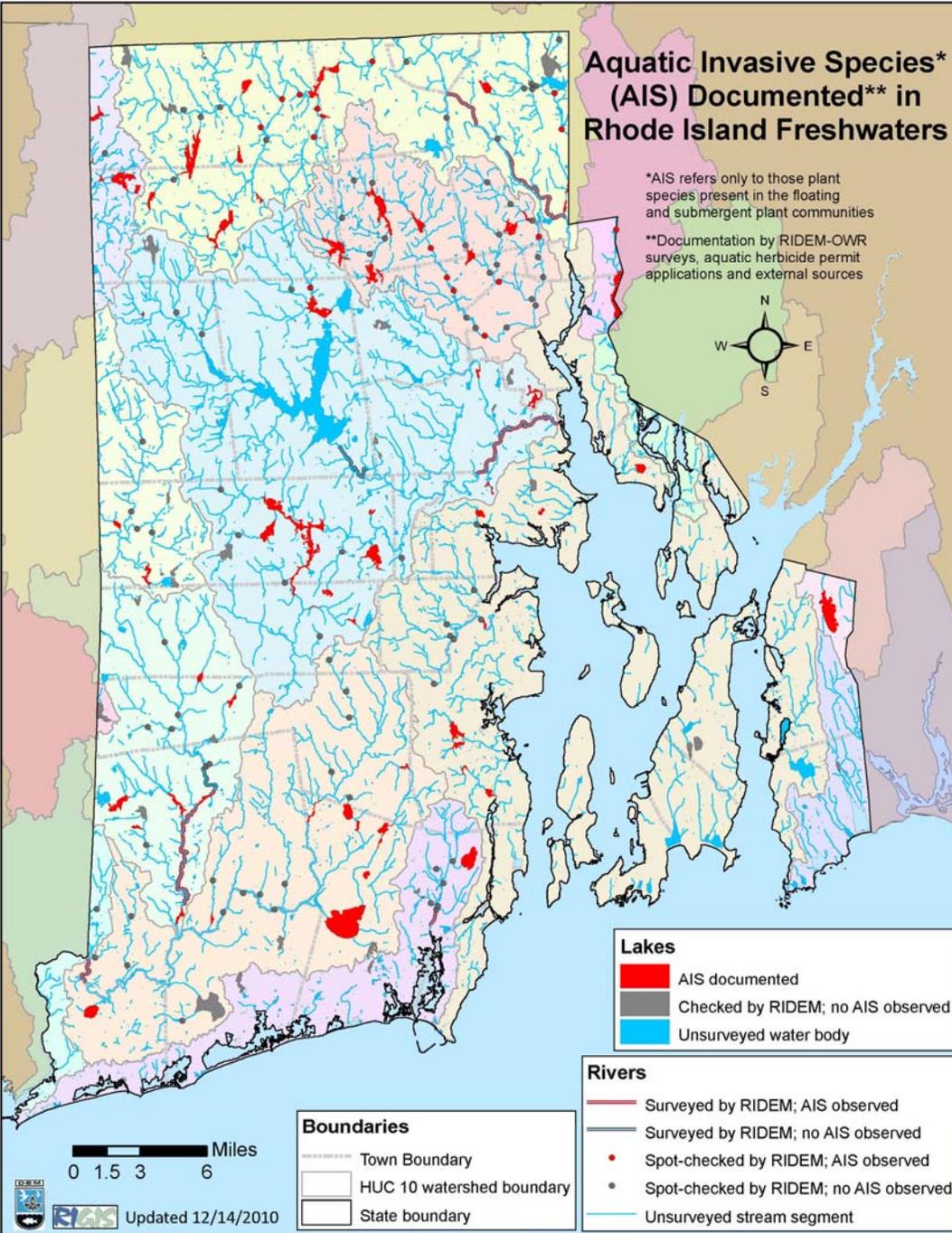


What Have We Found?

Aquatic Invasive Species* (AIS) Documented** in Rhode Island Freshwaters

*AIS refers only to those plant species present in the floating and submergent plant communities

**Documentation by RIDEM-OWR surveys, aquatic herbicide permit applications and external sources



Lakes

- AIS documented
- Checked by RIDEM; no AIS observed
- Unsurveyed water body

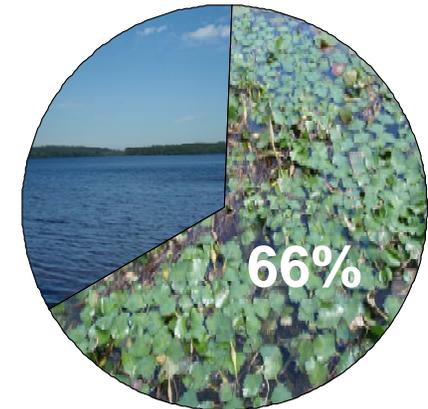
Rivers

- Surveyed by RIDEM; AIS observed
- Surveyed by RIDEM; no AIS observed
- Spot-checked by RIDEM; AIS observed
- Spot-checked by RIDEM; no AIS observed
- Unsurveyed stream segment

Boundaries

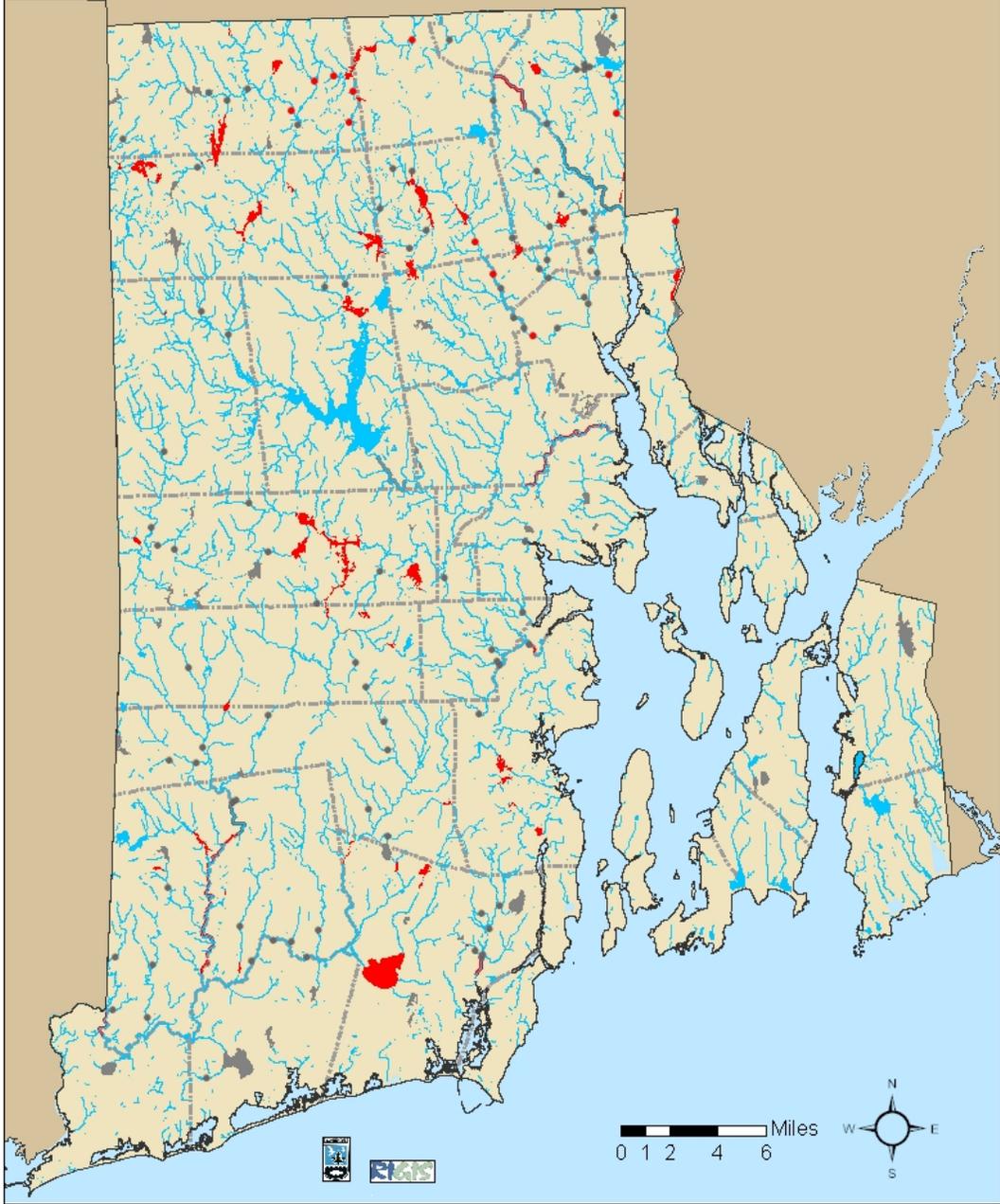
- Town Boundary
- HUC 10 watershed boundary
- State boundary

71 freshwater lakes have at least one invasive species

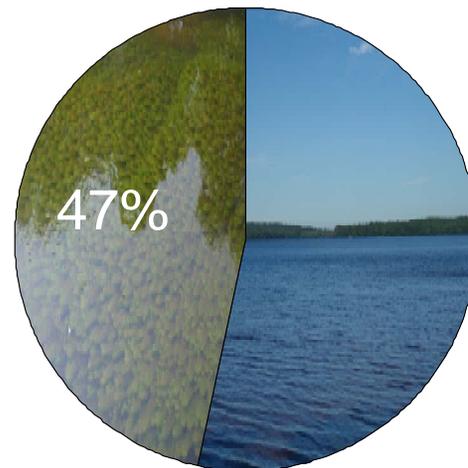
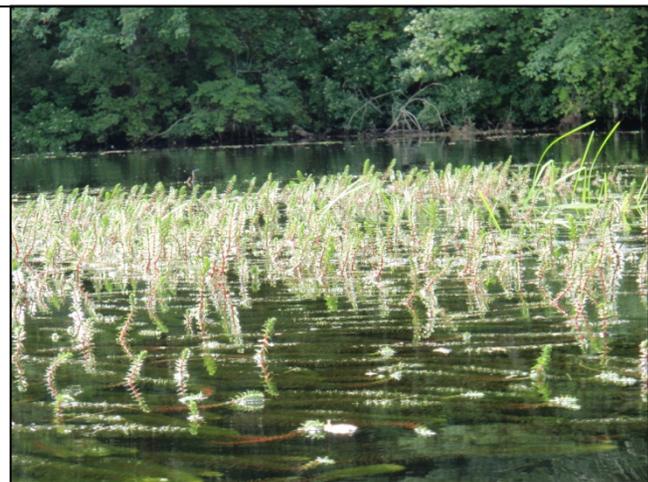


- AIS documented by RIDEM
- Checked by RIDEM; no AIS observed
- Unsurveyed water body

Variable Milfoil (*Myriophyllum heterophyllum*)
Documented by RIDEM-OWR in Rhode Island Freshwaters



Variable Milfoil
(*Myriophyllum heterophyllum*)
50 freshwater lakes have
variable milfoil



Fanwort (*Cabomba caroliniana*)
Documented by RIDEM-OWR in Rhode Island Freshwaters



Fanwort
(*Cabomba caroliniana*)
41 freshwater lakes have
fanwort



Other Invaders

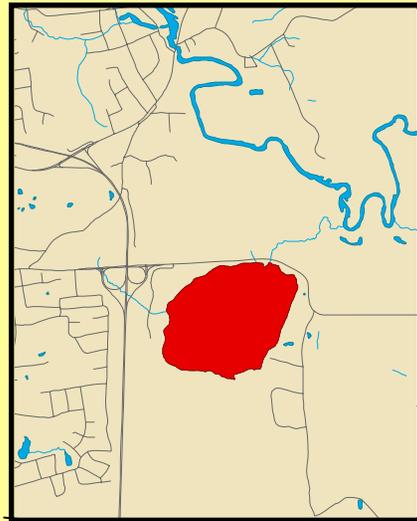
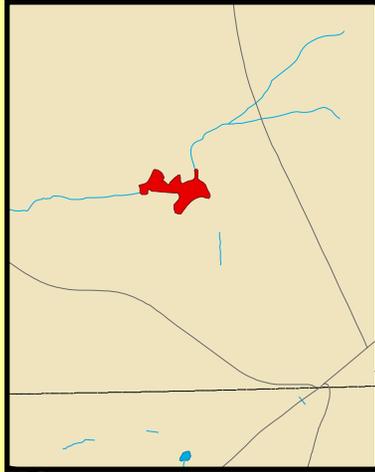
Species	Number of Lakes
Curlyleaf pondweed	6
Water chestnut	5
Mudmat	5
Eurasian milfoil	4
Inflated bladderwort	4
Spiny naiad	3
Brazilian elodea	2
Yellow floating heart	2
Parrot feather	1



Water Chestnut Populations

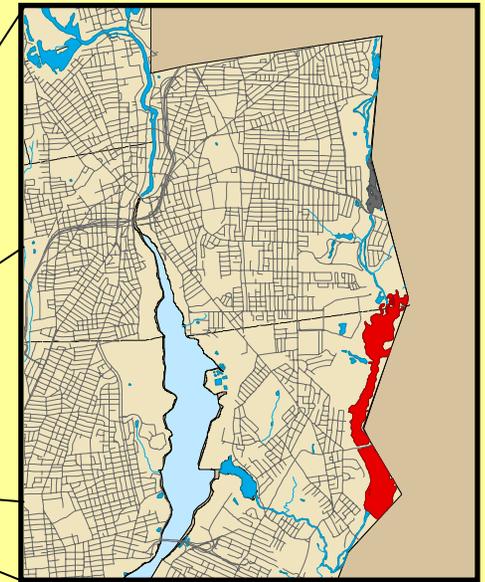
Porter's Pond

Discovered 2008



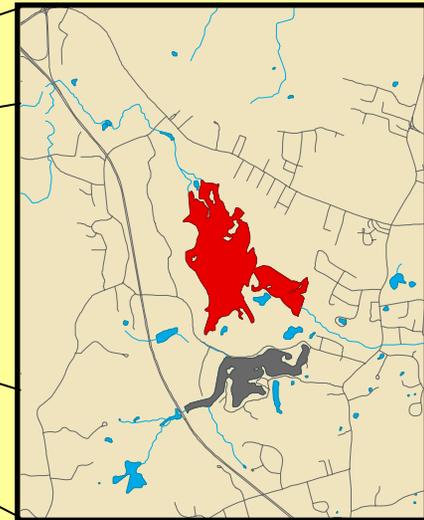
Chapman Pond

Discovered 2009



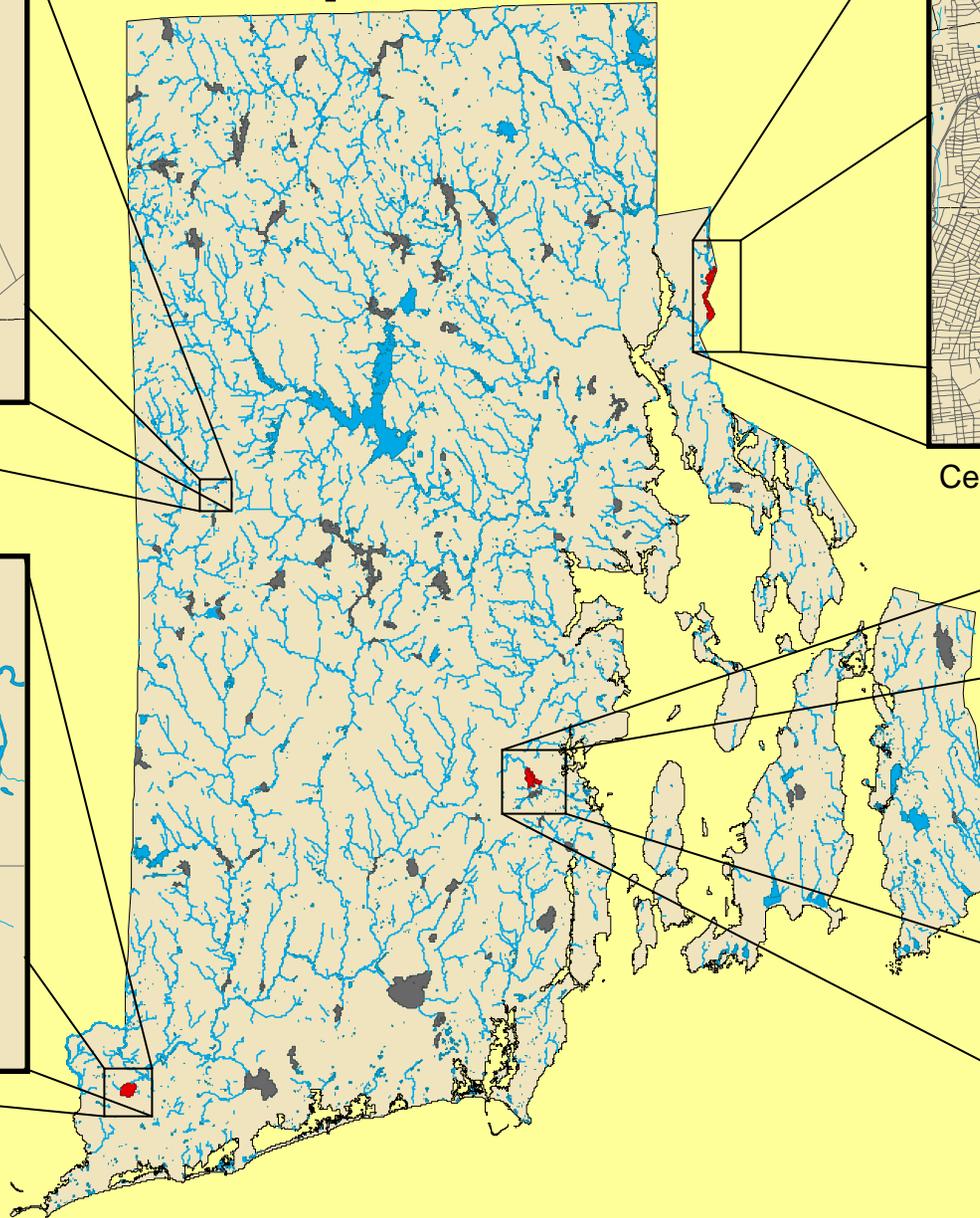
Central Pond & Turner Reservoir

Discovered 2009



Belleville Pond

Discovered 2007



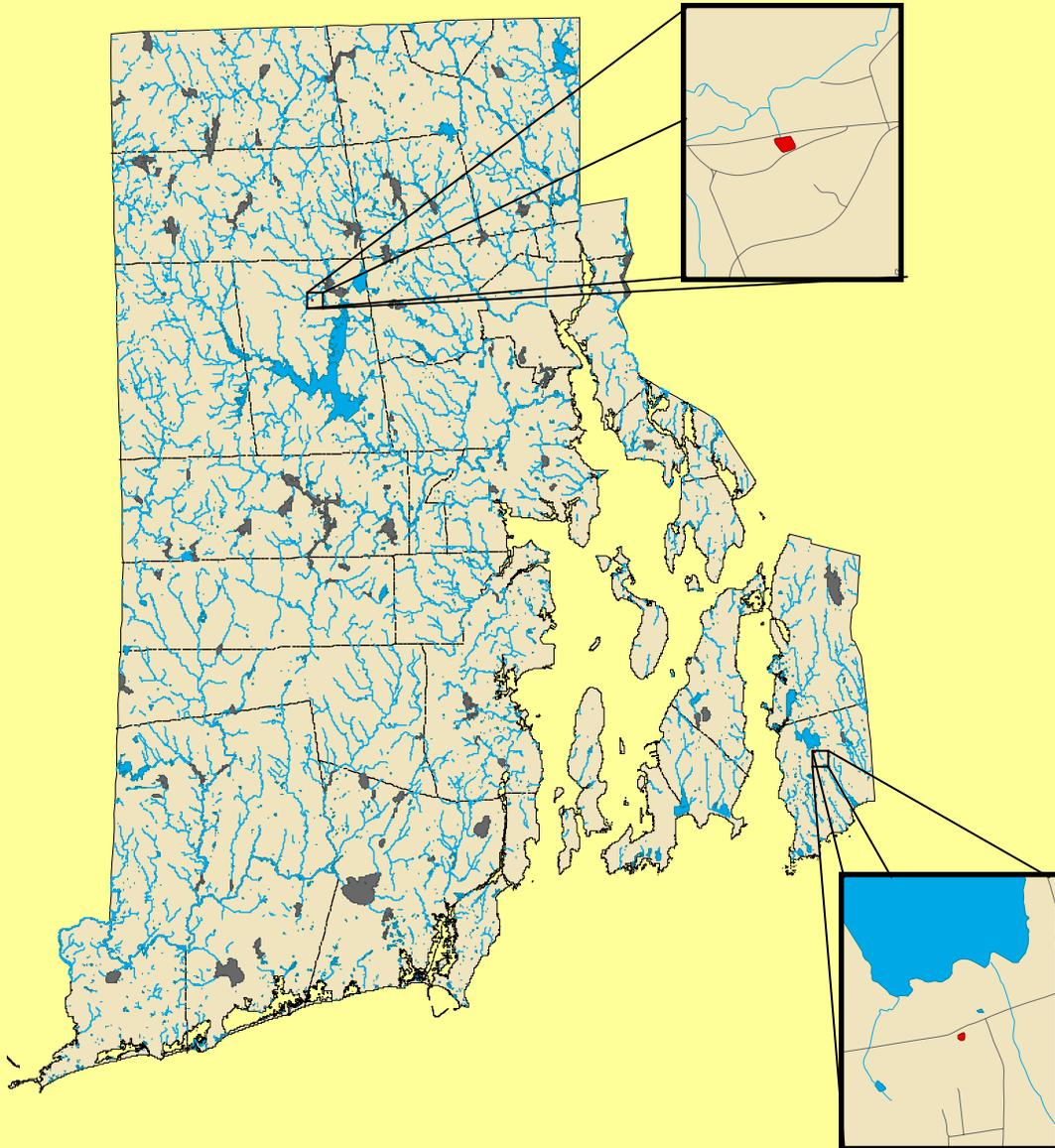
Water Chestnut Control at Chapman Pond (top row) and Belleville Pond (bottom row)



Water chestnut pull at Belleville Pond organized by RINHS. Pull at Chapman Pond organized by the Westerly Land Trust with technical assistance from RINHS

New for 2010!

Yellow floating heart
(*Nymphoides peltata*)



AIS in the Rivers



- RIDEM has checked **80** rivers and streams at some point along their course
- AIS has been documented in **14**



Why So Low?

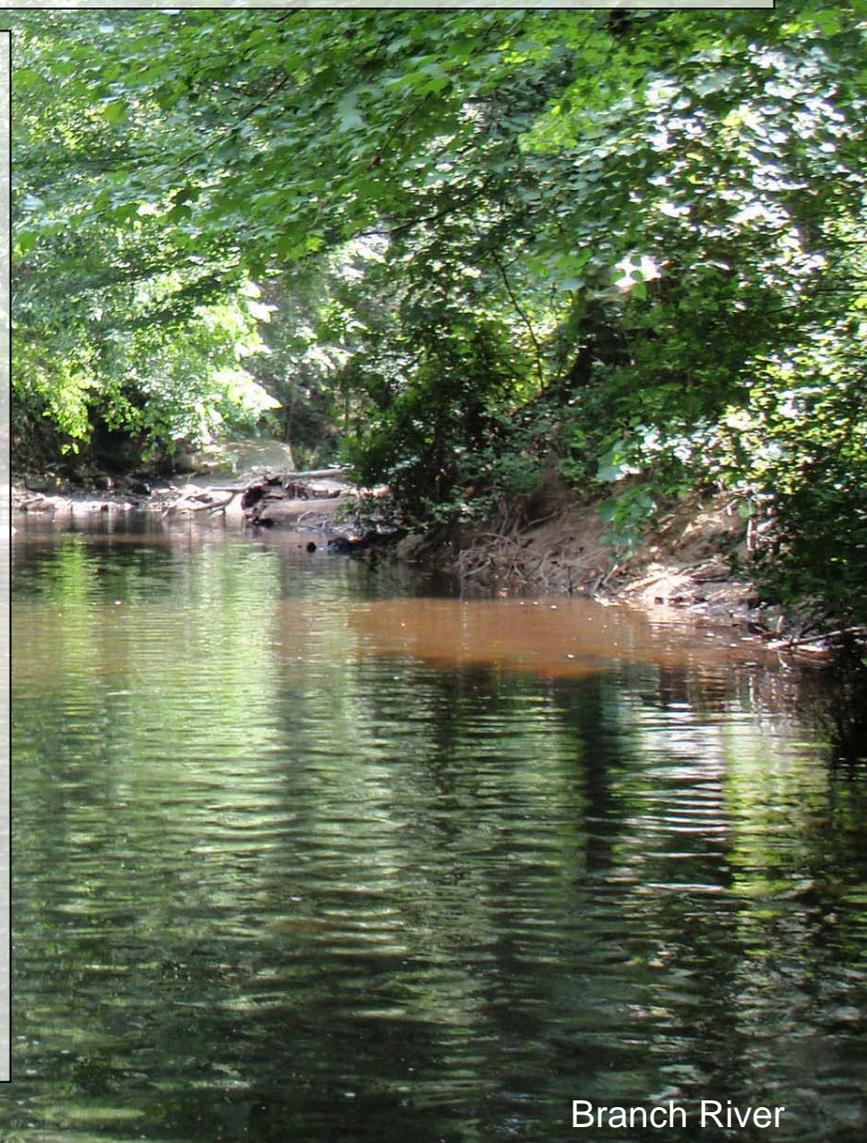
Headwater Streams

- Shaded
- Rocky
- Low nutrients
- Intermittent flow

Not good for AIS

Bigger Rivers, Bigger Opportunities

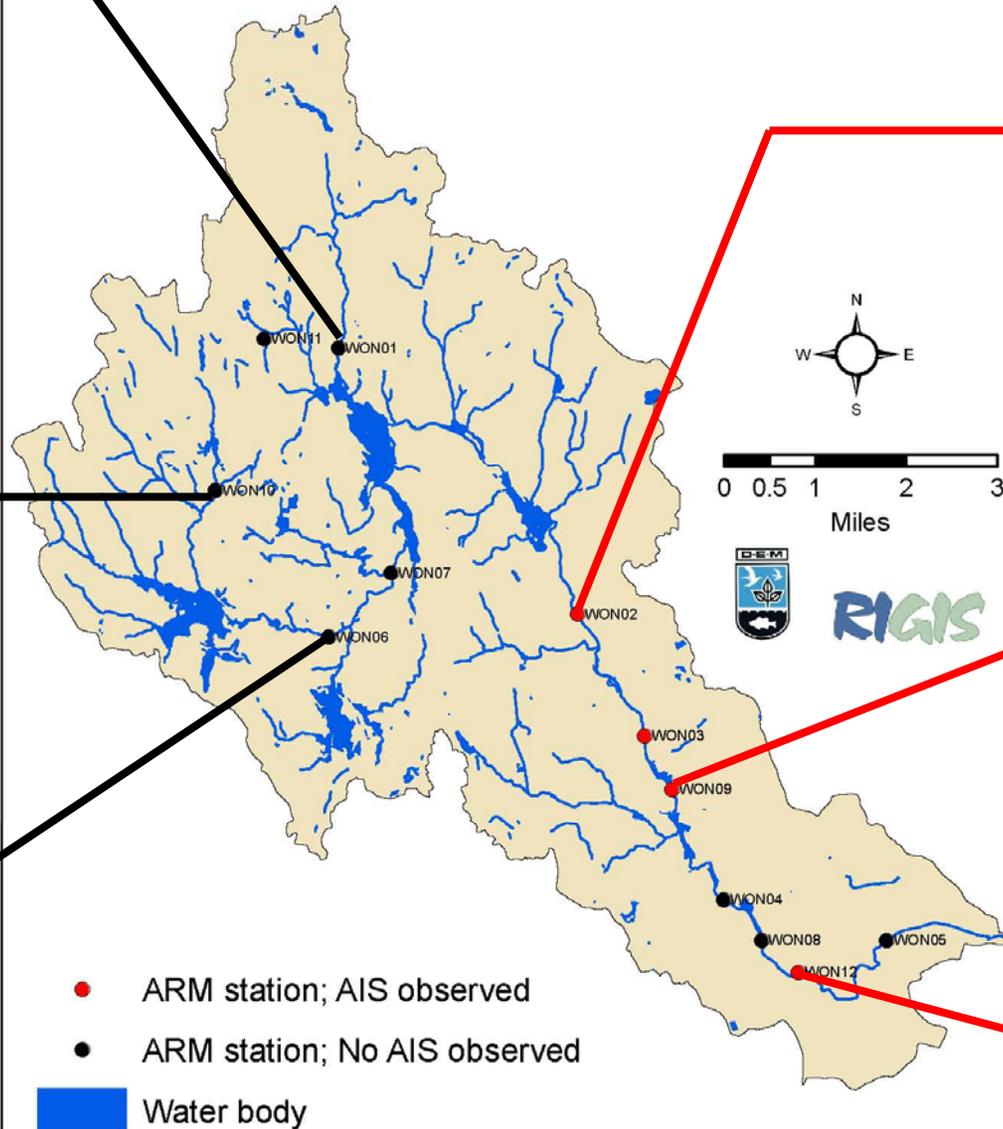
- More nutrients
- More light
- More muck (sedimentation)
- Slower moving (low gradient)
- More stable flow
- More sources of AIS from upstream impoundments



Major Rivers With AIS

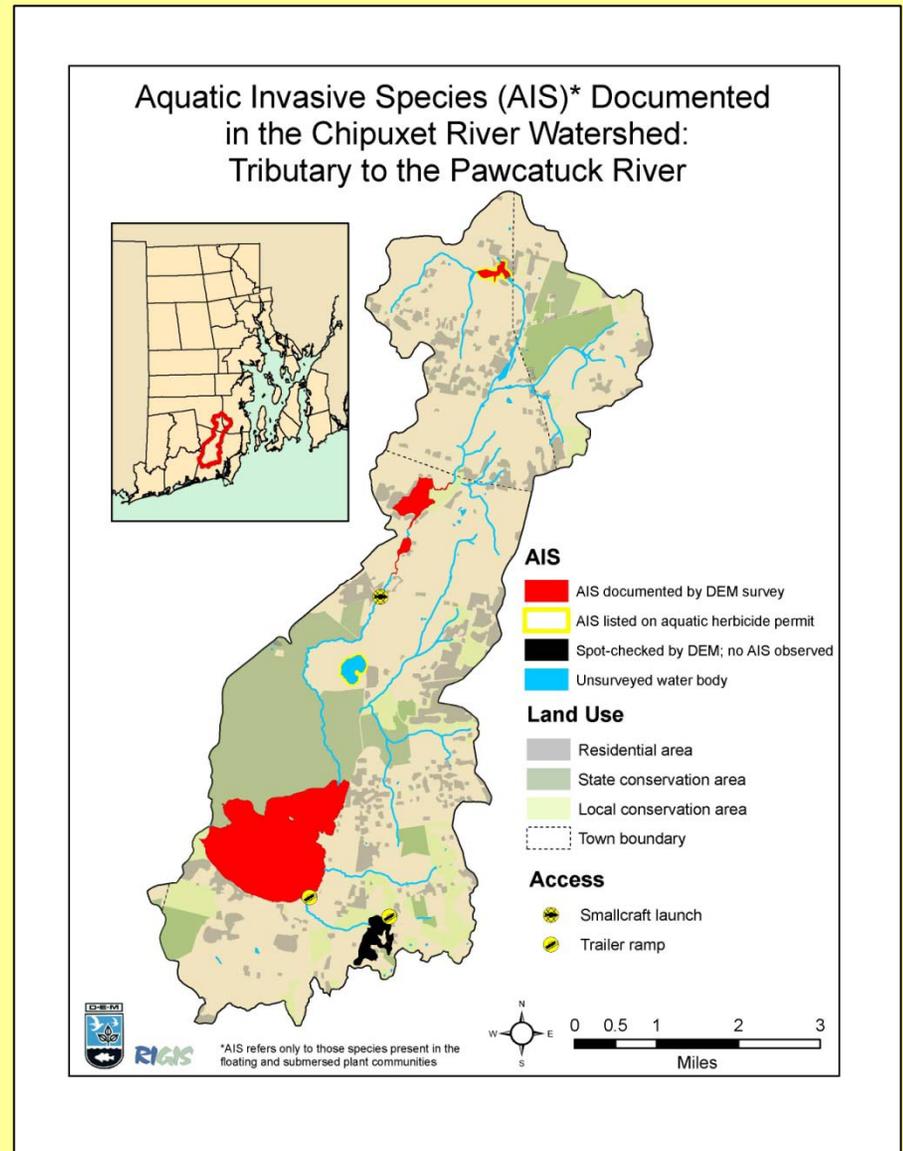
- Blackstone River
- Branch River
- Chipuxet River
- Clear River
- Millers River
- Moshassuck River
- Pawcatuck River
- Pawtuxet River
- Saugatucket River
- Ten Mile River
- West River
- Wood River
- Woonasquatucket River

AIS Observed at ARM Stations in the Woonasquatucket River Watershed During Summer 2009

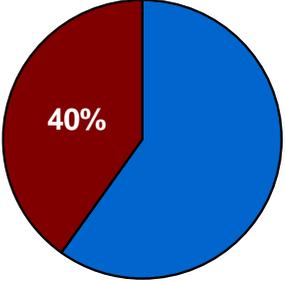
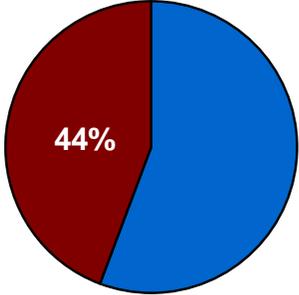
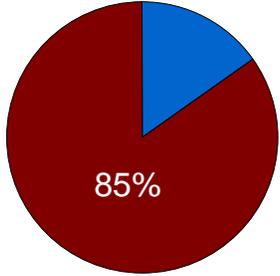


Management Implications

- Rivers transport AIS from lake to lake
- Infested lake can be a source of AIS to downstream water bodies
- Management in downstream water body ineffective unless upstream infestations are controlled
- AIS control on a watershed-scale



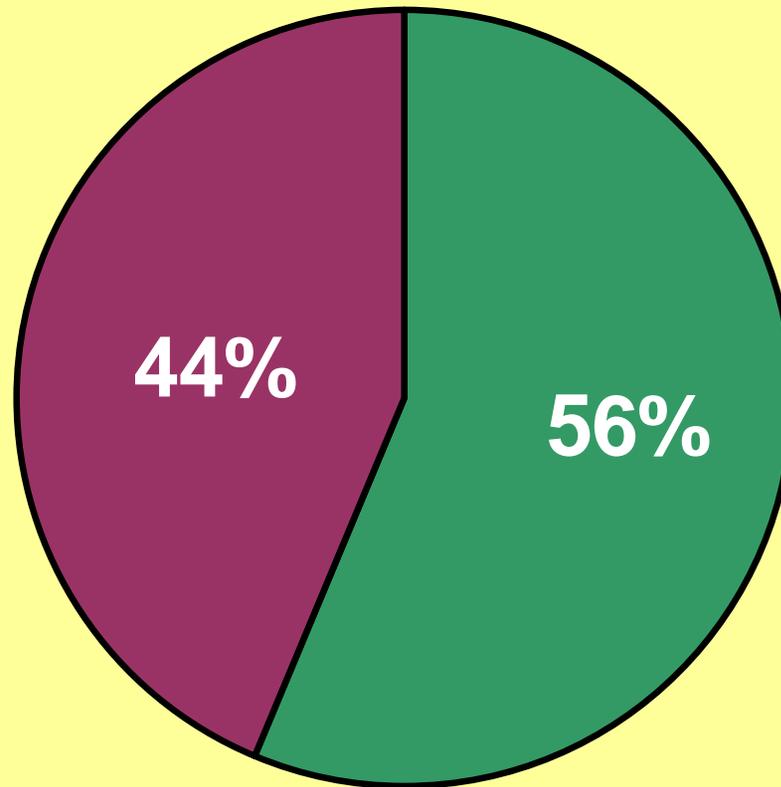
Types of Public Access

		# surveyed	# with AIS	
	Fishing Access	12	4	
	Smallcraft Launch	19	8	
	Trailer Ramp	33	29	

Not all lakes with AIS have public access

Lakes with AIS

Lakes with public access



Lakes without public access

How did they get there?!

Other Means of Introduction

- Wildlife
- Boats on private lakes
- Aquariums and water gardens
- Planting



Brazilian Elodea (*Egeria densa*)



Neither Arnold Pond nor Hundred Acre Pond have public access, yet the only two populations of Brazilian elodea are in these lakes. Brazilian elodea is a common aquarium plant and was likely introduced as the result of someone dumping their aquarium tank into the lake.

What You Can Do

STOP

THE SPREAD OF AQUATIC INVASIVE SPECIES

1/2 inch
Zebra Mussel

Variable Milfoil

Water Chestnut

Eurasian Milfoil

Fanwort

Carp

Goldfish

1/2 inch
Asian Clam

Koi

BOATERS: INSPECT VESSEL CAREFULLY BEFORE & AFTER USE!

- Remove ALL weeds and plant fragments from watercraft & trailer before & after use
- Drain boat & motor far from water; allow to dry before next use
- Clean off all waders, boots and gear after use in any waterbody
- Do not release bait or aquarium fish, shellfish or plants

For more information contact:
RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Division of Fish and Wildlife
(401) 789-0281 or (401) 789-7481
www.dem.ri.gov

- Check boat before and after use for plant fragments and remove all
- Drain water from boat after use and allow to dry before putting in new water body
- Do not empty bait buckets or release bait into water bodies
- Do not dump your aquarium or water garden into a lake
- Do not plant in your lake
- Become familiar with common aquatic invasive species in RI (fact sheets available on DEM website)
- Learn what water bodies in your watershed are infested
- Report AIS infestations

Questions?



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