

# Updates from New Hampshire

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# Overview

- Freshwater AIS
  - AIS - Plants
  - AIS - Animals
- Marine and Estuarine AIS
  - Algae
  - Invertebrates
  - Vertebrates



VARIABLE MILFOIL IN SQUAM RIVER. PHOTO CREDIT: AMY SMAGULA, NHDES



BOTRYLLOIDES VIOACEUS HAS MADE ITS HOME IN THE GULF OF MAINE. PHOTO CREDIT: JENNIFER DIJKSTRA/UNH



ASIAN CLAM COLLECTED OFF THE BOTTOM OF COBBETTS POND IN WINDHAM. PHOTO CREDIT: COBBETTS POND IMPROVEMENT ASSOCIATION

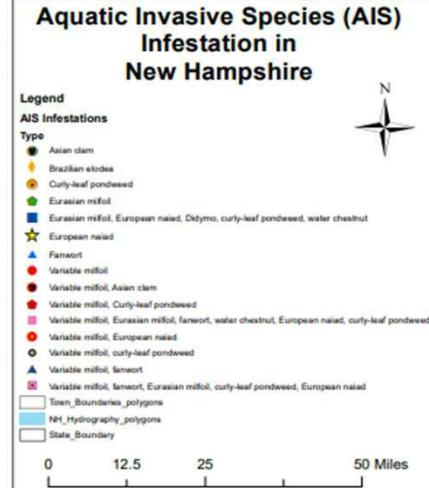
# Freshwater AIS – Plants

Overview by Amy Smagula, NHDES

<https://www.des.nh.gov/home-and-recreation/boating-and-fishing/invasive-species>

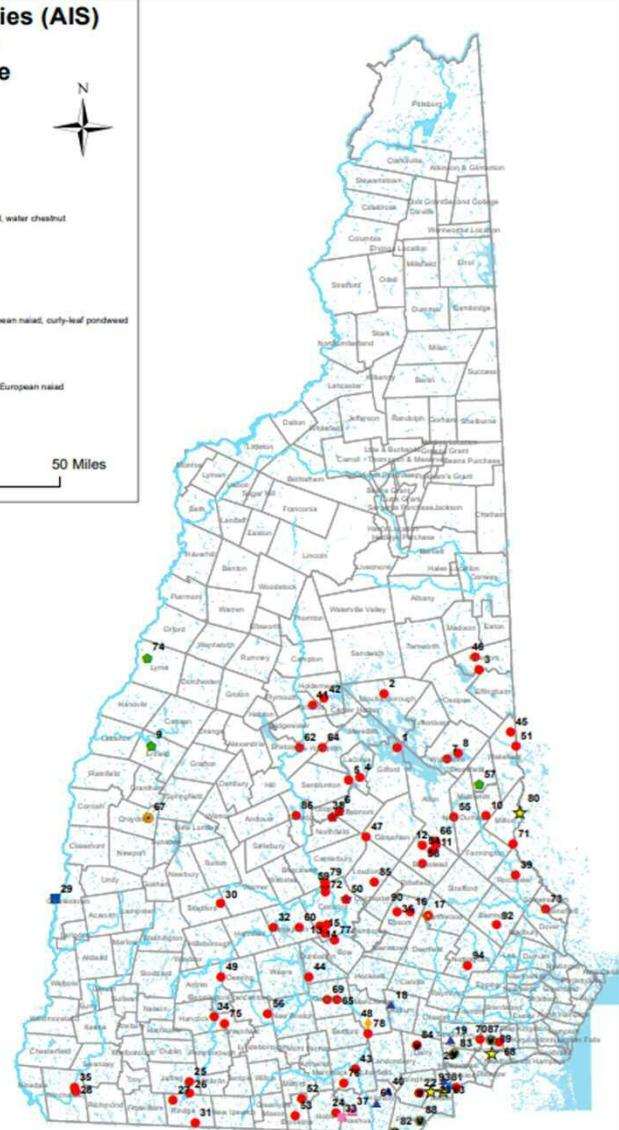
# AIS Plant Infestations in New Hampshire

- 94 infested waterbodies
- 117 total infestations (some waterbodies have multiple infestations, including as many as five different AIS plants)



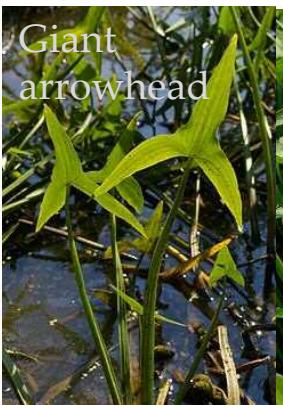
Map prepared by NH DES  
Exotic Species Program  
September 2022

Numbers correspond to separate key which lists waterbody name and town.



## Prohibited AIS Plants in NH

- New Hampshire actually prohibits the sale, introduction, transport, propagation, and distribution of 29 aquatic plant taxa.
- A full list can be found at <https://www.des.nh.gov/organization/commissioner/pip/actsheets/bb/documents/bb-40.pdf> .
  - This list is shared with aquarium enthusiasts, pet stores and the garden trade, to help prevent these species from being brought in and spread. Once in the landscape/waterbody, they can spread easily.



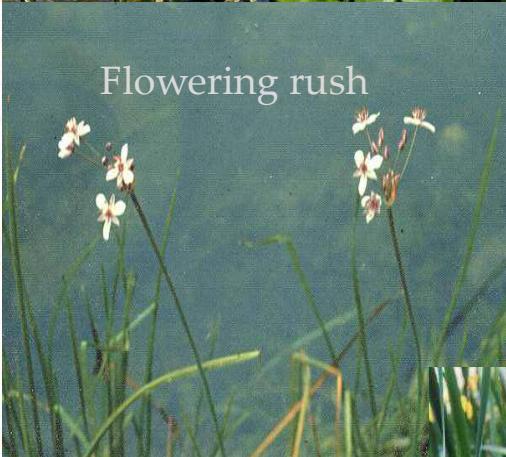
Giant arrowhead



Double flowering arrowhead



Common reed



Flowering rush



Hairy willow herb



Dwarf cattail



Water spinach



Reed sweet grass/manna grass



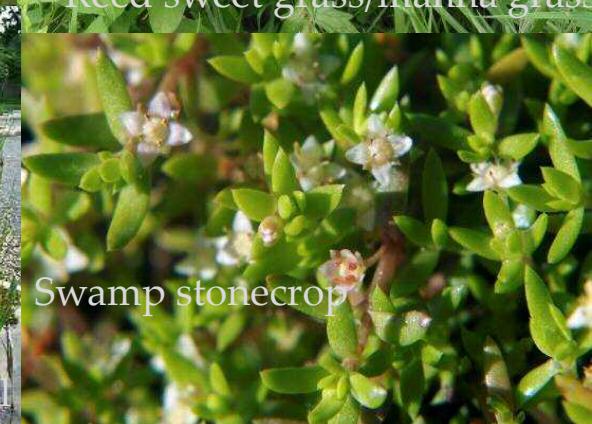
Purple loosestrife



Water forget-me-not



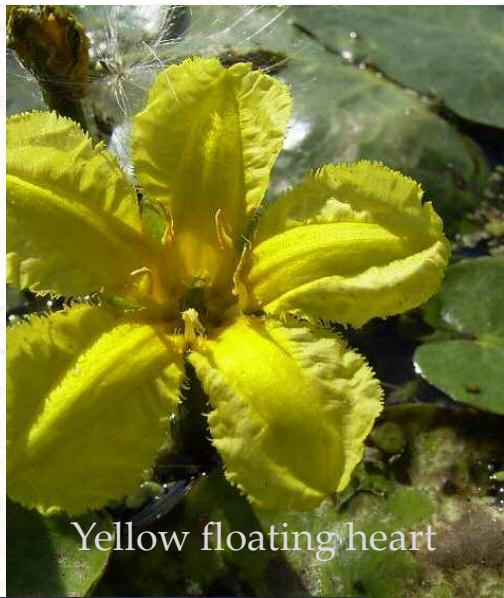
Mini cattail



Swamp stonecrop

## Emergent aquatic invasives

# Floating invasives



Yellow floating heart

Yellow floating heart

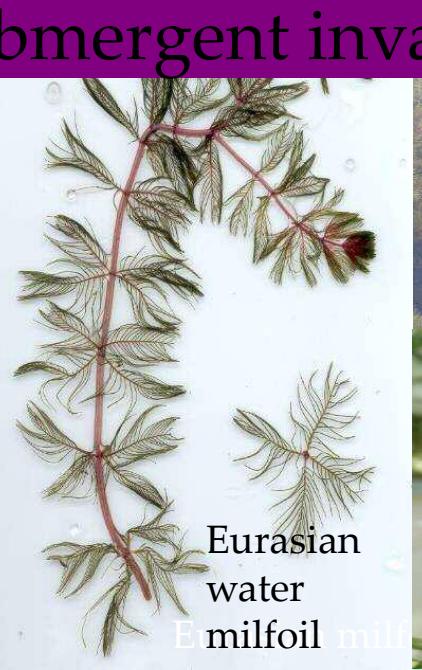
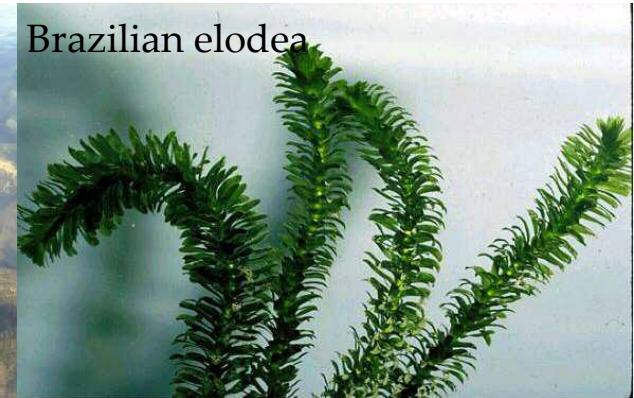
Water chestnut



Water chestnut



European frogbit



## Submergent invasives

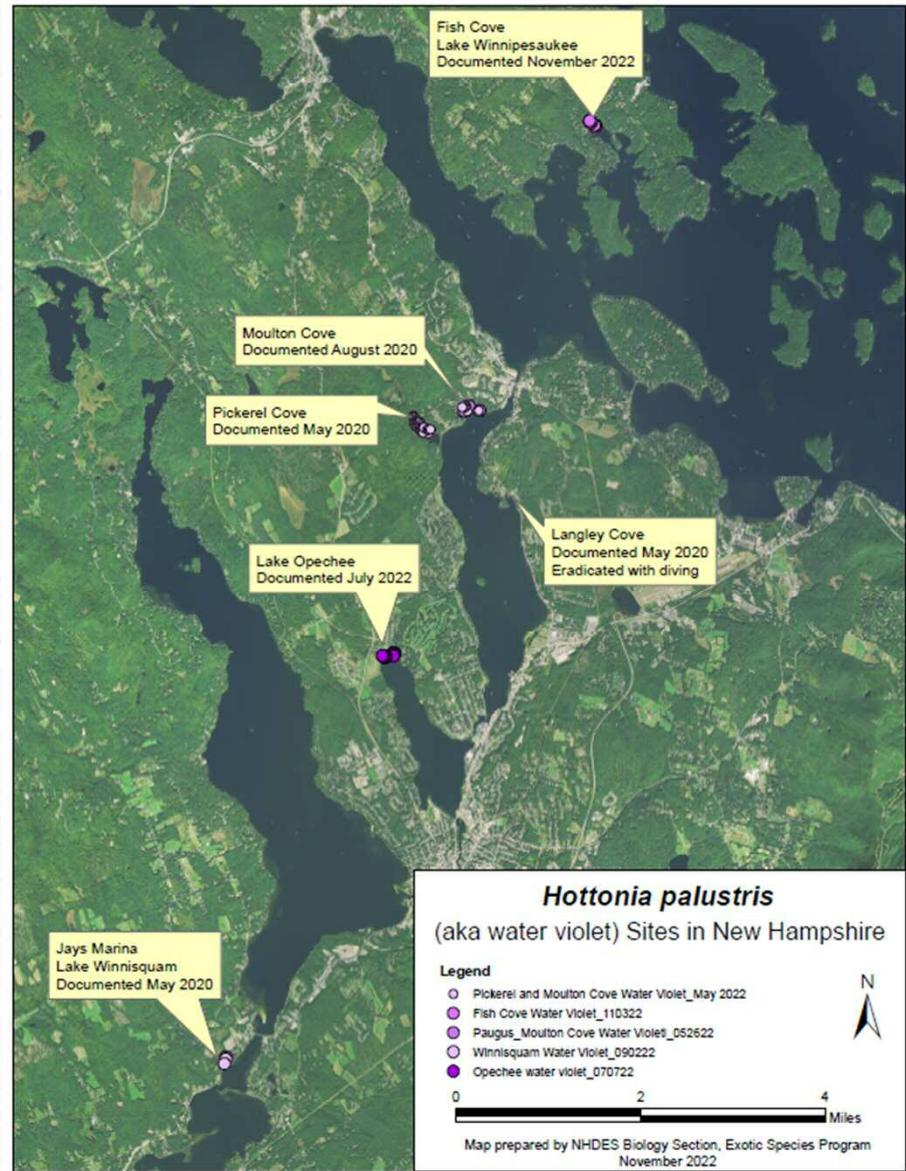


*The new baddie on the block*

- Water violet  
(a.k.a. *Hottonia palustris*)
- Not a state listed invasive  
- yet

# *Hottonia palustris* distribution in NH

As of November 4, 2022



## A note about *Nelumbo lutea* (relative to scheduled NEANS Panel site visit)

- The plant is not currently listed as a prohibited plant species in New Hampshire, so it is not regulated
- Since it seems to be popping up as a nuisance species in the region, NHDES will consider listing it as prohibited to restrict its spread through plant trade
  - *Our prohibited list is in rule, and rules expire in October 2024, so in revisions and re-adoption we will be expanding the list of prohibited species in the state based on recent movement of species not currently listed*



*Nelumbo lutea* in Whites Park pond  
Concord, NH

# Freshwater AIS – Animals

Overview by Scott Decker, NH Fish and Game

- Freshwater Fishing Digest of Laws
- 80,000 copies distributed annually

## STOP AQUATIC HITCHHIKERS!

The quality of our waters is extremely valuable, both as a natural and economic resource. In addition to providing essential aquatic habitat, New Hampshire's waters annually provide 14.7 million visitor days for boating, fishing and swimming — popular family-oriented recreational activities that add more than \$1 billion to the state's economy each year. Your help is needed to protect these resources. It's up to boaters and anglers to keep nuisance species from invading New Hampshire's waters!

New Hampshire's waters are threatened by several non-native aquatic invasive plants and animals. They can easily be transported to new waters by boats, motors, trailers, fishing equipment, live-wells, bait buckets, diving gear and other aquatic recreational equipment. Check your boat and equipment and remove any plants or other materials—milfoil and other invasives can easily adhere to propellers and many other catch points.

Invasives can also be put into our waters by individuals who are not aware of the environmental and economic damages these nuisance plants and animals can cause. Never release plants, fish or animals into a body of water unless they came out of that body of water. It's the law!

### Invasive Plants

RSA 487: 16-c states it is illegal to transport, import, purchase, propagate, sell, or distribute 14 species of non-native aquatic plants in New Hampshire. Among the 14 species, **variable milfoil** is the most abundant and problematic invasive aquatic plant in New Hampshire.

### Invasive Animals

Nonnative invasive animals are also a growing concern in New Hampshire. **Zebra mussels** and **quagga mussels** can attach to boat hulls and clog water intake systems. They are not here yet—it is extremely important to keep them out of New Hampshire waters.

**Asian clams** are already present in the lower Merrimack River and several ponds; they compete with native mussels for space and food.

The **Chinese mystery snail** is also here, present in lakes and ponds as far north as the Lakes Region. **Rusty crayfish** have been found



in Vermont. The spiny water flea and the fishhook water flea are present in the Great Lakes and Lake Champlain. These invaders compete with native species for zooplankton, affecting the entire food chain.

### It's the Law

RSA 487:16-d requires boaters to drain their boat and other equipment that holds water, including live wells and bilges, when leaving a waterbody. Pursuant to RSA 487:43, a special aquatic invasive species out of

state boater decal is required for display on motorized boats registered in a state other than New Hampshire, which are used on New Hampshire's waters. The out-of-state boater decal is available at [www.des.nh.gov](http://www.des.nh.gov).

### Learn More

For more information, contact the NH Department of Environmental Services, Exotic Species Program at 603-271-2248, [des.nh.gov](http://des.nh.gov); NH Fish and Game at 603-271-2301, [fishnh.com](http://fishnh.com); or visit [protectyourwaters.net](http://protectyourwaters.net).

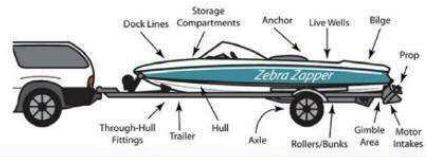


### Clean...Drain...Dry

To help prevent the transport of aquatic nuisance species, clean all recreational equipment whenever you leave a body of water:

- Remove any visible mud, plants, fish or animals.
- Drain water from equipment (engine water intake systems, bilge, live wells, bait buckets).
- Clean and dry anything that comes into contact with water (boats, paddles, trailers, waders, etc.).

Before leaving and before launching...  
inspect everything!



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## Aquatic Invasive Species in New Hampshire

Some species of aquatic wildlife and plants have become unwanted invaders in New Hampshire's waters. On this page, learn more about aquatic invasive species, the laws & rules around possession and use of aquatic species, and what you can do to help stop the invasion!



### STOP AQUATIC HITCHHIKERS!

Prevent the transport of nuisance species.  
Clean all recreational equipment.  
[www.ProtectYourWaters.net](http://www.ProtectYourWaters.net)

If you find NEW Aquatic Invasive Species, [take a picture and report here](#)

#### Tips for Anglers and Boaters

#### Definitions

#### NH Laws and Rules Related to Aquatic Invasive Wildlife

#### Who's Helping?

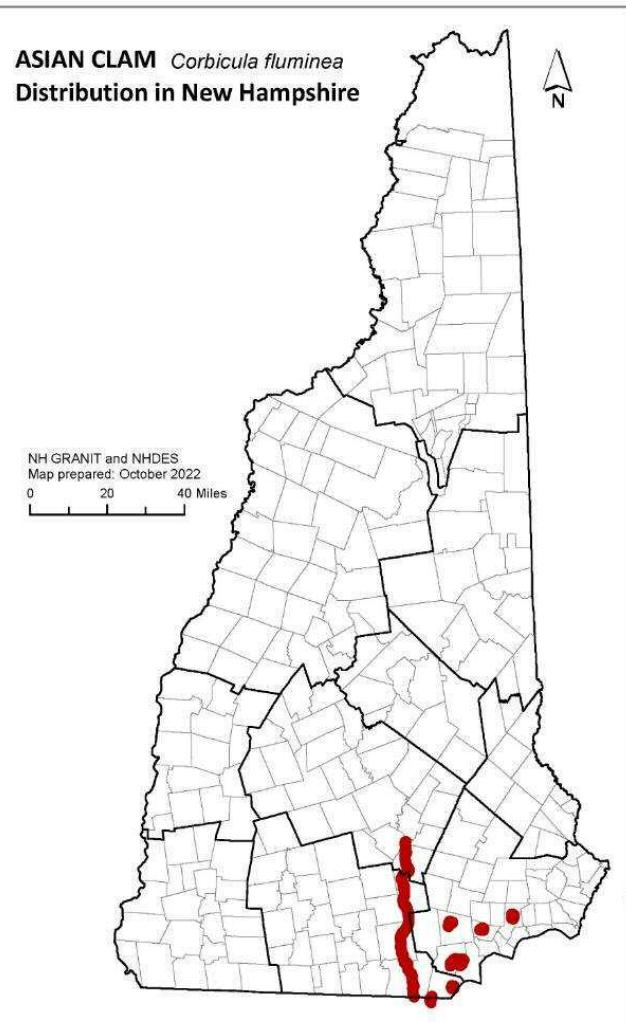
For additional information on aquatic invasive species visit:

- » [ProtectYourWaters](#)
- » [Aquatic Nuisance Species Task Force](#)
- » [National Invasive Species Council](#)
- » [Zebra Mussels Fact Sheet](#) ↗
- » [Clean, Drain, Dry: Please perform a self-inspection of your boat, trailer and gear](#) ↗
- » [Northeast Aquatic Nuisance Species Panel](#)

<https://www.wildlife.state.nh.us/fishing/nuisance-species.html>

## Asian Clam *Corbicula fluminea*





### Asian clam

*Corbicula fluminea*



Paul Smith's College

#### History

- First confirmed report in North America was in 1938 in the Columbia River drainage
- Since then Asian clams have become widely distributed especially in the southern United States

#### Characteristics

- Shells greenish-yellow to brown with thick concentric rings
- Thick symmetrical shell
- Up to 2 inches (5 cm) long
- Inside of shell is smooth and polished with a light purple tinge
- Three cardinal teeth in each valve

#### Habitat

- Large rivers and lakes
- Clams burrow prefer sandy or silty sediments into which they burrow up to 6-8 inches

#### Known Distribution in the Northeast

- Widely distributed in southern and western United States, in the Great Lakes and in southern New England
- Discovered in 2010 in Lake George, NY in the Champlain basin

#### Known Distribution in New Hampshire

- Cobbett's Pond, Windham
- Canobie Lake, Windham
- Little Island Pond, Pelham
- Long Pond, Pelham
- Sunset Lake (Wash Pond), Hampstead
- Beaver Lake, Derry
- Great Pond, Kingston
- Merrimack River south of Bow

#### Impacts

- Clogging of power plant and industrial water systems, irrigation canals and pipes and drinking water supplies
- May compete with native species for limited resources
- May promote algae blooms due to localized nutrient loading from dense clam beds (observed in Lake Tahoe, CA)

#### Additional Information

- NHDES fact sheet: [Asian Clams in New Hampshire \(nh.gov\)](#)
- NHDES Asian clam study: [Asian Clam Habitat, Population Density and Size Range \(nh.gov\)](#)
- USGS fact sheet: [Asian clam \(Corbicula fluminea\) - Species Profile \(usgs.gov\)](#)

## Green Sunfish *Lepomis cyanellus*



Bluegillfishing.net

- 2020 - Reported by an angler in Piscataquog River in Weare, NH
- Single specimen found by F&G biologists while electrofishing
- Unconfirmed reports from the Lamprey and Merrimack Rivers
- 2022 – 3 specimens found by NHDES biologists in Little Sugar River in Unity, NH





## Green Sunfish Facts

- Native to central US east of the Rocky Mountains, including the Great Lakes and the Mississippi River basin.
- Have spread as far west as California and now abundant in much of the Northeast US except NH and Maine
- Exceptionally tolerant of a wide variety of ecological conditions
- Can tolerate poor water quality
- Green sunfish have a larger mouth than our native pumpkinseed and redbreast sunfish. This makes them a more voracious predator and able to consume a wider variety of prey items.
- Popular aquarium fish and the likely vector of introduction



## What are we doing about Green Sunfish?

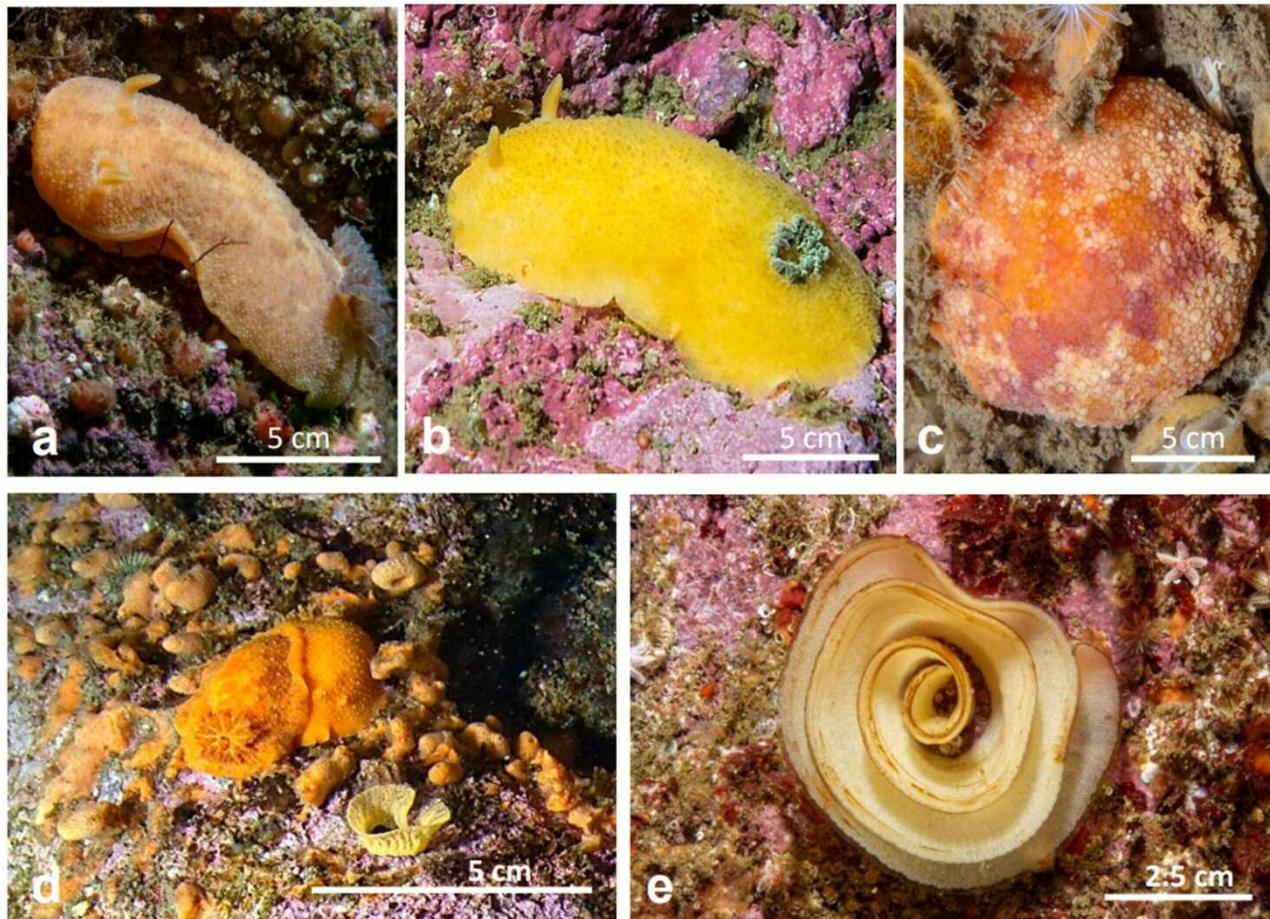
- Press release and social media post informing the public
- Emphasize release of fish without permit is illegal
- Following up on reports from anglers
- Encourage anglers to kill any fish caught
- Potential eDNA sampling to determine presence

# Marine and Estuarine AIS

Overview by Dr. Larry Harris, UNH

# *Doris pseudoargus*

- A very large sponge eating dorid nudibranch from Europe, first seen in 2017 by Alex Shure who took these images.
- From a paper in Biological Invasions: A European nudibranch new to the Gulf of Maine: *Doris psuedoargus* Rapp 1827 (DOI [10.1007/s10530-022-02917-0](https://doi.org/10.1007/s10530-022-02917-0)).



- The dominant red alga is *Dasyiphonia japonica* which is now a very conspicuous alga in benthic communities even up into Great Bay.

Also present are colonies of: *Didemnum vexillum* (white) and *Botrylloides violaceus* (orange) on the benthos and *Membranipora membranacea* encrusting kelp blades.



A quadrat photo taken off Star Island

Bryozoan *Tricellaria inopinata* growing on a kelp blade.

It is now a dominant bryozoan in both fouling communities and rocky subtidal habitats.

There is also *Botrylloides violaceus* (orange) and *Didemnum vexillum* (white) in the image.



Cropped image from Gosport Harbor

# New Hampshire Statewide AIS Management Plan Update

# Updates

- NH started drafting a statewide AIS management plan at least a decade ago, with many starts and stops
- A draft plan was reviewed by USFWS a few years back, with some great constructive feedback provided from that review
- In 2021, we picked up the plan again and started working on it in a concerted fashion with the state's standing Exotic Aquatic Weeds and Species Committee, a legislative standing committee with a wide range of stakeholder interests
- A revised plan exists now, which we will submit for another preliminary review by USFWS, to see if we are closer to meeting their requirements for finalizing a plan for NH
- Stand by for future updates!

Thank you!

Questions?