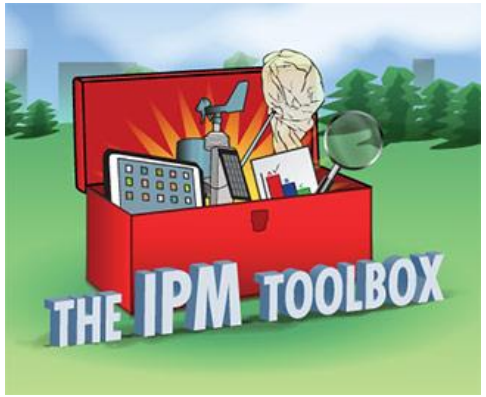
Northeastern IPM Center

AIS RAPID RESPONSE IN PENNSYLVANIA

CASE STUDIES OF SUCCESS AND LESSONS LEARNED

APRIL 12, 2021



Sea Grant Pennsylvania

USDA United States Department of Agriculture National Institute of Food and Agriculture

WEBINAR DETAILS

- Welcome

- A recording of this webinar will be available within a week at
  - http://www.neipmc.org/go/ipmtoolbox

WE WELCOME YOUR QUESTIONS

- Please submit a question **at any time** using the Q&A feature to your right at any time

- If you'd like to ask a question anonymously, please indicate that at the beginning of your query.

WEBINAR PRESENTER

- Sara Stahlman
- Extension Lead

SOME QUESTIONS FOR YOU

PENNSYLVANIA AIS RAPID RESPONSE PLAN

USDA United States Department of Agriculture National Institute of Food and Agriculture

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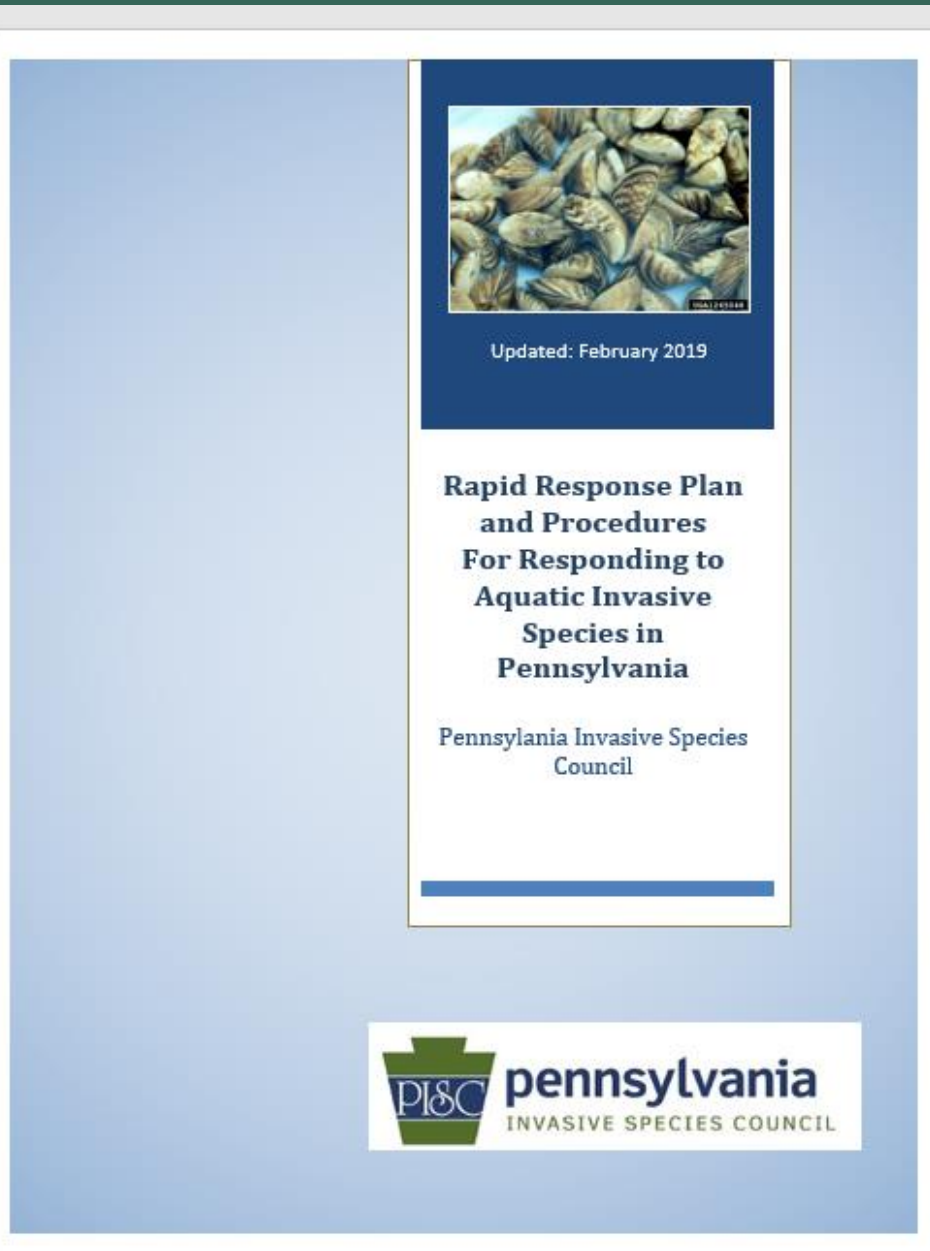
PENNSYLVANIA AIS RAPID RESPONSE PLAN

Interagency decision support framework designed to aid agencies in conducting a coordinated and structured response to new aquatic invasive species infestations.



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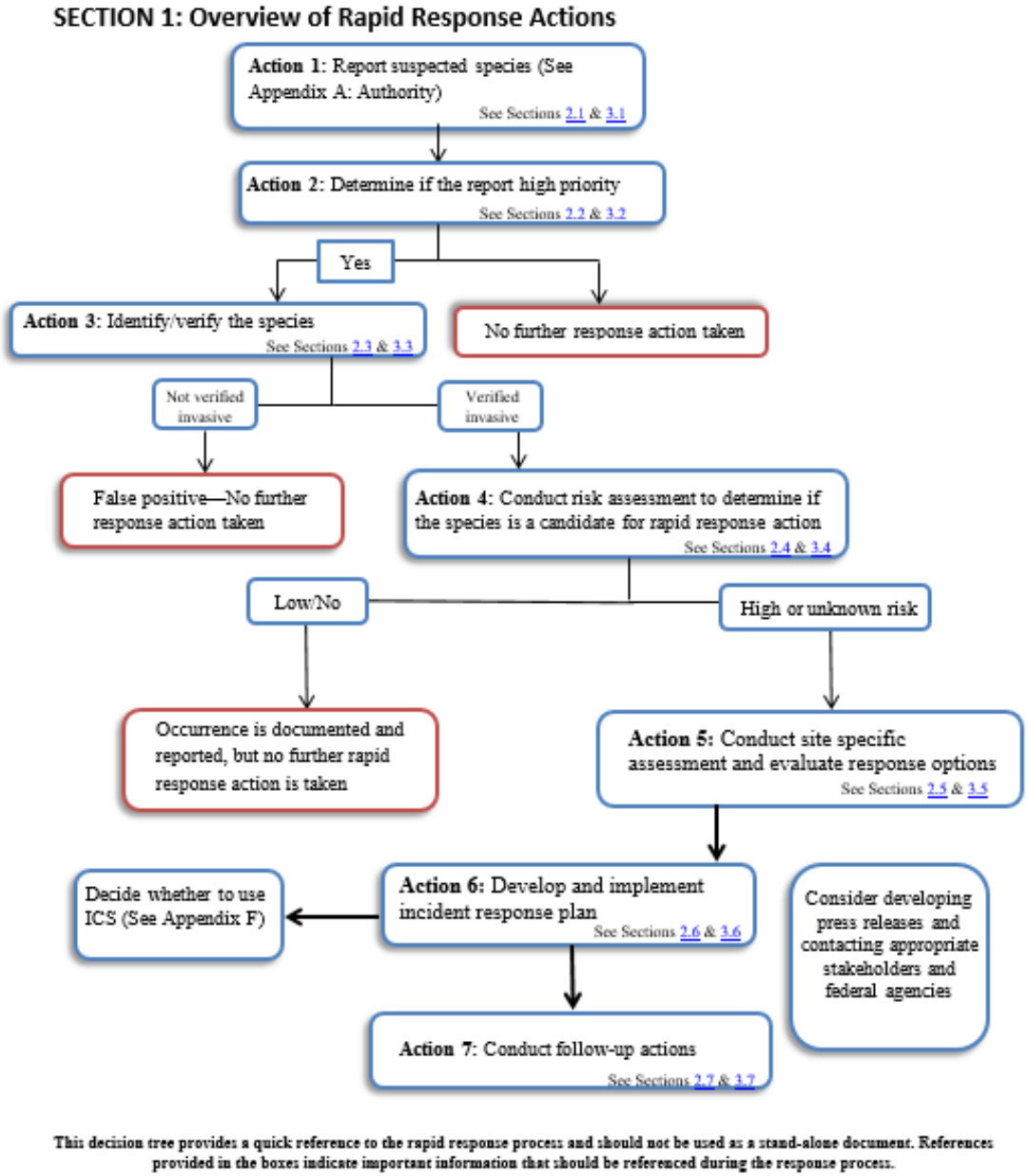
INVASIVE SPECIES COUNCIL RAPID RESPONSE SUBGROUP

- Kris Abel, Pennsylvania Invasive Species Council
- Jim Grazio, Pennsylvania Department of Environmental Protection
- Chris Urban, Pennsylvania Fish and Boat Commission
- Brian Pilarcik, Crawford County Conservation District
- Felicia Lamphere, Pennsylvania Department of Conservation and Natural Resources
- Sean Hartzell, Pennsylvania Fish and Boat Commission (AIS coordinator)

SECTION 1- DECISION TREE

Concise overview of all the action steps that may be needed in the rapid response process.



SECTION 2 – CHECKLIST OF ACTIONS

Action 1:
Report suspected AIS to AIS coordinator

☐ completed

Action 2:
Is the report high priority?

☐ completed

Action 3:
Identify/verify the species

☐ completed

Checklist of actions that can be used as a stand-alone document

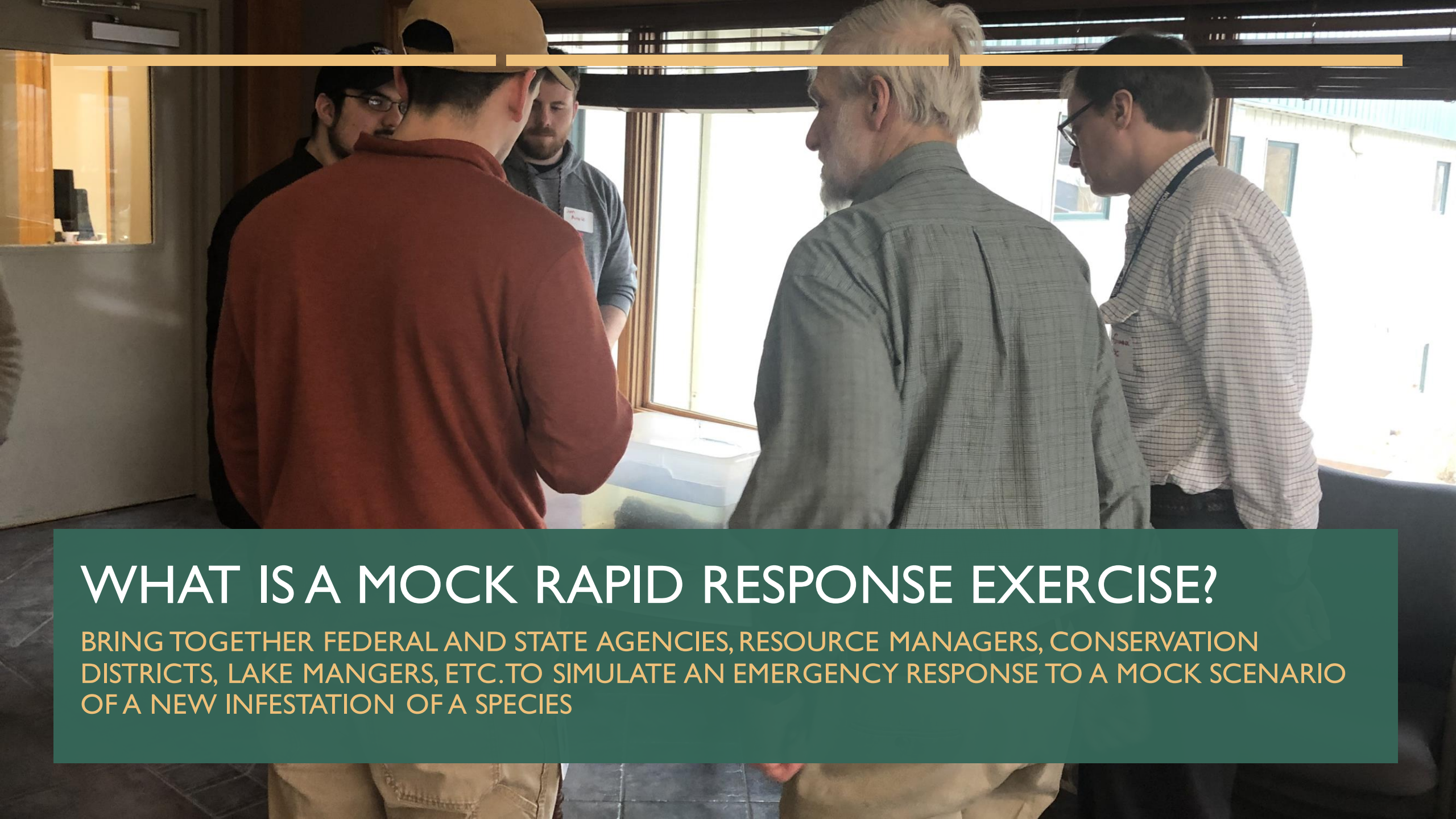
SECTION 3- DETAILED ACTION STEPS

- Detailed, comprehensive supporting information for each step
- Contact information for federal and state agencies, interested parties, and others
- Interactive tools:
  - Response Options Template
  - Incident Response Plan

THE CHALLENGE…

- What is it and why should we use it?
  - Provide a structure for communication and decision making
  - Allow for leveraging additional support and capacity for rapid response
- Need for education and outreach on rapid response

MOCK EXERCISES



WHAT IS A MOCK RAPID RESPONSE EXERCISE?

BRING TOGETHER FEDERAL AND STATE AGENCIES, RESOURCE MANAGERS, CONSERVATION DISTRICTS, LAKE MANGERS, ETC. TO SIMULATE AN EMERGENCY RESPONSE TO A MOCK SCENARIO OF A NEW INFESTATION OF A SPECIES

FAMILIARIZES PARTICIPANTS WITH THE PROCESS

TEST THE PENNSYLVANIA RAPID RESPONSE PLAN FRAMEWORK AND IDENTIFY EXISTING GAPS AND CHALLENGES

QUESTIONS

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CASE STUDY: WATER LETTUCE AND WATER HYACINTH ON PRESQUE ISLE STATE PARK

ERIE, PENNSYLVANIA

- Species found in September 2020 and reported to Pennsylvania Invasive Species Council Coordinator.
- Area known as “Low Bridge”
- Starry stonewort also present

September 3, 2020 ·

Can you identify the plants that don't belong? Doing monitoring work in the inner lagoon today with Jen Salem and look what we found. I would guess they were recently dumped into the water - please do not use the lake/wetlands to dispose of unwanted aquarium/garden plants - these are invasive and although tropical they could possibly survive a mild winter and spread. This is how problems start. These plants are water hyacinth (Eichhornia crassipes) and water lettuce (Pistia stratiotes).

REPORTED THROUGH SOCIAL MEDIA

REPORTING AND COMMUNICATION: LESSONS LEARNED

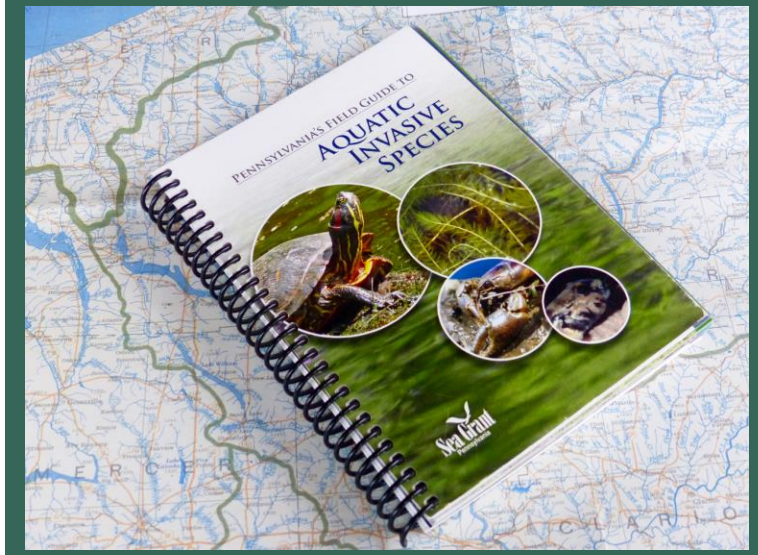
PENNSYLVANIA FISH AND BOAT COMMISSION ONLINE REPORTING FORM

PENNSYLVANIA IMAP INVASIVES

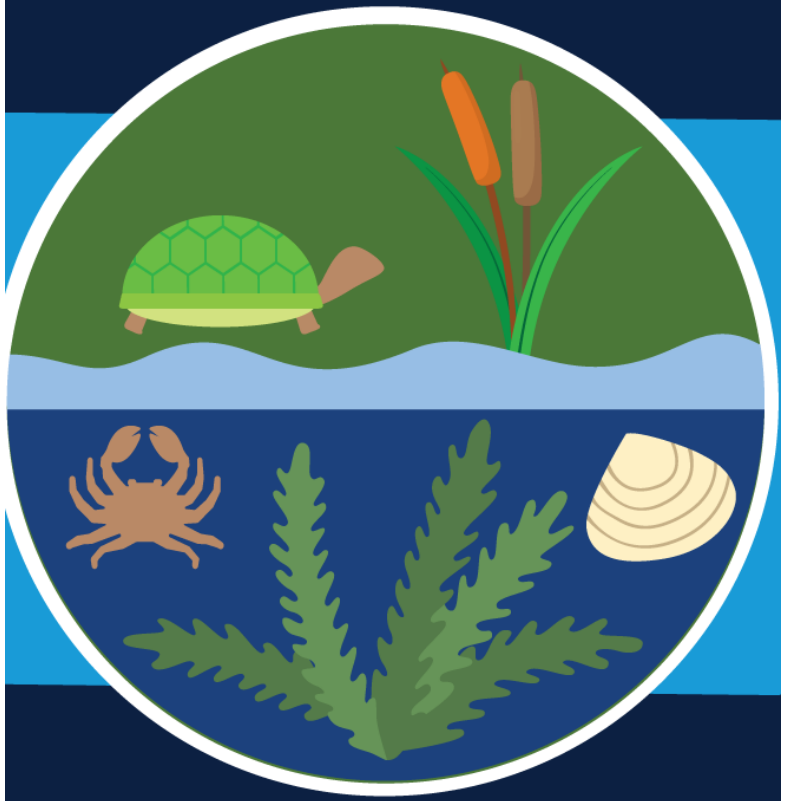
PENNSYLVANIA FIELD GUIDE SMART PHONE APP

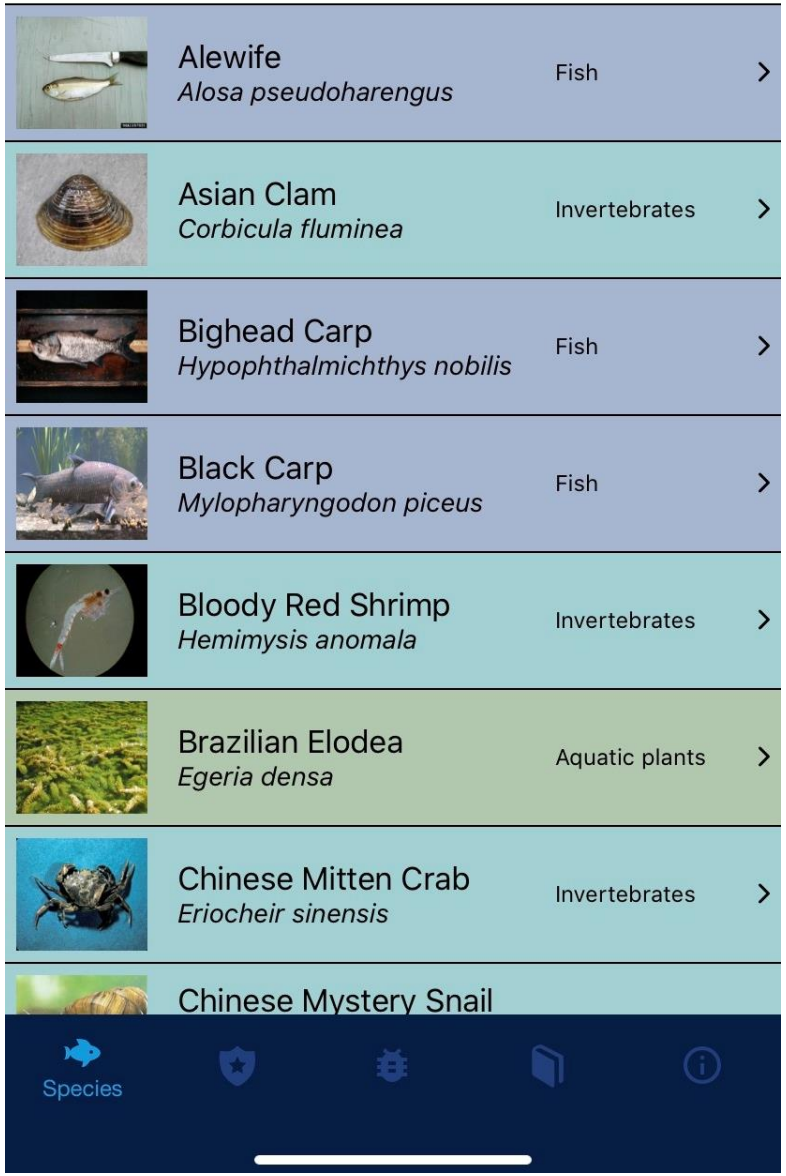
PENNSYLVANIA'S FIELD GUIDE TO AQUATIC INVASIVE SPECIES

SMART PHONE APP



PA AIS





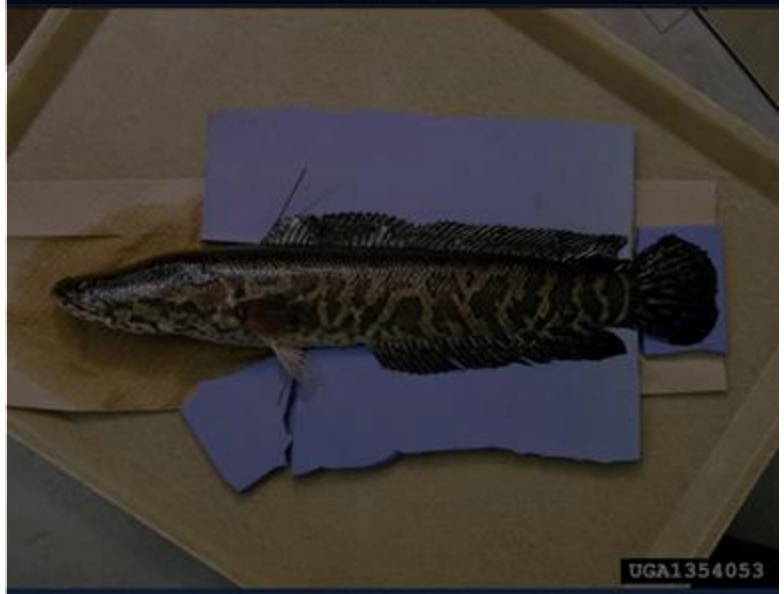
10:23

Back

Northern Snakehead

Channa argus

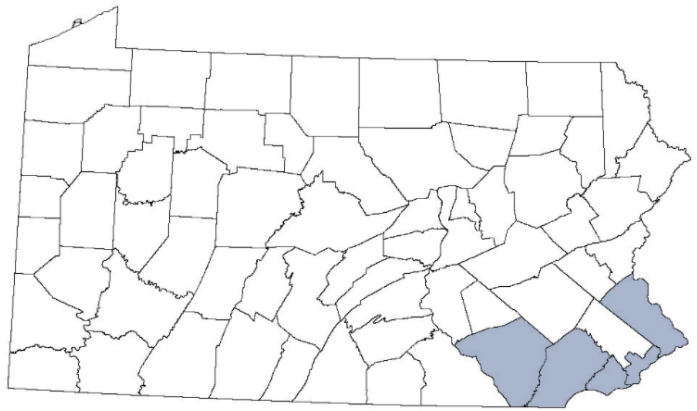
Report It!



The northern snakehead is a freshwater fish nicknamed "Frankenfish" because of its intimidating appearance and voracious appetite. An air bladder that works like a primitive lung lets this species survive out of the water in moist locations and wriggle over land to new bodies of water. These adaptations give the snakehead a competitive edge in securing habitat and expanding its range.

locations and wriggle over land to new bodies of water. These adaptations give the snakehead a competitive edge in securing habitat and expanding its range.

- Identification
- Similar Species
- Habitat
- Spread
- Distribution



Species

Select a Species

Choose Severity

Body of Water

Name of the nearest body of water

Infestation Details

Location Details

Add a Photo 0/3

Report

IMPROVING REPORTING OF INVASIVE SPECIES THROUGH THE PENNSYLVANIA INVASIVE SPECIES HOTLINE

- Created an AIS reporting hotline
- Current number: 1-866-253-7189
- Vanity number options: 1-833-Invasiv
- Social media "blitz" on invasive species reporting

REPORTING WATER HYACINTH AND WATER LETTUCE

- State
  - Pennsylvania Department of Conservation and Natural Resources (DCNR) notified as the jurisdictional agency that operates Presque Isle State Park where the observation was found
  - PA Fish and Boat Commission (PFBC) as it relates to managing aquatic invasive species in commonwealth waters
  - PA Dept. of Ag as it relates to managing PA Noxious Weed List
  - PA Department of Environmental Protection (DEP) as it relates to Clean Water Act and potential waterway impairments
- Federal
  - USGS -Great Lakes Aquatic Nonindigenous Species Information Systems
  - USFWS -involvement in Great Lakes Restoration Initiative long-term goal of no self-sustaining invasive species
- Other
  - iMapInvasives -Pennsylvania invasive species mapping and tracking)

IDENTIFICATION AND VERIFICATION

QUESTIONS

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PRELIMINARY RISK ASSESSMENT: IS THIS SPECIES HIGH PRIORITY?

- **Is the species already known in area?**
  - No
- **Is the species able to survive the climate?**
  - Yes – Although literature suggests it is not likely to thrive under exposure to harsh winter conditions
- **For that location, is there an existing report of higher risk species to which resources will be allocated?**
  - Many other invasive species are at this location, and actions and resources should be coordinated appropriately.

High impact potential for intended ecological and recreation uses of the water in which it was found if left unmanaged.

YES

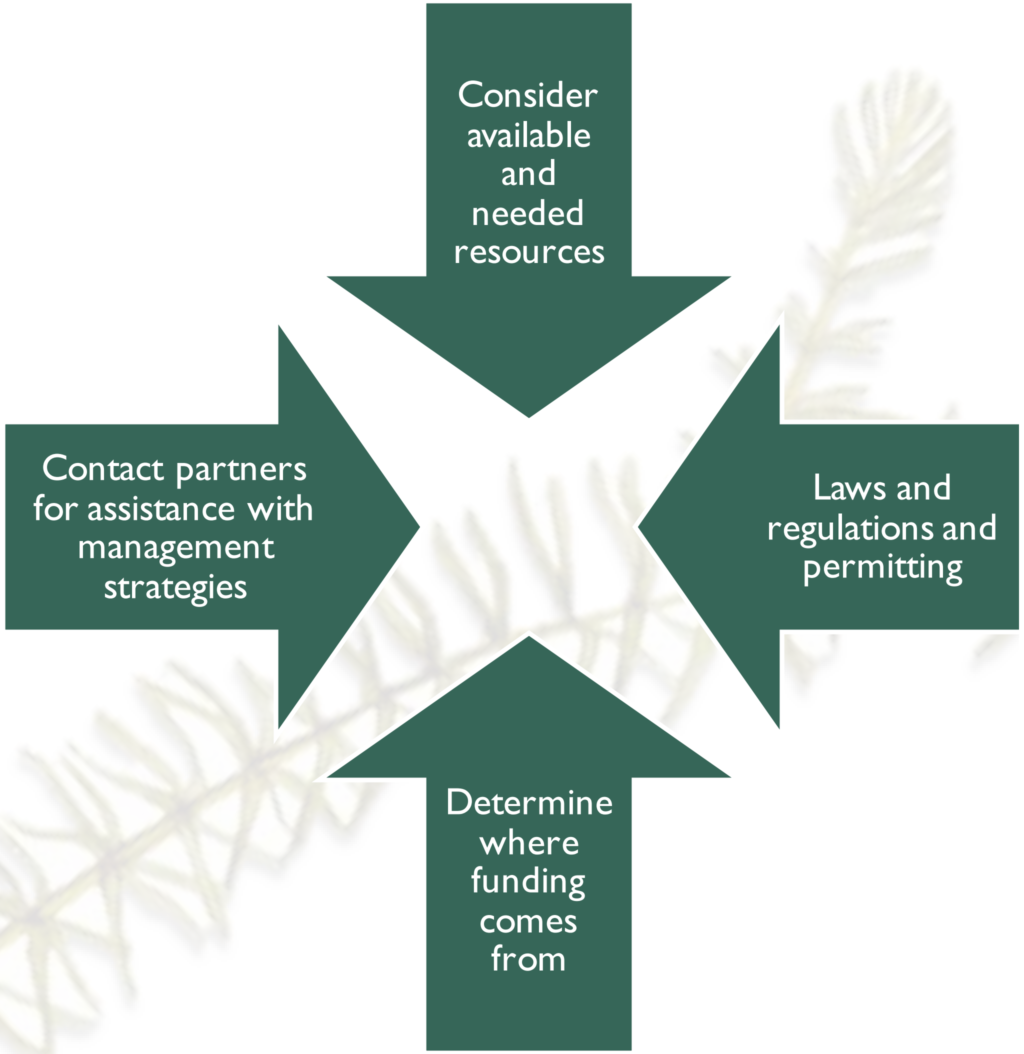
SITE ASSESSMENT: WHAT INFORMATION IS KNOWN?

Geographic Extent	Localized
Abundance	a few dozen plants were removed, but additional plants and reproductive material still present in the area
Origin	Most likely a result of aquarium dumping
Evidence of Reproduction	Stolon buds of various sizes were documented; no flowering structures reported
Other notes about infestation	The location of this report overlaps with other highly invasive species (e.g. starry stonewort), threatened and endangered species present in the area, and occurs within a very popular recreational waterway that is easily accessed from a roadway

IDENTIFY OBJECTIVES FOR THE RESPONSE

- Need to understand the goal to choose the best way to achieve it
- Eradication always primary goal, but is not always feasible
- Examples from case study:
  - Goal: Avoid further ecological harm and maintain suitable conditions for recreation activities at the park.
    - Outcome objective 1: Identify any new specimens
    - Outcome objective 2: Eliminate any identified specimens
    - Outcome objective 3: Limit probability of population as AIS pathway

BRAINSTORM ALL POSSIBLE RESPONSE OPTIONS



	Response Option 1	Response Option 2	Response Option 3	Response Option 4
What resources would be needed to implement this control strategy? (if appropriate, insert the quantities of each)	☐Personnel ☐Equipment: ☐Power Boats ☐Kayaks/Canoes ☐Nets ☐Fishing poles ☐Electrofishing gear ☐Waders ☐ Pesticides and applicators ☐Transportation	☐Personnel ☐Equipment: ☐Power Boats ☐Kayaks/Canoes ☐Nets ☐Fishing poles ☐Electrofishing gear ☐Waders ☐Pesticides and applicators ☐Transportation	☐Personnel ☐Equipment: ☐Power Boats ☐Kayaks/Canoes ☐Nets ☐Fishing poles ☐Electrofishing gear ☐Waders ☐Pesticides and applicators ☐Transportation	☐Personnel ☐Equipment: ☐Power Boats ☐Kayaks/Canoes ☐Nets ☐Fishing poles ☐Electrofishing gear ☐Waders ☐Pesticides and applicators ☐Transportation
List any other resources that may be needed to address this infestation				
Of the needed resources, which				

BRAINSTORM ALL POSSIBLE OPTIONS

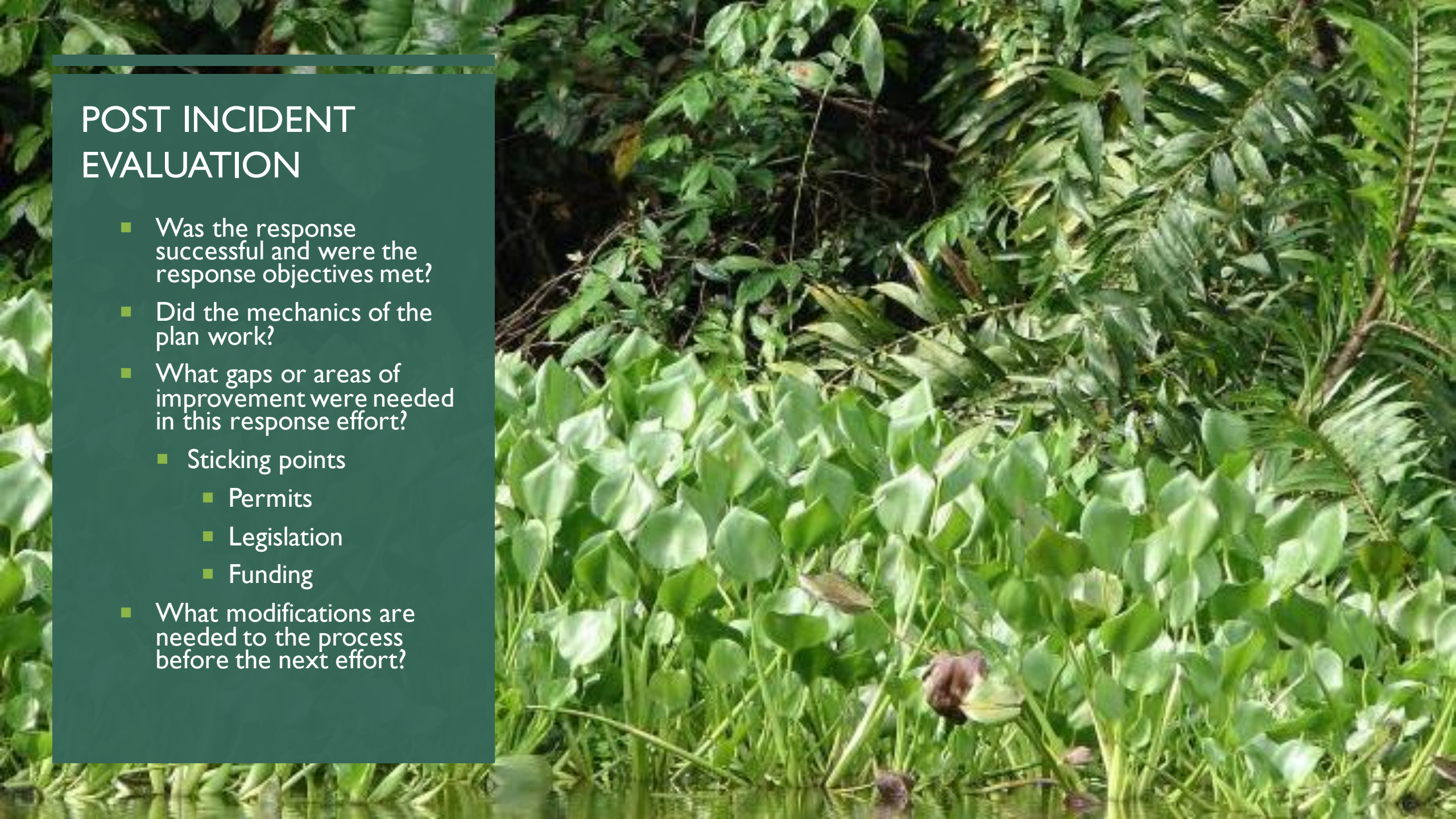
- No action: Due to designation as high risk, not a recommended action to pursue
- Intensified Surveillance: Continue to survey for and report these species
- Prevention: DCNR actively participate and promote Clean, Drain, Dry and Boat Stewards Programs
- Source Reduction: Limiting the sale and distribution of this species
- Education: AIS signage and disposal stations may be considered in the vicinity of the identified population
- Mechanical Removal: Hand removal may be an appropriate response
- Physical: Based on the existing population size, site conditions, and available information there is no feasible physical change (dewatering, pH modification, etc.) to the site that can be used to control the existing population without extreme associated costs
- Cultural: diverting recreational access to the shoreline here to other locations through passive management strategies
- Genetic: promotion of native plant material that could compete with this species
- Biological: Not sustainable to implement
- Legal: Pennsylvania Noxious Weed committee may consider the addition of water lettuce to the State Noxious Weed list. This would significantly reduce potential additional source material being released here.
- Pesticide: Based on existing extent use of aquatic herbicide is not recommended at this time. Re-evaluate in 2021

DEVELOP AN ACTION PLAN FOR CHOSEN RESPONSE

- Who will take the lead?
- How will the chosen response method will be implemented?
- Ensures those who should be at the table, are at the table
- Work together!
  - Include all partners (other agencies, organizations, stakeholders, etc.)

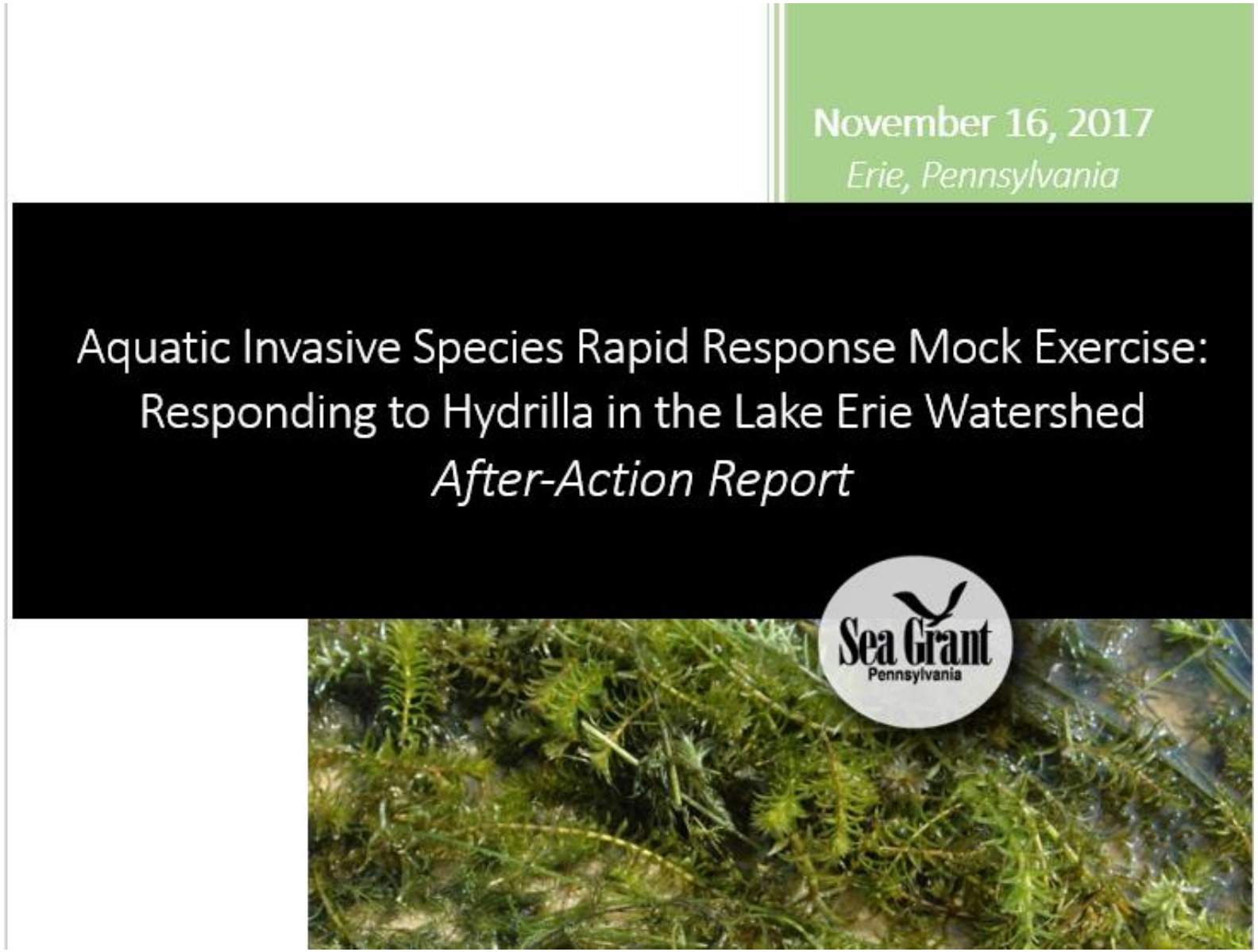
POST INCIDENT EVALUATION

- Was the response successful and were the response objectives met?
- Did the mechanics of the plan work?
- What gaps or areas of improvement were needed in this response effort?
  - Sticking points
    - Permits
    - Legislation
    - Funding
- What modifications are needed to the process before the next effort?



KEY OUTCOMES AND LESSONS LEARNED FROM THE RESPONSE

- Increase knowledge about the plan and how to use it
- Increased coordination, communication, networking and "knowing what role I play"
- Initial feeling of being "overwhelmed" with the steps and tediousness of filling out each of the steps
- Ultimately resulted in less work moving forward and having it all planned out was extremely beneficial to all involved.



PRODUCE A REPORT DETAILING THE RESPONSE TO THE SCENARIO AND HAVE DISCUSSIONS ABOUT SUCCESSES, FUTURE NEEDS, AND NEXT STEPS

NEXT STEPS

- Identified issues with suggestions for improvement and action steps

Issue	Suggestions for Improvement
Confusion among state agencies about who is responsible for what in some situations (for example: aquatic plants, private lands,)	Agencies should work together to identify "gray" situations and develop clearly-defined roles and responsibilities
Lack of funding for RR outside of Lake Erie watershed. Lack of "emergency" RR funding across state.	Increase funding for AIS prevention and control, including RR activities.
New agency staff are not fully trained on RR plan.	Implement more regular RR training within agencies and as part of other job training. Increase promotion of the plan to state agencies and organizations.
Lack of a unified reporting process in Pennsylvania	Work within agencies to develop an internal reporting chain for AIS that cannot be interrupted by personnel vacancies.
Lack of dedicated agency and organization staff working on aquatic invasive species issues in Pennsylvania	Seek alignment between agency-specific issues and AIS impacts to help encourage the need for dedicated staffing for invasive species.
In some cases, the actions steps in the plan are not being used by agencies and organizations to address new infestations.	Work with upper level management at state agencies to create buy-in on using the Plan and following its guidelines for rapid response.

2021 RAPID RESPONSE PLAN UPDATE

- Funding Matrix

Grant Name	Agency/Organization	Level	Amount Available	Notes
Growing Greener	PA DEP	State		
Coastal Zone Management Fund	PA DEP	State		
Great Lakes Restoration Initiative	USFWS	Federal	$100,000-$800,000	Must be used to protect the Great Lakes
Mid-Atlantic Panel on AIS	Mid-Atlantic AIS panel	Regional	$5,000-$10,000	
ANS Taskforce	USFWS/ANS Task Force	Federal	$30,000-$93,000	PFBC is designated applicant, 5% Cap on Administration costs, Must be used to implement PA AIS Management Plan
Watershed Protection Grants	William Penn Foundation	Delaware Watershed		Delaware watershed. Science/monitoring projects
PA Farm Bill	PDA, USDA APHIS			

RAPID RESPONSE PLAN UPDATE: CASE STUDIES

- Water Chestnut, Mercer County Conservation District
- Hydrilla, Pymatuning State Park
- Asian Carp, 84 Pay lakes
- European Frogbit, Lake Wilhelm
- Water Lettuce and Water Hyacinth, Presque Isle State Park
- Northern snakehead, Lower Susquehanna River
- Round Goby, French Creek

RAPID RESPONSE PLAN UPDATE

- Permitting Guidance
- BMPs for Control

Chemical Control of Aquatic Plants

Table 7-21. Chemical Control of Aquatic Plants

Herbicide, Formulation, and Mode of Action Code	Amount of Formulation	Active Ingredient Rate or Concentration	Precautions and Remarks[2]
Algae, blue-green			
copper sulfate (various)	See label	0.5 to 1 ppm	Apply crystals or powder at early stage of growth by any method to give rapid and uniform dispersion. For best results, apply on a clear day. Do not apply to muddy water. **Warning: Copper is toxic to fish.** Formulated copper products have a greater margin of safety to fish.
sodium carbonate peroxyhydrate (various)	See label	0.3 to 1.7 ppm	Apply with 8 to 10 hours of daylight remaining. Do not reapply within 48 hours.
Algae, filamentous and planktonic			
copper complex (various)	0.6 gal/acre ft	0.2 ppm	Dilute with water in ratio of at least 9-to-1 and apply uniformly. For best results, apply on a clear day and break up floating mats of filamentous algae before treatment. **Warning: Copper is toxic to fish.**
copper sulfate (various)	See label	0.5 to 1 ppm	Same as under Algae, blue-green. For best results break up floating mats of filamentous algae before treatment. **Warning: Copper is toxic to fish**. Formulated copper products have a greater margin of safety to fish.
diquat (Reward) 2 lb/gal MOA 22	See label	0.18 to 0.37 ppm	For certain filamentous algae—*Pithophora* spp. and *Spirogyra* spp. Check label for application instructions. For best results, break up floating mats before treatment.
Algae, macro, chara, nitella			
copper complex (Cutrine-Plus Granular) 3.7 G (Cutrine-Plus) 0.9 lb/gal (K-Tea) 0.8 lb/gal	60 lb/surface acre 1.2 gal/acre ft 1.7 to 3.4 gal/acre ft	2.2 lb/acre 0.4 ppm 0.5 to 1.0 ppm	Distribute granular formulation evenly over infested area when plants are young. If chara is in water less than 3 ft deep or growth is near the surface, the liquid formulation may be used. Dilute with water in ratio of at least 9-to-1 and apply uniformly. **Warning: Copper is toxic to fish.**
Algae, Pithophora and cladophoraa			
flumioxazin (Clipper) 51% MOA 14	6 to 12 oz/A	3 to 6 ai/A or 100 to 400 ppb	Early morning applications may be more effective. If vegetation is dense, treat in sections to avoid reducing dissolved oxgen. Water pH greater than 7.5 will reduce effectiveness.

PENNSYLVANIA SEA GRANT RESOURCES

Sea Grant Pennsylvania
www.paseagrant.org

CLEAN YOUR GEAR!

Preventing the Spread of Aquatic Invasive Species in Pennsylvania

TIPS FOR WATERFOWL HUNTERS

Waterfowl hunting is a popular pastime for many Pennsylvanians, and hunting activities contribute significantly to the recreational economy. However, aquatic invasive species (AIS) like Eurasian watermilfoil and zebra mussels can threaten habitat for waterfowl and other wildlife. Hunters should take precautions to ensure they don't spread plants and animals that can be accidentally transported on duck boats, blind material, and hunting gear.

Photo courtesy of Ed Lewandowski, Delaware Sea Grant.

STOP AQUATIC HITCHHIKERS!™
Prevent the transport of aquatic invasive species.
Clean all recreational equipment.
www.ProtectYourWaters.net

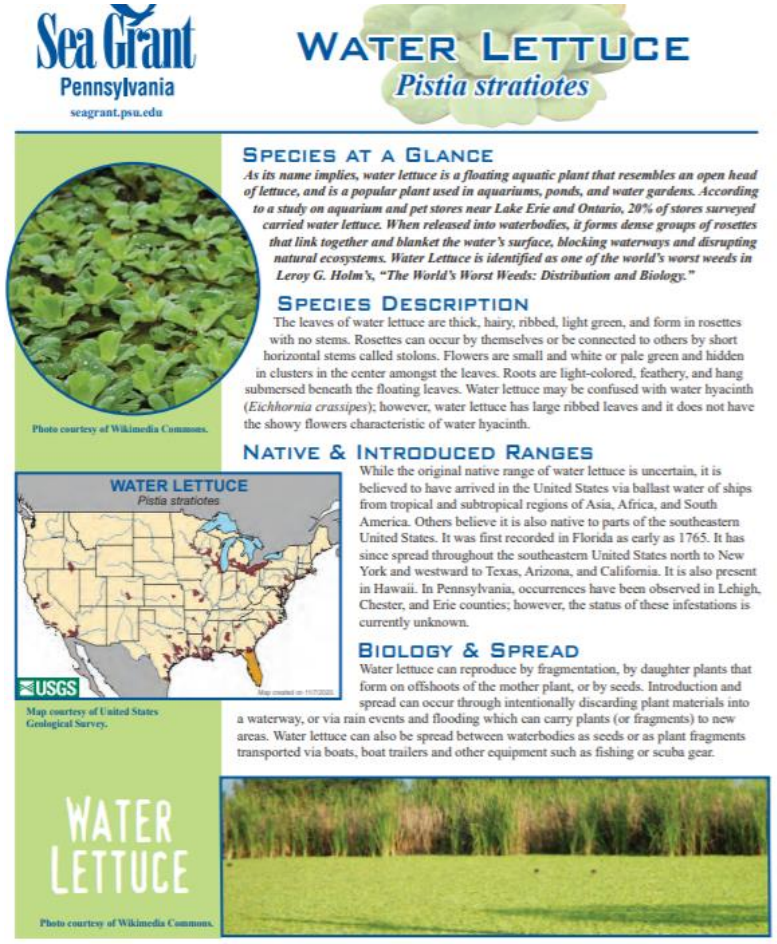
Aquatic invasive species (AIS) are non-native plants, animals, or pathogens that cause harm to the environment, the economy, and human or animal health. Preventing the spread of AIS is important because once introduced, these species disrupt ecosystems, reduce biodiversity, and cost communities huge amounts of time, money, resources, and lost revenue.

Photo courtesy of Ed Lewandowski, Delaware Sea Grant.

Photo courtesy of William Stanell, Ducks Unlimited website.

Many people associate the threat of spreading AIS with activities such as boating and fishing; however, hunters are also at risk of moving aquatic invaders from one water body to another. Once introduced, AIS can negatively impact waterfowl habitat by degrading water quality, replacing native plants that waterfowl use for food and breeding sites, and disturbing the food chain. AIS have also been blamed for severe die-offs of fish-eating waterfowl in Lake Erie because invasive mussels and round gobies may move the Type E botulism toxin up the food chain to birds where it can cause death.

Hunters often travel to multiple swamps, creeks, and rivers each season and from day to day. AIS can hitchhike in the mud, water, and plant debris that can collect on boats, decoys, waders, boots, clothing, and even hunting dogs. When not in blinds, hunters often brush themselves in and hide gear in the surrounding vegetation. Even a single fragment of some kinds of vegetation could start a new population if spread to a different water body. By following a few simple steps, waterfowl hunters can play an active role in preventing the spread of AIS (see other side).



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WATER LETTUCE
Pistia stratiotes

SPECIES AT A GLANCE

As its name implies, water lettuce is a floating aquatic plant that resembles an open head of lettuce, and is a popular plant used in aquariums, ponds, and water gardens. According to a study on aquarium and pet stores near Lake Erie and Ontario, 20% of stores surveyed carried water lettuce. When released into waterbodies, it forms dense groups of rosettes that link together and blanket the water's surface, blocking waterways and disrupting natural ecosystems. Water Lettuce is identified as one of the world's worst weeds in Leroy G. Holm's, "The World's Worst Weeds: Distribution and Biology."

Photo courtesy of Wikimedia Commons.

SPECIES DESCRIPTION

The leaves of water lettuce are thick, hairy, ribbed, light green, and form in rosettes with no stems. Rosettes can occur by themselves or be connected to others by short horizontal stems called stolons. Flowers are small and white or pale green and hidden in clusters in the center amongst the leaves. Roots are light-colored, feathery, and hang submersed beneath the floating leaves. Water lettuce may be confused with water hyacinth (*Eichhornia crassipes*); however, water lettuce has large ribbed leaves and it does not have the showy flowers characteristic of water hyacinth.

NATIVE & INTRODUCED RANGES

Map courtesy of United States Geological Survey.

While the original native range of water lettuce is uncertain, it is believed to have arrived in the United States via ballast water of ships from tropical and subtropical regions of Asia, Africa, and South America. Others believe it is also native to parts of the southeastern United States. It was first recorded in Florida as early as 1765. It has since spread throughout the southeastern United States north to New York and westward to Texas, Arizona, and California. It is also present in Hawaii. In Pennsylvania, occurrences have been observed in Lehigh, Chester, and Erie counties; however, the status of these infestations is currently unknown.

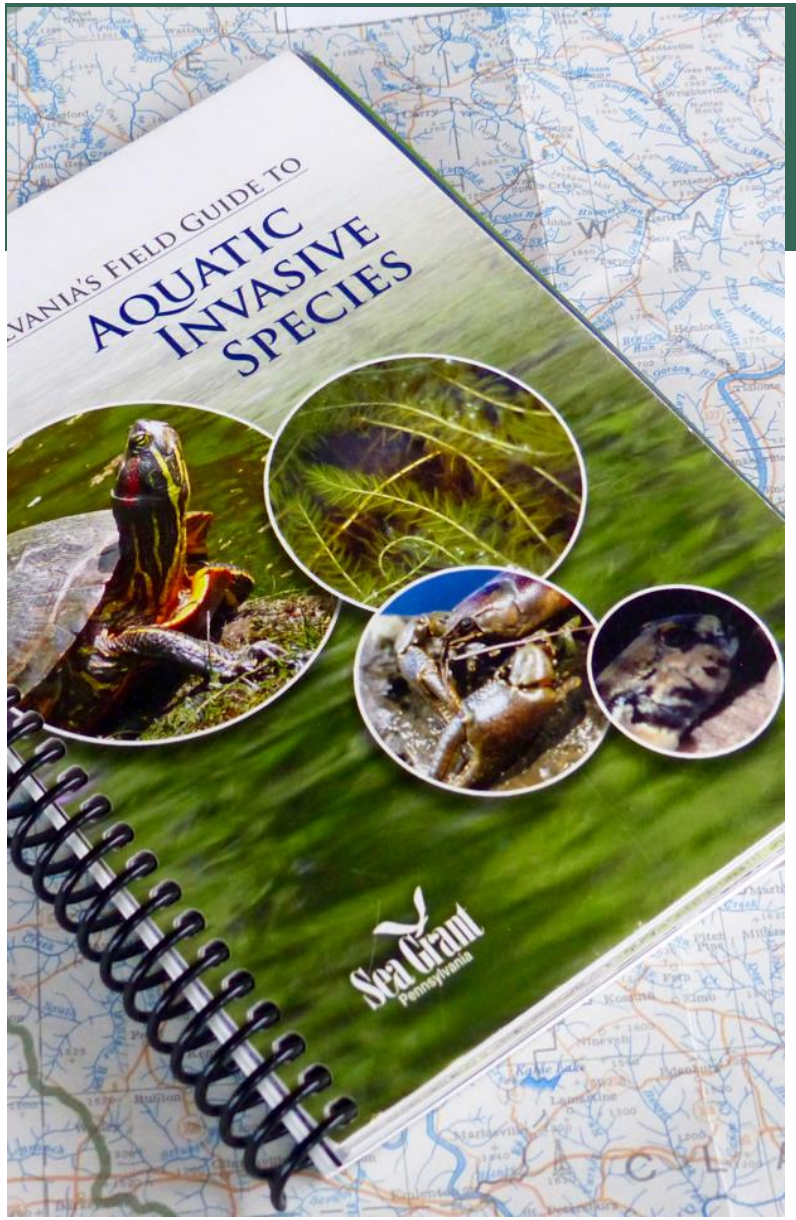
BIOLOGY & SPREAD

Water lettuce can reproduce by fragmentation, by daughter plants that form on offshoots of the mother plant, or by seeds. Introduction and spread can occur through intentionally discarding plant materials into a waterway, or via rain events and flooding which can carry plants (or fragments) to new areas. Water lettuce can also be spread between waterbodies as seeds or as plant fragments transported via boats, boat trailers and other equipment such as fishing or scuba gear.

WATER LETTUCE

Photo courtesy of Wikimedia Commons.

- Aquatic Invasive Species Fact Sheets (63)



Giant Knotweed

Fallopia sachalinensis

Species at a Glance

Giant knotweed is an herbaceous perennial and member of the buckwheat family. It forms large colonies of erect stems, which are woody in appearance and can reach heights over 3.7 m (12 ft).

Identification

Leaves: Large rounded leaves **alternate** on the stem and reach over 0.3 m (1 ft) in length. They have heart-shaped bases and rounded lobes. Thin, wavy hairs are present on the underside of the leaves in June through mid-September.

Flowers: Small flowers reach about 10 cm (3.9 in) in length and range in color from a creamy white to greenish white. They grow in short, branched clusters from leaf **axils** at the ends of stems and appear from August to October.

Fruit/Seeds: Three-sided seeds are shiny, brown to black, egg-shaped, and have a paper-like texture.

Stems/Roots: Smooth, hollow, jointed stems are swollen at the **nodes**, are light green in color, and resemble bamboo shoots.

AQUATIC INVASIVE SPECIES FIELD GUIDE

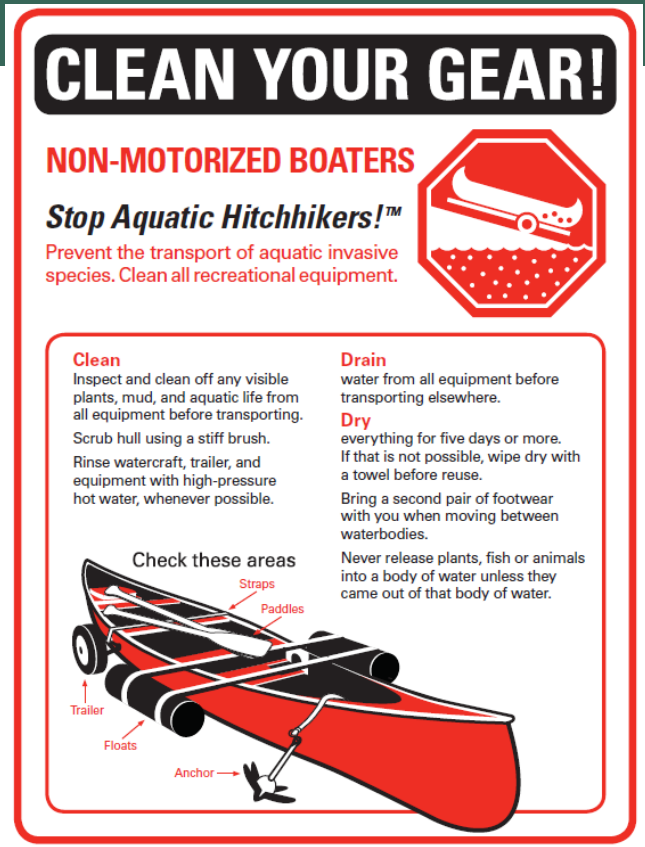

Great Lakes
RESTORATION
Sea Grant
Great Lakes Network
Orconectes rusticus
Rusty Crayfish


Eurasian Watermilfoil
Classroom Guide
AQUATIC INVASIVE SPECIES
INVADERS


Photos courtesy of Pennsylvania Fish and Boat Commission
Northern Snakehead (Channa argus)
Enlarged scales on head
No bony plates between lower jaw bones
Pelvic fins near head
Long anal fin
Northern Snakehead WATCH
Northern Snakehead WATCH
Northern snakehead can be confused with the Burbot or Bowfin
Burbot (Lota lota)
Double dorsal fin
Barbel on chin
Long anal fin
Pelvic fins in front of pectoral fins
Photo courtesy of Wisconsin DNR.
Bowfin (Amia calva)
No scales on head
Bony plates between lower jaw bones
Pelvic fins at mid-body
Short anal fin
Photos courtesy of Pennsylvania Fish and Boat Commission

AIS SIGNAGE


GRAVEL PIT POND CONTAINS THIS HARMFUL AQUATIC SPECIES:
Round Goby
– Adult size: Up to 10 inches
– Pelvic fins are fused
– Mottled olive and brown body
– Black spot on rear of first dorsal fin
– Large head with frog-like raised eyes
STOP AQUATIC HITCHHIKERS!™
Prevent the spread of invasive plants and animals
Bait buckets and angling equipment can easily transport harmful aquatic species
REMOVE aquatic plants, animals and mud from fishing rods and reels, fishing lines, lures, buckets, nets, and other equipment.
DRAIN water from all equipment before transporting anywhere.
DISPOSE of unwanted live bait, fish parts, and worms in the trash.
RINSE equipment with hot (104°F or higher) water OR
DRY equipment for at least five days
Sea Grant Pennsylvania
In Pennsylvania, it is UNLAWFUL to: Possess, introduce or import, transport, sell, purchase, offer for sale, or barter the following species in the Commonwealth: snakehead (all species), black carp, bighead carp, silver carp, zebra mussel, quagga mussel, European rudd, rusty crayfish, ruffe, round goby, and tubenose goby.


CLEAN YOUR GEAR!
NON-MOTORIZED BOATERS
Stop Aquatic Hitchhikers!™
Prevent the transport of aquatic invasive species. Clean all recreational equipment.
Clean
Inspect and clean off any visible plants, mud, and aquatic life from all equipment before transporting.
Scrub hull using a stiff brush.
Rinse watercraft, trailer, and equipment with high-pressure hot water, whenever possible.
Drain
water from all equipment before transporting elsewhere.
Dry
everything for five days or more. If that is not possible, wipe dry with a towel before reuse.
Bring a second pair of footwear with you when moving between waterbodies.
Never release plants, fish or animals into a body of water unless they came out of that body of water.
Check these areas
Straps
Paddles
Trailer
Floats
Anchor

THANK YOU!

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QUESTIONS

Northeastern IPM Center

USDA United States Department of Agriculture National Institute of Food and Agriculture

Sea Grant Pennsylvania

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