Illinois Needs Heroes: Preventing the Introduction of Aquatic Invaders in Trade

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Organisms in Trade (OIT) Pathway

- Established in the Great Lakes are 17 species from aquarium release, 23 planted, 9 bait release (GLANSIS search Oct 6th, 2016)
- 9 million households with ornamental fish (Chapman et al 1997)
- 7% - 25% hobbyists release ornamentals (Gertzen et al 2008, Meyer et al 2016)

IISG OIT Outreach in Illinois

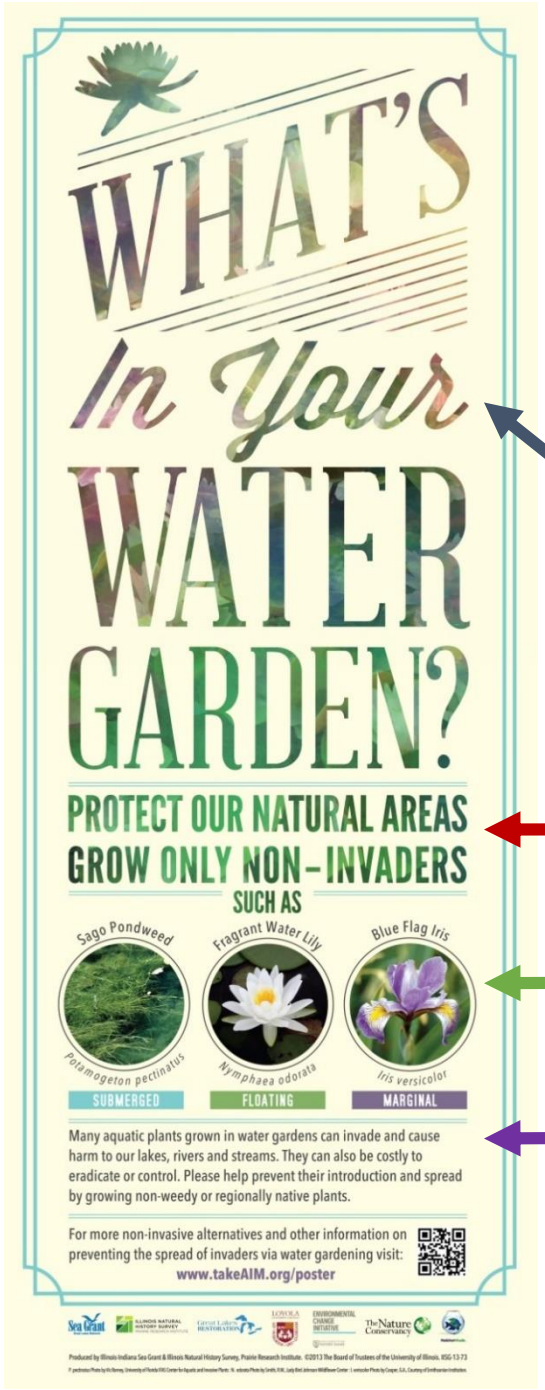
- Social Science – NCSU Needs Assessment
- Notre Dame STAIR Tools - Risk Assessments – Purchasing Guides
- Be A Hero
- TakeAIM.org
- Future Directions

Needs Assessment

- Hobbyist purchasing and disposal behaviors
- Surveys in US Great Lakes states – trade shows
- “Effects of Outreach on the Prevention of Aquatic Invasive Species Spread among Organisms-in-Trade Hobbyists” (Seekamp et al 2016)

Recommendations for Outreach

- Activate personal norms.
- Retailers and trade shows are strong outlets for delivering information.
- Actionable purchasing and disposal suggestions for hobbyists.
- Environmental connection between releasing OIT and AIS impacts.



Activate personal norms.

Retailers and trade shows are strong outlets for delivering information.

Actionable purchasing and disposal suggestions for hobbyists

Environmental connection between releasing OIT and AIS impacts.

Notre Dame's Science-Based Tools for Assessing Invasion Risk (STAIR)

- Biological data used to estimate likely invaders
- Fish, Mollusks, Plants
  - Screened species lists for consumers
- Crayfish, Turtles
  - Tools completed, species not screened at time of development

ENVIRONMENTAL CHANGE INITIATIVE
UNIVERSITY OF NOTRE DAME
LOYOLA UNIVERSITY CHICAGO
The Nature Conservancy
Great Lakes RESTORATION

WHAT'S *In Your* WATER GARDEN?

PROTECT OUR NATURAL AREAS
GROW THESE NON-INVADERS

MANY PLANTS AVAILABLE TO WATER GARDENERS ARE INVASIVE

If introduced into our waterways -either accidentally or intentionally- they can reduce the amount of food available to fish and wildlife and change how ecosystems function.

They can also cost millions to eradicate or control.

Growing only non-weedy or regionally native plants is one way you can help protect our natural areas from aquatic invaders.

MORE WAYS YOU CAN HELP

- Build your water garden away from waterways and flood-prone areas.
- Rinse plants before planting to remove animals, eggs and other plants or plant parts.
- Weed out uninvited plants.
- Seal unwanted plants in a plastic bag and place them in the trash. If possible, freeze the bag before disposal.
- Never release plants or animals into waterways.

For more information on water gardens and aquatic invaders in the marketplace (AIM), visit
www.TakeAIM.org/card

Produced by Illinois-Indiana Sea Grant & Illinois Natural History Survey, Prairie Research Institute in partnership with the Great Lakes Sea Grant Network, Loyola University Chicago, Environmental Change Initiative at the University of Notre Dame, The Nature Conservancy, and the PIJAC, USFWS and NOAA Habitattitude™ campaign (www.habitattitude.net). Funding for this program is provided by the Great Lakes Restoration Initiative. IISG-15-021

GROW THESE NON-INVADERS

Asclepias incarnata (swamp milkweed)	*Lobelia cardinalis* (cardinal flower)	*Lemna minor* (common duckweed)
Caltha palustris (marsh marigold)	*Mimulus ringens* (Allegheny monkey flower)	*Nelumbo lutea* (American lotus)
Decodon verticillatus (swamp loosestrife)	*Orontium aquaticum* (golden dub)	*Nuphar advena* (spatterdock)
Glyceria canadensis (rattlesnake manna grass)	*Peltandra virginica* (green arrow arum)	*Nymphaea odorata* (fragrant water lily)
Hibiscus moscheutos (crimsoneyed rosemallow)	*Pontederia cordata* (pickerelweed)	*Ceratophyllum demersum* (hornwort)
Iris versicolor (blue flag iris)	*Sagittaria latifolia* (broadleaf arrowhead)	*Elodea canadensis* (American waterweed)
Juncus effusus (soft rush)	*Saururus cernuus* (lizard's tail)	*Potamogeton pectinatus* (sago pondweed)
Justicia americana (American water-willow)	*Schoenoplectus pungens* (common three-square)	
Liatris spicata (dense blazing star)	*Sparganium eurycarpum* (great bur-reed)	

AVOID THESE INVADERS

- Marginal
- Floating
- Submerged

Acorus calamus (European sweetflag)	*Nasturtium officinale* (watercress)	*Nymphoides peltata* (yellow floating heart)
Alternanthera philoxeroides (alligatorweed)	*Phragmites australis* (common reed)	*Egeria densa* (anacharis)
Butomus umbellatus (flowering rush)	*Stratiotes aloides* (water soldier)	*Limnophila sessiliflora* (dwarf ambulia)
Glyceria maxima (reed manna grass)	*Typha angustifolia* (narrowleaf cattail)	*Myriophyllum aquaticum* (parrot feather)
Houttuynia cordata (chameleon plant)	*Aponogeton distachyos* (cape pondweed)	*Myriophyllum spicatum* (Eurasian watermilfoil)
Iris pseudacorus (yellow flag iris)	*Callitriche stagnalis* (pond water-starwort)	*Najas minor* (brittle waternymph)
Lythrum salicaria (purple loosestrife)	*Hydrocharis morsus-ranae* (European frogbit)	*Potamogeton crispus* (curlyleaf pondweed)
Marsilea quadrifolia (European waterclover)	*Nymphoides cristata* (crested floating heart)	

WHAT'S IN YOUR AQUARIUM?

PROTECT OUR NATURAL AREAS
PURCHASE ONLY NON-INVADERS

SNAILS, CLAMS, MUSSELS, FISH, CRAYFISH AND TURTLES

TURTLES

Purchase or legally obtain turtles native to your region. For example, the commonly sold red-eared slider (*Trachemys scripta elegans*) is native to parts of Illinois, Indiana and Ohio but can harm native turtles in Pennsylvania by competing with them for food and nesting sites. Some states such as Indiana prohibit the sale of native turtles, which includes the red-eared slider.

CRAYFISH

Crayfish, also known as crawfish or crawdads, are some of the most threatened species in the U.S. The 39 native crayfish in the Midwestern states each belong only in very specific areas; sometimes this area can be as small as a single lake. The introduction of a new crayfish to these narrowly defined areas is one of the biggest threats to those native crayfish. For these reasons, some states such as Pennsylvania prohibit the sale and possession of crayfish. Crayfish should never be released into any water other than that from which it was caught.

Check with your state's natural resources agency or a reputable retailer about current laws regarding crayfish and native turtle sales, which are often different among states. Visit TakeAIM.org to find state and federal contacts and see state and federal regulations.

Buyers beware! Many fish, crayfish, snails, and turtles are sold by their common or generic names. These names can sometimes refer to many different species, both invaders and non-invaders. Purchasing animals by their Latin or scientific name can help you avoid this costly mistake.

Many animals used in classroom and home aquariums are invasive.

If accidentally or intentionally released into our waterways, they can degrade natural areas by decreasing native biodiversity, reducing the amount of food available to fish and wildlife, introducing diseases to wild populations and changing how ecosystems function.

Aquatic invaders can also harm the health of humans and livestock, reduce crop yield and fish catch, and impede electricity production and drinking water distribution. Once introduced, they can be expensive to control and often impossible to eradicate.

Purchasing only regionally native or non-invasive animals can reduce the likelihood that harmful species are accidentally introduced into our natural areas. Although many of the species listed as invasive or potentially invasive in this brochure are prohibited for trade in one or more Great Lake states, those that are not prohibited still have a strong potential to harm the environment.

COMMON NAMES CAN BE MISLEADING. USING SCIENTIFIC NAMES CAN HELP YOU MAKE BETTER PURCHASES.


Corbicula fluminea - Asian clam

PURCHASE THESE NON-INVADERS*

SNAILS, CLAMS AND MUSSELS:

- ***Biomphalaria havanensis*** - ghost ramshorn
- ***Clea helena*** - assassin snail
- ***Clithon corona*** - horned nerite snail, horned bumblebee snail, crown nerite snail
- ***Drepanotrema cimex*** - rigid ramshorn
- ***Marisa cornuarietis*** - giant ramshorn snail
- ***Melanoides tuberculata*** - red-rimmed melania
- ***Nerita natalensis* (group)** - "tracked" zebra nerite snail, tiger nerite snail, batik nerite snail
- ***Neritina reclivata*** - olive nerite snail
- ***Planorbella duryi*** - Seminole ramshorn, American ramshorn snail
- ***Tarebia granifera* or *Thiara granifera*** - quilted melania
- ***Tylomelania* cf. *gemmifera*** - gold rabbit snail
- ***Tylomelania gemmifera* X *zeamais*** - black rabbit snail
- ***Tylomelania gemmifera*** - yellow antenna rabbit snail
- ***Tylomelania kruimeli*** - rabbit snail
- ***Tylomelania patrichalis*** - yellow antenna rabbit snail
- ***Tylomelania* sp.** - yellow rabbit snail
- ***Tylomelania towutica*** - yellow spotted rabbit snail
- ***Tylomelania zeamais*** - rabbit snail

FISH:

- ***Boehlkea fredcochui*** - Cochu's blue tetra
- ***Colisa lalia*** - dwarf gourami
- ***Corydoras aeneus*** - bronze corydoras
- ***Corydoras paleatus*** - blue leopard corydoras
- ***Gymnocorymbus ternetzi*** - black tetra
- ***Gyrinocheilus aymonieri*** - sucking loach
- ***Hasemania nana*** - silvertip tetra
- ***Helostoma temminckii*** - kissing gourami
- ***Hemigrammus bleheri*** - firehead tetra
- ***Hemigrammus erythrozonus*** - glow light tetra
- ***Hemigrammus ocellifer*** - head-and-taillight tetra
- ***Hemigrammus rhodostomus*** - rummy-nose tetra
- ***Hyphessobrycon eques*** - serpae tetra

FISH (CONTINUED):

- ***Hyphessobrycon flammeus*** - flame tetra
- ***Hyphessobrycon herbertaxelrodi*** - black neon tetra
- ***Hyphessobrycon megalopterus*** - black phantom tetra
- ***Hyphessobrycon pulchripinnis*** - lemon tetra
- ***Mikrogeophagus ramirezi*** - ram cichlid
- ***Moenkhausia sanctaefilomenae*** - red eye tetra
- ***Otocinclus affinis*** - dwarf sucking catfish
- ***Paracheirodon axelrodi*** - cardinal tetra
- ***Paracheirodon innesi*** - neon tetra
- ***Paracheirodon simulans*** - green neon tetra
- ***Pristella maxillaris*** - golden pristella tetra
- ***Pterophyllum scalare*** - angelfish
- ***Trichogaster leerii*** - pearl gourami
- ***Trichopodus trichopterus*** - three spot gourami

AVOID THESE KNOWN OR POTENTIAL INVADERS*

SNAILS, CLAMS AND MUSSELS:

- ***Anodonta cygnea*** - swan mussel
- ***Bellamya chinensis* or *Viviparus malleatus*** - Chinese mystery snail, Japanese trapdoor snail
- ***Bellamya japonica*** - Japanese mystery snail
- ***Corbicula fluminea*** - Asian clam, freshwater clam
- ***Helisoma anceps*** - two-ridge ramshorn
- ***Lasmigona subviridis*** - green floater
- ***Lymnaea peregra*** - pond snail
- ***Physa fontinalis*** - common bladder snail
- ***Physella acuta*** - European physa
- ***Planorbis contortus* or *Bathyomphalus contortus*** - ramshorn snail
- ***Pomacea bridgesii*** - spiketop applesnail, mystery snail

FISH:

- ***Cobitis taenia*** - spined loach
- ***Leuciscus idus*** - ide
- ***Misgurnus fossilis*** - European weatherfish or European weather loach

*Based on research conducted at Loyola University Chicago, University of Notre Dame and The Nature Conservancy.

Never release aquatic plants or animals into waterways!

- Inspect purchases and remove unwanted eggs, animals, seeds, plants or plant parts.
- Dispose of debris and unwanted aquatic plants and packaging material in a sealed plastic bag in the trash. If possible, freeze the bag before disposal.
- Sterilize waste water (¼ teaspoon bleach for each gallon of water) and pour down the toilet or sink – never down a storm drain.
- Find new homes for unwanted pets, such as schools, retailers or other hobbyists.
- Contact a veterinarian or pet retailer for guidance on humane disposal of animals.

For more information on aquatic invaders in the marketplace (AIM) or to learn about species regulations for your state, visit:

www.TakeAIM.org/animals

Sea Grant · Illinois Natural History Survey Prairie Research Institute · Great Lakes Restoration · Loyola University Chicago · Environmental Change Initiative · The Nature Conservancy · Habitat Rhode

Cover photo *Parachelodon innesi* by H. Krisp; *Lymnaea peregra* photo by Bloplx.dk, *Corbicula fluminea* photo by Oregon Department of Fish and Wildlife, *Trachemys scripta elegans* photo by Greg Hume at Wikimedia Commons, *Procambarus clarkii* photo via Wikimedia Commons, *Pomacea bridgesii* by MdE at Wikimedia Commons.

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Be a Hero – Illinois Invasive Species Outreach

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

BE A HERO RELEASE ZERO™

FIGHT THE SPREAD OF AQUATIC INVADERS

PLANTS BAG AND PLACE IN THE TRASH.

ANIMALS FIND A NEW OWNER OR SEEK ADVICE ON HUMANE DISPOSAL.

WATER DISINFECT OR REPURPOSE.

RELEASEZERO.ORG

AQUATIC INVADERS IN THE MARKETPLACE

MANY OF THE PLANTS AND ANIMALS FOR SALE CAN INVADE AND CAUSE HARM TO OUR NATURAL AREAS.

THEY CAN COST MILLIONS TO CONTROL AND ARE ALMOST ALWAYS IMPOSSIBLE TO ELIMINATE.

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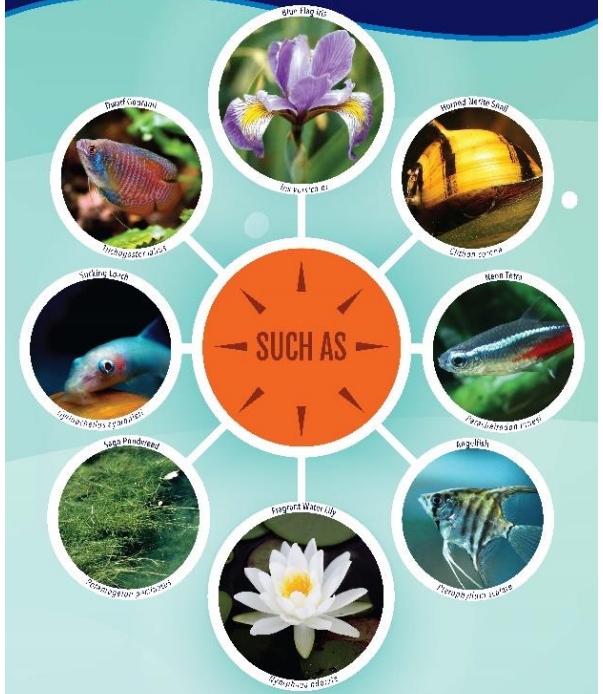
PURCHASE ONLY NON INVADERS



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BE A HERO TRANSPORT ZERO™

FIGHT THE SPREAD OF AQUATIC INVADERS

REMOVE PLANTS, ANIMALS AND MUD FROM ALL EQUIPMENT.

DRAIN ALL WATER FROM YOUR BOAT AND GEAR.

DRY EVERYTHING THOROUGHLY WITH A TOWEL.

TRANSPORTZERO.ORG

BE A HERO TRANSPORT ZERO

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TRANSPORTZERO.ORG

95% OF BOATERS AND ANGLERS*
ARE ALREADY FIGHTING THE SPREAD OF AQUATIC INVADERS–HITCHHIKING PLANTS AND ANIMALS THAT CAN HARM ILLINOIS WATERS AND RUIN YOUR BOATING AND FISHING.

KNOW THE LAW:
IT IS ILLEGAL TO ENTER OR LEAVE A WATERBODY WITH AQUATIC PLANTS AND ANIMALS ATTACHED TO YOUR BOAT OR TRAILER. TRAVEL ON ILLINOIS HIGHWAYS WITH AQUATIC PLANTS OR ANIMALS ATTACHED IS ALSO PROHIBITED.

DON'T DUMP BAIT

• REMOVE •	• DISPOSE •	• NEVER RELEASE •
NON-BAIT FISH AND OTHER HITCHHIKERS FROM YOUR BAIT BUCKET BEFORE FISHING.	OF ALL UNWANTED BAIT AND HITCHHIKERS IN THE TRASH.	ORGANISMS CAUGHT IN ONE BODY OF WATER INTO ANOTHER.

BE A HERO TRANSPORT ZERO™

HELP PROTECT ILLINOIS WATERS

Boating, fishing, hunting, and wildlife watching are traditions that we want to preserve for future generations.

BE A HERO TRANSPORT ZERO

JOIN THE FIGHT!

As someone who cares about our lakes, rivers, and wetlands, I pledge to protect them from aquatic invaders. To help stop their spread:

I will remove, drain, and dry before I leave a water access.

I will follow AIS laws and regulations.

I will learn to recognize AIS.

I will dispose of all unwanted bait and fish parts in the trash.

I will share this information with other recreationists.

By working together and taking responsibility, we can help protect our waters!

What are AIS?

Aquatic invasive species (AIS), such as zebra mussel, kpikella, silver carp, and didymo, are plants and animals that do not naturally occur in our waters. Once established in a new body of water, they can do lasting damage to our environment, outdoor recreation, and Illinois' economy, which all rely on healthy water resources.

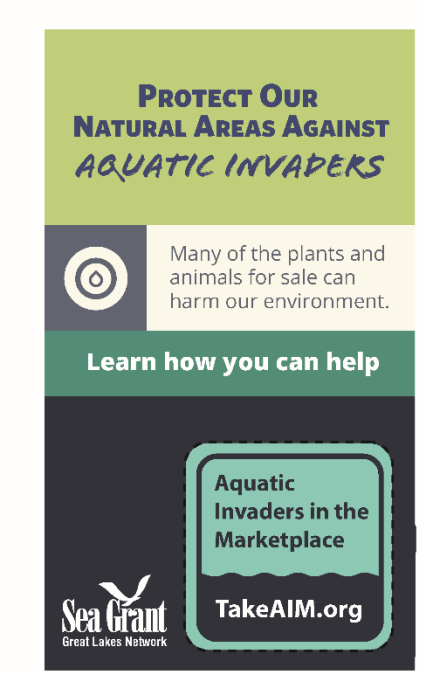
How do they spread?

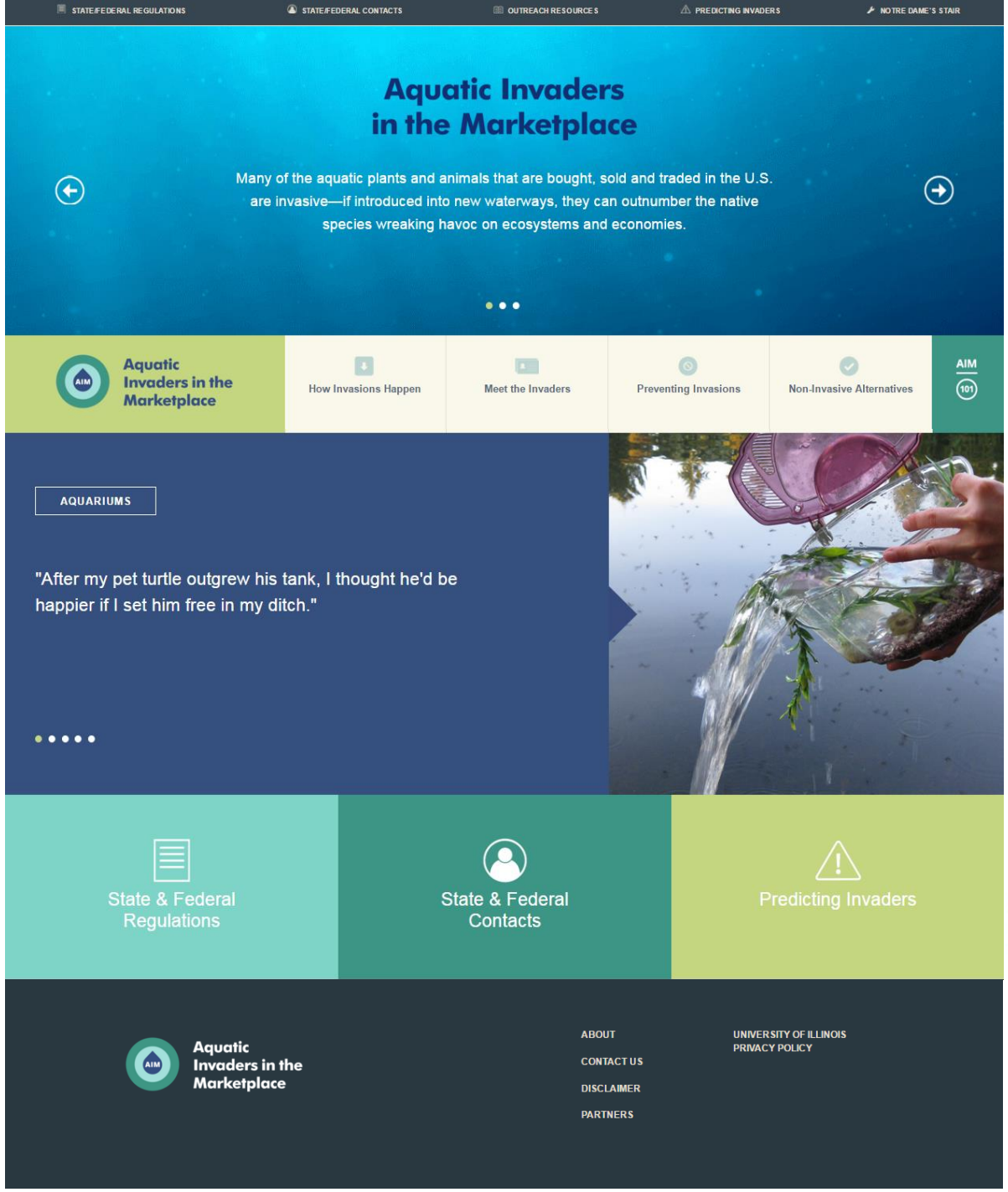
Often easily overlooked, the main way that these aquatic travelers spread is by hitching rides on boats, trailers, and gear used by anglers, boaters, and other recreationists. If you leave a water access site without taking precautions, you may be transporting these harmful organisms from one body of water to another.

What can you do?

The good news is that many of Illinois' lakes, rivers, and wetlands are not yet infested with invasive species. With a few simple but effective steps, you can help protect our valuable waters.

TakeAIM.org



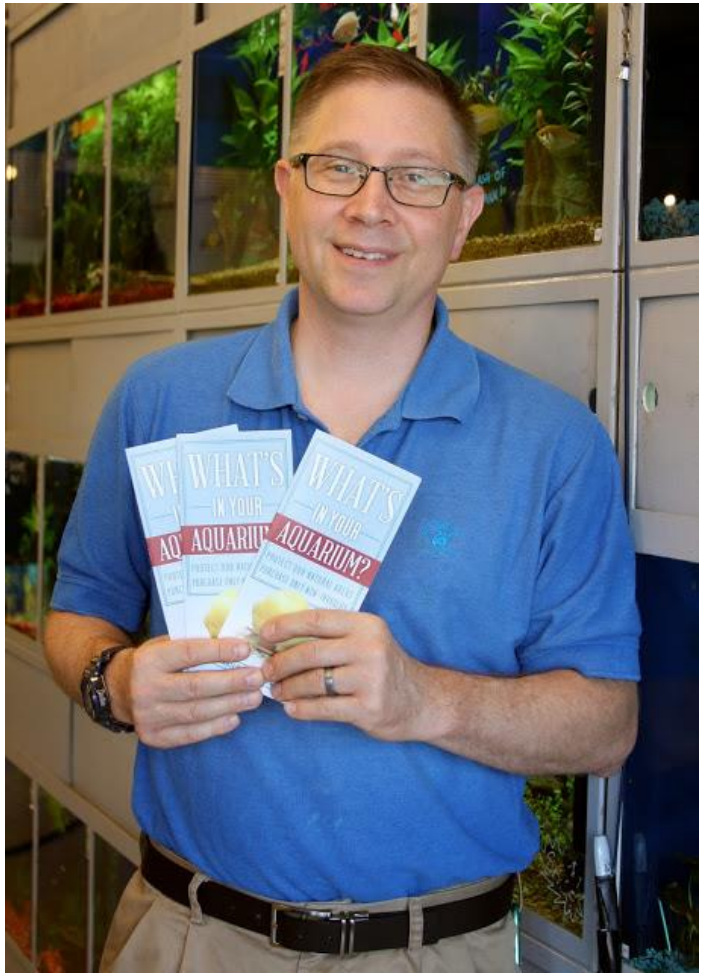


Great Lakes RESTORATION

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Retailer Response to OIT Outreach

- 118 IL retailers sent survey, 19 returned
  - 63% would avoid selling AIS in the future.
  - 32% would accept unwanted organisms from customers.
  - 89% of retailers said they would talk to customers about AIS.
- 40 of 45 (~89%) retailers in IL, IN and MI agreed to distribute OIT materials (2 declined, 3 unsure)



Hobbyists Response to OIT Outreach

- Hobbyists surveyed in IL and IN during trade shows/talks (2014-2015)
  - 98% self reported increases in AIS awareness (n=111)
  - 86% able to specify learned action (n=112)
  - 28% specified an action they would take in the future (n=112)
  - 56% already taking action (n=107)

Future Outreach Efforts

- Pet Surrender
  - Events
  - Network – Shameless plug for participants
- AIS Free Retailer Program
- Be A Hero
  - Websites
  - Release Zero Promotional Items
  - Signage
  - Pull off Area

Questions?

ILLINOIS NATURAL HISTORY SURVEY
PRAIRIE RESEARCH INSTITUTE

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ILLINOIS - INDIANA