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## Organism in Trade Pathways



THIS YEAR'S LOVE, CREATIVE COMMONS



ANDREW C., CREATIVE COMMONS

Using aquatic invasive species prevention messaging on pet products (left) can remind consumers that pet release threatens our environment and economy. The red swamp crayfish (right) invasion of a stormwater pond in Wisconsin is an example of the potential costs of pet release.

### Why Address Organism in Trade Pathways?

Organism in trade (OIT) pathways are significant risks for release or escape of new species and the spread of established species of fish, plants, snails, crayfish, turtles, and diseases and pathogens. Successful management of OIT spread can be accomplished by addressing each pathway for potential introduction and spread. Risks can be reduced by removing existing invasive species in trade, preventing new species from entering trade and by modifying behaviors, like pet release, that introduce OIT into the environment. By engaging natural resource management, academia, industry and consumer stakeholders while making decisions based in sound research and science, the risk for introduction through OIT pathways can be eliminated or reduced to acceptable levels.

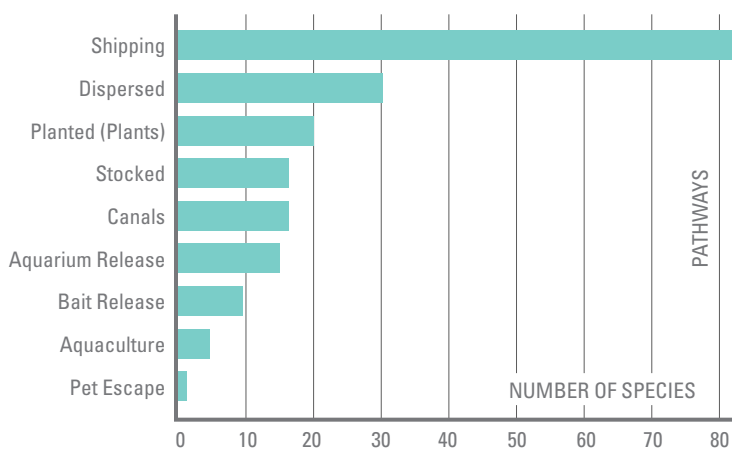
### Invasions of the Great Lakes

Outside of invasions associated with ballast water, OIT pathways are some of the most probable ways that new species can enter the Great Lakes. The live organism trade is a large industry

in the United States, and with the large number of organisms being shipped, bought and transported every day, the possibility that something will escape or be intentionally released exists. The red swamp crayfish and hydrilla are two examples of organisms that have been introduced into the Great Lakes Basin through OIT pathways.

Red swamp crayfish (*Procambarus clarkii*) were discovered in a stormwater drainage pond in Germantown, Wis., in 2009. They are larger and more aggressive than crayfish native to the Great Lakes. They can decrease levels of aquatic vegetation and damage earthen dams and levies by burrowing. These crayfish are used as classroom study specimens and as food items, and they are often introduced through intentional release. Since discovery, containment and eradication efforts have cost the Wisconsin Department of Natural Resources and local partners more than \$750,000.

Hydrilla (*Hydrilla verticillata*) is an aggressive aquatic plant that invaded much of the southern United States as a result of aquarium releases and water garden escapes in the 1950s. Like other invasive aquatic plants, hydrilla forms dense mats in lakes and rivers that interfere with recreational



Outside of invasions associated with ballast water and hull fouling, new invasive species are primarily introduced into the Great Lakes through organisms in trade invasion pathways (GLANSIS 2014).

boating and fishing. Mats displace native aquatic plants, which affects fish and wildlife — causing recreational, ecological and economic impacts. Hydrilla is now encroaching on the Great Lakes Basin with known infestations in Indiana, Pennsylvania and New York.

Goldfish (*Carassius auratus*) have been found to infest several lakes, ponds and rivers likely as a result of aquarium release. They harm water quality by increasing turbidity through their feeding behavior. Increased turbidity increases water temperature and decreases dissolved oxygen, which can cause fish kills. Few fish eradication efforts have been successful, but goldfish were eliminated from a stormwater pond in Duluth, Minn., to protect a connected designated trout stream that flows to Lake Superior. It required several months of work and cost \$100,000.

To address future invasions, a combination of regulations prohibiting the sale of potentially invasive species and education efforts designed to change risky behavior have reduced the probability of these species being released or escaping into the environment.



## GL Biotic Symposium June 3 – 4, 2014 Milwaukee, Wisconsin

### What was GL Biotic?

The Great Lakes Briefs on Invasive Organisms Traded in Commerce (BIOTIC) Symposium was the first symposium in the region to bring together experts to discuss OIT invasion pathways. The goals

were to identify research gaps to improve management of OIT and facilitate the efficient transfer of information between researchers, managers, educators, industries/associations and the public. Synthesis presentations focused on aquaculture; live specimen, live bait and pet releases; and spread of pathogens and diseases. Highlights included innovative approaches to risk assessment, regulations, outreach and industry efforts. Outcomes from the GL Biotic Symposium will be implemented over the next few years.

### Pathway synthesis highlights

- Voluntary industry practices, like HACCP, have successfully reduced risk in aquaculture and live bait pathways.
- Many ornamental aquarium fish pose a low risk to the Great Lakes region; risk assessment can focus efforts on the few that could establish in the region.
- The potential for the spread of disease and pathogens can be addressed by using many already established invasive species prevention actions.

EXAMPLE: The HACCP process helps live bait harvesters identify likely places where invasive species may be transported or introduced. Corrective actions can be taken at those critical control points and record-keeping efforts document that the actions were taken.

### Industry panel highlights

- The use of risk assessment tools that identify potentially invasive species can help industry address issues before bringing a species to market.



KEVIN KAPUSCINSKI

Large goldfish, such as these, can be found throughout the Great Lakes. This is an indication that independent release events are happening throughout the basin.



PAUL SKAWINSKI



TIM CAMPBELL



TIM CAMPBELL

Monitoring efforts have helped locate populations of invasive plants commonly used in water gardens (top, right) before the plant could spread to uninvaded bodies of water and cause problems (left). The Habitattitude campaign provides guidance on responsible pet ownership and outlines options for people that can no longer care for their pets (bottom, right).

- The use of industry-supported voluntary BMPs and outreach campaigns like “Right Plant Right Place” and “Habitattitude” can engage all segments of the industry in prevention activities.

EXAMPLE: The Pet Industry Joint Advisory Council is partnering with the U.S. Fish and Wildlife Service and numerous other agencies to develop a standard risk assessment protocol for new pet species coming into the United States. This saves the public and industry money — it prevents new invasions, and it reduces industry investment in potentially invasive species.

#### Outreach highlights

- The Habitattitude campaign has been effective at raising awareness of invasive species issues and at educating owners about alternatives to pet release.
- Messaging that fosters personal obligation and attributes responsibility to hobbyists can encourage sustainable behavior.
- Programs that build retailer trust and enhance hobbyist networks can build capacity for invasive species prevention efforts.

EXAMPLE: NGOs/organizations like Kingdom Animalia Exotic Animal Rescue use the Habitattitude campaign to raise awareness of alternatives to pet release in Wisconsin. With the ability to take in

and rehome animals, KAEAR helps make one of the Habitattitude recommendations a reality.

#### Risk assessment highlights

- Many invasion risk assessment tools exist that require varying amounts of resources and time (minutes to days) to complete.
- Using multiple risk assessment tools collectively can provide a “weight of evidence” approach that may provide an opportunity for more consistent and comprehensive adoption of these tools.
- eDNA monitoring tools can be used to assess risk of contamination in organisms in trade.

EXAMPLE: Some risk assessments can be just a decision tree where one or two characteristics can predict invasibility. More complex risk assessments involve long questionnaires that use every aspect of a species’ life history to determine invasion risk.

#### Regulation highlights

- Species management regulations tend to be best for raising awareness and managing intentional trade and introductions.
- Pathway management regulations reduce overall risk and manage unintentional introductions.
- Species management regulations should strive to be proactive, rapid, flexible, science-based, cost effective and have stakeholder support.



TIM CAMPBELL



TIM CAMPBELL

Both disposal and surrender guidance for unwanted organisms can help protect the Great Lakes and our environment from the unwanted impacts of invasive species.

Wisconsin's NR-40 regulations are a good example of species regulations that address all of these.

EXAMPLE: A collaborative effort in the western U.S. brought invasive species managers together to develop a model watercraft inspection and decontamination regulation that would make these programs consistent across states. A similar process can be used to help make regulations regarding OIT pathways consistent.

### Needs Identified by the Great Lakes BIOTIC Symposium

- Better “end of use” guidelines for teachers using classroom study specimens.

- More availability of prevention campaign and program resources (e.g., Stop Aquatic Hitchhikers!, Habitattitude, Nab the Aquatic Invaders, and AIS-Hazard Analysis and Critical Control Point/HACCP) throughout the Great Lakes Basin for local partners.
- Incorporate existing risk assessment tools in decision making.
- Continued collaborative approach with industry stakeholders.

All stakeholders represented at the Great Lakes BIOTIC Symposium have a role to play in addressing these needs.

For summaries of GL BIOTIC Symposium presentations, visit [seagrants.wisc.edu/OIT](http://seagrants.wisc.edu/OIT).

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