OIT: Lessons from the GL BIOTIC Symposium

Tim Campbell

UW Extension University of Wisconsin-Extension

Environmental Resources Center

Wisconsin Dept. of Natural Resources

Habitattitude™ PROTECT OUR ENVIRONMENT DO NOT RELEASE FISH AND AQUATIC PLANTS www.Habitattitude.net

Sea Grant Minnesota

Sea Grant University of Wisconsin

Great Lakes RESTORATION

What this is…

- Broad overview of OIT pathways, issues, and current work

What this isn't…

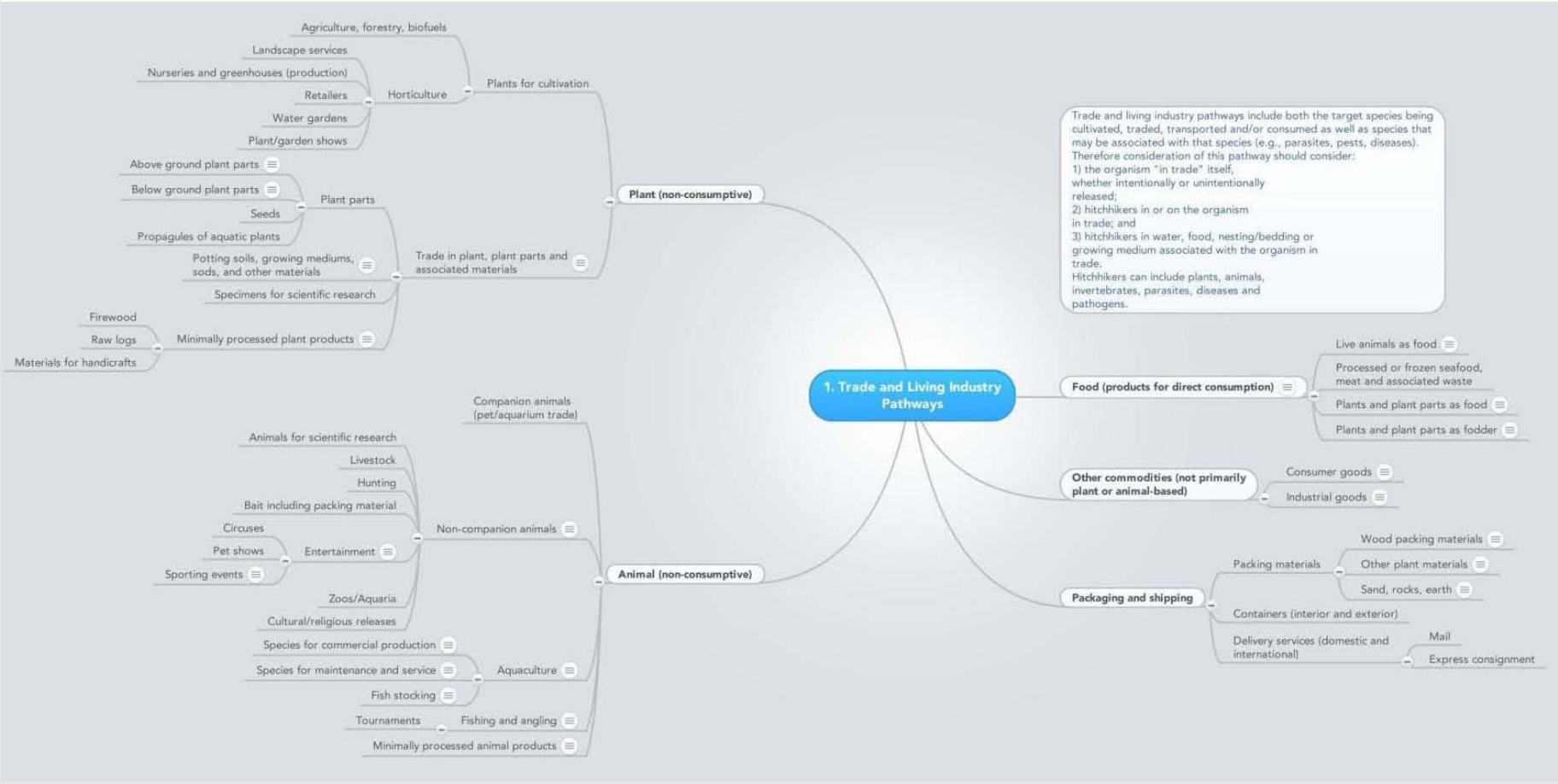
- In-depth analysis of each pathway
- Go to seagrant.wisc.edu/OIT for that
  - Contact speakers listed there or in presentation

My OIT Lens

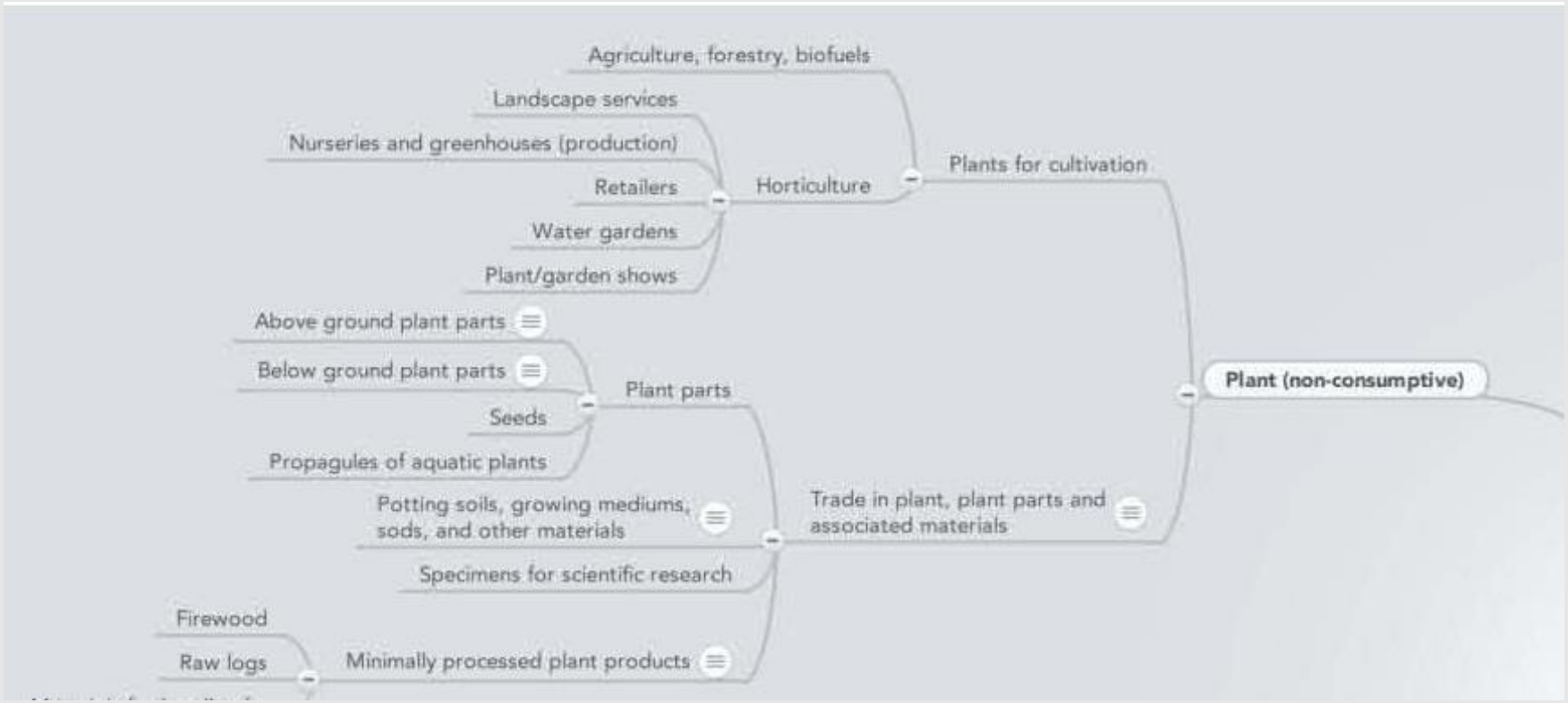
What are OIT pathways?

Trade and living industry pathways include both the target species being cultivated, traded, transported and/or consumed as well as species that may be associated with that species (e.g., parasites, pests, diseases). Therefore consideration of this pathway should consider:
1) the organism "in trade" itself, whether intentionally or unintentionally released;
2) hitchhikers in or on the organism in trade; and
3) hitchhikers in water, food, nesting/bedding or growing medium associated with the organism in trade.
Hitchhikers can include plants, animals, invertebrates, parasites, diseases and pathogens.

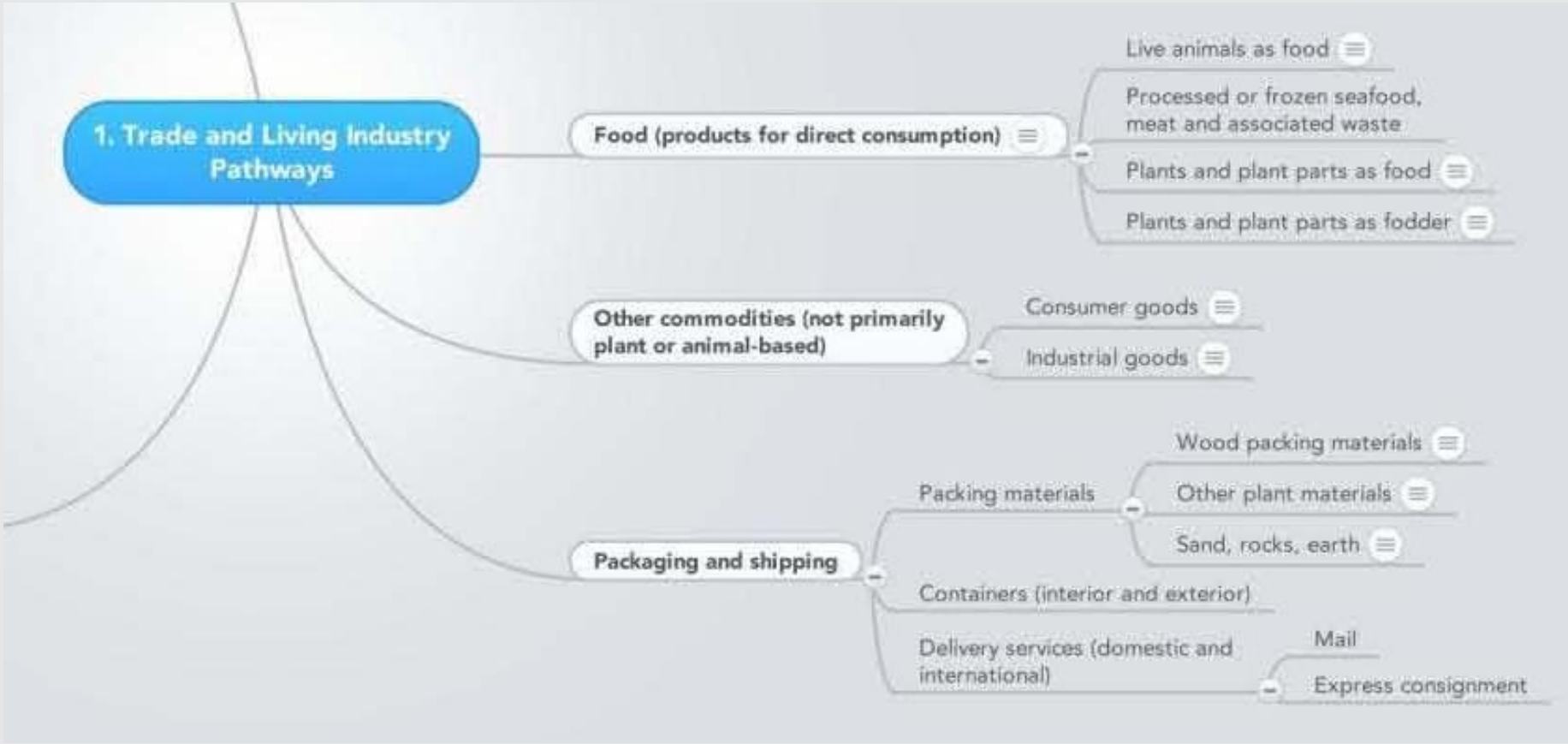
There are a lot of them



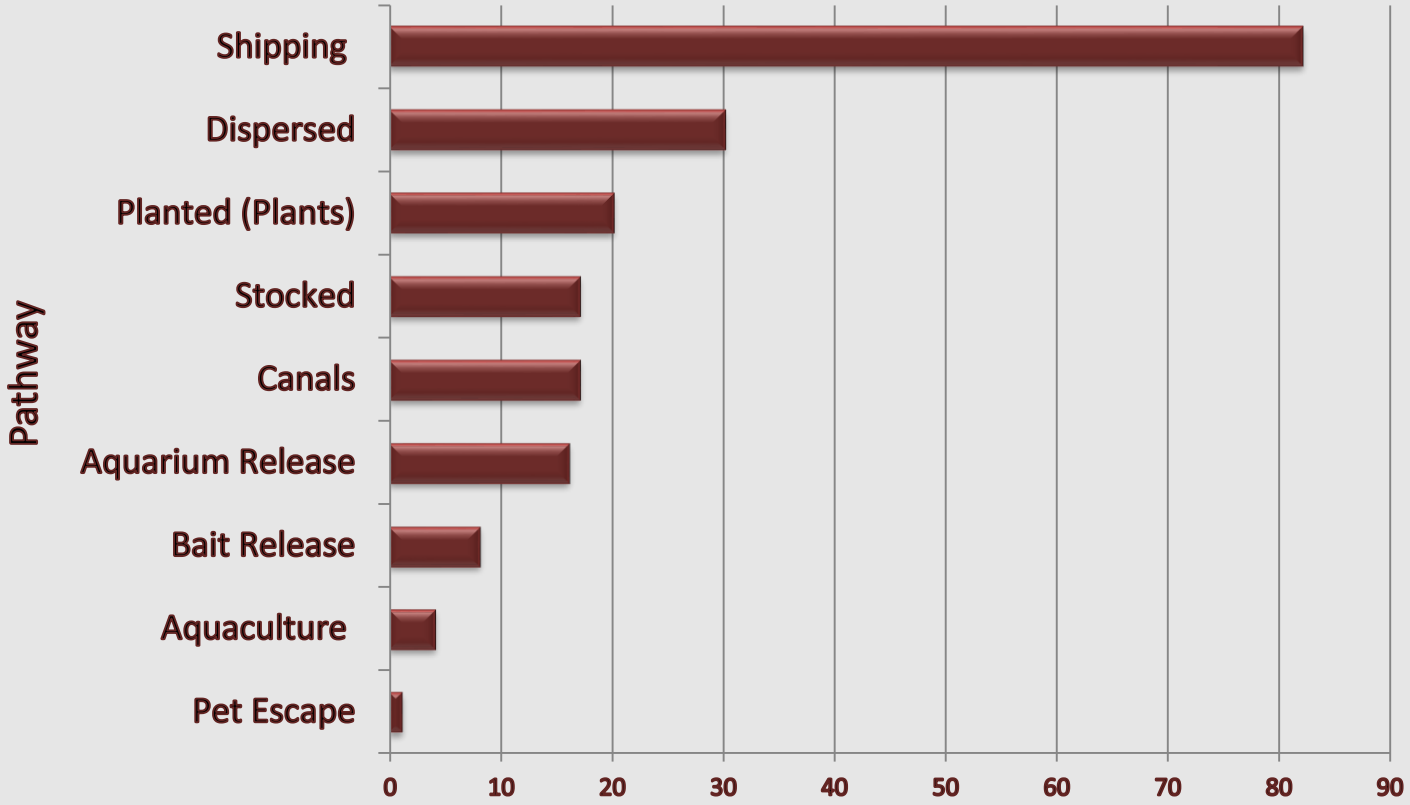
There are a lot of them



There are a lot of them



GL Invasions by Pathway



GLANSIS Non-Indigenous Species List for Great Lakes

How GL BIOTIC Addressed This

- Pathways
  - Aquaculture
  - Live Bait
  - Classroom use
  - Aquarium release
  - Disease/pathogens
- Panels
  - Outreach
  - Regulations
  - Industry
  - Risk Assessment
  - Networking

What's being done?

A lot of awesome things that I will cover in <10 minutes

Pretty Fish in Cold Places

The Ornamental Fish Trade as a Pathway for Invasive Species in the Great Lakes

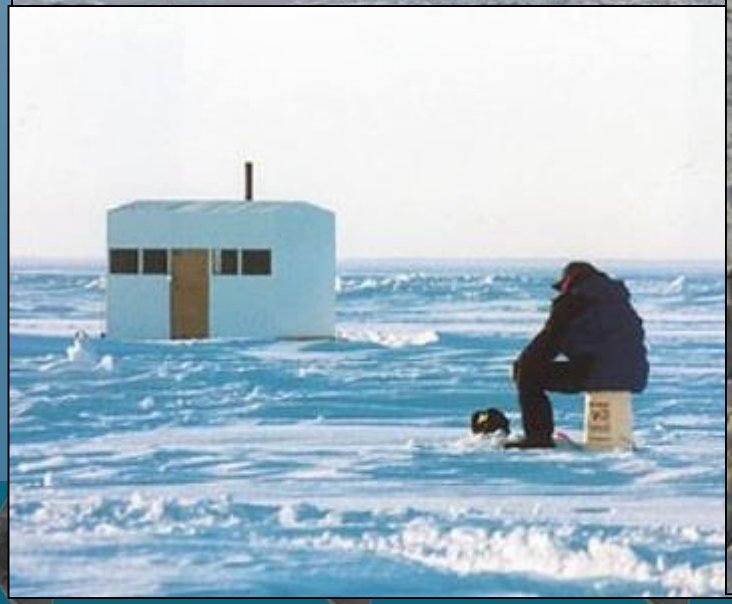
Jeffrey E. Hill

UF IFAS UNIVERSITY of FLORIDA

SFRC SCHOOL OF FOREST RESOURCES & CONSERVATION

GLBIOTIC Workshop
Milwaukee, WI
4 June 2014

RISK??? Questions?

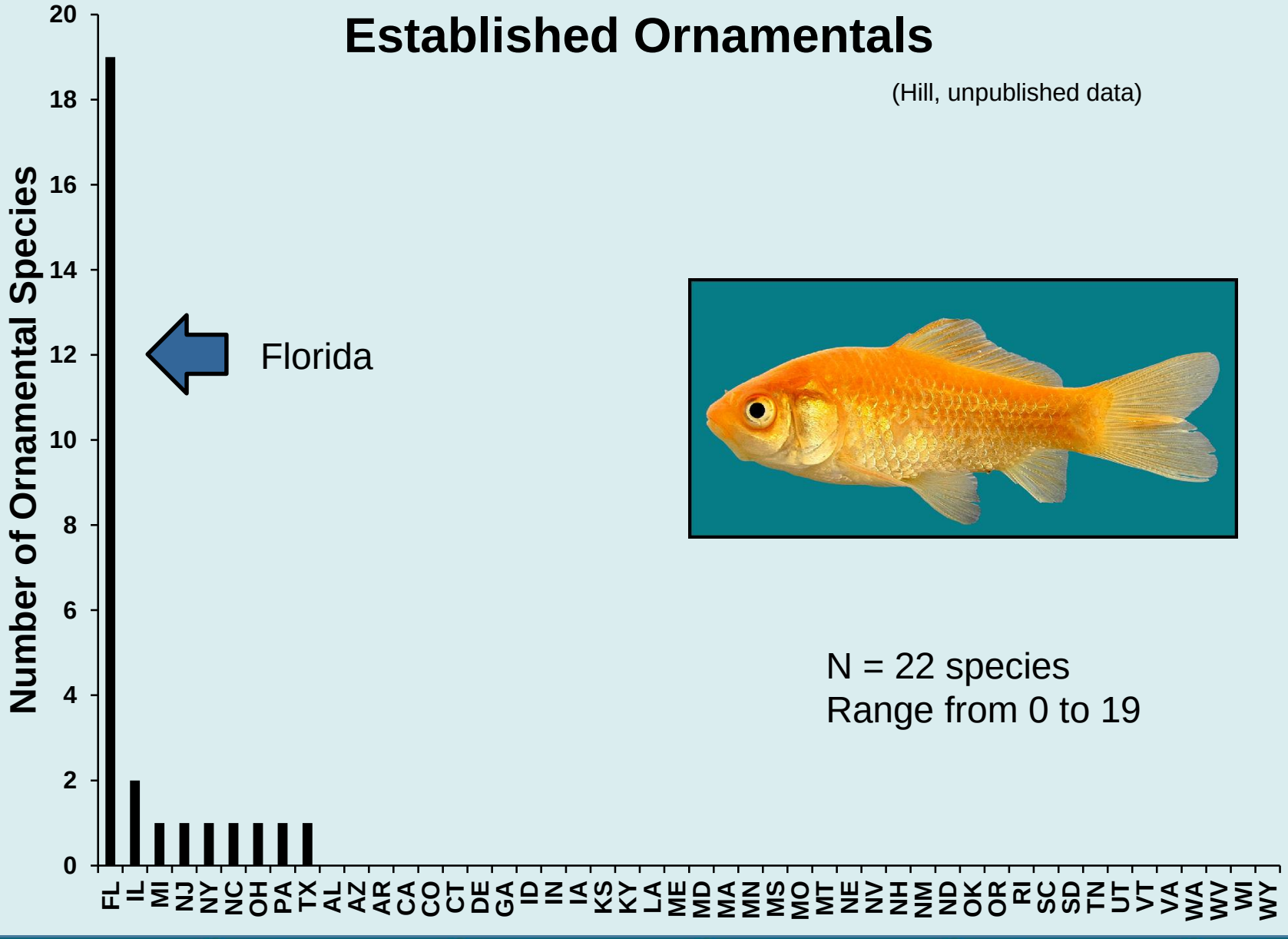


Historical Perspective

- 1848 First U.S. pet store
- 1910 Importers/growers
- 1980s Marine hobby
- Currently
  - 800+ varieties farmed in Florida
  - 2000+ species in trade (freshwater/marine)
- 14.3 million U.S. households with fish
- 145 million pet fish
  - APPMA 2014

Established Ornamentals

(Hill, unpublished data)



N = 22 species
Range from 0 to 19

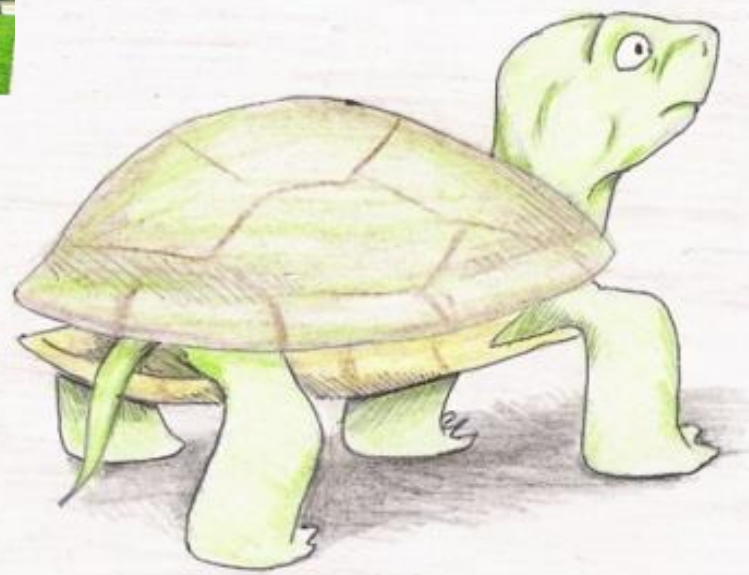
Bottom Line

- Most species in the ornamental fish trade are tropical and have a low climate match for most regions

- The Great Lakes region has a lot of problems with invasives, but the aquarium fish trade is a minor risk

Classroom activities as consumers of organisms in the trade and pathways for invasive species: turning a dilemma into solutions

Sam Chan, Tania Siemens and Jennifer Lam *
Sea Grant College Program
Oregon State University
samuel.chan@oregonstate.edu



Artwork by Shannon Ritter, 12th Grade, Glencoe HS, Hillsboro, Oregon, USA

Great Lakes Biotics 2014: Organisms Traded in Commerce, Milwaukie, WI

Schools and science curricula as potential aquatic invasive species pathways

Biological supply houses

Organism suppliers

Science curricula developers

Schools

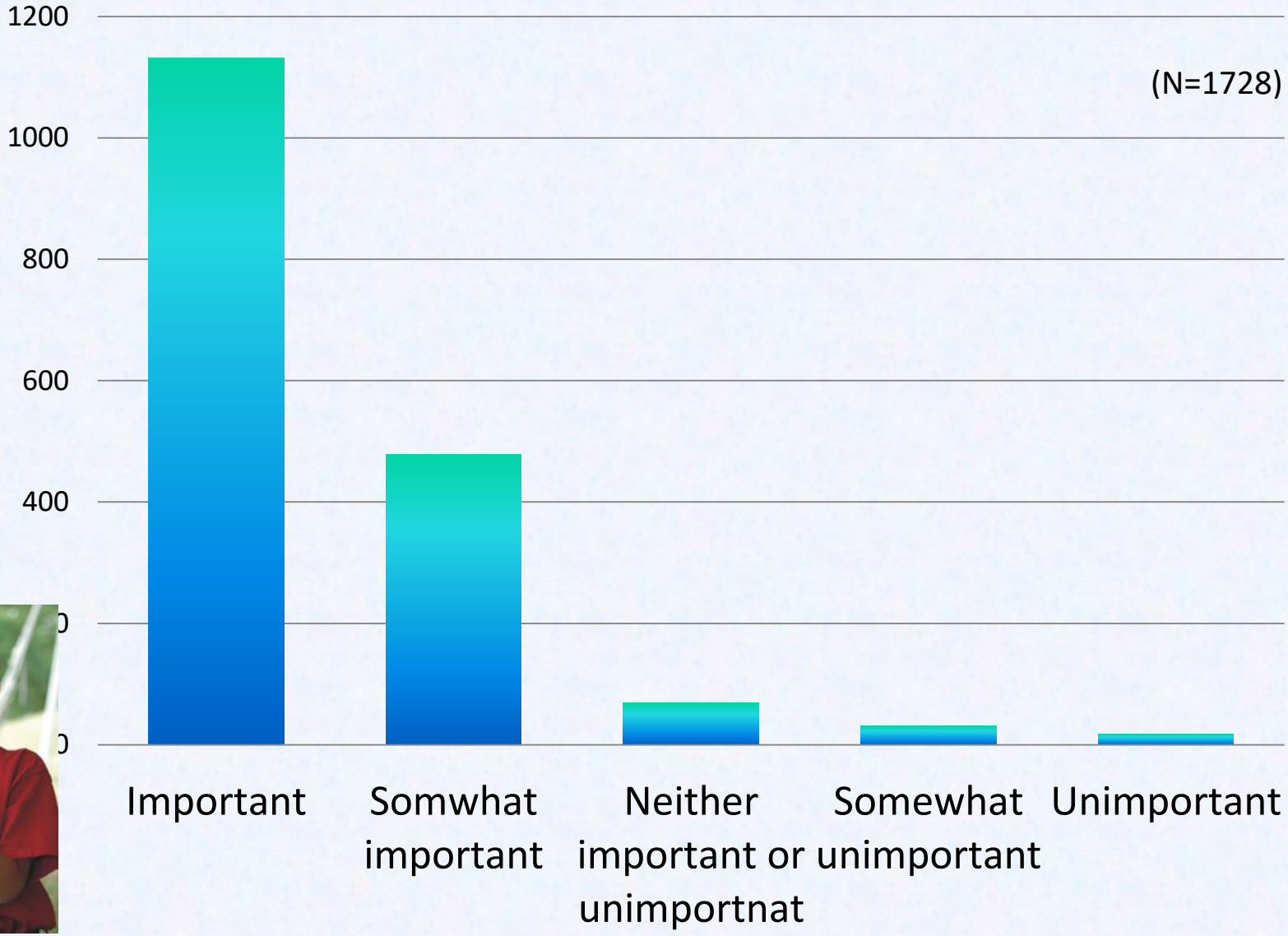
Euthanasia

Pets

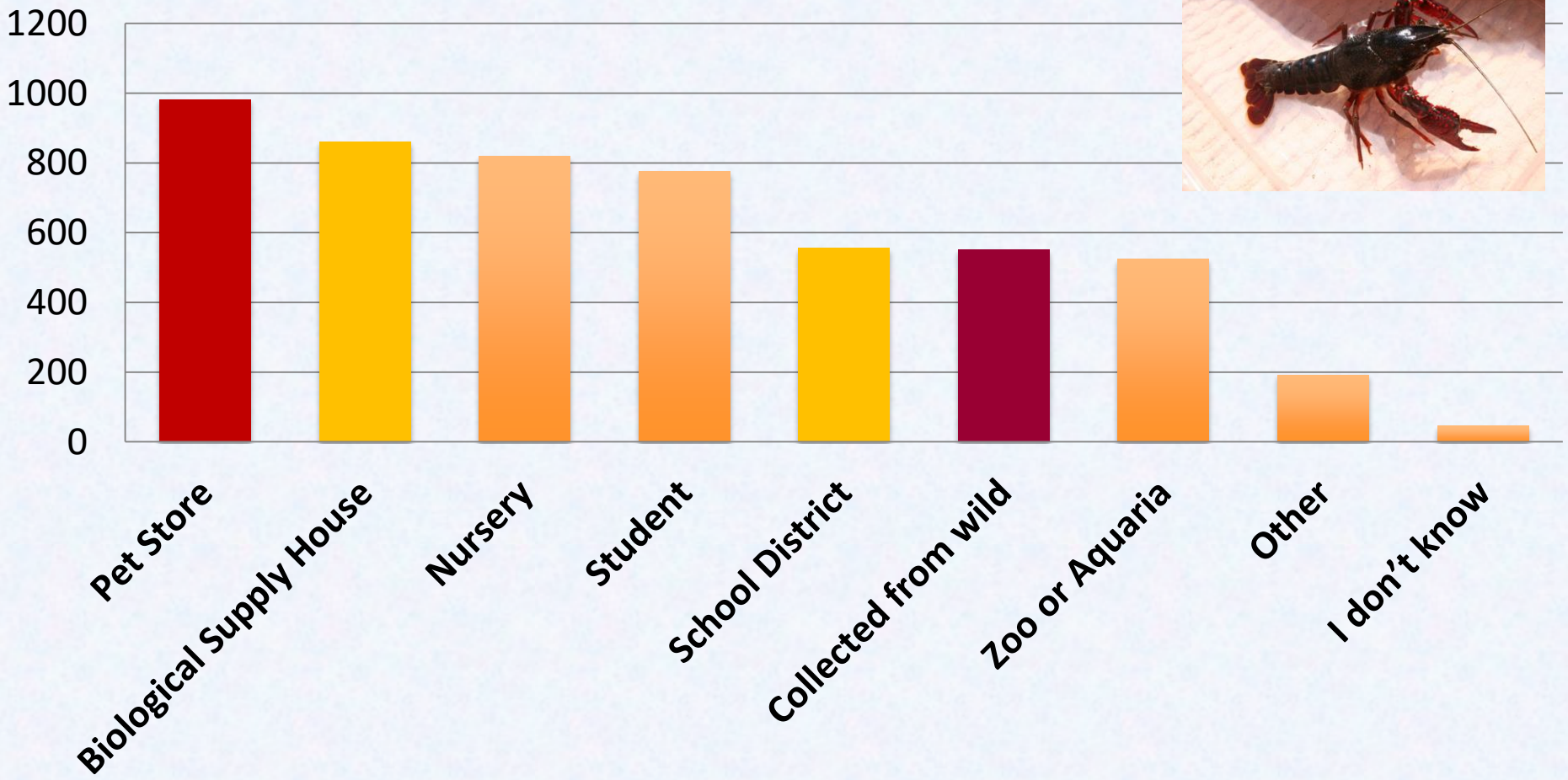
Disposal options

Release

How important are live animals and plants important in the classroom?

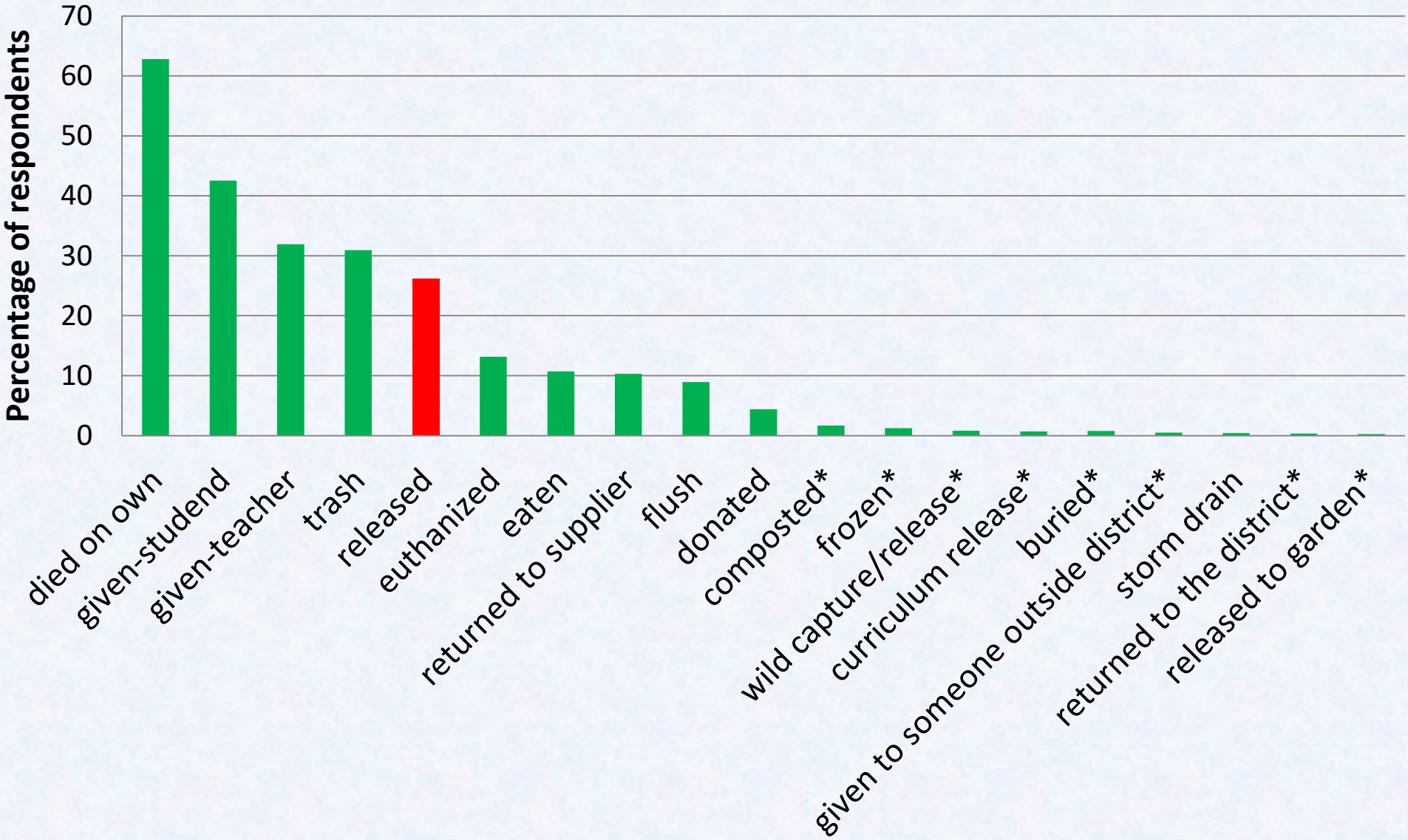


Sources of Classroom Organisms (N=1944 Teachers



What Happens to Classroom Plant and Animals?

(N=1979 teachers)



The HACCP Approach to Prevent the Spread of Aquatic Invasive Species by Aquaculture and Baitfish Operations

Ronald E. Kinnunen,
Michigan Sea Grant
and
Jeffrey L. Gunderson,
Minnesota Sea Grant

Sea Grant
Great Lakes Network

Aquaculture (bait)

Hazard Analysis and Critical Control Point

- HACCP is preventive, not reactive
- Concentrates on the points in the process that are critical to the safety of the product
- Stresses communication between the regulator and industry

HACCP Process

Conduct hazard analysis

Identify critical control points (CCP)

Establish control measures

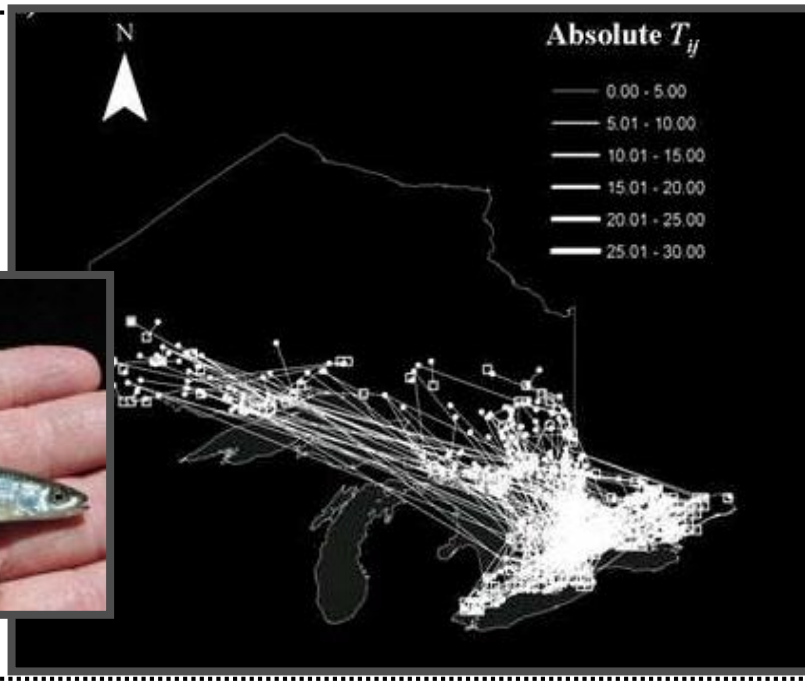
Monitor each CCP

Establish corrective action to be taken when a problem occurs

Establish a record-keeping system

Verify that the HACCP plan and control measures work

Reducing Risk in an Interdisciplinary World: Bycatch, Distribution Networks, and Risky Behaviour within Baitfish Pathways



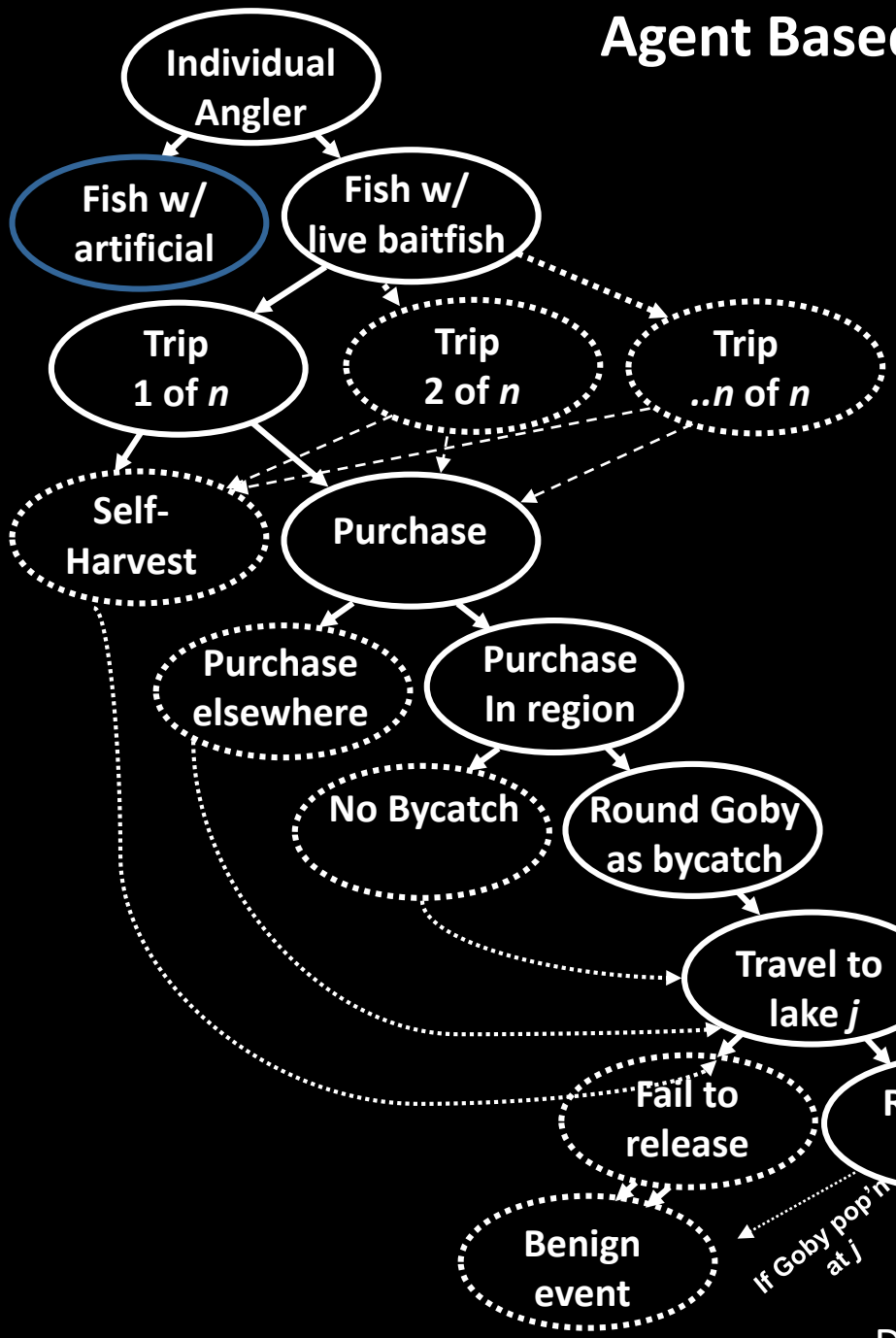
Andrew Drake

Department of Biological Sciences

University of Toronto Scarborough

UNIVERSITY OF TORONTO SCARBOROUGH

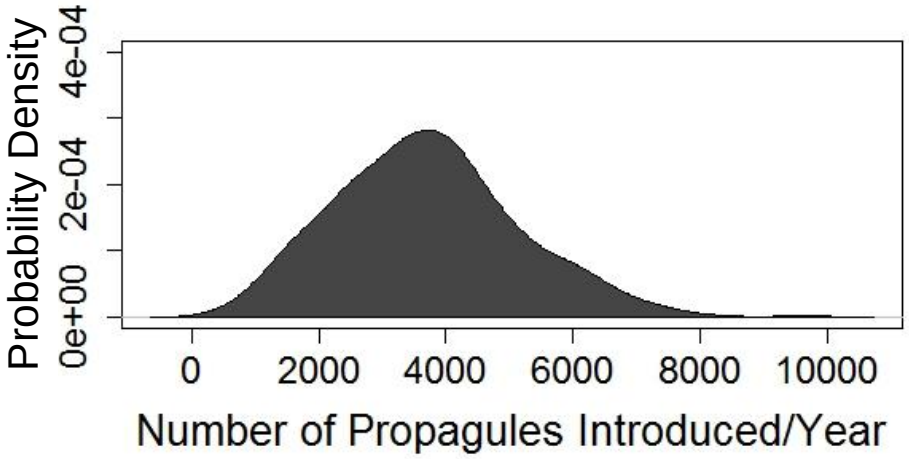
Agent Based Model: Monte Carlo Resampling

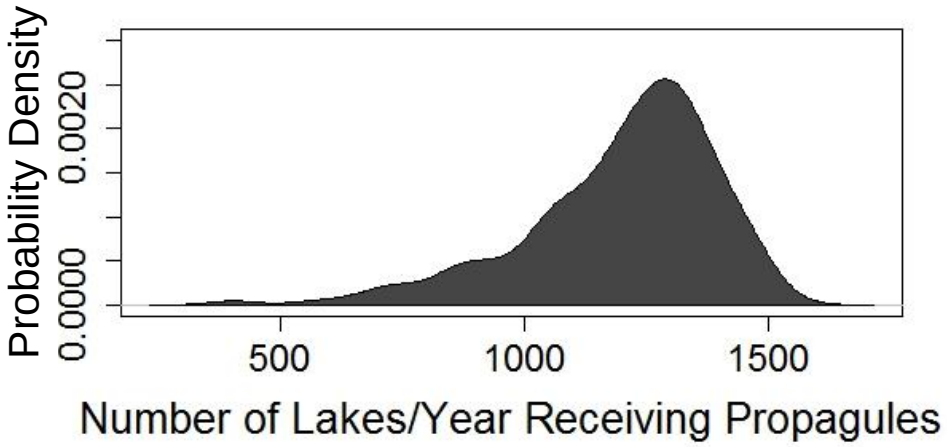


- Repeat for *n* trips per angler
- Repeat for *n* anglers
- Repeat for 4.2 M trips/yr

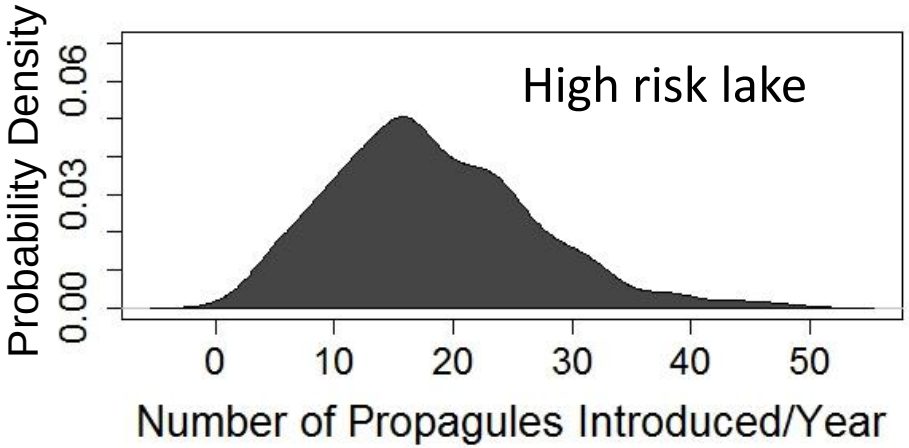
n Round Goby propagules introduced for single trip

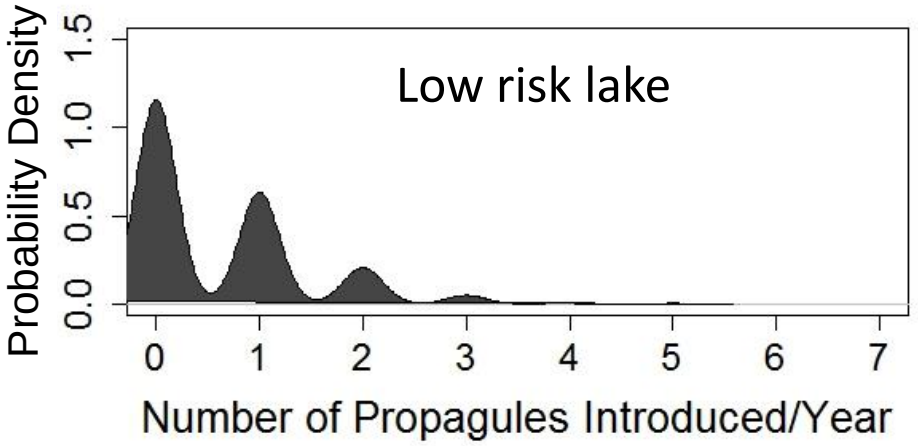
Drake and Mandrak 2014, *Ecological Applications*



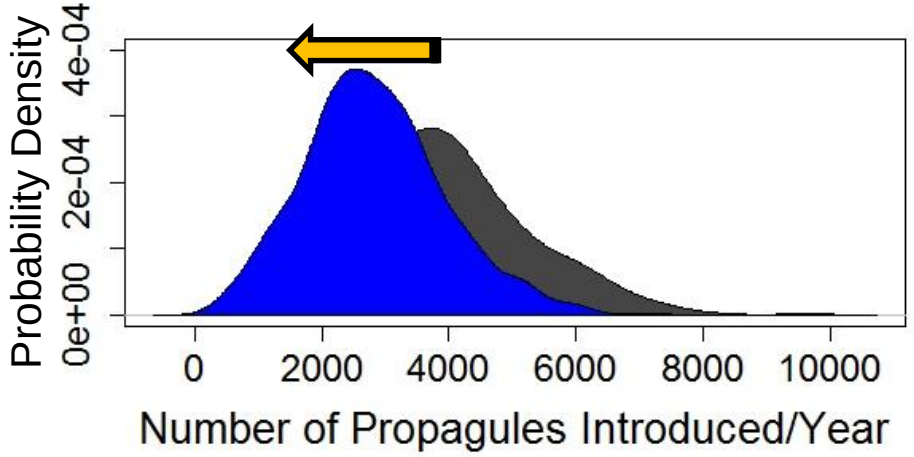


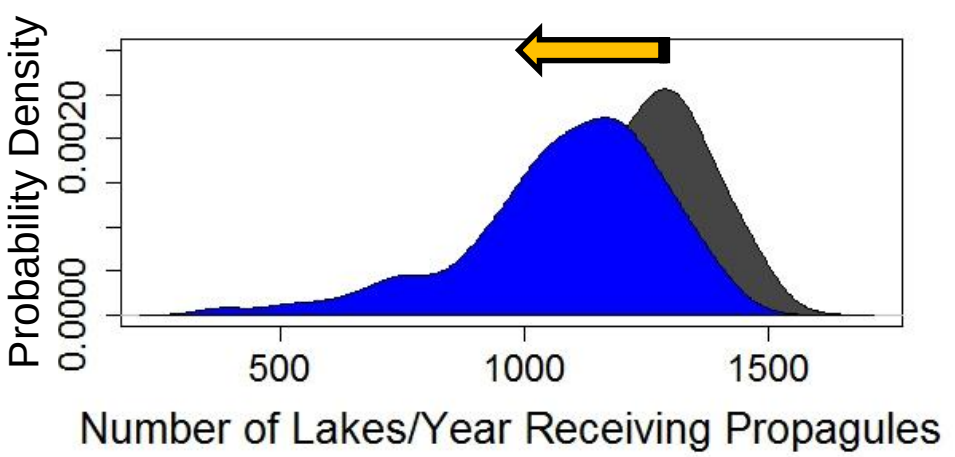
What difference could policy and outreach make?



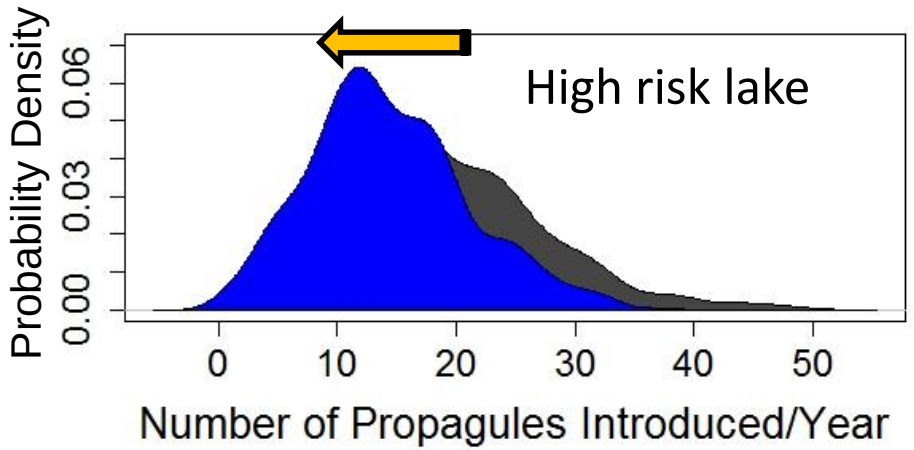


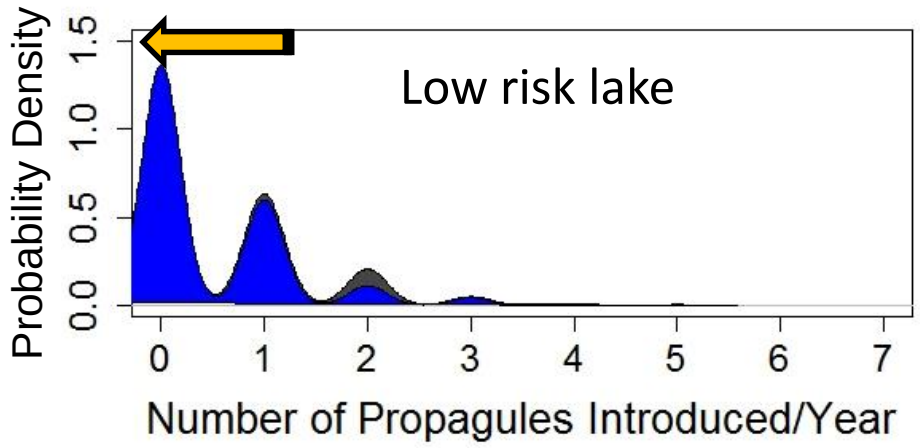
Drake and Mandrak 2014, *Ecological Applications*



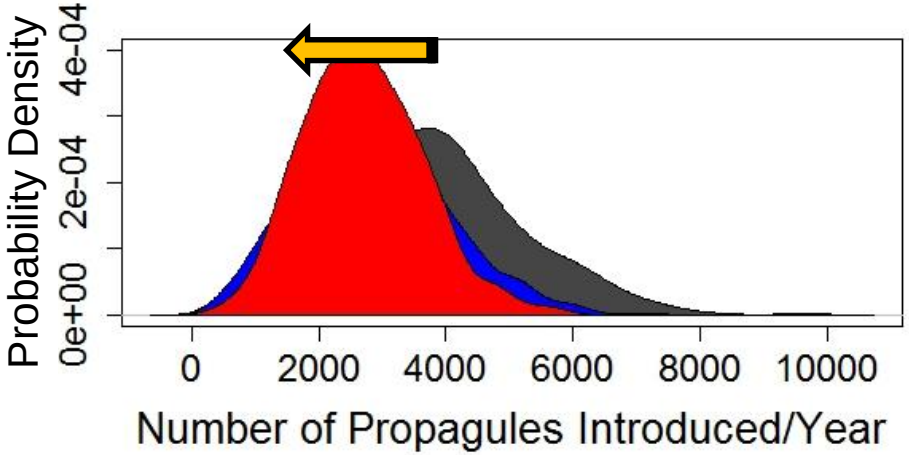


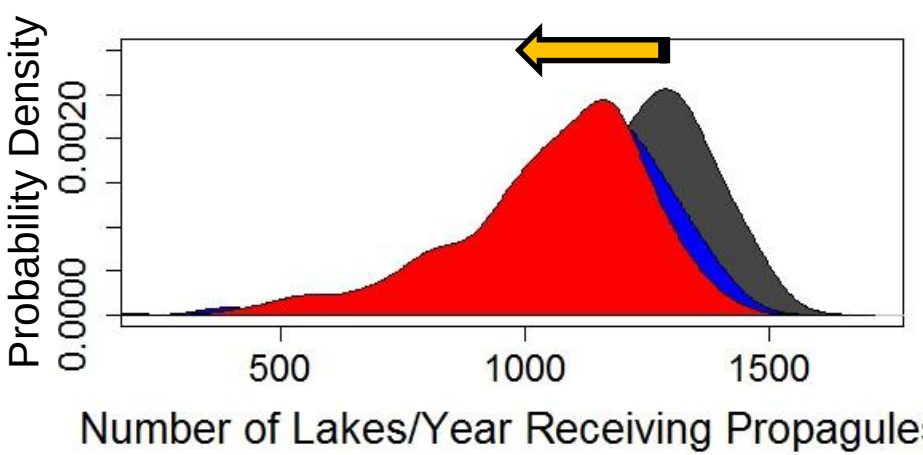
Reduce *P* release by 25%: high *P* of reducing introduction risk



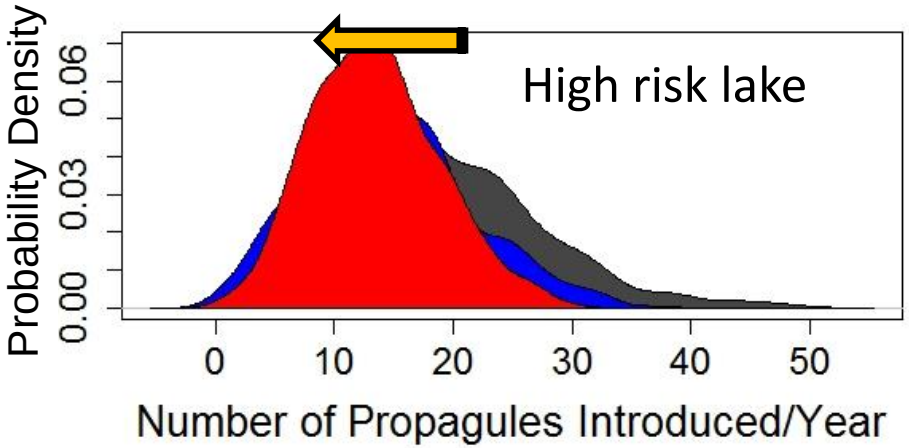


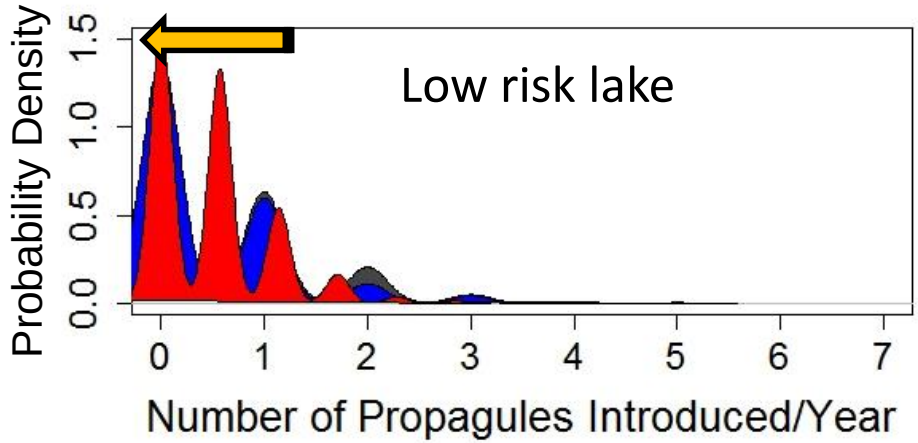
Drake and Mandrak 2014, *Ecological Applications*



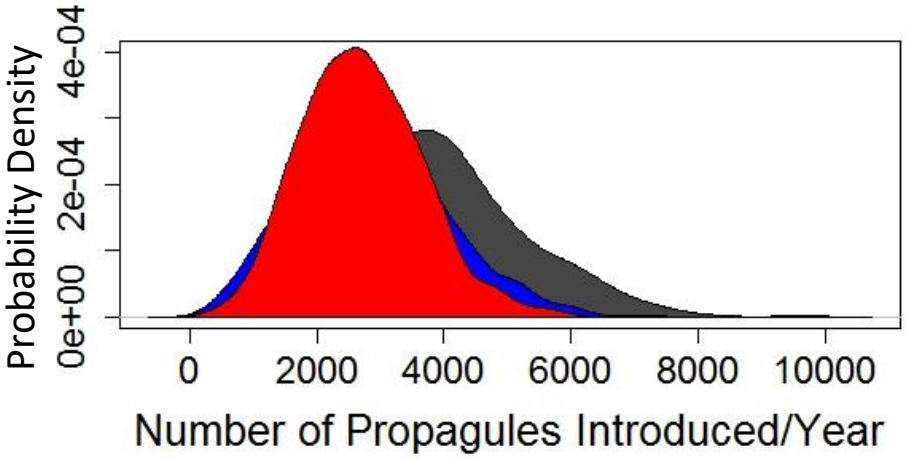


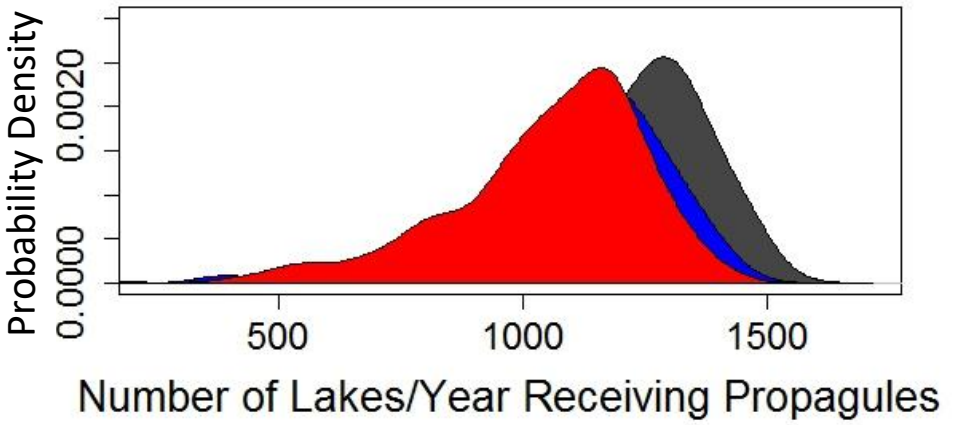
Reduce *P* purchase goby by 25%: high *P* of reducing risk



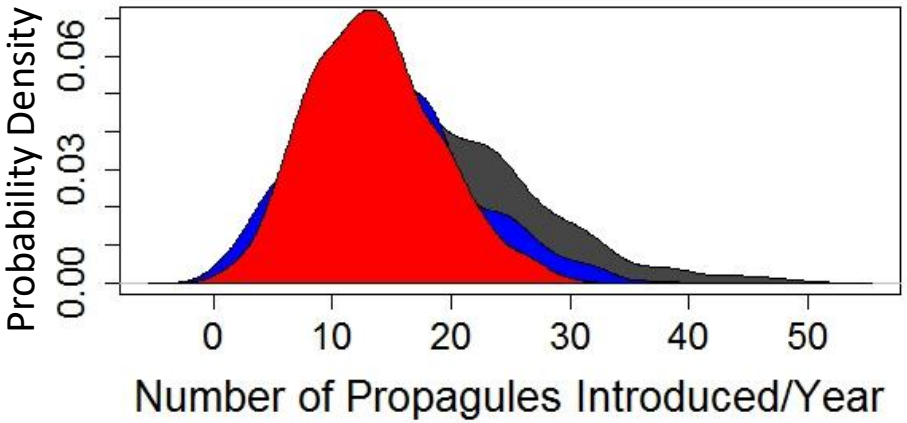


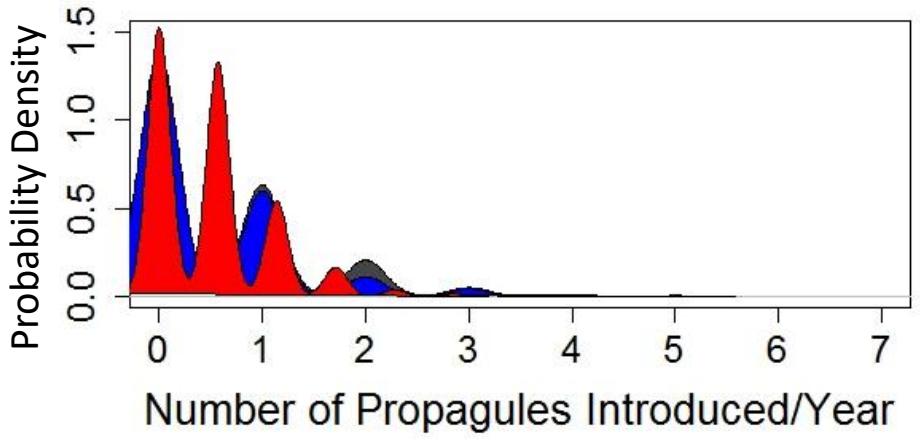
Drake and Mandrak 2014, *Ecological Applications*





Key: meaningful changes in bycatch and risky behaviour, expected with policy, outreach, and enforcement, have high probability of reducing introduction risk





Drake and Mandrak 2014, *Ecological Applications*

How to Summarize the Ecological Risk of Live Baitfish Pathways?

- *When given a large enough sample size, improbable becomes probable*
- Although bycatch rates are relatively low, and risky trips are infrequent, the sheer volume of activity results in a sizeable number of AIS introduced each year
- Similar mechanisms probably exist for other jurisdictions, but a thorough assessment of bycatch and distribution networks is warranted.
- Many bait issues are bycatch issues, compounded by imperfect detection, movement, and release behaviour
- Individuals extremely important: risky harvesters, anglers effectively controlling public good of aquatic ecosystems
- Glass half-full: *many* harvest events and angling trips benign; strong management, outreach & enforcement success
- Key control points exist: manipulating bycatch and release rates best opportunity to manage invasion risk

From our panels

- Industry Perspectives
  - Continue collaborative approach to solution development
- Risk Assessment
- Outreach
  - Fact sheet, teacher training, Habitattitude Surrender Collaborative
- Regulations

Where should I go to learn more?

- Seagrant.wisc.edu/OIT
- GL BIOTIC fact sheet
- Any of the other presenters

You should also go to…

II

What are your questions?

Providing I left enough time….

Habitattitude™
PROTECT OUR ENVIRONMENT
DO NOT RELEASE FISH AND AQUATIC PLANTS
www.Habitattitude.net

Sea Grant University of Wisconsin

Sea Grant Minnesota

Great Lakes RESTORATION

ERC ENVIRONMENTAL RESOURCES CENTER

WISCONSIN DEPT. OF NATURAL RESOURCES

UW Extension
University of Wisconsin-Extension