

Aquatic Invasive Species in Commerce Summit

Developing Solutions to Mitigate Risks
March 8, 2023 10am-1pm Pacific Time

Project supported
by:



The project team



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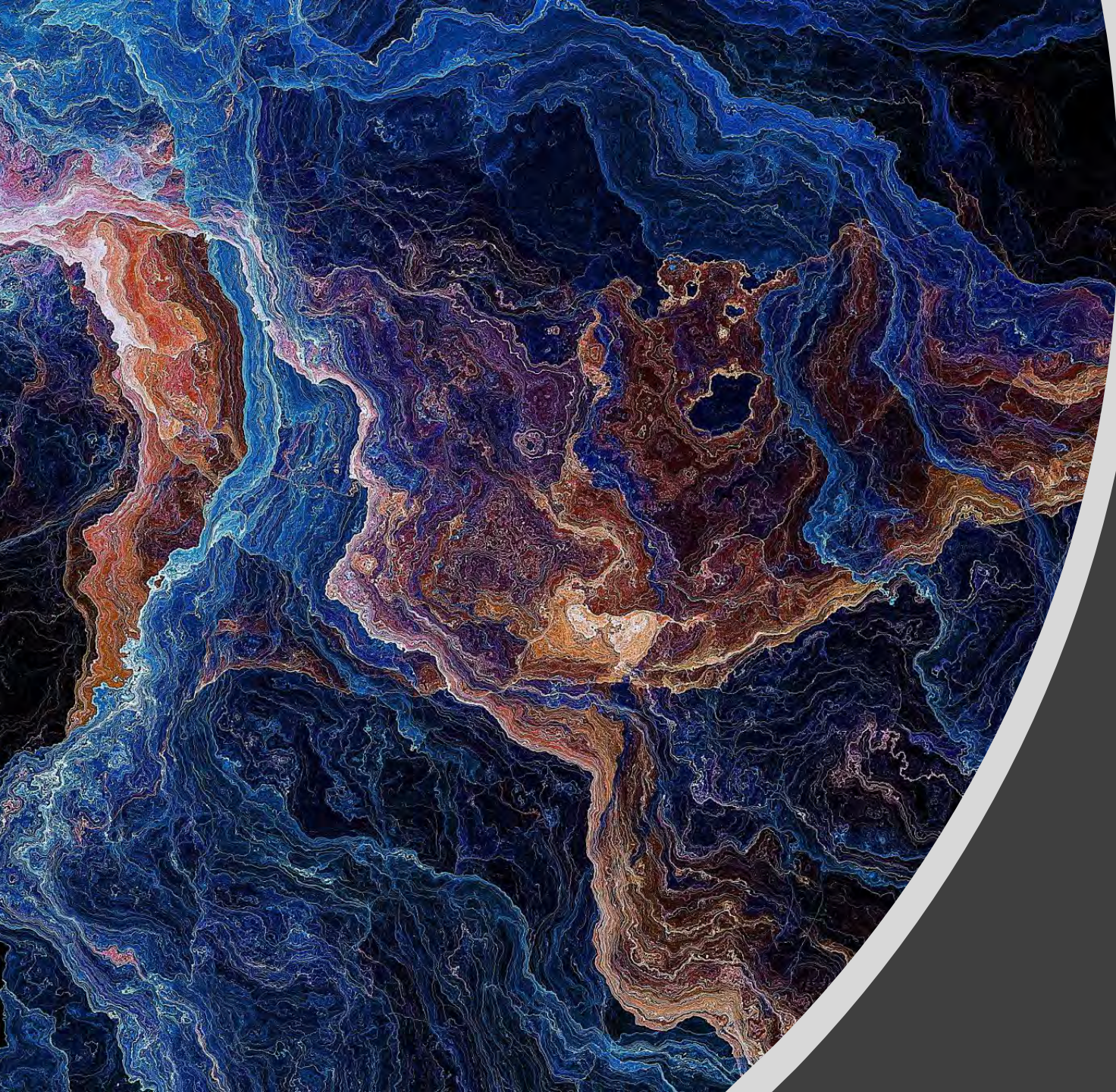
Stephanie Otts

National Sea Grant Law Center

<https://nsglc.olemiss.edu/>

Agenda

- **Welcome** (L. Elwell, L. DeBruyckere)
- **Brief Project Overview** (L. Elwell)
- **Survey Results and Trends** (L. DeBruyckere)
- **Presentations**
 - Outreach and Education (T. Campbell – Wisconsin Sea Grant)
 - Voluntary Industry Standards (C. Carrière, Pet Industry Joint Advisory Council-Canada)
 - AIS Information Infrastructure and Access (K. Wixted, Association of Fish and Wildlife Agencies)
 - Labeling and Recordkeeping (J. Hiduke, 5DTropical Inc.)
 - E-Commerce (L. Walters, University of Central Florida and H. Malone, US Department of Agriculture/Animal Plant Health Inspection Service/Plant Protection and Quarantine)
 - Monitoring, Inspection, and Enforcement (G. Fish, Maine Department of Agriculture, Conservation, and Forestry)
 - Regulations (S. Otts, National Sea Grant Law Center)
- **Analyzing Invoices for Invasive Species – A Novel Approach** (M. Tlusty, University of Massachusetts Boston)
- **Introduction of Work Group Topics**
- **Next Steps**



Project Overview



Goal

Develop and implement measures that prevent the introduction, or spread, of aquatic invasive species through commerce using science-based, landscape-level prevention measures implemented across North America.

Objectives



Assess the aquatic species supply chain to determine what can be addressed through regulations, incentives, and other tools.



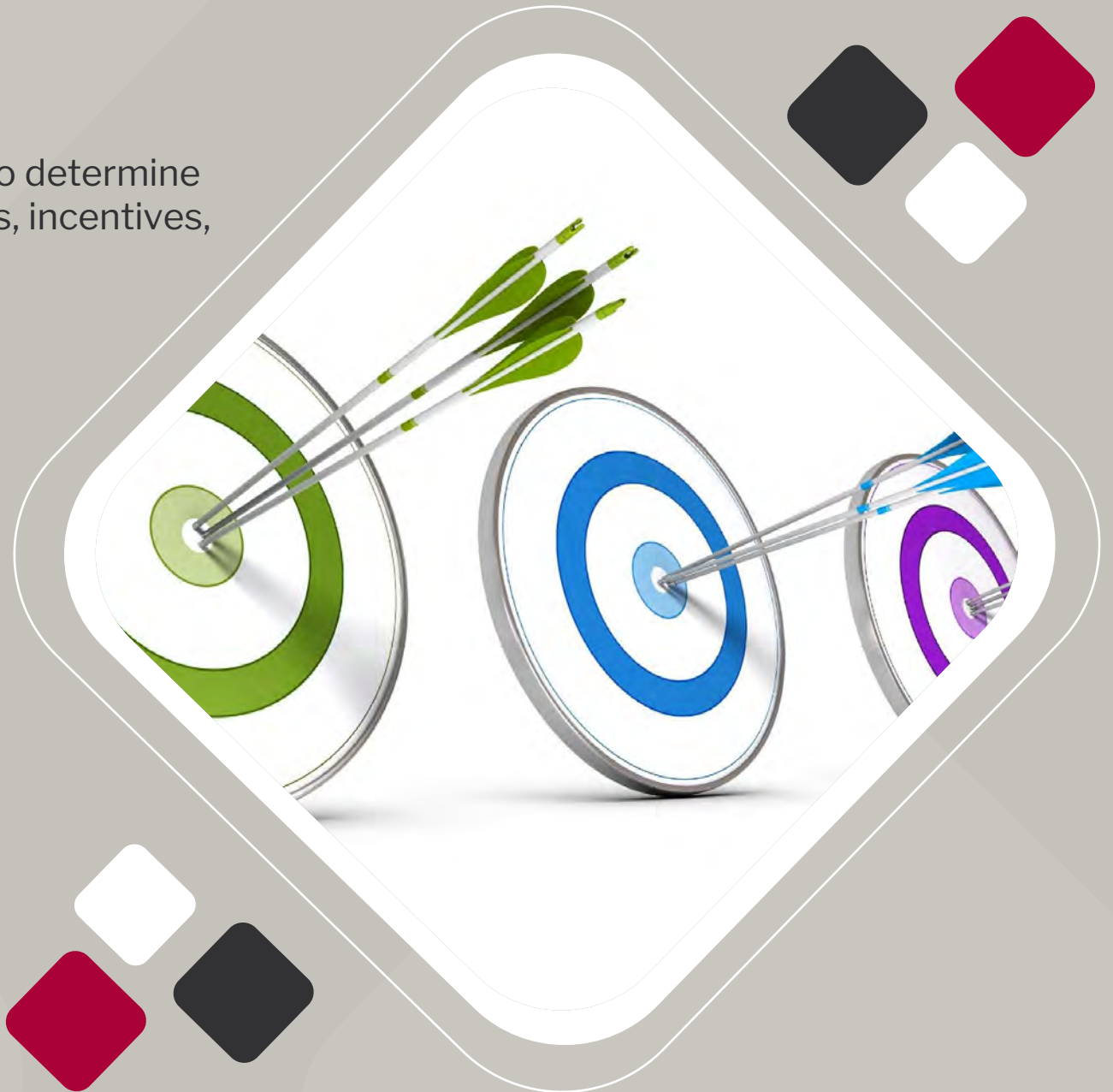
Convene industry and agency partners to develop potential solutions.



Develop and share best management practices, voluntary codes of conduct, and regulatory approaches.



Develop toolkits for buyers, sellers and agencies.

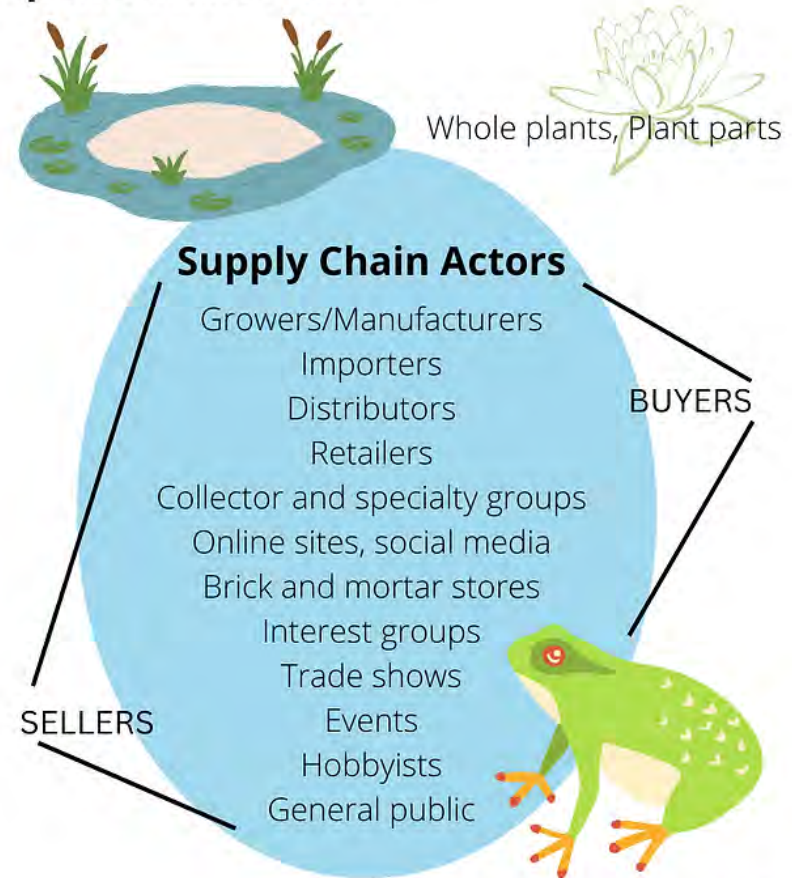


AIS Trade and Transport Via Commerce

Identifying and Interrupting the Chain of Transmission

Project
Scope

Aquatic Plant Trade

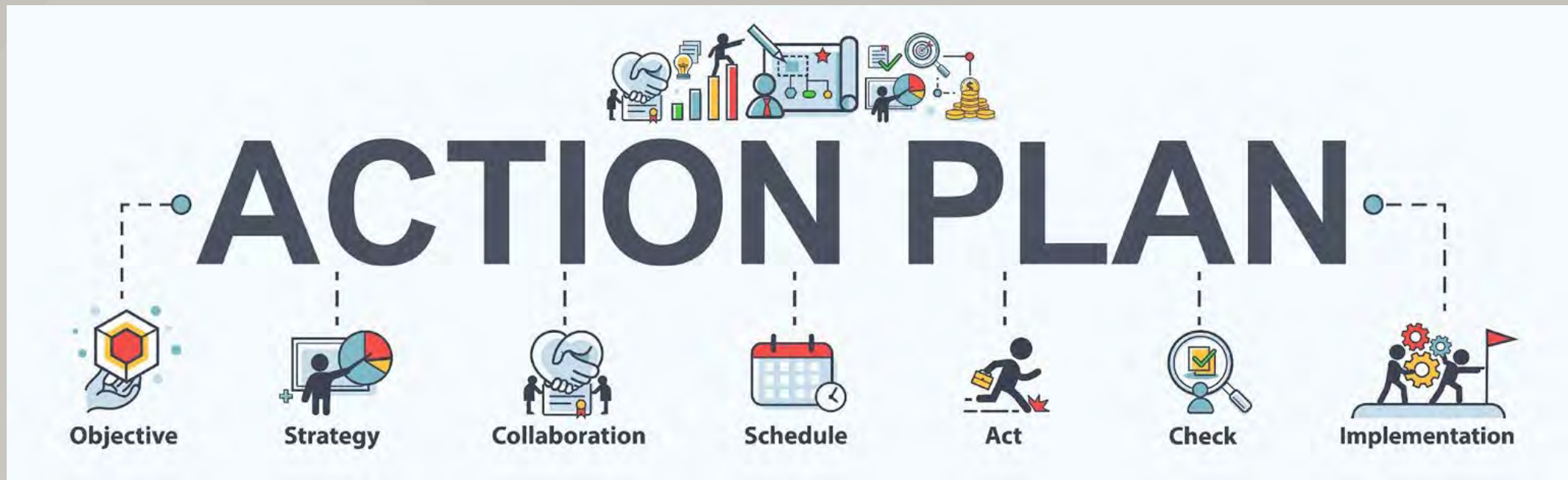


Non-food Animals

Amphibians, Invertebrates,
Fish, Reptiles, Molluscs

A. Convene Partners to Develop Action Plan

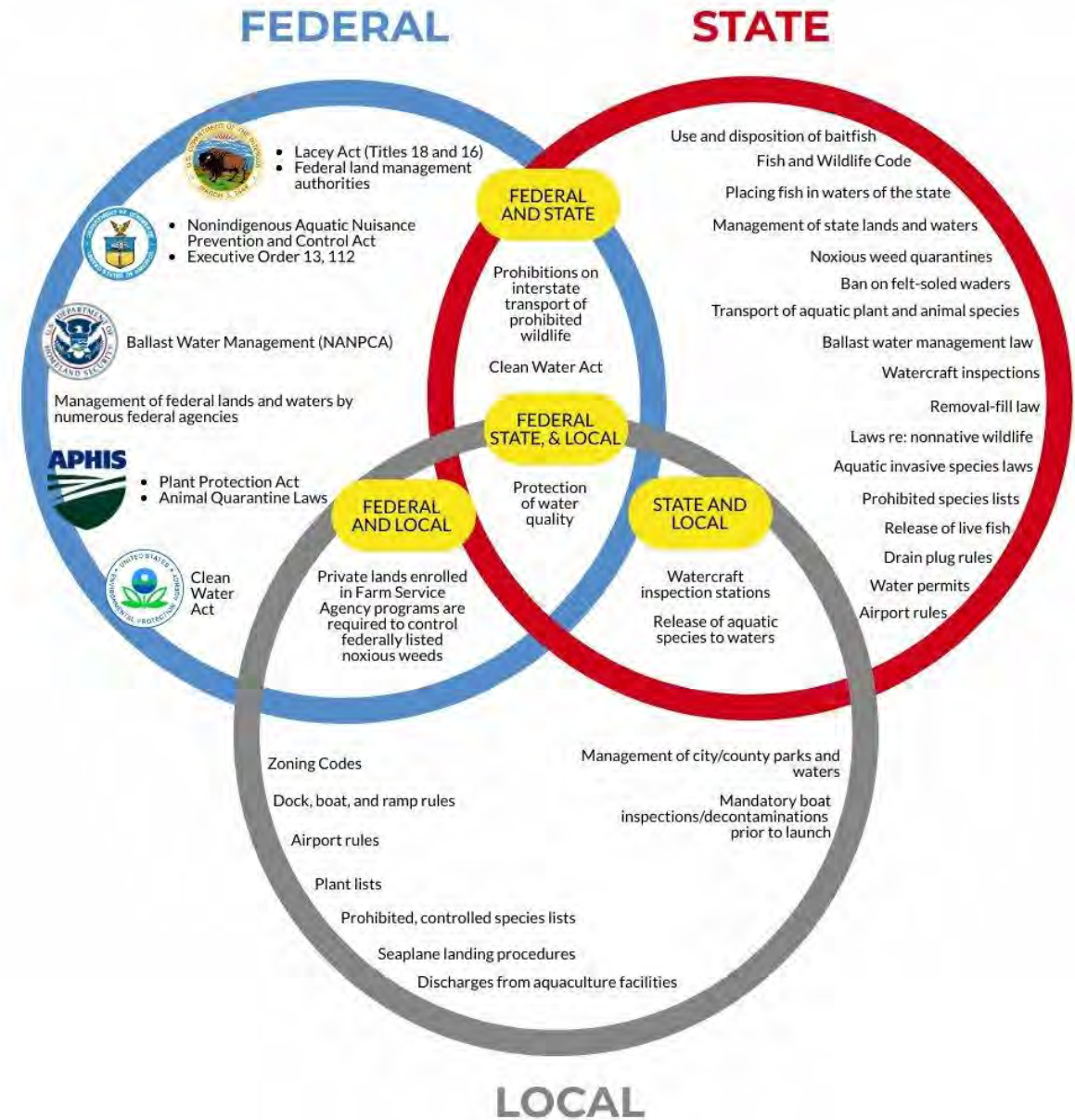
- Draw from review of supply chain landscape
- Conduct surveys
- Facilitate work groups to identify issues and brainstorm solutions
- Generate an action plan that contains timelines, resources, and responsible parties



B. Address Regulatory Gaps

- Identify loopholes and barriers that contribute to introduction and spread of AIS in commerce
- Explore models to define the most efficient and effective regulatory practices
- Develop case studies
- Follow hypothetical shipment along pathways to explore solutions

Aquatic invasive species prevention, management, and control authorities exist at the federal, state, and local levels. In some cases, federal/state, federal/local, state/local, and federal/state/local laws have overlapping and complementary authorities.



C. Conduct Effective Outreach

- Develop and maintain toolkits illustrating BMPs
- Provide toolkit for state agencies
- Provide easy access to restricted species in each state
- Create one-stop shop for buyers and sellers to access information



Milestones



October 2022 – Launch website



November-December 2022 – Survey (agencies, buyers, sellers)



January 2023 – Assessment of supply chain



March 2023 – Summit #1



March–September 2023 – Focus groups



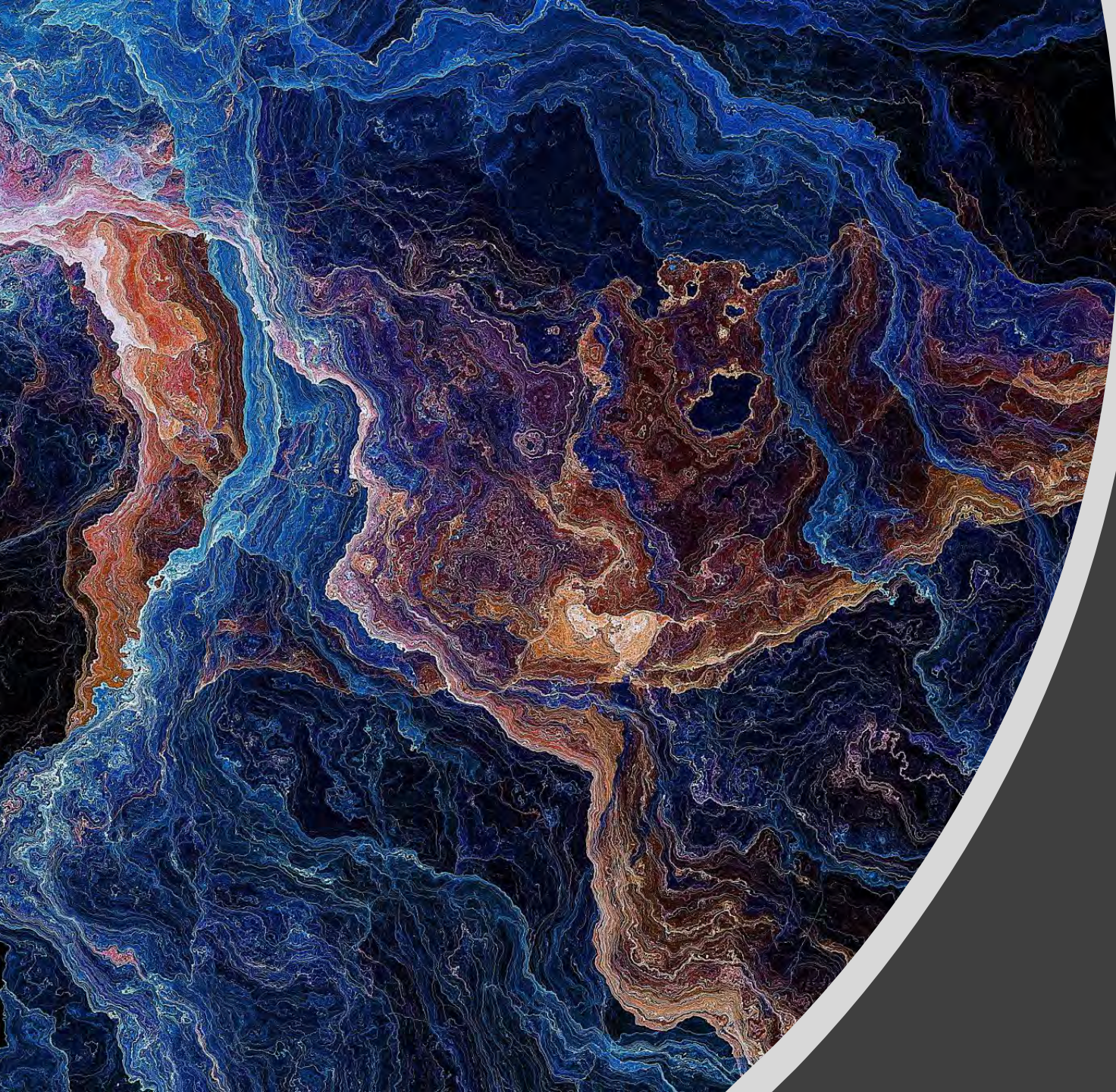
September – Action Plan Draft



September 2023 – Regulatory Framework



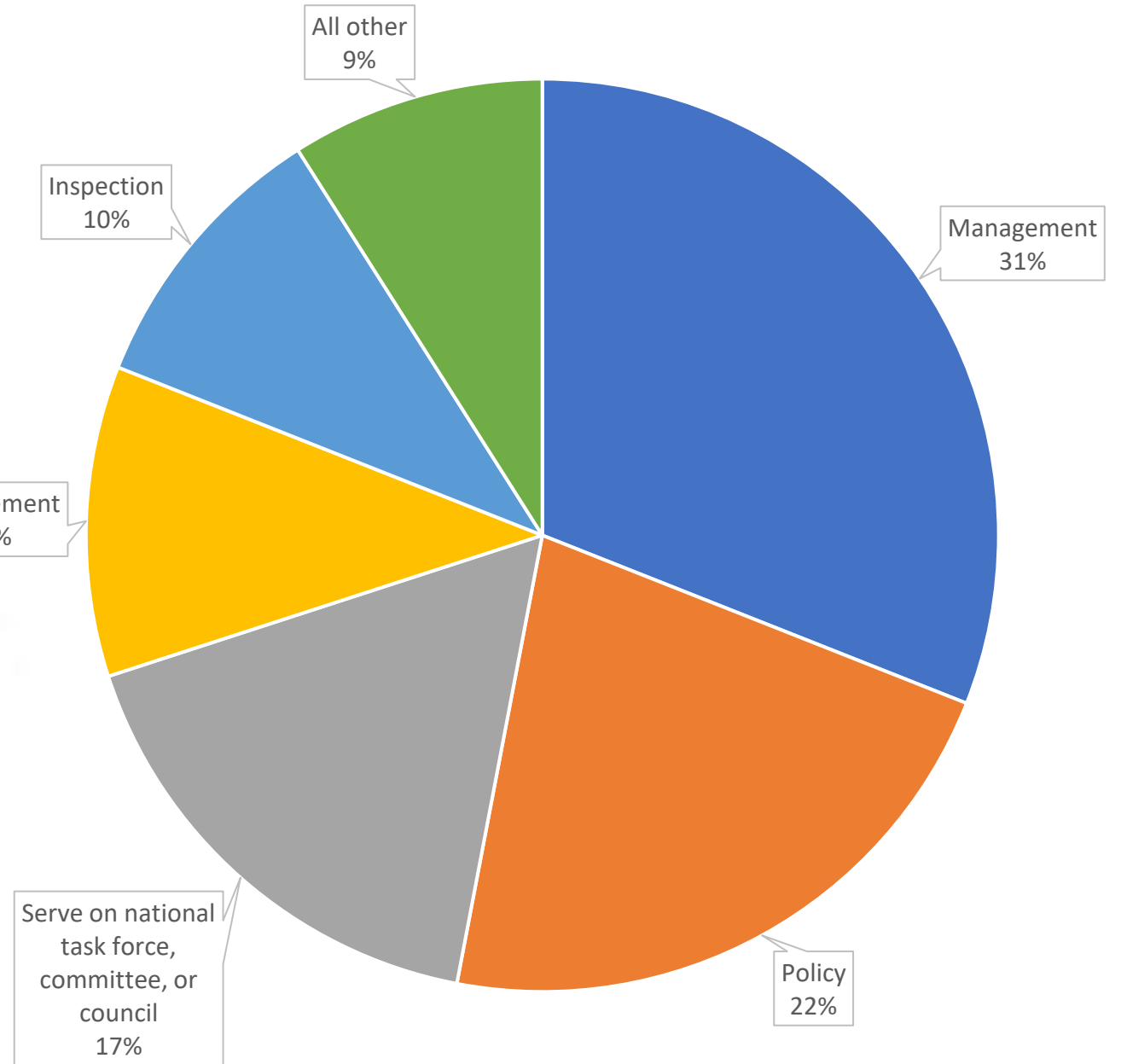
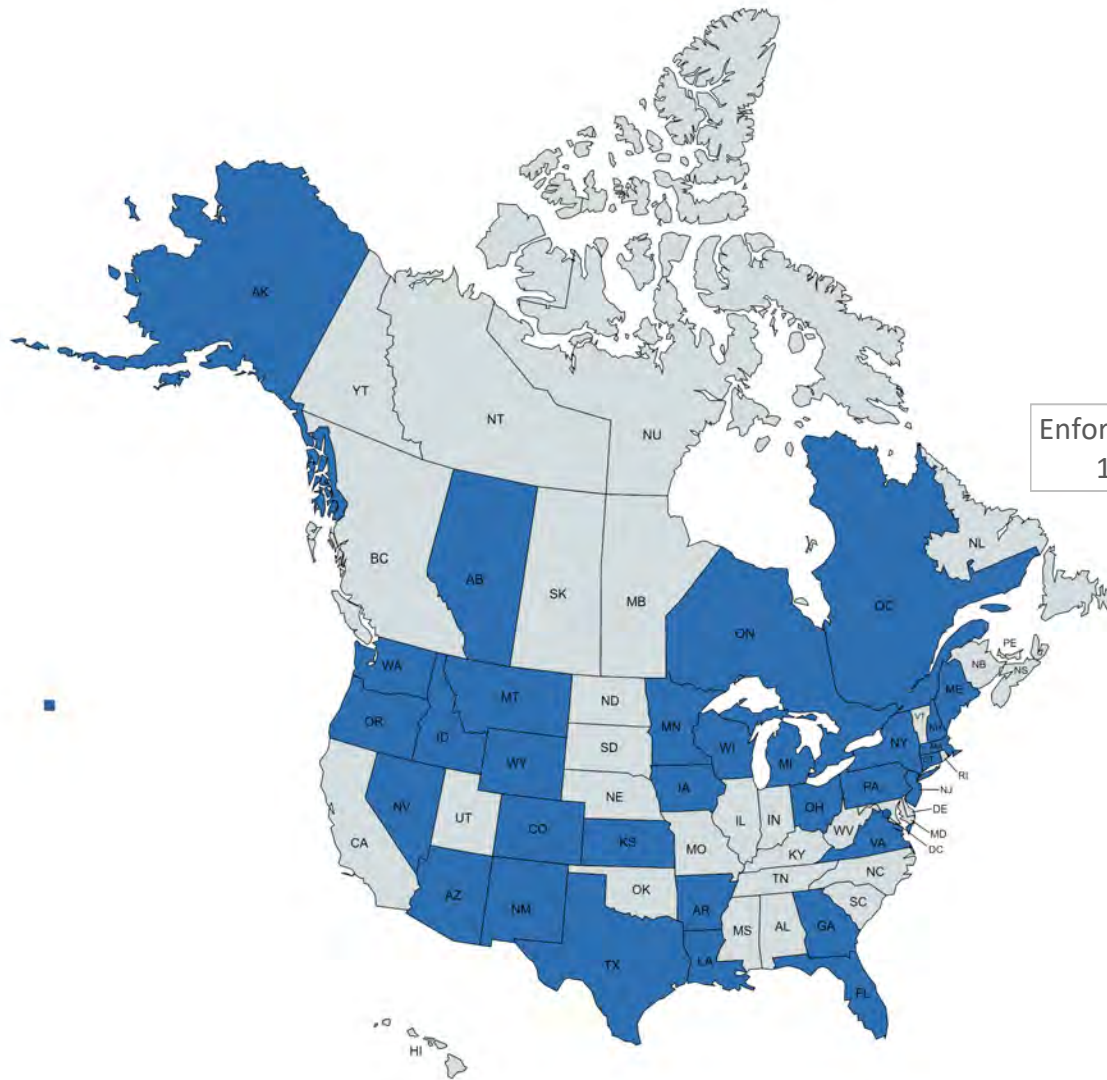
May 2024 – Finalize Action Plan, Toolkits



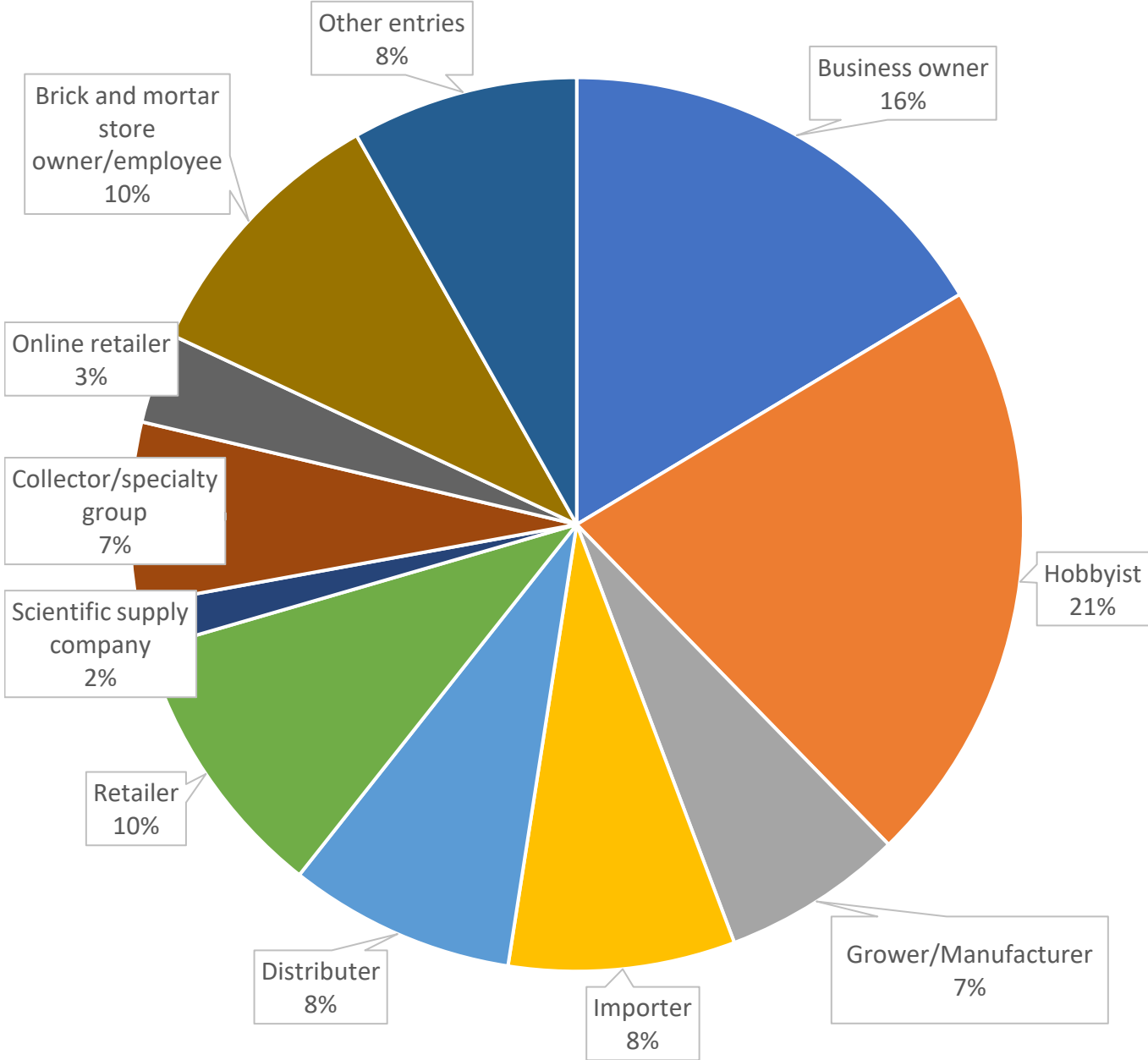
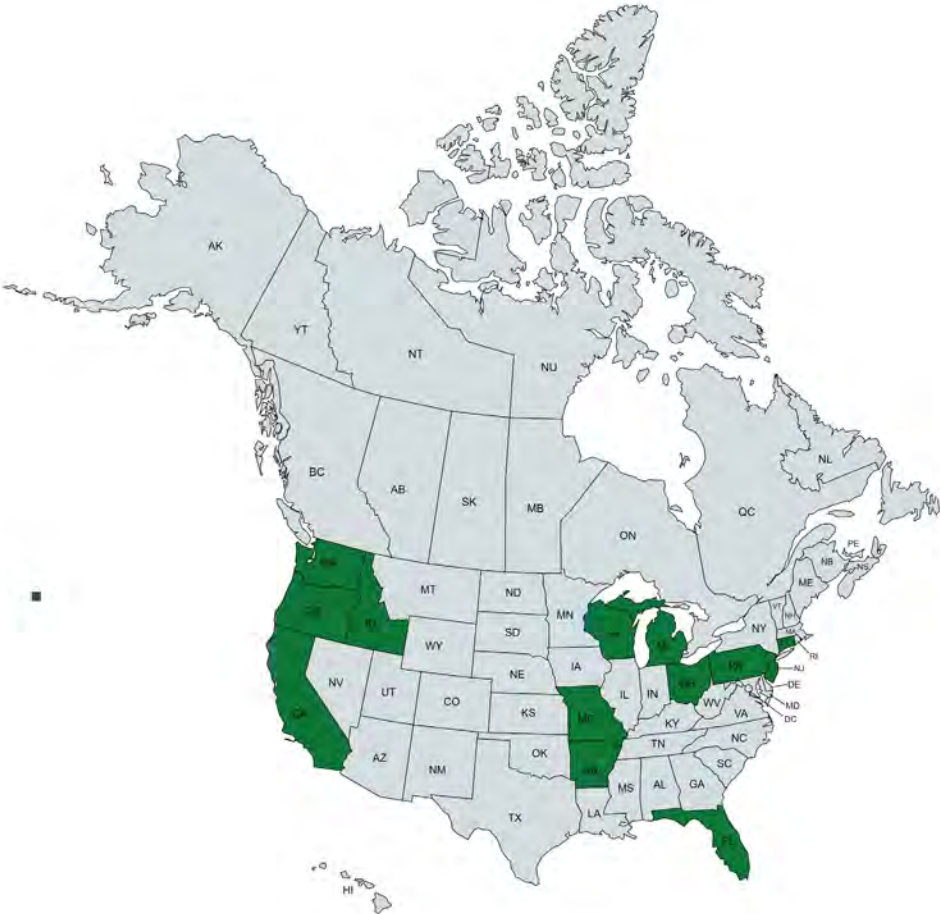
Survey Results

Agency - 68 Respondents

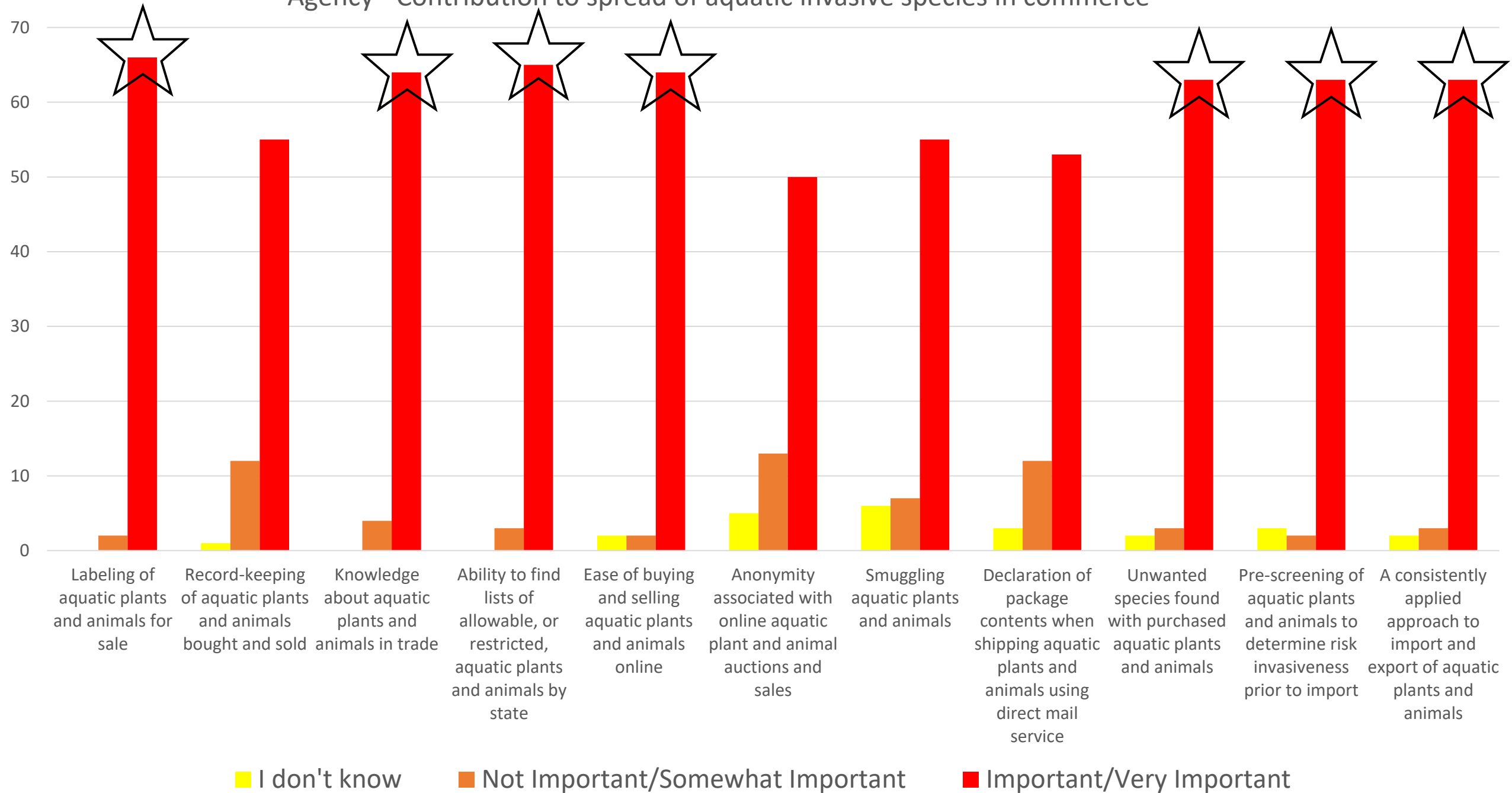
Agency role relative to aquatic plants and animals



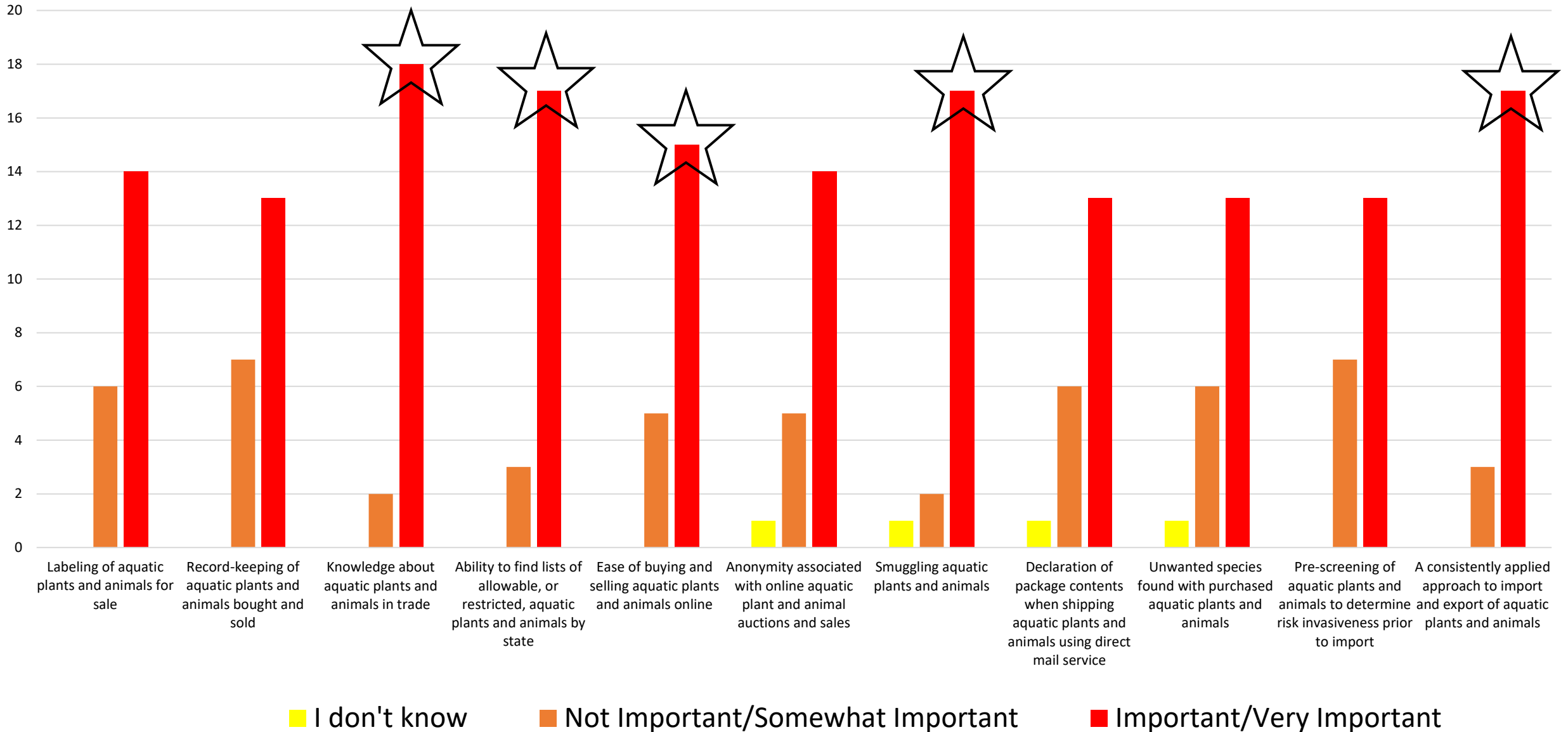
Buyers/Sellers -19 Respondents

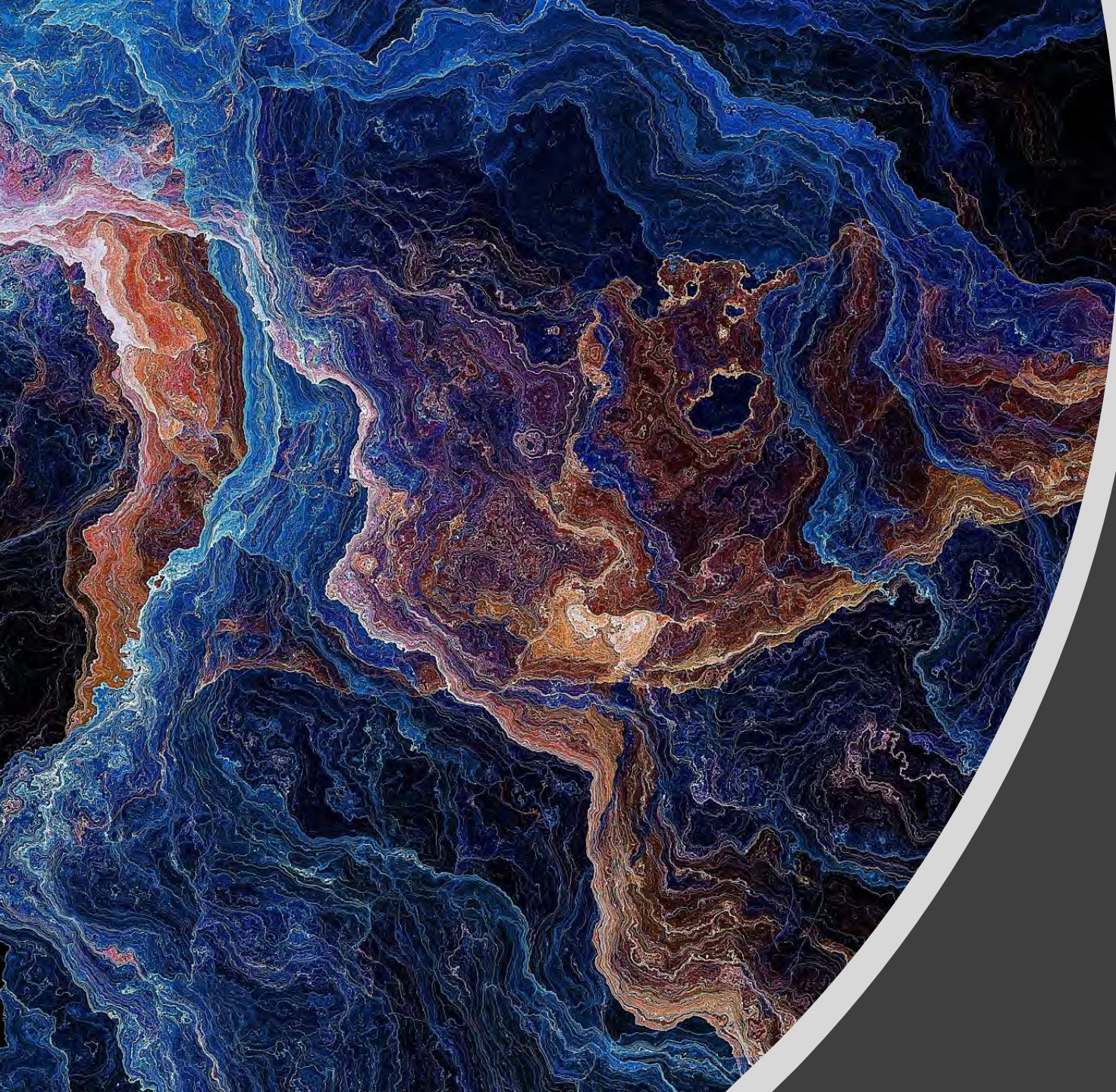


Agency - Contribution to spread of aquatic invasive species in commerce



Buyers and Sellers - Contribution to spread of aquatic invasive species in commerce





What
else contributes
to AIS
introduction and
spread?

What else contributes to AIS introduction and spread?

IMPROPER DISPOSAL OF UNWANTED PLANTS & ANIMALS



- Lack of knowledge
- Lack of options
- Lack of full-scale strategic outreach, communication, education, evaluation

What else contributes to AIS introduction and spread?

FISHING-RELATED ACTIVITIES



- Tackle bait shops
- Baitfish release
- Fish stocking without permit (bucket biology)
- Plants moved in bait trade



What else contributes to AIS introduction and spread?



ENFORCEMENT & REGULATIONS

- Enforcement of regulations - repeat offences, confiscation and warning
- Patchwork of regulations - inconsistent state AIS lists
- Inability to interpret regulations
- Lack of state statutes to address sale of prohibited animals once the species has been imported illegally
- Failure of online marketplaces to police illegal sales

What else contributes to AIS introduction and spread?



INSPECTION

- Insufficient capacity for inspection of AIS bought and sold
- Lack of searchable, shareable, interoperable electronic dataset of wildlife and plant species in North America
- Lack of a coordinated approach to interstate import and export of aquatic plants and animals

What else contributes to AIS introduction and spread?



OUTREACH & EDUCATION

- Lack of understanding of consequences
- Lack of direct outreach to local pet stores, nurseries, garden centers, and home decor stores
- Lack of public and retailer education on AIS impacts
- Apathy of businesses and consumers re: AIS risks
- Inability to identify high-risk species
- Risks to local trade (friend passing along species to friend)
- Lack of a one-stop shop for public, sellers, and government agencies to access info on regulations, responsible pet ownership, pet disposal, and rehoming resources

What else contributes to AIS introduction and spread?

SUPPLY

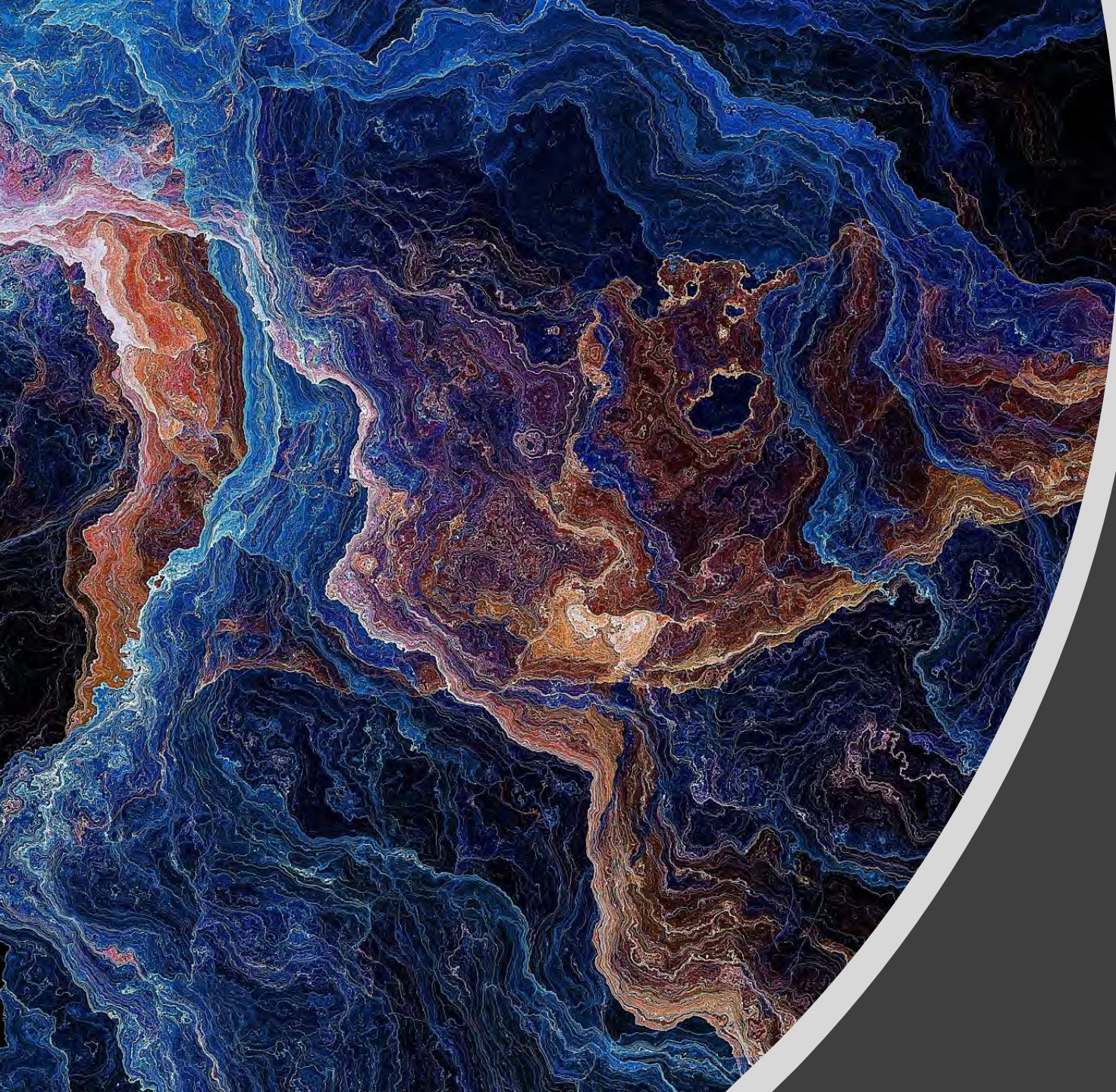
- Lack of supply of desirable (non-risky, low-risk, or native) species
- Difficulty in determining wholesalers of products
- Complex supply chains
- Availability and ease of buying online



What else contributes to AIS introduction and spread?

OTHER

- Lack of an automated risk assessment capability to assess every species in a shipment identified on commercial import documentation
- Training of CBP Agriculture Specialists
- Ballast water
- Lack of consistent federal and industry support
- Lack of small business membership in pet advocacy networks



Regulatory Actions

Regulatory actions to reduce AIS introduction and spread

INSPECTION

- Inspect small plant shipments to residences
- Pet store/garden compliance inspections
- More comprehensive screening of imported goods using eDNA technologies
- Conduct regular inspections of brick and mortar retail outlets
- Use molecular tools at Ports of Entry for plant and wildlife imports
- Review inspection authorities to ensure agencies have inspection authority
- Establish a consistent declaration and inspection process using software and AI



Regulatory actions to reduce AIS introduction and spread

CERTIFICATION

- System to ensure products are certified free of invasives
- Biosecurity requirements for culture systems
- License retailers
- Mandate sellers to undertake a certification program re: education on AIS in commerce and state regulations



Regulatory actions to reduce AIS introduction and spread

BUYING & SELLING

- Require vendors to:
 - Accept return of no longer wanted AIS
 - Source material responsibly
 - Include cautions with sales – have buyer sign to acknowledge receipt
 - Advise customers of state-specific restrictions/regulations
 - Prohibit sales to customers in states with prohibitions
 - Include information in packaging re: release of organisms
 - Register in a national database (if they sell aquatic plants and animals)
- Pre-screen prior to import
- Label AIS at all retail locations
- Sell only native species at bait shops
- Sell only when takeback location is identified
- Restrict online sales and/or cross-border trade entirely
- Prohibit sale of state and federally listed taxa
- Require copies of approved animal import documents from buyer's state before animals are bought and shipped
- Limit the number of individuals or plants that can be sold depending on the taxa of the organism



Regulatory actions to reduce AIS introduction and spread

E-COMMERCE SPECIFIC

- Create filters, screens, and oversight mechanisms for AIS in commerce regulated by state and federal agencies – build out AIS lists that commerce sites can integrate
- Prohibit online sales involving imports
- Prohibit online sales from social media pages, E-Bay, etc.
- Regulate high-risk AIS in e-Commerce
- Inspect sellers of online sales
- Require thorough record-keeping of organisms sold online, with reporting requirements to state agencies
- Require posting of prohibited species lists, by state, on website
- Require listing sites where they cannot ship



Regulatory actions to reduce AIS introduction and spread

SPECIFIC REGULATIONS

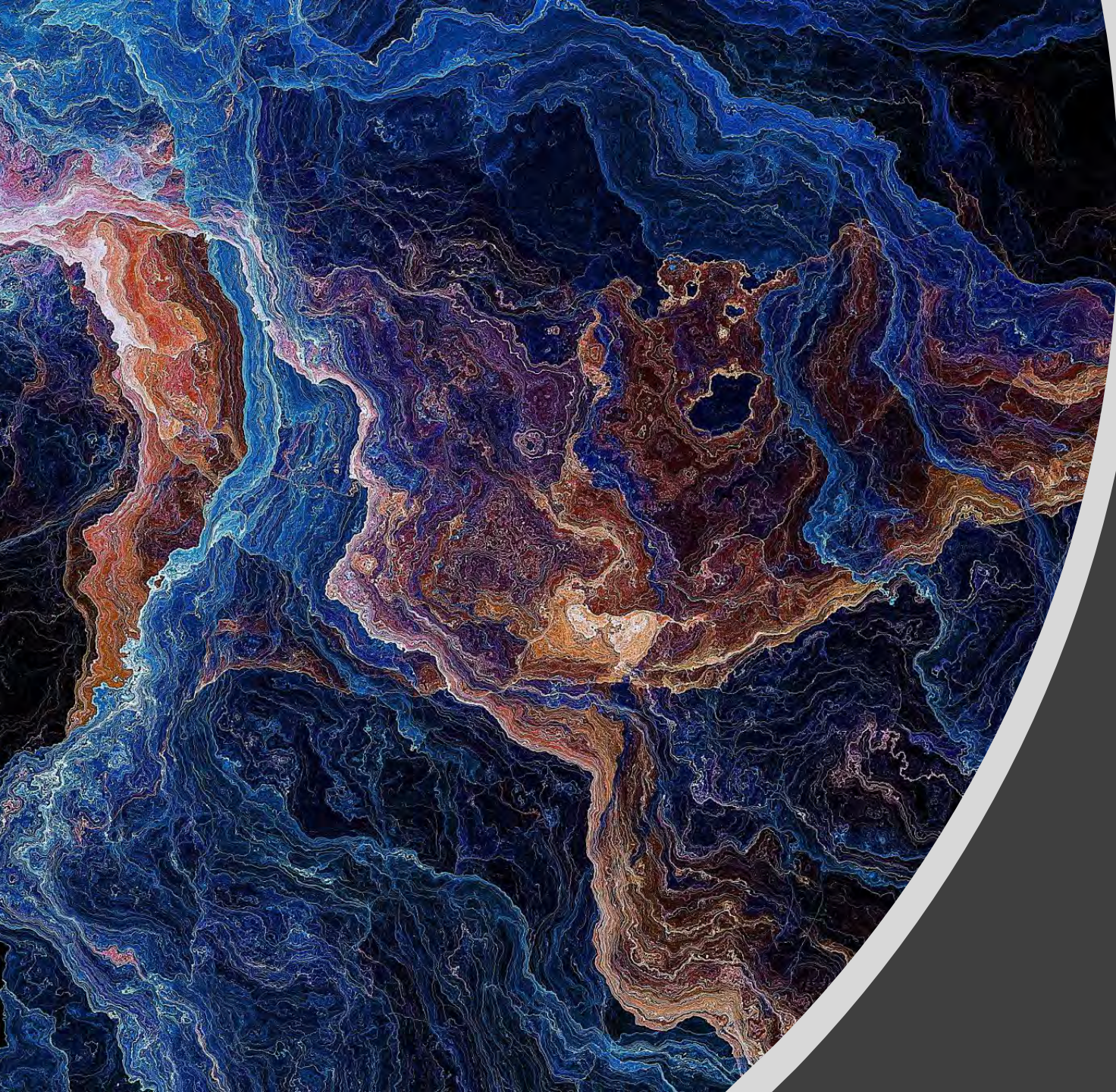
- Standardize regulations across jurisdictions
- Improved state statutes for enforcement
- Central location for regulations and enforcement
- Interjurisdictional consistency in species regulations and prohibited species lists
- Simplify regulations and work with other states to consolidate lists of AIS regulations
- Harmonize regulations within regions; coordinate enforcement actions w/in and across regions/establish communication network to understand regional issues



Regulatory actions to reduce AIS introduction and spread

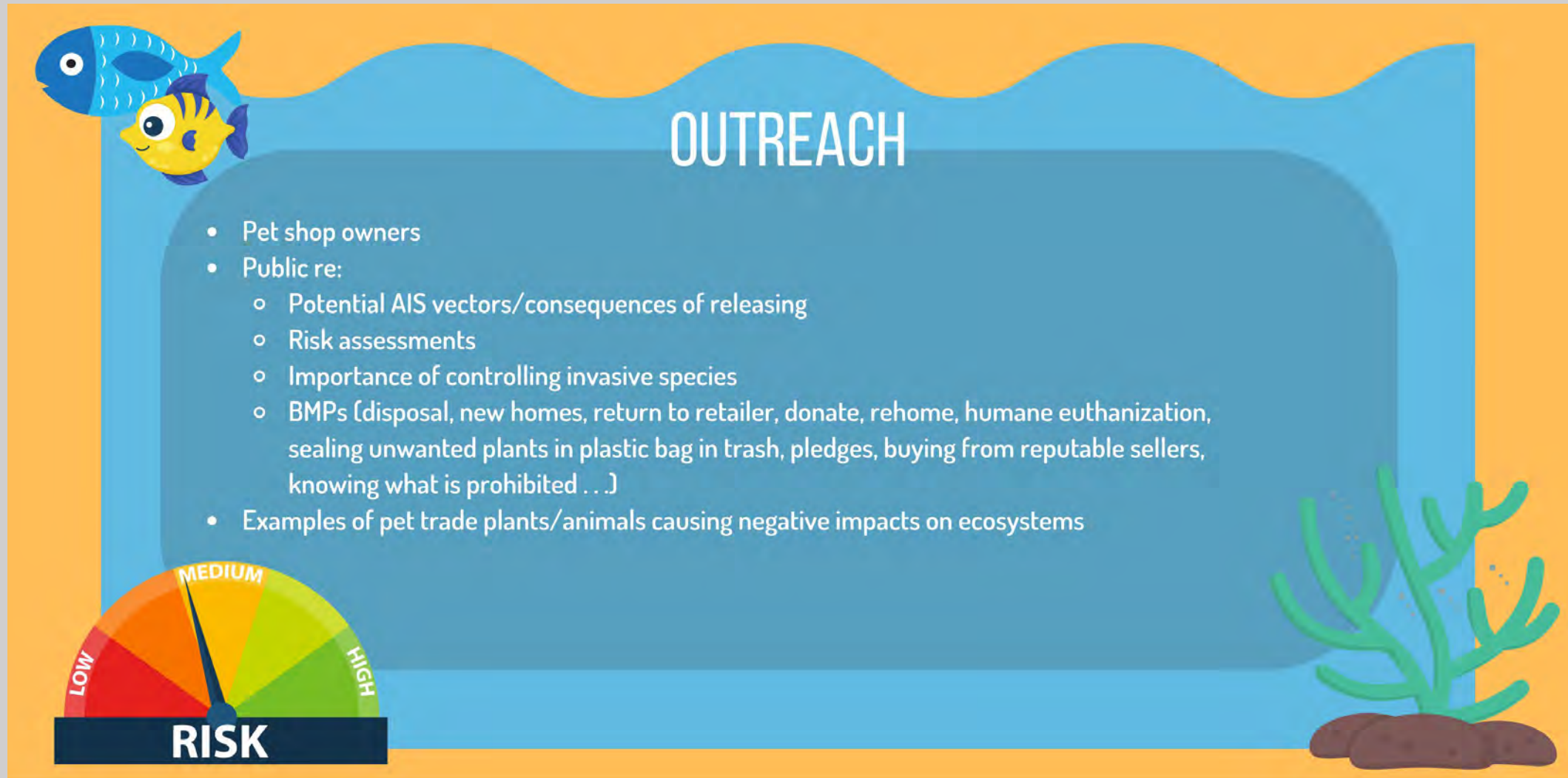
OTHER

- Increased fines for non-compliance - escalating penalties
- Warning letters, fine, leverage for repeat offenders or if failure to pay
- Resources/staffing
- Build capacity within enforcement personnel - create 1 dedicated law enforcement position in each state to oversee AIS in commerce
- Improved enforcement of regulations on shipping of living organisms
- Authorize federal funding to support state monitoring programs and enforcement of state and federal laws
- Analysis of authorities to address AIS in commerce pathways, especially e-Commerce
- Provide businesses with licenses that can be withheld for repeat offenses
- Mandate more accurate documentation of imported organisms
- Require documentation to show compliance with invasive species regulations
- More robust lists of banned and allowed species
- Adopt white lists instead of black lists
- Risk
- Increase horizon scanning and regulation at federal level



Voluntary Actions

Voluntary actions to reduce AIS introduction and spread



The infographic is set against a blue background with a wavy top edge, resembling water. In the top left corner, there are two cartoon fish: a blue one and a yellow one. In the bottom right corner, there is a green coral-like plant on a brown rock. The word 'OUTREACH' is written in large white letters in the upper center. Below it is a list of bullet points. In the bottom left corner, there is a semi-circular risk scale with three segments: red for 'LOW', orange for 'MEDIUM', and green for 'HIGH'. The word 'RISK' is written in white on a dark blue bar below the scale.

OUTREACH

- Pet shop owners
- Public re:
 - Potential AIS vectors/consequences of releasing
 - Risk assessments
 - Importance of controlling invasive species
 - BMPs (disposal, new homes, return to retailer, donate, rehome, humane euthanization, sealing unwanted plants in plastic bag in trash, pledges, buying from reputable sellers, knowing what is prohibited . . .)
- Examples of pet trade plants/animals causing negative impacts on ecosystems

RISK

LOW MEDIUM HIGH

Voluntary actions to reduce AIS introduction and spread

BUYER SELF-REGULATION

- Do research before purchasing
- Only purchase species that cannot survive in the wild
- Encourage friends/family members to buy low-risk species
- Never release organisms
- Voluntary pledge to buy aquatic plants and animals only from businesses that commit to screening
- Other BMPs (previous slide)



Voluntary actions to reduce AIS introduction and spread

INDUSTRY SELF-REGULATION

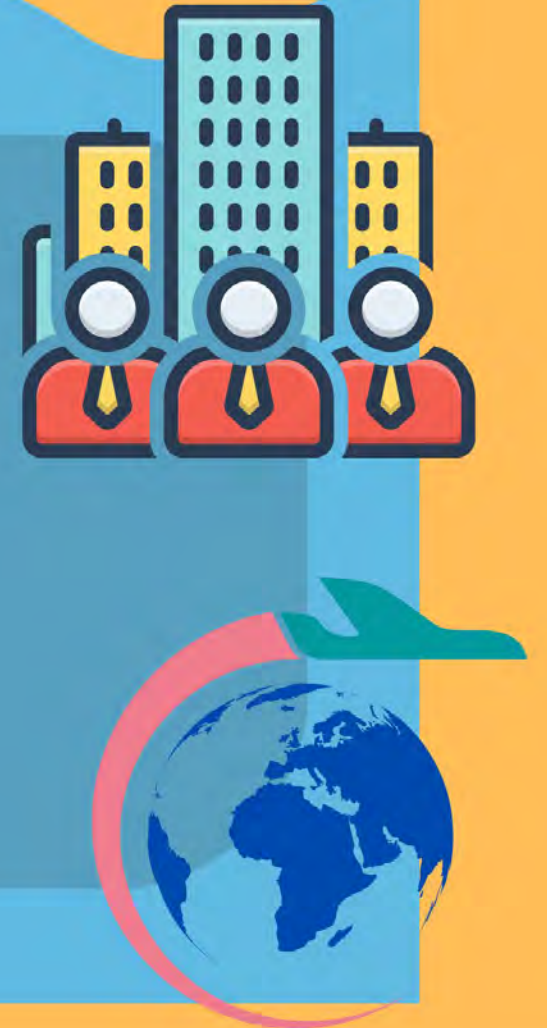
- Don't sell regulated species - don't ship exotics
- Deal in only non-risky, low-risk species
- Sign a declaration you are not selling illegal, or high-risk species
- Properly label species
- Offer native, or less-risky species as alternatives
- Communicate risks of releasing plants and animals to environment
- Train staff to screen for AIS in stock tanks and during sales transactions
- Identify and dispose of high-risk species properly
- Obtain species only from producers that commit to screening
- Provide customers with risk of establishment, impacts, and management actions
- Contract trace
- Make it easy to return to dispose of unwanted pets or plants
- Report bycatch (unwanted species) in shipments
- Register species during sales/imports
- Develop and operate a traceable purchasing and selling chain for agency oversight
- Report suspect species to state wildlife agencies before selling
- Use blacklists of high-risk species identified through risk screenings
- Consult shipping destination state lists
- Inspect and destroy contaminant organisms or stocks of contaminated plants



Additional things agencies can do . . .

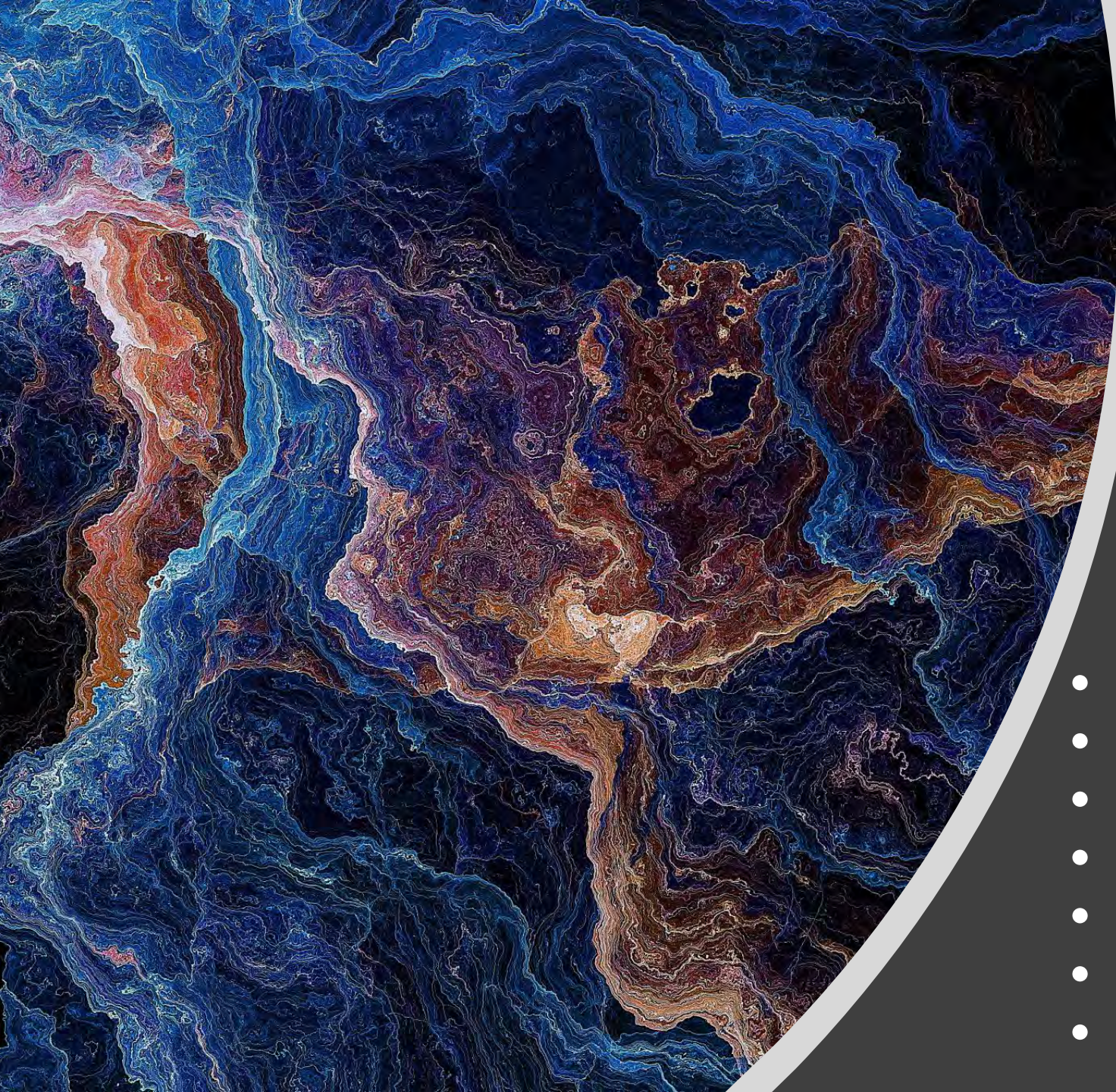
AGENCY ACTIONS

- Update easily accessible lists of allowed and regulated species
- Use education campaign materials
- Coordinate regionally with suppliers
- Leverage funding and partnerships to fund capacity at jurisdictional and regional scales
- Build partnerships and relationships with buyers/sellers
- Create and maintain a website where people can search common and scientific names of organisms and be provided with applicable rules
- Outreach and education to online sales platforms, monitoring of platforms
- Inspection of every aquatic plant and animal for sale
- One-stop shop for permits and permitting requirements, jurisdictions, and authorities
- Promote sourcing within North America versus importing
- Dedicate law enforcement staff to AIS inspection duties
- Adopt AI technology to detect AIS on commercial import documents
- Coordinate among states on prohibited species lists
- Develop a strategic plan with metrics and sustained investments



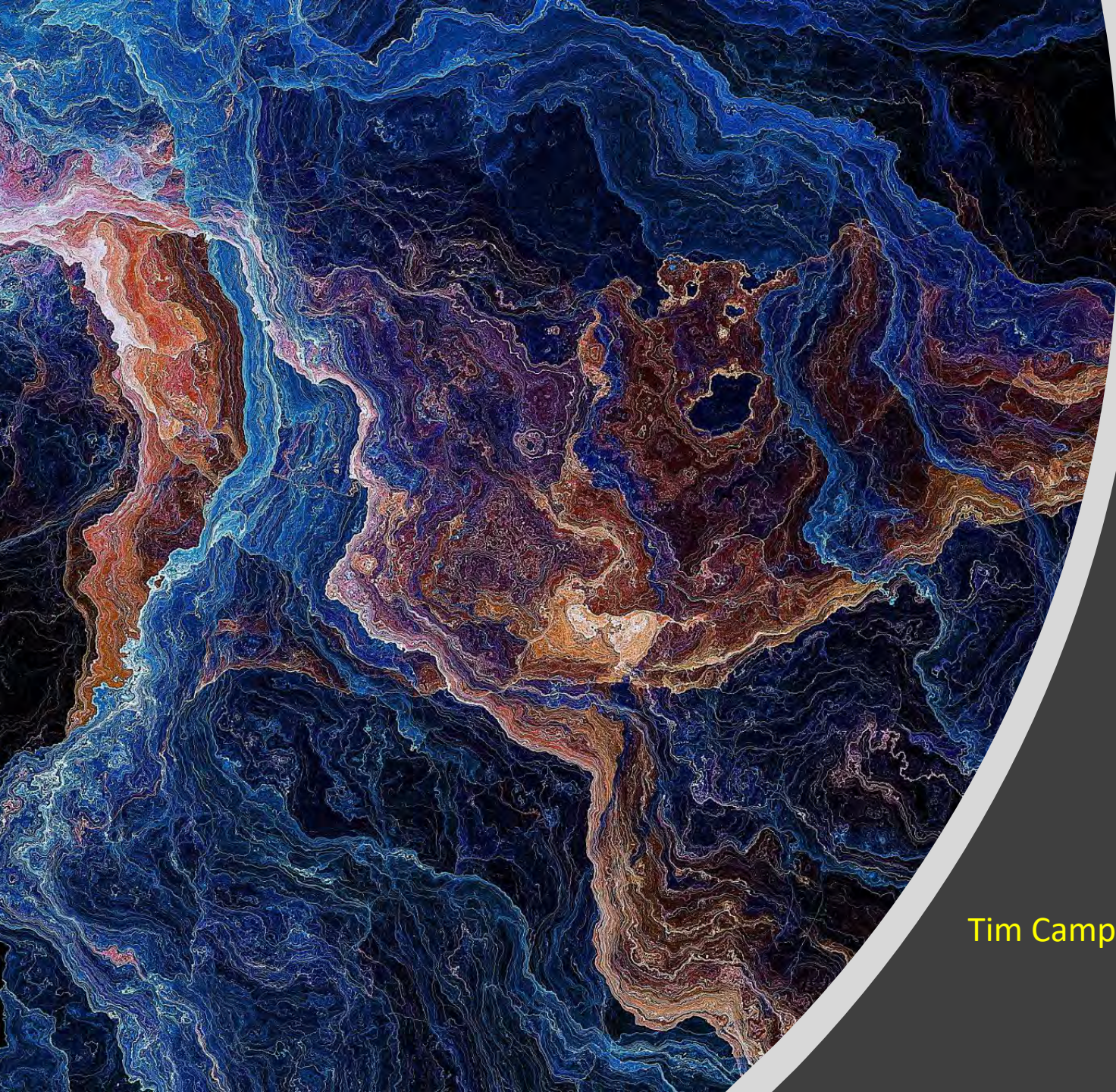


Additional comments and perspectives



Key Focal Areas

- Outreach and Education
- Voluntary Industry Standards
- AIS Information Infrastructure and Access
- Labeling and Recordkeeping
- E-Commerce
- Monitoring, Inspection and Enforcement
- Regulatory Approaches



Outreach and Education

Tim Campbell, Wisconsin Sea Grant AIS Program Manager

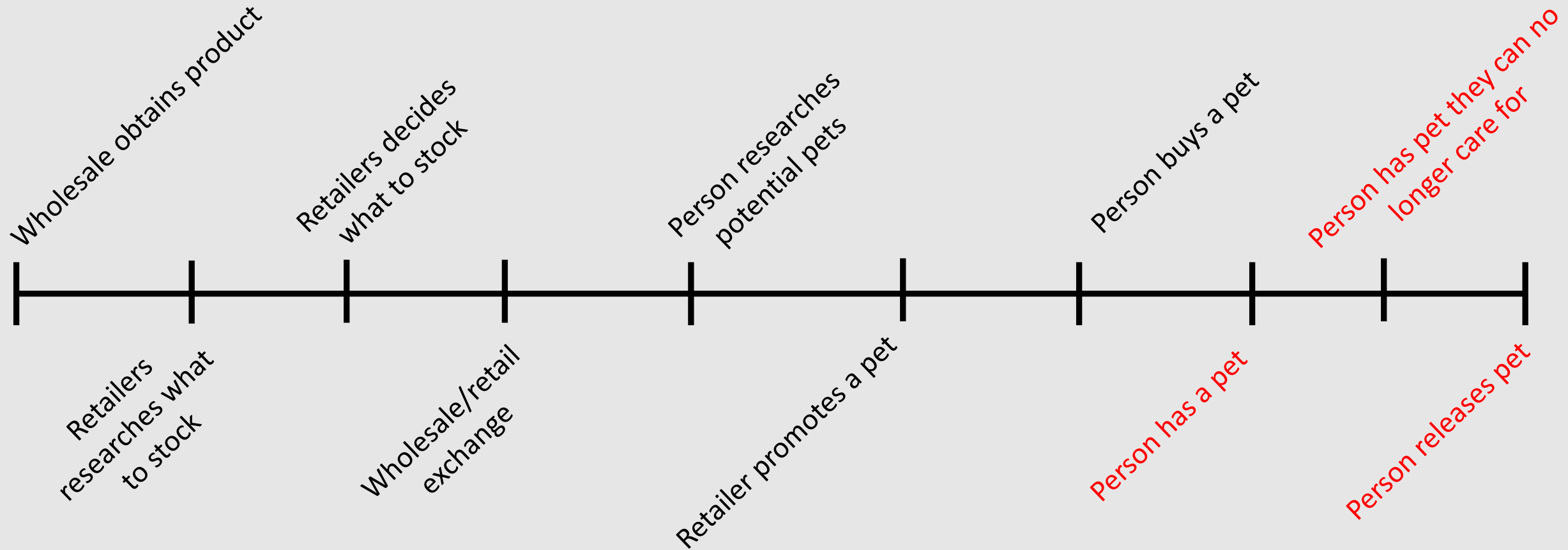


AIS in Commerce:

Outreach gaps, needs, and solutions

Tim Campbell
Paige Filice
Matt Smith
Greg Hitzroth

A reminder of what our system is



These are important, but outside of this project

- Outreach campaign coordination and optimization
- Pet surrender networks
- Resources for pet owners after they have a pet



Key factors contributing to gaps & challenges

- System complexity
 - Diversity of knowledge and actions we're trying to promote
 - Federal and state regulations
 - Different motivations for action
- AIS Outreach is often lumped together, but working with OIT can be substantially different than recreational water users
 - Boats and pets aren't the same
- Intersection of LE and Outreach
 - Consistent regulatory enforcement – everyone on a level playing field
 - Difference between outreach staff and LE
- Working with big, national brands
 - Staff turnover and chain of command
 - Federal vs state messaging
- Regional, national, international coordination
 - what formal networks are there?
 - Need time and effort to talk about these things



Criteria that should be considered for solutions

- Is an OIT specialist needed? Or could someone else more general implement?
 - People that know OIT or people that are good at a skill?
 - Natural resources background vs pet/animal/plant background?
- Ability for industry to integrate materials and programming
- How much continuous effort is needed?
- How can we track our effort? How can we evaluate it? Tracking progress.
- Consistent, dependable funding for it?
 - Not to just develop new things, but deliver things consistently
- Clear roles and responsibilities, clear metrics & objectives for people to meet.

Possible solutions

- Supply chain analysis to understand what is happening and what messages are needed
 - A system diagram with outreach goals/messages/metrics for each step
- Social science to understand attitudes, motivations, behaviors
 - Both of hobbyists and businesses
- Other possible solutions
 - OIT specialists for outreach or dedicated effort for staff with specific expertise
 - Make it easier for people to get answers to questions
 - HACCP approaches for retail stores
 - Better use of digital advertising and outreach
 - Consistent labeling of species for improved communication
 - Consistent to keep outreach going
 - Improve industry/outreach relationship

Project Report:

Addressing Aquatic Invasive Species in Illinois through Outreach and Planning:

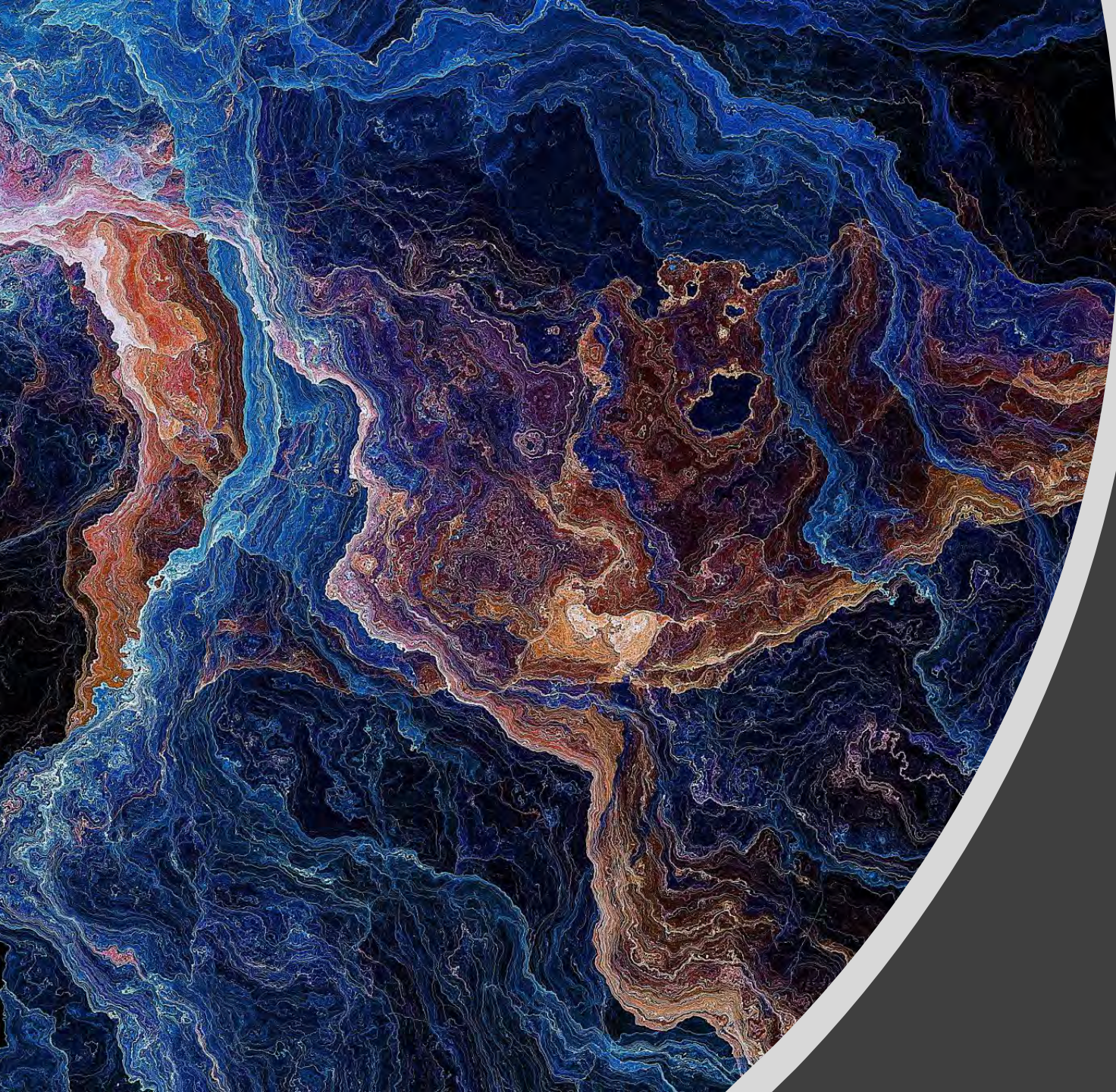
Enhancing Effectiveness of Organisms-in-Trade through Survey Research

Case studies highlighting outreach gaps

- Invasive Crayfish Collaborative (OIT is big!)
 - Big lesson: initial scope was large
 - Being species specific left the entire supply chain and different aspects open
- Targeted ads on peer-to-peer sites (online outreach)
 - Kijiji Giving ad space for free
 - Marbled crayfish - synonyms important (self-cloning crayfish)

Looking forward to the discussion!

Tim.Campbell@wisc.edu



Voluntary Industry Standards

Christine Carrière, CEO - PIJAC Canada



Voluntary Industry Standards

AIS in Commerce Virtual Summit

Animal welfare is everyone's business!™



www.pijaccanada.com

March 8th 2023



Regulations & Collaboration

Getting to Vs 2.0

**INVASIVE
MESSAGING**

=





STOP the STOPS!



The escape and release of animals and plants from aquariums, terrariums and water gardens can harm the environment. If these aquarium species survive in the wild, they can cause the loss or decline of native plants and animals.

Never release aquarium pets and plants into our lakes, rivers and wetlands. It isn't good for your pet, and it can harm our native fishes and their environment.



Fisheries and Oceans Canada



DON'T LET IT LOOSE



FISH RESCUE

You have options!

This special program was created to eliminate the illegal dumping of tropical fish, and amphibians into our Canadian Waterways and watersheds. The information below has been copied from a brochure that was published to explain this serious problem to concerned hobbyists. Partners in this program are The Toronto Zoo, Royal Ontario Museum, Ontario Federation of Anglers and Hunters, Canadian Fisheries and Oceans, Ontario Ministry of Natural Resources, PIJAC (Pet Industry Joint Advisory Council, CAOAC (Canadian Association of Aquarium Clubs) and all affiliated local Aquarium Clubs which belong to CAOAC.

STOP AQUATIC INVASIVE SPECIES DON'T LET IT LOOSE



Canada

HAVE UNWANTED FISH? WHAT CAN YOU DO?



CONTACT CAOAC

Contact our fish rescue team leader: Ann Marie Towellamtowell@shaw.ca

Email

CONTACT YOUR LOCAL CLUB

Find your closest club here:

Fish Club

CONTACT YOUR LOCAL FISH STORES

Some local stores will accept unwanted fish.

ADVERTISE ON KIJJI

kijji allows ads for animals looking to be rehomed.



Proactive Industry



Habits + Habitats + Attitudes = Habitattitude™



Making Wise Choices to Protect the Environment from Invasive Species

Goldfish (*Carassius auratus*)
NYS Invasive Species-
harmful to the environment
do not release live fish into ponds, streams,
lakes, or sewers. Consult your store for
alternatives or rehoming unwanted specimens.



Opportunities

Cultures have long celebrated the arrival of spring by displaying live goldfish among the symbols of perpetual life on their holiday tables.





Moss Balls - Case Study

March 2021



Early March
Notification – Moss
Balls Contamination
Alert



Inspections ???


November

PIJAC Canada Issues
guidance to pet
businesses

Invasive Species Alert: Zebra Mussels in Aquarium Moss Balls


March 9, 2021 / in Advocacy, Alerts, Animal Welfare, Business, Education, Pet Owners / by Susan Dankert





Together for healthy nature

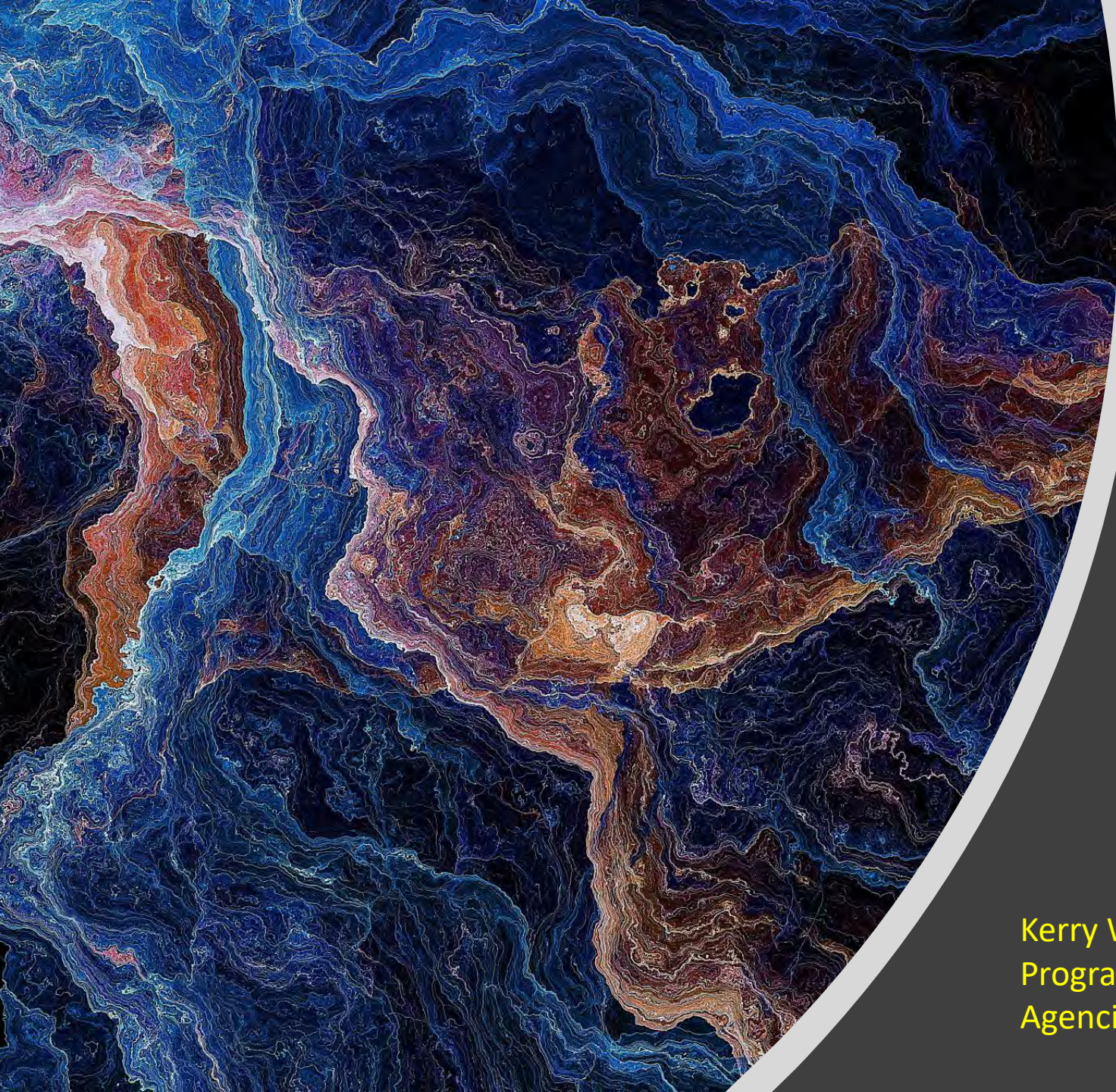
Material developed with European Commission funding for contract "Invasive alien species: improvement of understanding and communication"





information@pijaccanada.com





AIS Information Infrastructure and Access

Kerry Wixted, Amphibian, Reptile, and Invasive Species
Program Manager, Association of Fish and Wildlife
Agencies

Inaccessible & Inconsistent Information on Regulated Species



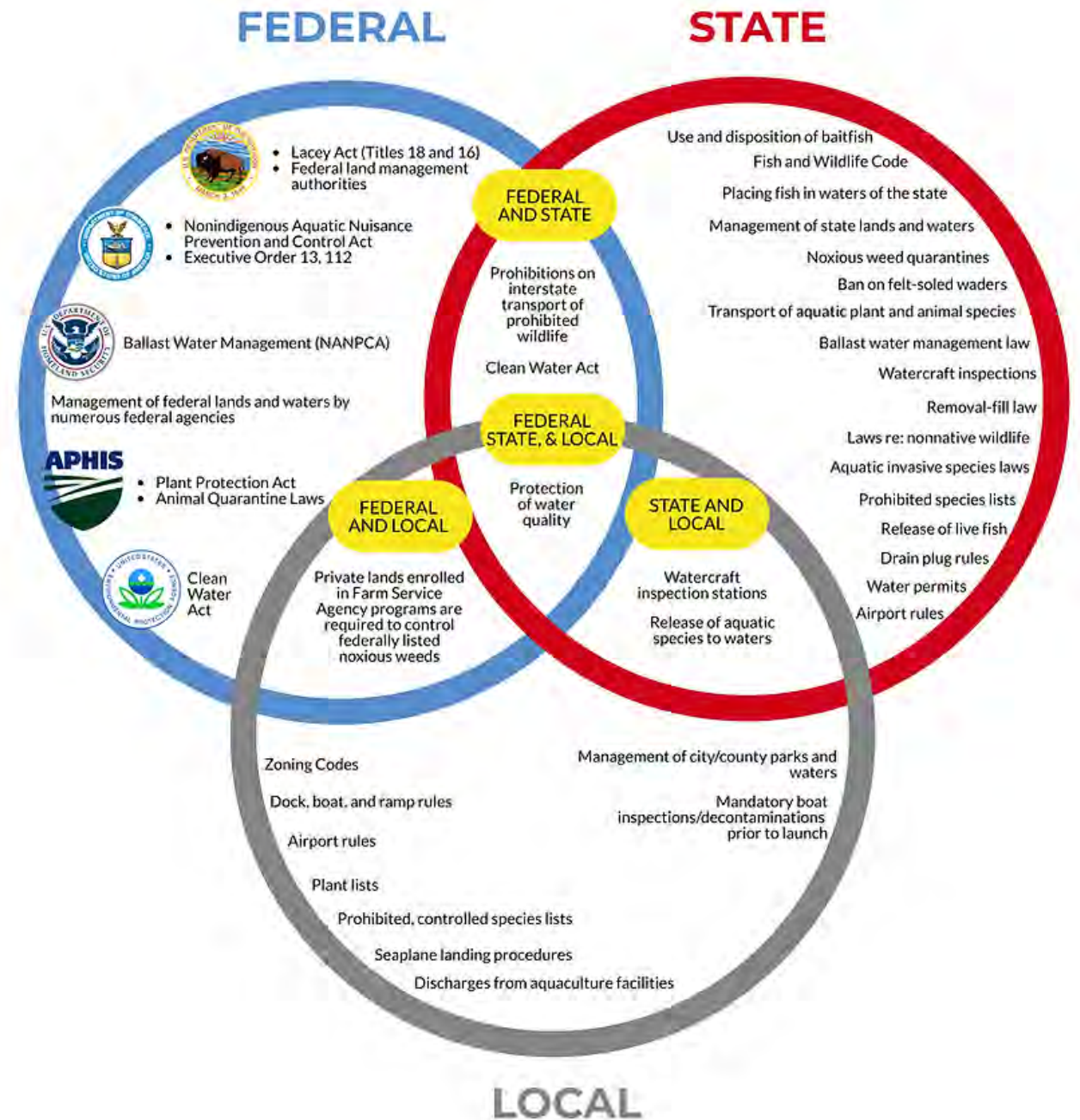
Kerry Wixted
AFWA Invasive Species
Committee



Invasive species are regulated at multiple levels



Photo Credit: Mark Yokoyama CC by NC ND 2.0





Key Gaps & Deficiencies

Patchwork regulations & statutes

Species often regulated by different agencies

No centralized database

Lack of communication

Key Gaps & Deficiencies: The Name Game

- Varying legal definitions
 - *Invasive, restricted, prohibited*
- Name standardization
 - Common name?
 - Scientific name?
 - Taxonomy changes
- Cultivars/subspecies

New York State Prohibited and Regulated Invasive Plants

September 10, 2014



NYSD DEPARTMENT OF
ENVIRONMENTAL CONSERVATION



NYSD DEPARTMENT OF
AGRICULTURE AND MARKETS



Key Gaps & Deficiencies: The Name Game

Parrot feather

Brazilian watermilfoil

Parrot's feather

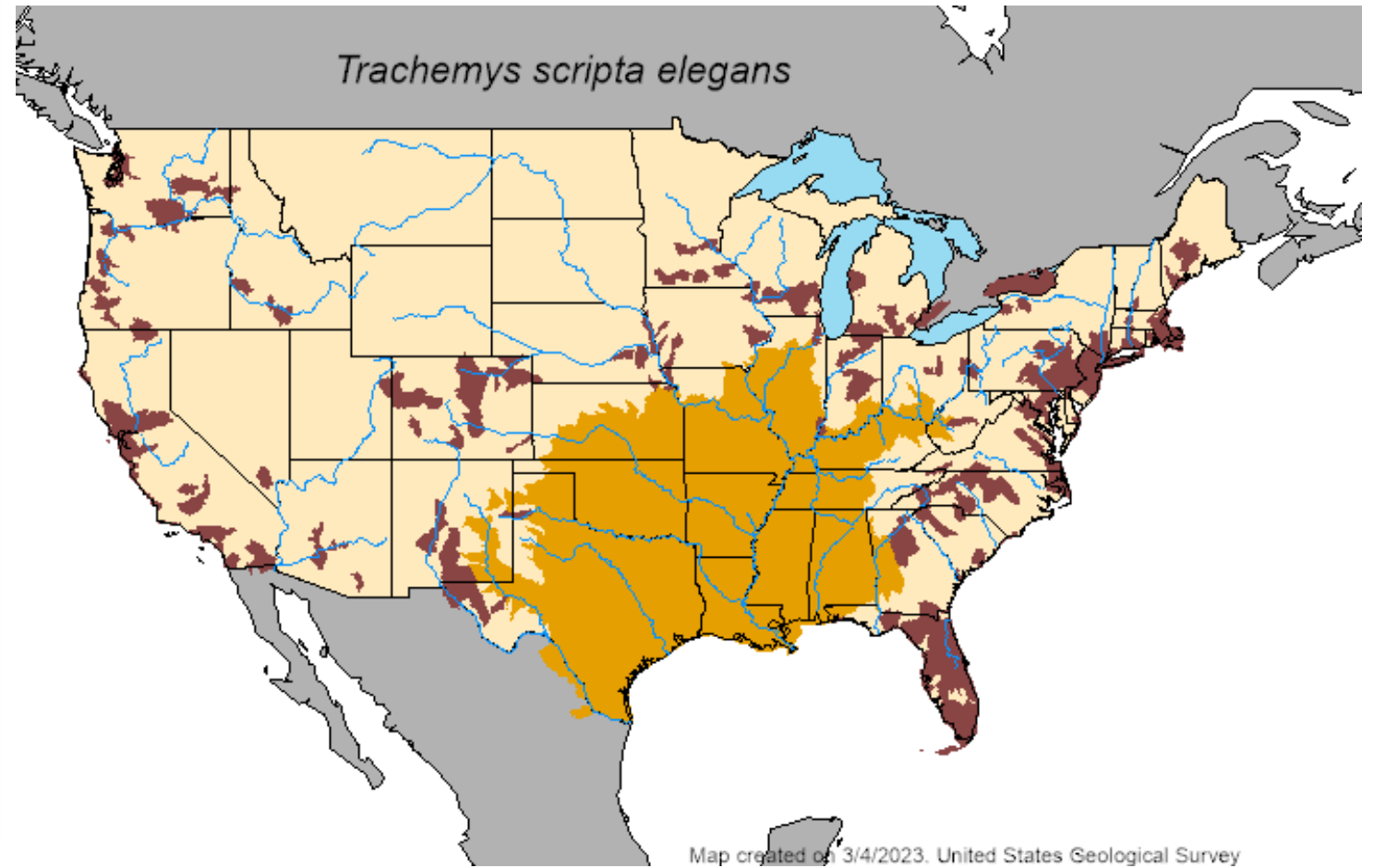
Parrot feather watermilfoil

Enydria aquatica

Myriophyllum brasiliense

Myriophyllum proserpinacoides

Case Study: Red-eared Slider



Criteria to Consider

Consistent Language

Accessibility/ Readability/ Adoptability

Outreach & Communication



Possible Solutions



Aquatic
Invaders in the
Marketplace

- Centralized regulation database
- Model language
- Needs:
 - Regulatory contacts
 - Marketing & outreach
 - Stakeholder input
 - Regular updates (AI?)
 - Taxonomic resources
 - Funding
- Screening online sales



Photo Credit: Chris Taylor, Illinois History Survey, Bugwood.org

Thank You!



Dr. Nicole Angeli, PhD

Director; U.S. Virgin Islands Division of Fish and Wildlife

Kim Bogenschutz

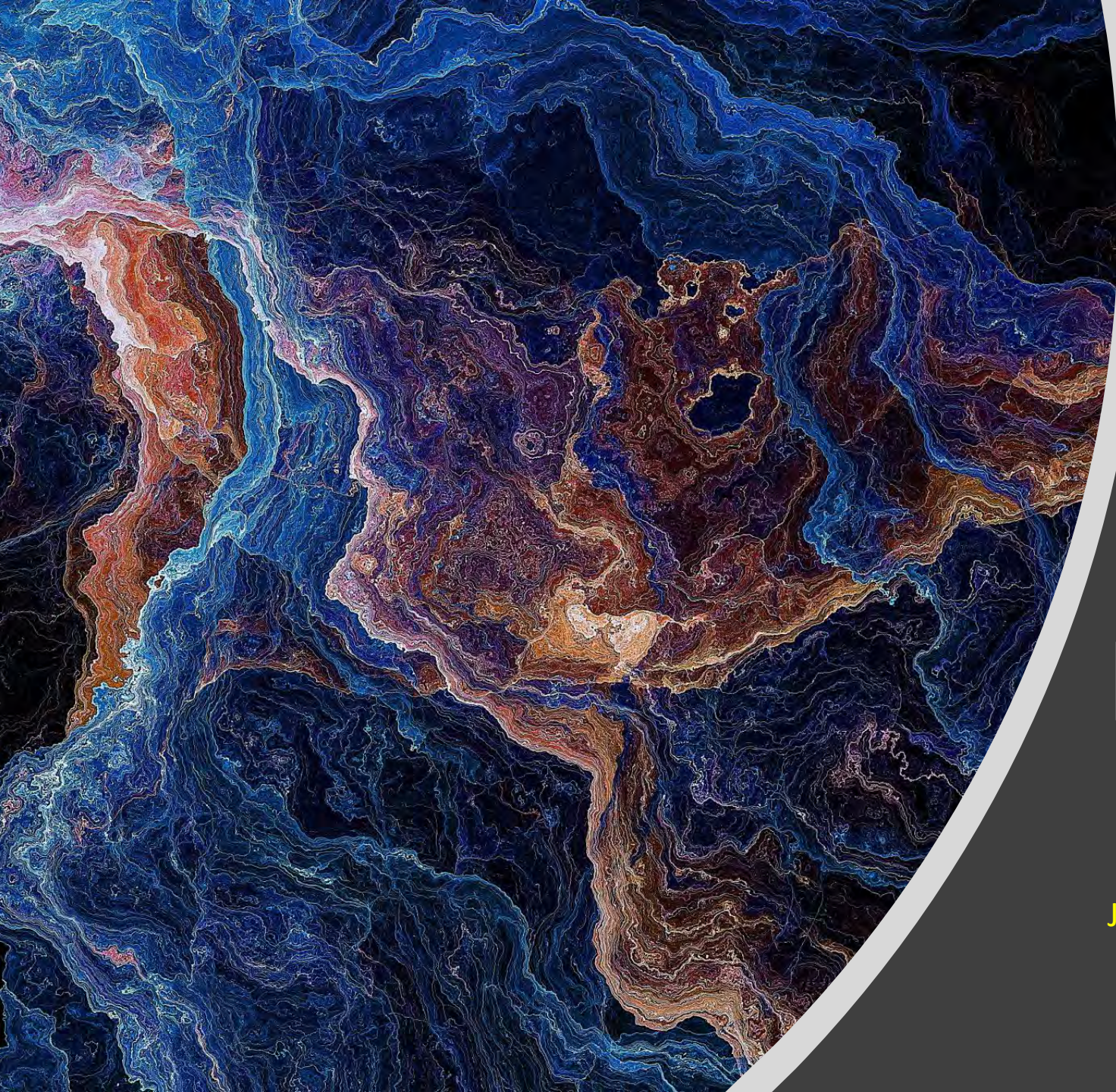
ALS Program Coordinator; Iowa Depart. of Natural Resources (IDNR)

Lane Kisonak

Chief Legal Officer; Association of Fish and Wildlife Agencies (AFWA)


Kerry Wixted

Program Manager; Association of Fish and Wildlife Agencies (AFWA)



Labeling and Recordkeeping

Joe Hiduke, 5D Tropical Inc. Sales Manager



Records & Labeling and their roles in controlling aquatic introductions

Joe Hiduke

5D Tropical, Inc

Records & Labels

- ▶ In general, accurate labeling and record keeping are neither contributing to or preventing new AIS
- ▶ Educational labels geared toward the end consumer may have value in reducing introductions
- ▶ They are important tools in containing spread of accidentally distributed species



Current Industry Standards

- ▶ In general, most orders will go out with a packing slip indicating what species are in the shipment. At least common name, may include scientific name depending on shipper and/or origin.
- ▶ All bags in a shipment will typically have a label affixed with the species name and consignee.
- ▶ Tracking number on the label also identifies the shipper and consignee.

INVOICE/ 5D See History		DATE			
PAST DUE		02/20/2023			
		INVOICE #			
		516654			
TRACKING NUMBER	TERMS	SALES REP	SHIP DATE	SHIP VIA	CUSTOMER CODE
1Z9369X86641...	30-DAYS	BG1	02/20/2023	UPS AIR	IRGYUL
ITEM CODE	ITEM DESCRIPTION	SCIENTIFIC NAME	ORIGIN	QTY	
	BOX#				
10005-F	GLOFISH(R) BARB-GALACTIC PURPLE(R) (NO PR)	PUNTIUS TETRAZONA	US	100	
	BOX#				
12012-F	GLOFISH(R) TETRA-STARFIRE RED(R)	GYMNOCORYMBUS TERNETZI	USA	120	
	BOX#				
1268-F	GLOFISH(R) TETRA-ELECTRIC GREEN(R)	GYMNOCORYMBUS TERNETZI	USA	240	
	BOX#				
12013-F	GLOFISH(R) TETRA-COSMIC BLUE(R)	GYMNOCORYMBUS TERNETZI	USA	120	
	BOX#				
1288-F	GLOFISH(R) TETRA-SUNBURST ORANGE(R)	GYMNOCORYMBUS TERNETZI	USA	120	
	BOX#				
SUB	SUBTOTAL				

Records & Labels

- ▶ Accuracy of labels and invoices is irrelevant if inspectors are unable to identify the species
 - ▶ Limitation of a white list regulatory system
 - ▶ Easier to train inspectors to identify a small number of prohibited or restricted species versus identifying 40,000 legal species
- ▶ Any introductions are most likely to come from end consumer
 - ▶ Responsible entities in the pet trade are not intentionally introducing anything
 - ▶ Continue to push for consumer education. Habitatitude.

	Amphibians & Invertebrates (Snails, Shrimp, Crabs, and Crayfish)	
22251403	African Clawed Frog (NO AZ, CA, HI, KY, MT, NV, NJ, NC, OR, VW, WA)	6
22251404	Albino African Clawed Frog (NO AZ, CA, HI, KY, MT, NV, NJ, NC, OR, VW, WA)	6
22251334	Black Mystery Snail (NO GA)	12
3034256	Magenta Mystery Snail (NO GA)	12
22251339	Assassin Snail (NO GA)	12
22251728	Black Racer Nerite Snail	6
3011983	Orange Rabbit Snail (NO GA)	3
22251762	Assorted Fancy Shrimp	12
22251408	Red Cherry Shrimp	6
22251731	Red Rili Shrimp	6

Resource Gaps Contributing to AIS

- ▶ A comprehensive prohibited species lists by state than would be incorporated in labels and inventory systems by distributors
- ▶ No responsible distributor intentionally ships prohibited species to states where they are illegal
- ▶ Tremendous difficulty in knowing laws from 50 states plus US territories, as well as county & city regulations
- ▶ Each state may have multiple agencies involved in regulating plants, invertebrates, fish, amphibians and reptiles (DEP/DNR/F&W/Ag/Etc)



Resource Gaps Contributing to AIS

- ▶ USFWS 3-177 Requirements for Tropical Fish
 - ▶ All fish are combined
 - ▶ Crustaceans, mollusks, amphibians broken out on separate lines



Solutions

- ▶ A comprehensive site for regulations
- ▶ Suppliers continuing to educate their customers
 - ▶ There are species in trade that are not appropriate for all keepers
 - ▶ Beginning hobbyists should be discouraged from keeping these species
- ▶ Alternatives for consumers when they are no longer able to care for a pet
 - ▶ Amnesty Days
 - ▶ Rescue Organizations
 - ▶ Humane Euthanasia
 - ▶ Aquarium Society Fish Fry Fundraiser



Solutions

- ▶ Bag labels and tank labels for retailers to educate customers about the risks of releasing pets
- ▶ Tank labels for in-store use designating 'monster fish'



HABITATTITUDE™
PROTECT OUR ENVIRONMENT
www.habitattitude.net

PARTNER WITH HABITATTITUDE™

Help spread the word about responsible pet ownership and choosing wisely to protect our environment from invasive species



www.Habitattitude.net/partner-with-habitattitude

Case study-Zebra Mussels

- ▶ Perfectly illustrates a coordinated and cooperative approach
- ▶ Zebra mussels were found in a retail store in Washington in 2021
- ▶ Found in moss balls that were shipped from a US distributor but originated in Ukraine
- ▶ It was determined that all the moss balls in trade at that time went back to the same source, and were potentially contaminated



Image Credit: Wyoming Game & Fish

Case Study-Zebra Mussels

- ▶ Proper sales records allowed our industry to quickly locate all the moss balls that had been sent out
- ▶ All distributors reached out to their customers that had purchased these moss balls with instructions to destroy them
- ▶ Every one of these moss balls was inspected and cleared by USDA
- ▶ New regulations require USFWS clearance for moss balls in addition to USDA

USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

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- ▶ Emergency & Regulatory Compliance
- ▶ Imports & Exports
- ▶ International Services
- ▶ Pests & Diseases
- ▶ Plant Health
- ▶ Wildlife Damage

News and Announcements

APHIS Extends Public Comment Period for Plan to Strengthen Regulations for Handling Wild and Exotic Animals for Exhibition, Environmental Enrichment Requirements
Mar 6, 2023, 6:26:02 PM GMT

Join a Free Webinar on February 28 "Navigating Avian Influenza: Your Questions Answered"

USDA FAQ's and resources about coronavirus (COVID-19). [LEARN MORE](#)

**Plant Protection Act 7721
2023 Spending Plans**
The Plant Pest and Disease Management and Disaster Prevention Program & The National Clean Plant Network
[Click for details](#)

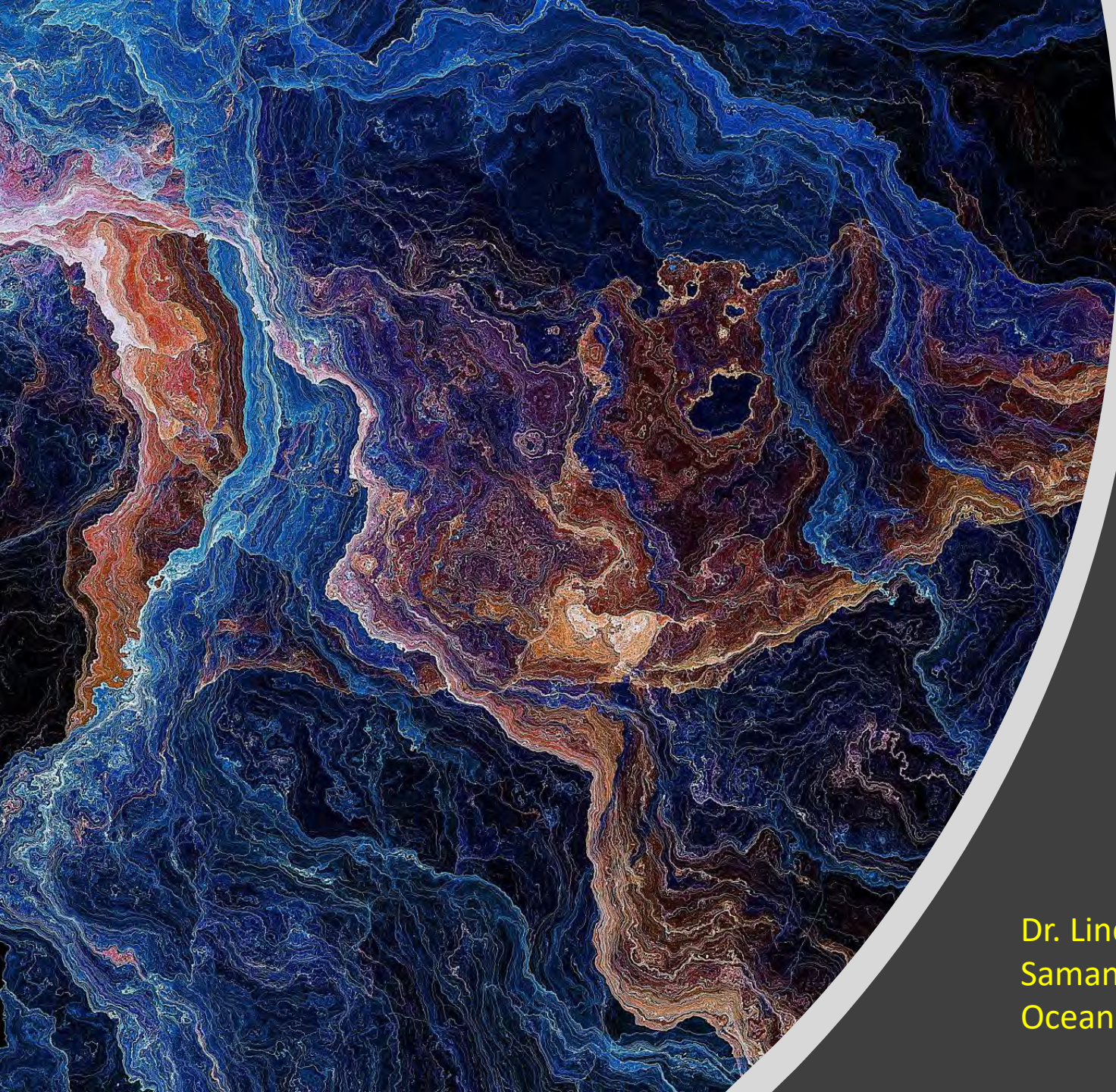
Spotlights

[Find Your Future With Us](#)

[African Swine Fever](#)



Thanks for your attention



E-Commerce

Dr. Linda Walters, University of Central Florida Professor
Samantha Hamilton, National Sea Grant Law Center Esq.
Ocean and Coastal Law Fellow



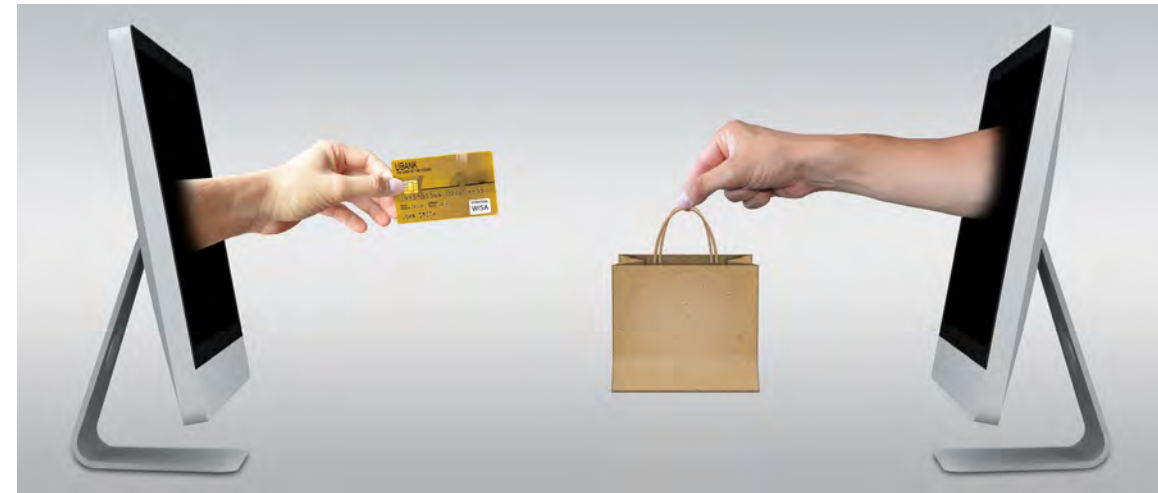
E-COMMERCE

Samantha Hamilton, National Sea Grant Law Center

Linda Walters, Pegasus Professor, University of Central Florida

OVERVIEW

- E-commerce is “a term that covers everything a business does online to sell to consumers, both domestically and overseas. It includes: the sale through a website, the online advertising that leads to a sale, and the brand building that helps tie it all together as a narrative for consumers.”



CHALLENGES

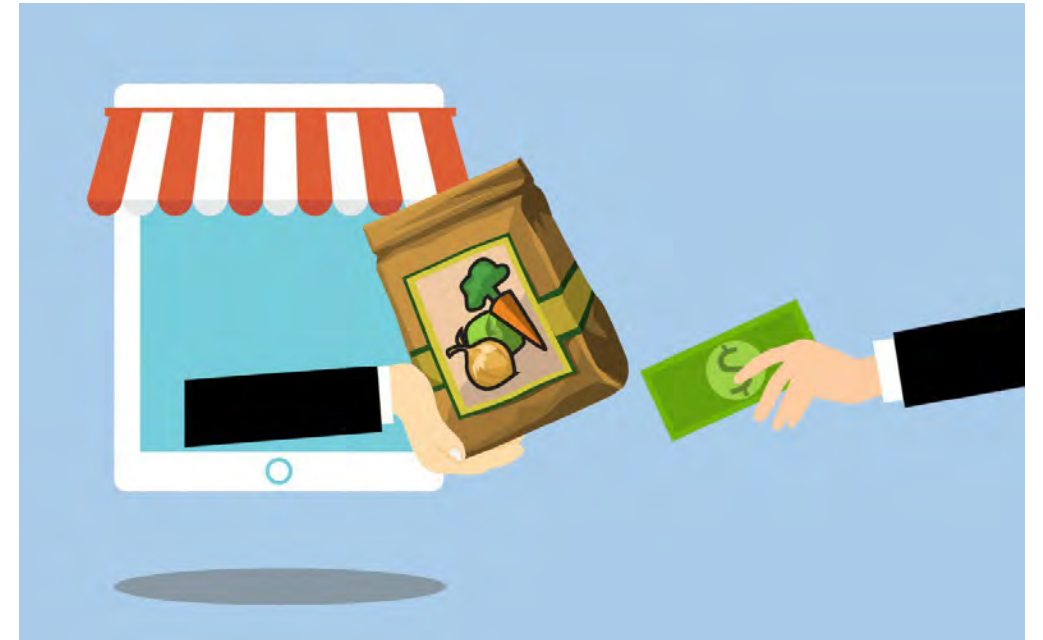
- E-Commerce is:
 - Global and ubiquitous;
 - Fast-paced and ever-changing;
 - Hard to regulate and monitor
- Laws cannot keep up;
 - Inconsistency
 - Anonymity of buyers/sellers
 - Monitoring & Enforcement
- Lack of liability
- Availability of information



This Photo by Unknown Author is licensed under CC BY-SA-NC

SOLUTIONS/VOLUNTARY MEASURES

- Regulation – **channels** of e-commerce
- Voluntary monitoring by third-party platforms
- Seller education
 - Labeling, acknowledgements, invasive species lists
 - Increase buyer education/awareness





DR. LINDA WALTERS,
PEGASUS PROFESSOR,
UNIVERSITY OF
CENTRAL FLORIDA

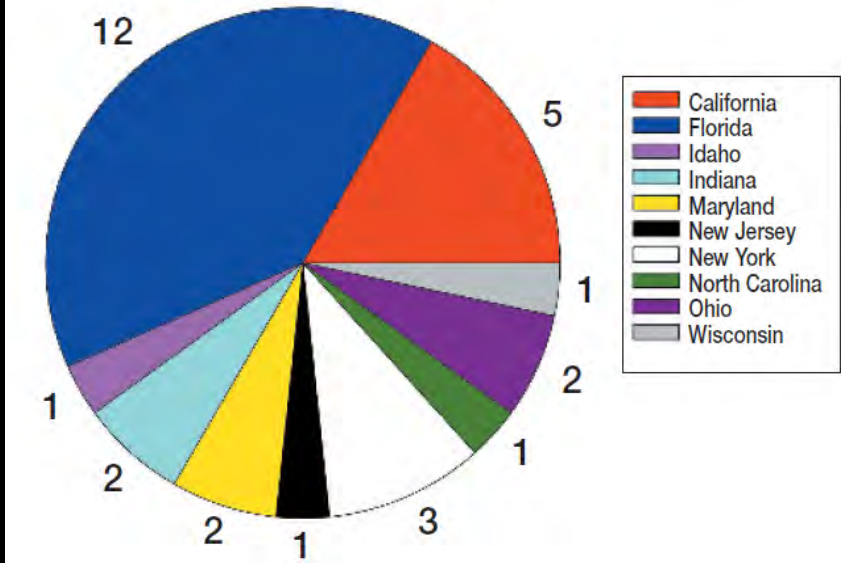
E-COMMERCE AND
HUMAN-MEDIATED
DISPERSAL OF
AQUARIUM SPECIES

- *What we did:*
 - *Purchased the popular green macroalga *Caulerpa* from 30 internet retailers and 60 internet auction sites*
 - *Purchased “live rock” from 30 sites: 10 internet retailers, 10 internet auction sites, 10 local retailers – all kept in separate aquaria for 1 month*
 - *Involved 22 volunteers and 200+ search hours online*

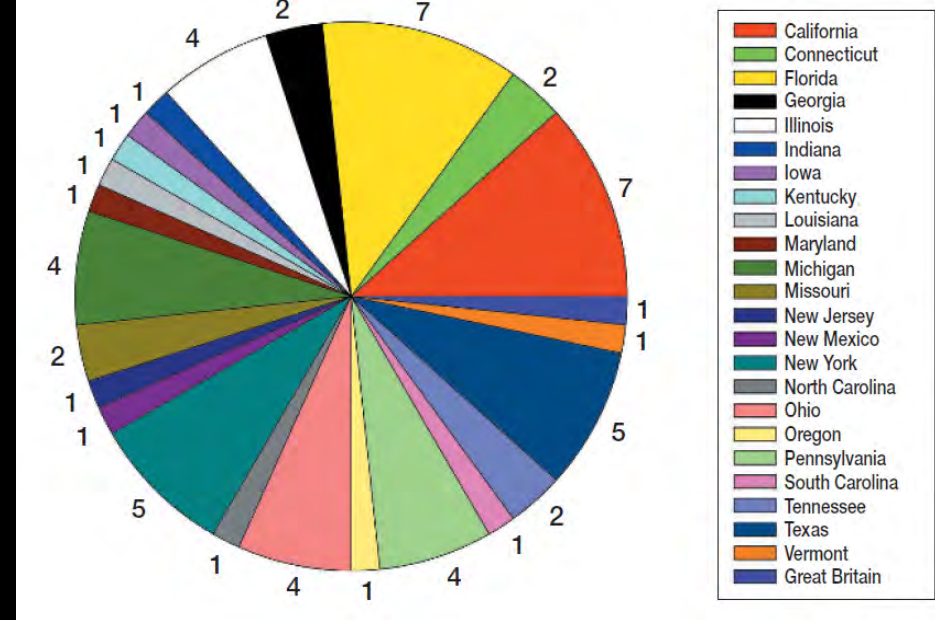
WHAT DID WE FIND FOR CAULERPA?

- 12 species of *Caulerpa* transported to Orlando via e-commerce
- Purchased from Great Britain + 25 states (52% landlocked)
- Florida was origin of 40% internet retailers, 12% internet auctions
- 2 suppliers for education contracted with south Florida harvesters
- Only 10.6% of sellers provided correct genus and species names

Internet retail sites selling *Caulerpa*



Internet auction sites selling *Caulerpa*

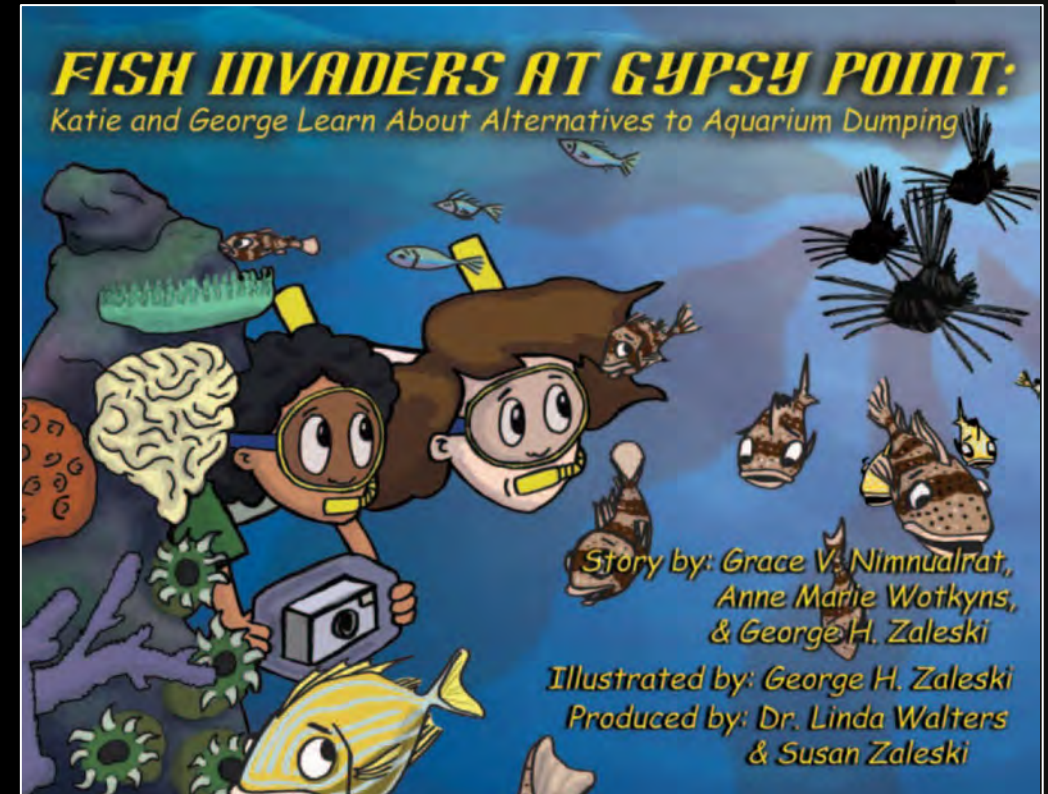




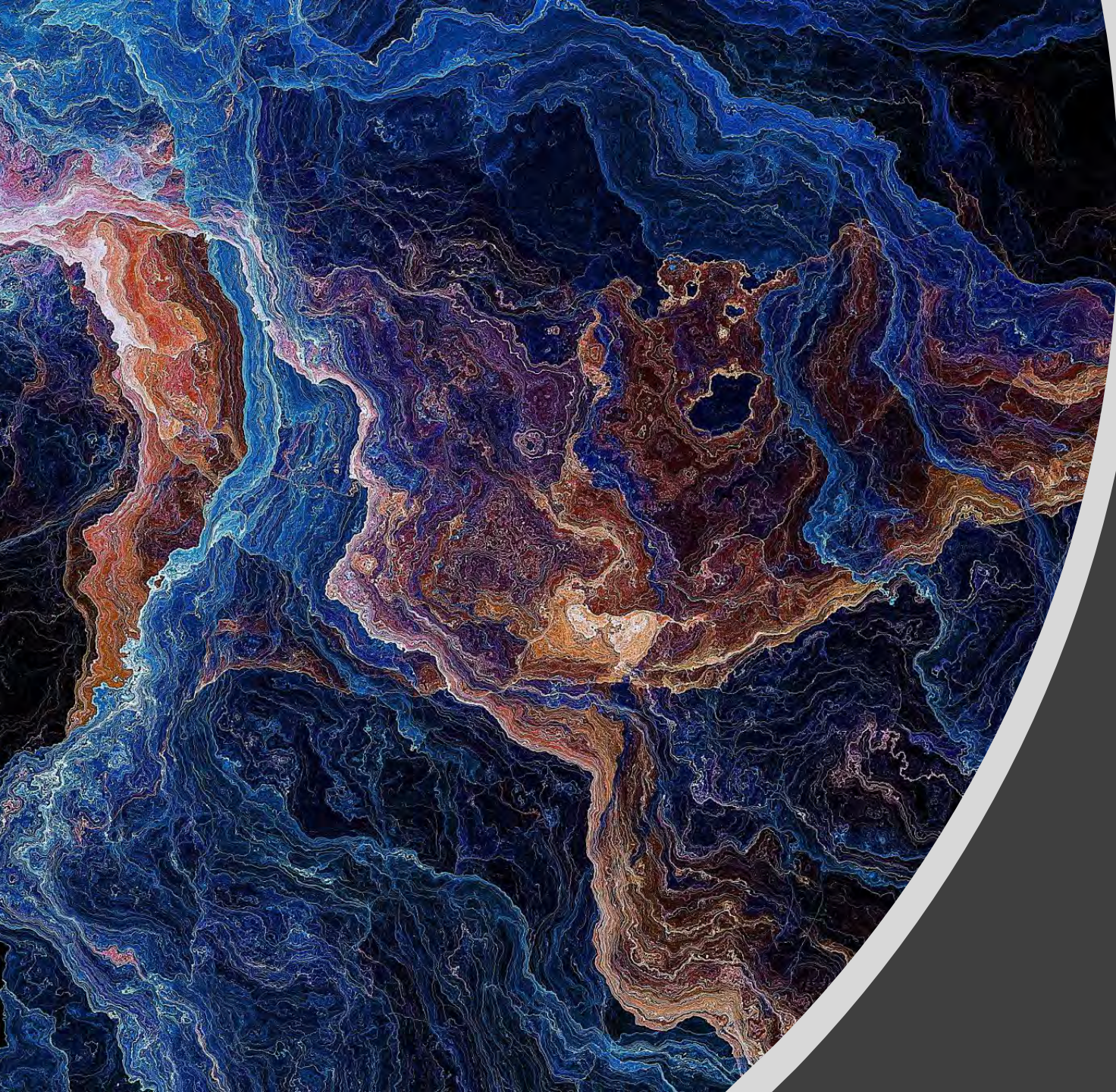
WHAT
DID WE
FIND FOR
“LIVE
ROCK”?

- *Included hard corals harvested from reefs & cured aquaculture rocks*
- *Reported origins: Haiti, Caribbean, Florida Keys, Marshall Islands, Pohnpei, Fiji, Tonga, Samoa, Vanuatu*
- *We found 4 species of Caulerpa (not visible until week 4 of cultivation)*
- *We found 53 additional marine species*
27 invertebrate species, 25 species of macroalgae, cyanobacteria

Best tool for preventing unwanted “aquarium dumping”: EDUCATION



Digital copies of books available at: stars.library.ucf.edu/ceelabbooks/



Monitoring, Inspection, and Enforcement


Gary Fish, Maine Department of Agriculture,
Conservation, and Forestry State Horticulturist

Monitoring, Inspection and Enforcement

GARY FISH

MAINE DACF



 **Patti Davis** added 7 new photos. ⋮
🔒 Highly Rated • 2 hrs • 📷

Marimo Moss Balls, actually algae, are super low-maintenance. They like a cool and shaded space to chill out and fresh water every few weeks. They grow slowly and can live for what seems like forever (the oldest known marimo is over 200)!!!

Japanese legends say they originated from the hearts of two lovers who couldn't bear to part - their heart... [See More](#)



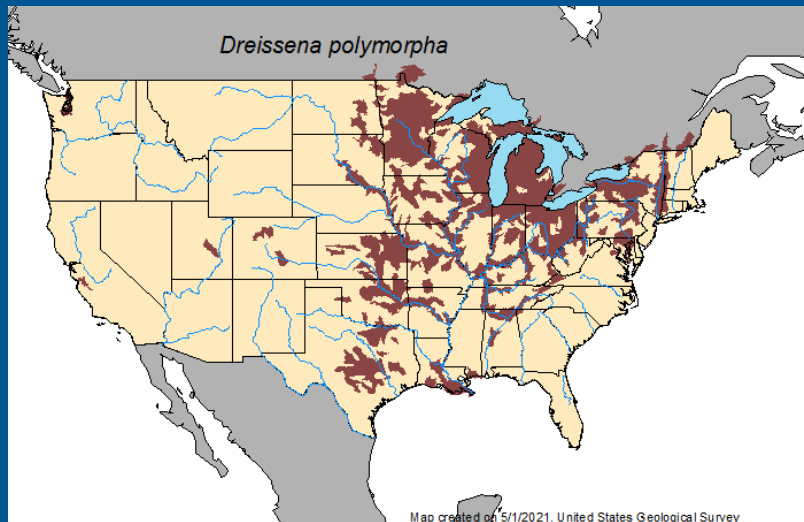
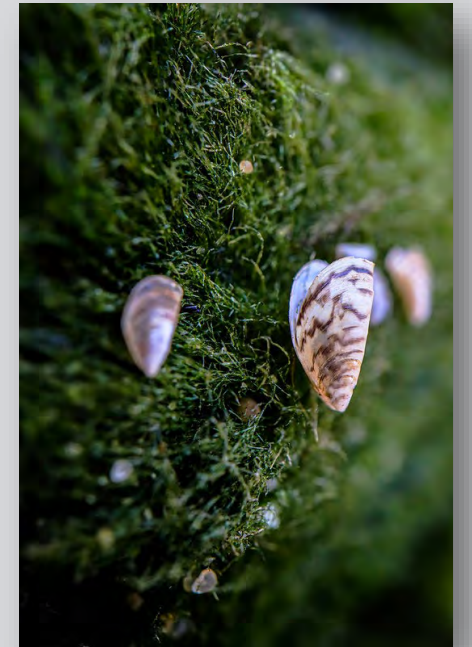
\$10 · BRUNSWICK, ME
Marimo Moss Balls, all sizes MESSAGE

Marimo moss balls
are the perfect,
imperfect example

MOSS BALL CONCERNS



- USGS confirmed zebra mussels confirmed inside moss balls on March 2, 2021
- Native to the Black and Caspian Sea drainages in Eurasia
- Introduced into North America through ballast water in 1980's
- Notorious Biofouling Invader
- Listed as Injurious Wildlife under the Lacey Act



An Atypical AIS Challenge

A **contaminated plant commodity** but not with a plant pest

- ✓ Zebra mussels listed as injurious wildlife

Widely dispersed: At least 46 States with found contaminated moss balls

- ✓ Pet stores, grocery stores, water gardens, eCommerce retailers
- ✓ Invasive species management and law enforcement responsibilities

Active **law enforcement investigation** at State and Federal levels

- ✓ Complicated communications: Federal to State enforcement staff

Management Objectives & Actions

- Stop the importation of zebra mussel contaminated moss ball products into the United States
- Properly dispose of contaminated moss ball products already in the U.S. supply chain, retail stores, on-line eCommerce, and home aquariums.
- Federal agencies including, the USFWS, USDA, USGS, CBP, and NISC began meeting regularly to share information and determine where and how to take action.
- State agencies also collaborated on where and how to take action



2021 Timeline of Some Key Activities and Events

-
- 2/25 — Seattle PetCo and filed report to NAS
- 3/1 — moss balls shipment destroyed
- 3/2 — USGS confirms ID; 2 States
- 3/3 — USGS notifies ANSTF; 8 States
- 3/5 — Web page for disposal/decon; FWS/USDA/CBP start meeting on regular basis; Pest Bulletin created; FWS Office of Law Enforcement opened investigations for possible criminal violations (ongoing)
- 3/7 — First Q&A developed; 29 States
- 3/8 — AFWA begins working w/ States to obtain contact tracing info (product names/suppliers); 32 States
- 3/10 — CBP routing all moss ball shipments to Plant Inspection Stations; Wyoming bans sale of Moss Balls; FWS briefs State Fish Chiefs; 33 States
- 3/12 — Canada forms ICS response and contacts ANSTF coordination/info sharing; 38 States

-
- 3/16 — Arizona quarantine established
- 3/23 — North Dakota quarantine established
- 3/29 — eCommerce letters issued by USDA and FWS
- 4/6 — Alaska quarantine established
- 4/8 — Pet Advocacy Network issues guidance to pet businesses
- 4/12 — Terrarium garden sales reported at Carr-Safeway; Wyoming take back program announced
- 4/22 — AmericanHort article published; 42 States
- 4/23 — PANetwork issues water garden decon protocols
- 4/25 — Seized shipment sent to USGS
- 4/26 — FWS/USDA/CBP issues 2nd round of Q&As
- 4/27 — 46 States. Only States w/o confirmed contaminated moss balls DE, RI, WV, HI

Moss balls: Examples of Federal Action

U.S. Fish and Wildlife Service

- Coordinating enforcement of international, federal, and state levels
- Communicating information to federal, regional and state partners

- Coordinating with industry
- Securing eDNA technology for use at inspection sites

U.S. Department of Agriculture

- Working with USFWS to intercept ZM at plant inspection stations
- Communicating with eCommerce to restrict sales

U.S. Customs and Border Protections

- Targeting certain international shipments for referral to CBP Plant Inspection Stations
- Traceback and trace-forward efforts

U.S. Geological Survey

- Maintains records in NAS database, Assists with identification of specimens
- Development of point-of-use eDNA tools

Examples of Industry Action

Pet Advocacy Network

- ✓ Industry alert – March 5th
- ✓ Included an alert on Habitattitude
- ✓ Developed decontamination protocols using KCL (Potassium Chloride)
- ✓ Recommended an industry moratorium on moss ball trade
 - “Place a moratorium on the importation, purchase, and sale of all moss balls until a method of testing and treatment can be established to ensure a clean trade.”
- ✓ Developed water garden decontamination protocols

PetCo/Pet Smart

- ✓ Recommended disposal and refunded/recalled contaminated products
- ✓ Issued consumer alerts
- ✓ Supportive of law enforcement officials collecting moss balls as evidence

Examples of Industry Action (Continued)

- **Albertsons – Carr/Safeway**
 - ✓ Committed to removing **terrarium moss ball products** from shelves
- **On-line market places, such as Amazon, Etsy, and eBay**
 - ✓ **Removed listings of foreign IP addresses** where direct imports into the United States of propagative material was occurring
- **AmericanHort**
 - ✓ Newsletter: “protocols do not exist to enable safe, clean, and compliant trade in moss balls. Until such protocols are developed, **retailers are urged not to sell moss balls**. Retailers and their customers are **urged to safely destroy moss balls and to decontaminate the aquarium or water garden systems in which they were growing.**”
- **Marshall Meyers (Attorney representing aquarium industry importers/exporters)**
 - ✓ Working to obtain **water samples** from global suppliers of moss balls to validate eDNA sampling
 - ✓ **Facilitated communications** between industry and agency personnel

Examples of State Action

Agricultural quarantines of moss balls: WY, AZ, AK, OR, ND

- This has been extremely helpful in reaching out to industry on a national basis.

Many States regulate the use, possession, and transport of zebra mussels.

- Working with local pet stores, nurseries, aquatic supplies, and on-line merchants.

Contact tracing information and local enforcement of State laws and regulations

Facilitating communications between Federal & State law enforcement and AIS personnel

Many articles written

- Maine sent out messages to:
 - Pet stores
 - Grocery stores
 - Garden centers
 - Facebook marketplace
 - Etsy seller
 - Online seller

Protect Maine's Waterways From the Invasive Zebra Mussel



left: Marimo moss ball contaminated with zebra mussels, Right: a display of Marimo moss balls for sale at a pet store

In March we [forwarded a message from the Maine Department of Inland Fisheries and Wildlife](#) about marimo moss balls that were sold in the aquarium trade and potentially infested with invasive zebra mussels. At the time we believed that the moss balls were mainly sold by pet stores or other businesses selling aquarium materials, since then we have learned that marimo moss balls are also sometimes sold as terrarium or houseplants. With this in mind, we wanted to provide more information about zebra mussels and the proper disposal of contaminated materials including exposed marimo moss balls, other plants and water.

What are marimo moss balls?

Marimo moss balls (*Aegagropila linnaei*) are not plants, but a form of filamentous green algae. Although not common, in nature they are found in lakes in Japan and northern Europe, where gentle wave action forms the algae into its characteristic round shape. Marimo moss balls are sold for decorative use in aquariums (sometimes under the trade name "Betta Buddy") and are also occasionally sold as terrarium or house plants. Marimo moss balls are not considered invasive.

Moss Ball Entry Into U.S.:

Key Changes Due to Contamination

Pre	Post
Moss ball State regulations: HI	Moss ball State regulations: HI, WY, AZ, AK, OR, ND
	CBP, USDA, FWS law enforcement and invasive species staff meet regularly
< 12 moss balls non-commercial shipment	1 moss ball = commercial shipment and referred to PIS
Non-commercial person-to-person shipments	All moss ball shipments under permit
Imports arriving through Plant Inspection Stations at JFK, LAX, and Miami	Imports must arrive through JFK or LAX
Shipments cleared if no pests or pathogens of plants	All moss ball shipments referred to the USFWS
	Agreement to pursue eDNA testing of moss ball shipments by USFWS

What roadblocks or gaps in authorities or response were highlighted?

Aquatic plant commodities:

- ✓ Imports inspected by CBP and PPQ for regulated pest and pathogens of plants
- ✓ If imports are not properly manifested it could be a case where USDA-APHIS Smuggling Interdiction and Trade Compliance would become involved
- ✓ If non pest and pathogens of plants are found during PPQ inspection, shipments referred to FWS as the primary regulator of wildlife imports
- ✓ Other organisms found on moss balls within States: nematodes and flatworms; snails and fingernail clams; ostracods and copepods; macrophytes and algae; sponges; and mites

Unanticipated national/international scope in “rapid response”:

- ✓ No national ICS plan in place for AIS

Zebra mussels listed as injurious wildlife:

- ✓ No interstate prohibition
- ✓ Need for continued State leadership on quarantine of moss balls: Leverage use, possession, and sale authorities

Going Forward

After-Action Report

Update Website

Continue controls on imports

- ✓ Refer all moss ball shipments to Plant Inspection Stations through JFK or LAX
- ✓ Agreement to sample any new moss ball imports using point-of-use eDNA sampling; Re-export based on positive molecular finding

Continue working with Industry

- ✓ To develop clean trade protocols and processes

Collectively urge and advocate at local, regional, state, and national levels that retailers not sell moss balls until clean trade processes are in place

Thank You!

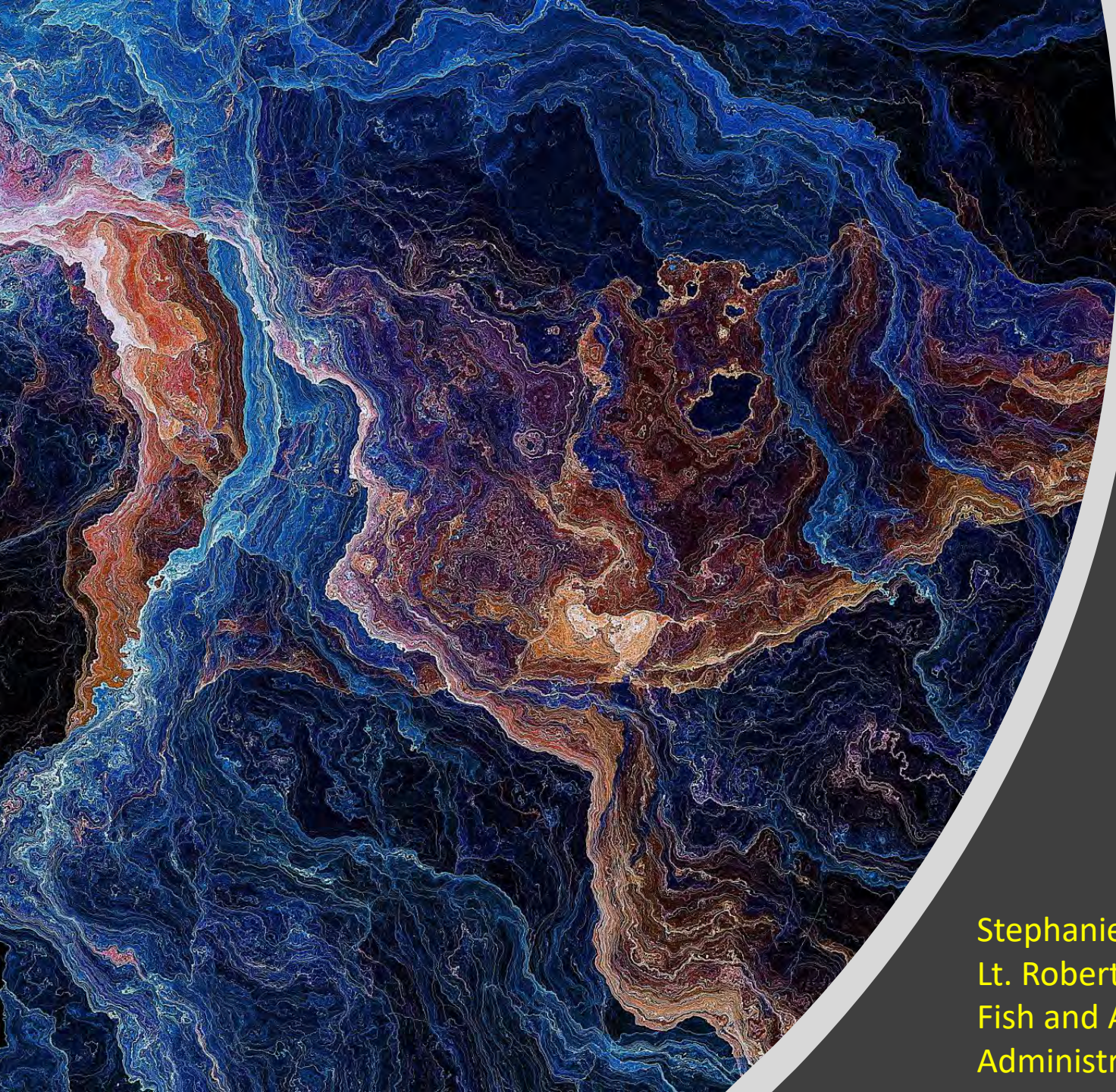
This presentation was first developed by:

Susan Pasko

Craig Martin

US Fish & Wildlife Service





Regulatory Approaches

Stephanie Otts, National Sea Grant Law Center Director
Lt. Robert Stroess, Wisconsin DNR Warden, Commercial
Fish and Aquatic Species in Trade Enforcement Program
Administrator

A large, thick black L-shaped graphic is positioned in the corners of the slide, framing the central text. The top-left corner has a horizontal bar extending to the right and a vertical bar extending downwards. The bottom-right corner has a horizontal bar extending to the left and a vertical bar extending upwards.

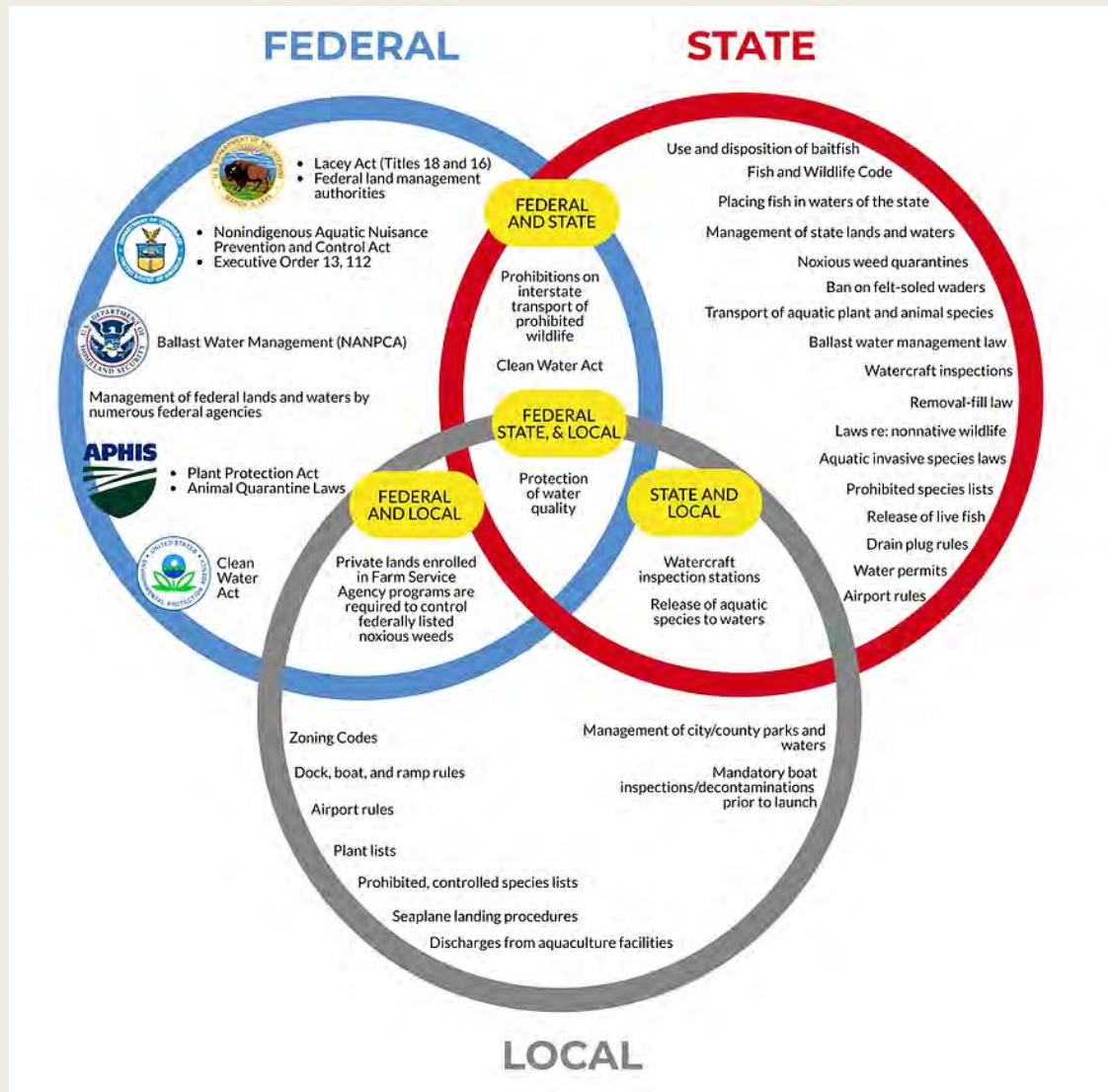
AIS IN TRADE: CHALLENGES FOR THE REGULATORY FRAMEWORK

Stephanie Otts, Director, National Sea Grant Law Center

Aquatic Invasive Species in Commerce Virtual Summit

March 8, 2023

Network of AIS Laws and Authorities



- Lots of laws on the books, but not designed to address e-commerce sales
- Inconsistencies among jurisdictions reduce effectiveness
- Violations difficult to detect

E-COMMERCE PLAYERS & LEGAL RESPONSIBILITIES



SELLER

May not possess, sell, or ship prohibited species

Legal Issue: May not be located in state where buyer located/ sale takes place

THIRD PARTY PLATFORM

No legal responsibilities

Legal Issue: Immune from illegal acts by users of their sites



TRANSPORTER

May not transport prohibited species

Legal Issue: May not know what they are transporting

BUYER

May not import, buy, or possess prohibited species.

Legal Issue: May not know what they are buying



Regulations and Enforcement

AIS in Commerce Summit

March 8, 2023



-- Conservation Warden Lieutenant Robert Stroess --

Administrator – Aquatic Species in Trade Enforcement Program

AIS-in-trade law enforcement has nothing to do with “weeds on a trailer”.

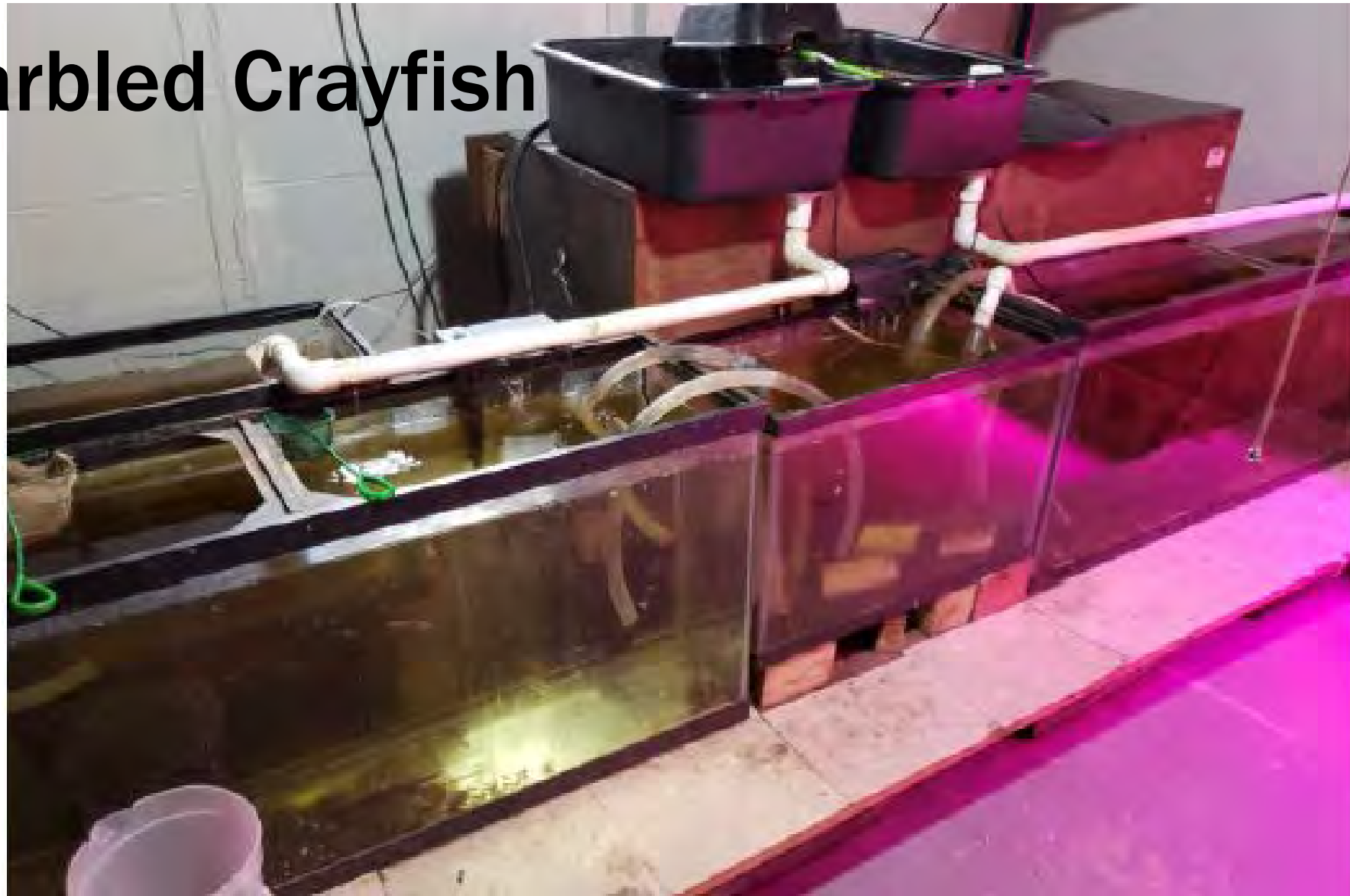


Yet this is the extent of what some states' law enforcement programs do for AIS work.



Online Pet Marbled Crayfish

- e-Bay seller in WI
- 8 tanks in basement
- Bought 20; seized 300



. . . Online Pet Marbled Crayfish (continued) . . .

- eBay – 139 crayfish in 27 transactions
- Wisconsin forwarded sales info. to 14 states
 - 6 = ILLEGAL (OH, MI, PA, CA, MD, ME)
 - 4 = No restrictions (GA, IL, IN, NJ)
 - 4 = Staff were unsure if illegal (DE, AZ, NY, FL)
- Search warrant to eBay identified more Wisconsin clients and revealed the original supply to Wisconsin buyer came from Ohio dealer, so forwarded this info to Ohio
- And Ohio continued to expand the web in this case . . . Hundreds more in 36 states!
- Pennsylvania – as of October 2022 – identified another dealer from our info., seized another 100 marbled crayfish, and are investigating other sales by the Pennsylvania dealer





Fish Market Live Food Crayfish

- Company has both a fish farm and a retail fish market
- Ordered RSC from Louisiana supplier
 - Supplier had been educated by Great Lakes Fishery Commission – Law Enforcement Committee outreach letter
 - Would not ship RSC to Wisconsin
 - Arranged to ship to Indiana (legal there)
 - Owner drove to Indiana to pick up 200 pounds
- Convicted owner and fish market

50 lbs live crawfish left in the market today! Come grab some before we close at 4:00 PM!

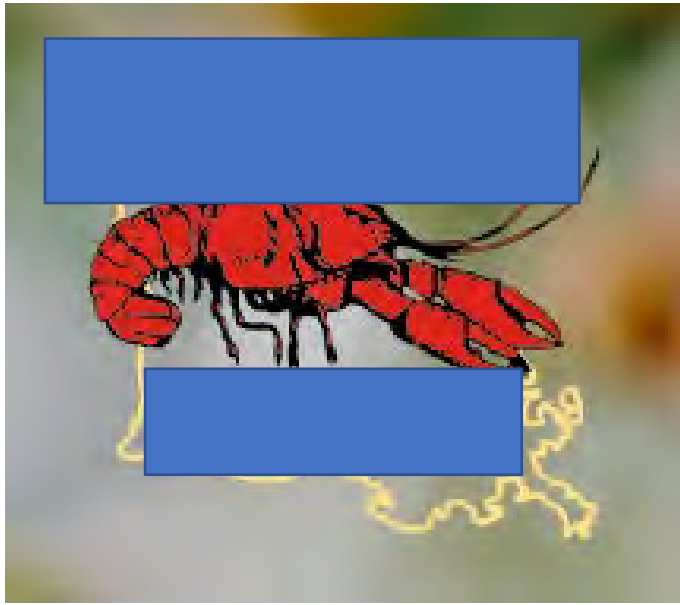
Mobile Uploads · Jul 3 ·



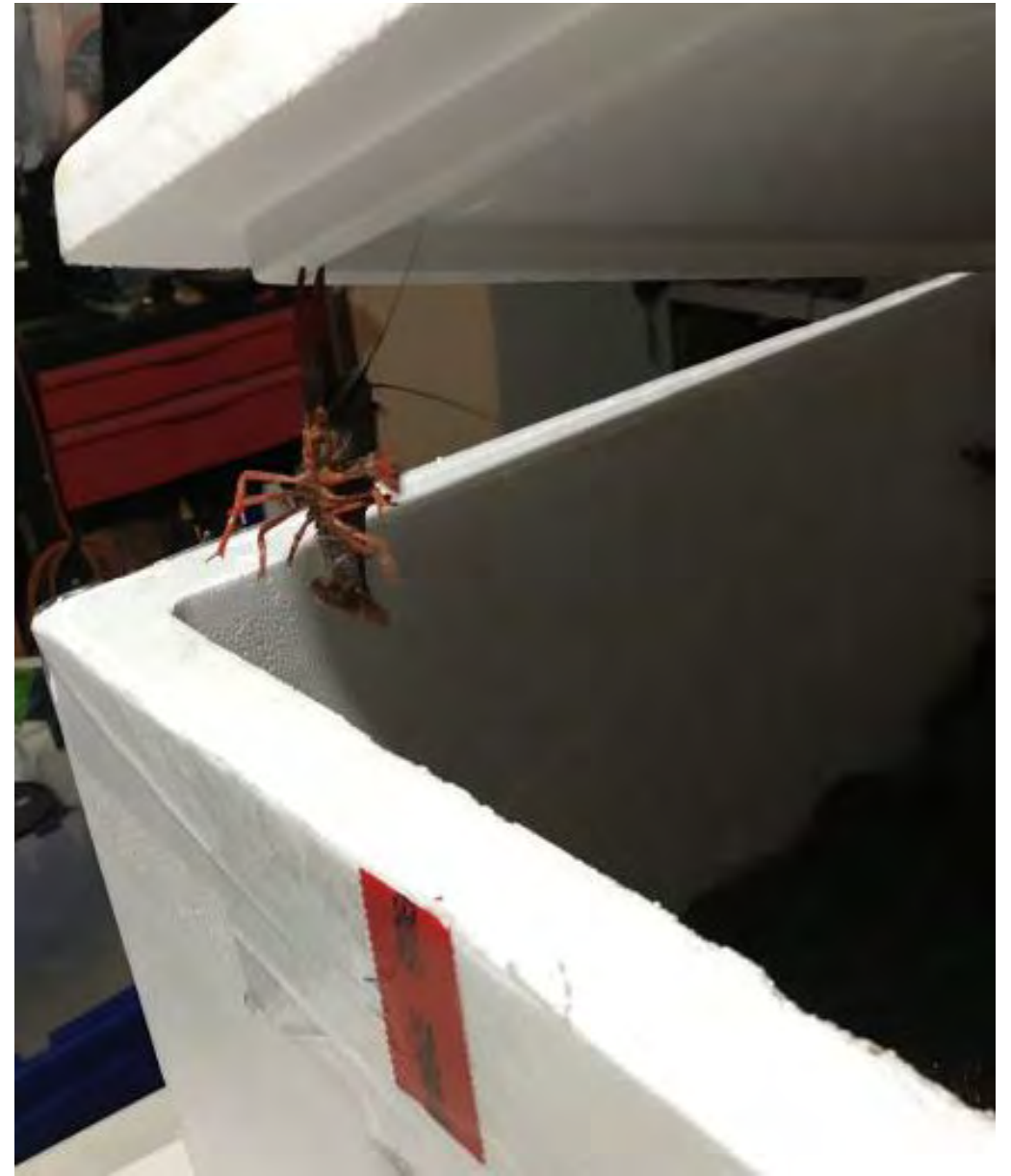
Online Live Food Crayfish







- 16 shipments
- 12,816 red swamp crayfish
- 15 criminal charges
 - 10 convictions
 - 5 dismissed
 - \$34,380 penalty



Invasive Bighead, Silver, and Grass Carp

- Complaint of store w/aerated tanks and prices posted for bighead/grass carp
- Surveillance of store and vehicles; Covert purchases over numerous months
- WI Wholesale Fish Dealer (WFD) and Fish Farm – Licensed in both WI and IL
- Picked up fish from IL commercial fishers; ICED (IL) vs. EVISCERATED (WI)
- Contacted while delivering 13 invasive carp; Missing records for 1,030 lbs. from that day alone
- Search warrant – lots of records . . . and missing lots of records (28,000 pounds/year)
- February 2022 – 19 convictions (including 2 crimes) - \$12,504.10 in penalties



Gaps/Deficiencies – Key Factor #1

- State conservation agencies don't have specialized law enforcement staff
 - Very few states with specialized LE staff or LE units working on AIS-in-trade
 - Lack of dedicated funding to working aquatic organisms in trade industries
 - Many interconnected industries (live fish transport, commercial fishing, fish stocking for pay lakes, private pond stocking, wild bait harvest and bait sales, live food (crayfish, tilapia, swamp eels, crabs), aquarium and water garden pets, specialty grocery stores, etc.)
 - Need specialists who are aware of these
 - Without specialists, it's like a police officer who primarily works traffic enforcement being asked to also investigate a nationwide drug trafficking organization
 - Executive level chiefs/administrators within these agencies
 - Lack of awareness of the vast illegal trade in these industries
 - Outside traditional hook and bullet law enforcement efforts
 - Limited by existing funding tied to certain activities . . . not just a general pool of money available (hunting, fishing, ATVs, boating, air pollution, state parks or public lands, etc.)
 - Internal culture issue (“I don't want to work on that”, “That's not what game wardens do”)

Gaps/Deficiencies – Key Factor #2

- Disparate laws between states
 - State A – Native Game Animal . . . State B – Prohibited . . . State C – Restricted
 - Regulated but different exemptions
 - Red swamp crayfish – State A: OK as a pet but illegal as live food . . . State B: no restrictions . . . State C: must be dead . . . State D: no possession even if dead
 - Bighead carp – State A: OK to transport if put in a container with ice . . . States B, C, and D: must be eviscerated before transport . . . State E: must be gilled or eviscerated
 - Labeling requirements completely inconsistent (common vs. *scientific*, or no requirements at all) . . . *Procambarus clarkii* vs. neon red vs. red swamp vs. Louisiana crawfish vs. crawfish vs. ghost lobster vs. specter crayfish . . .
 - Out-of-state distributors are out of reach . . . A species that is OK to have in the originating state that gets shipped to a state where it is illegal to have will not be federally charged. And most states' laws are not set up to be able to prosecute for a shipment that originated in another state and sent via UPS or FedEx.

Gaps/Deficiencies – Key Factor #3

- Agencies and programs working in silos
 - Disconnect between programs (Invasives, Law Enforcement, Education, Fisheries Mgmt., Wildlife Mgmt.)
 - A regulatory/education program is NOT a law enforcement program.
 - No “teeth” with most regulatory/education programs.
 - Educate, re-educate, re-educate, re-educate . . . Doesn’t fix the problem with repeat offenders by only providing education.
 - Split regulatory/enforcement authorities between different state agencies
 - Department of Agriculture regulates businesses/species A, B, and C
 - Department of Natural Resources regulates businesses/species X, Y, and Z
 - They each regulate parts of businesses/species L, M, and N



Possible Solutions

- Disparate laws between states
 - LE staff should join interstate organizations and develop interstate relationships.
 - Intentionally work the distributor of a species together . . . Jointly notify distributors about species . . . Follow-up to see if they complied.
 - Find a way to require records to list *scientific names* (legislation, agency rules, etc.).
- Species should be listed PROACTIVELY and so they are easy to identify and enforce.
 - “All non-native crayfish species” . . . This would have made marbled crayfish illegal everywhere
 - “All non-native freshwater fish species except . . .”
- Concerted effort needed between programs and agencies . . . Regulatory programs, education program, AND law enforcement . . . FAILS without all three!
- Push for dedicated AIS-in-trade funding and staff
 - Research if “hook and bullet” funding can be used to work AIS-in-trade . . . Catching a distributor of an invasive species protects fish and game FAR MORE than catching a hunter with an extra turkey, an angler with a bass that is under a size limit, or a hunter/angler without a hunting/fishing license! Don’t stop “hook and bullet” enforcement, just adjust priorities
 - Dedicate enforcement staff to work aquatic species in trade enforcement (which includes AIS) . . . Remember, regulatory/education program staff are NOT enforcement staff
 - Executive level chiefs/administrators within these agencies
 - Educate them about the widespread distribution of AIS-in-trade
 - They have the power to change priorities and hook-and-bullet enforcement culture

CONNECT WITH US

Robert Stroess

Conservation Warden Lieutenant

Commercial Fish and Aquatic Species in Trade
Enforcement Program Administrator

Wisconsin Department of Natural Resources

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(920) 901-1361



/WIDNR



@WIDNR



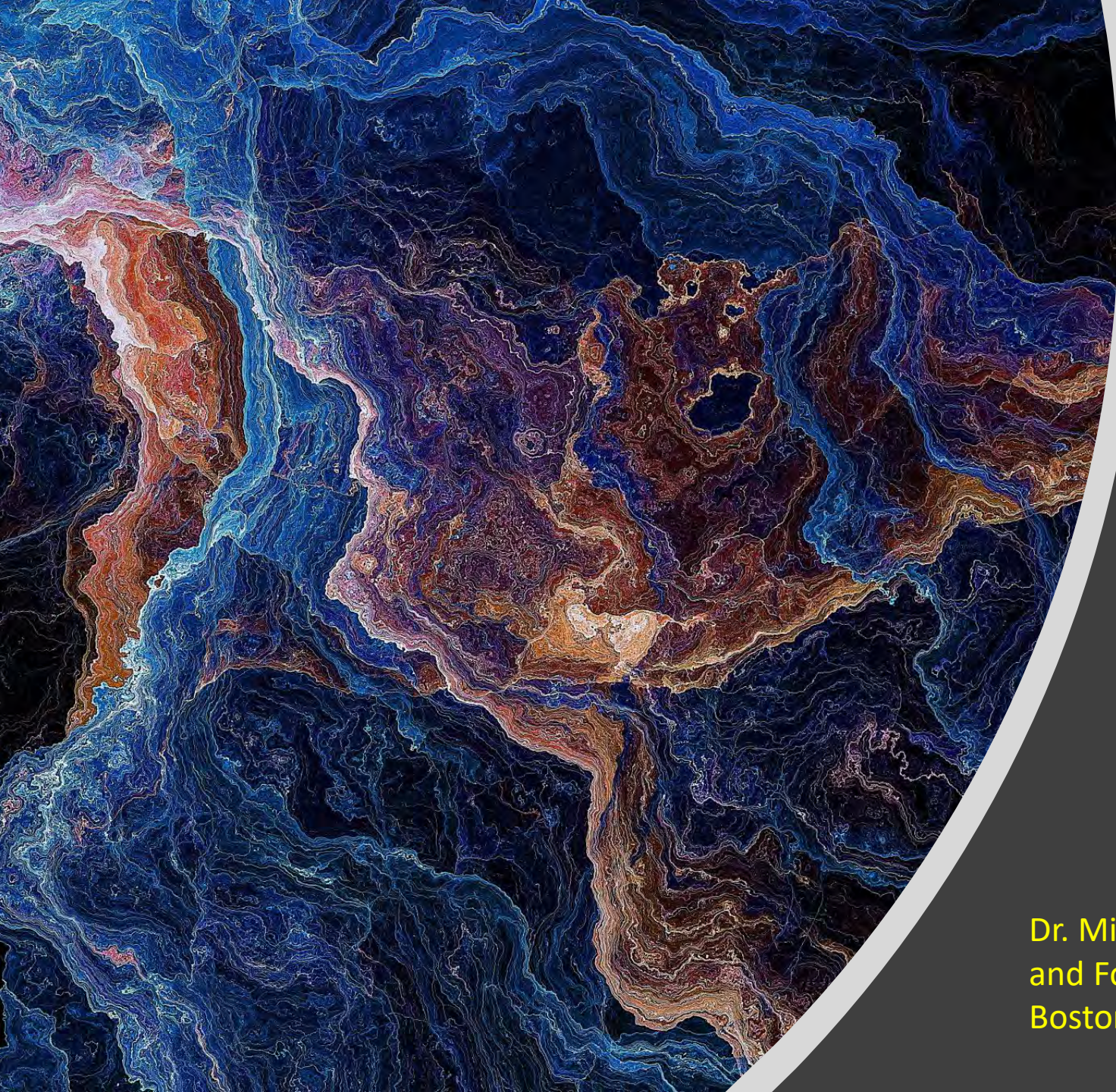
@WI_DNR



/WIDNRTV



"WILD WISCONSIN:
OFF THE RECORD"



Analyzing Invoices for Invasive Species – A Novel Approach

Dr. Michael Tlusty, Associate Professor of Sustainability
and Food Solutions, University of Massachusetts-
Boston

Analyzing Invoices for Invasive Species - A Novel Approach

Michael Tlusty PhD

University of Massachusetts Boston

Boston, MA



Aquatic Invasive Species (AIS) in Commerce Virtual Summit

Developing Strategies to Mitigate Risk | March 8, 2023,

Collect invasive species data at
trade bottlenecks

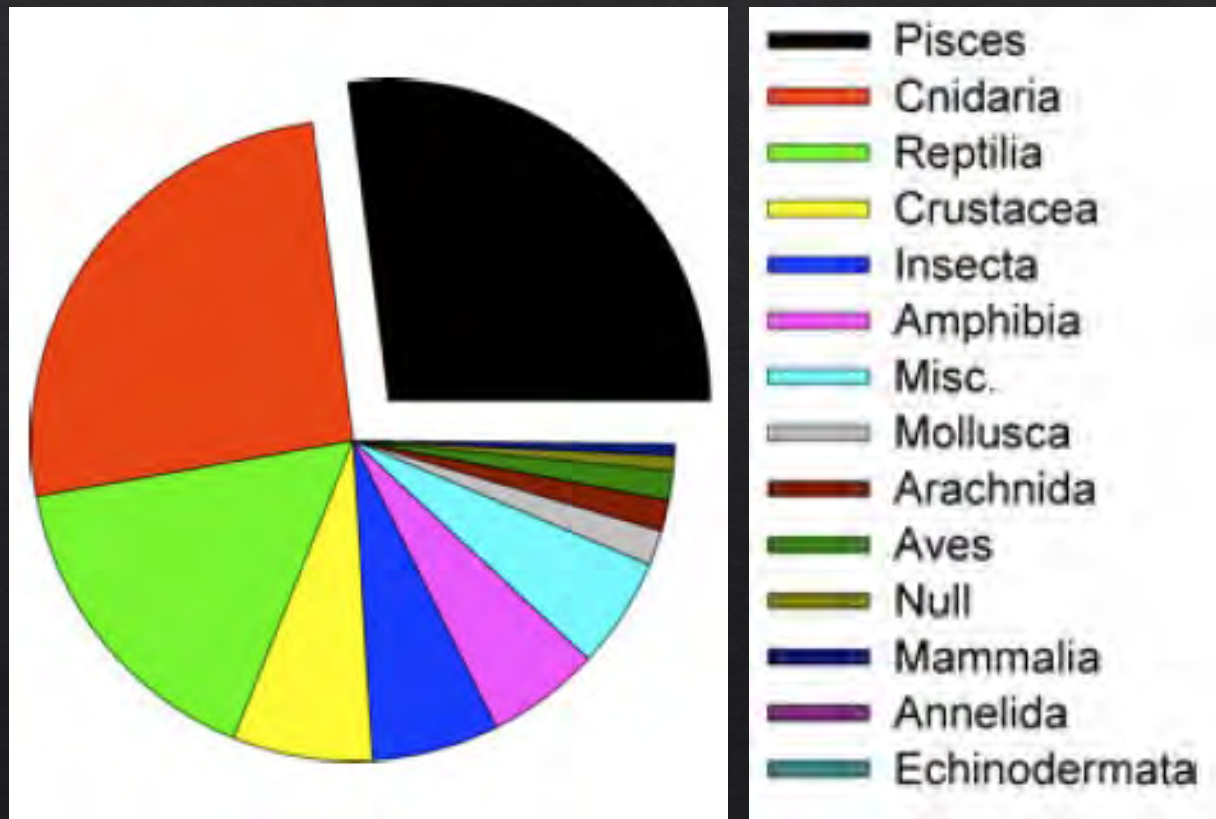


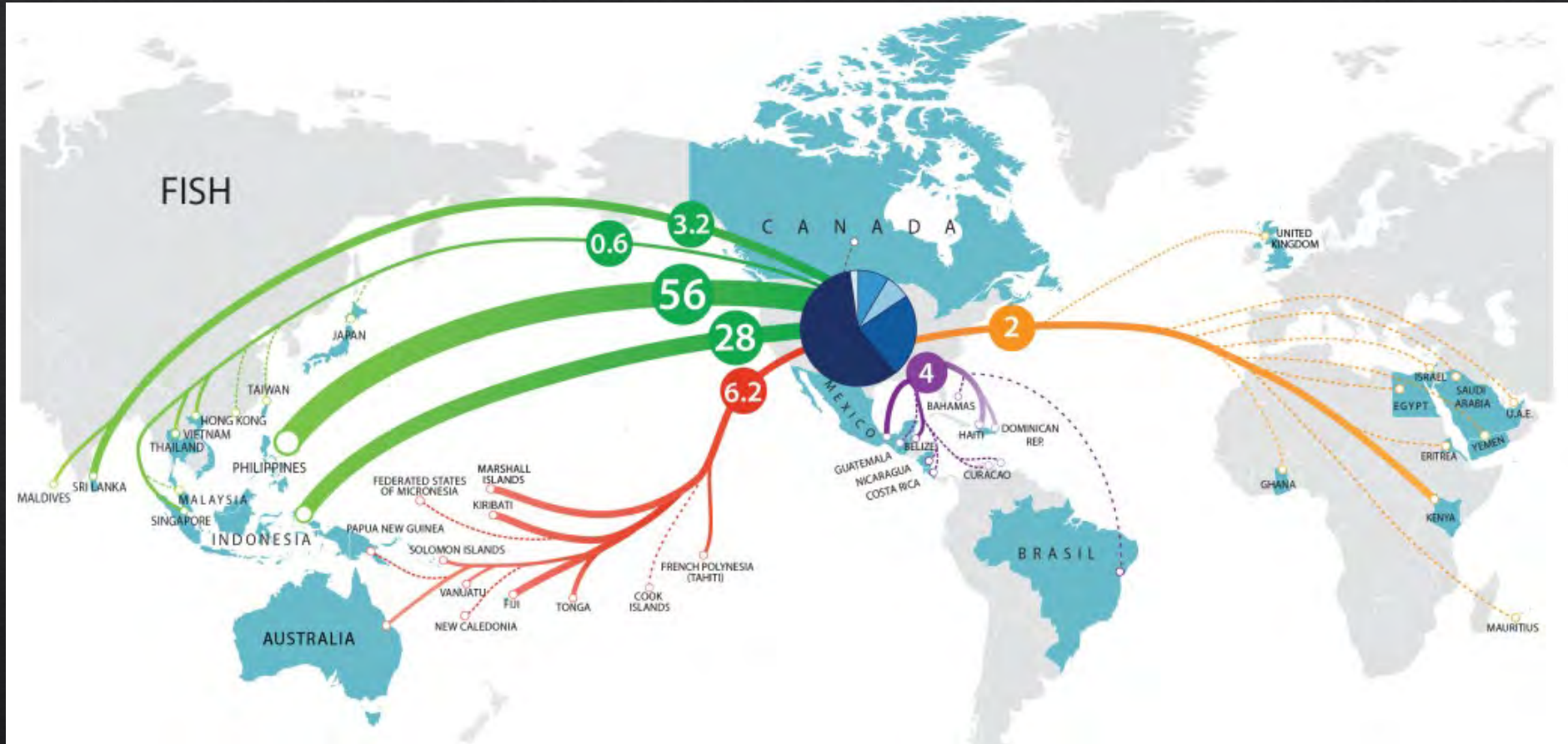
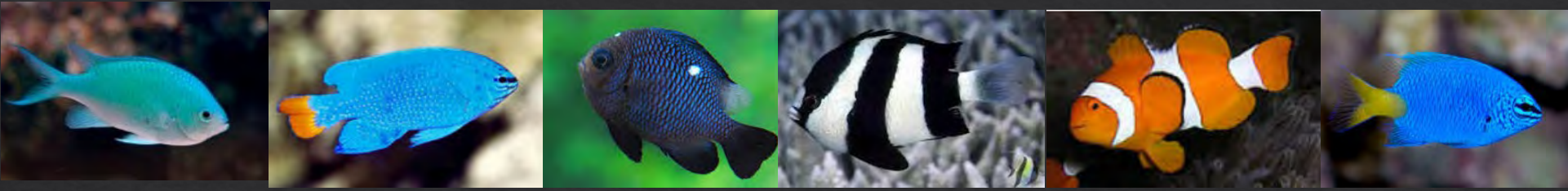
Open Access

U.S. drowning in unidentified fishes: Scope, implications, and regulation of live fish import

Katherine F. Smith, Michael D. Behrens, Lisa M. Max, Peter Daszak

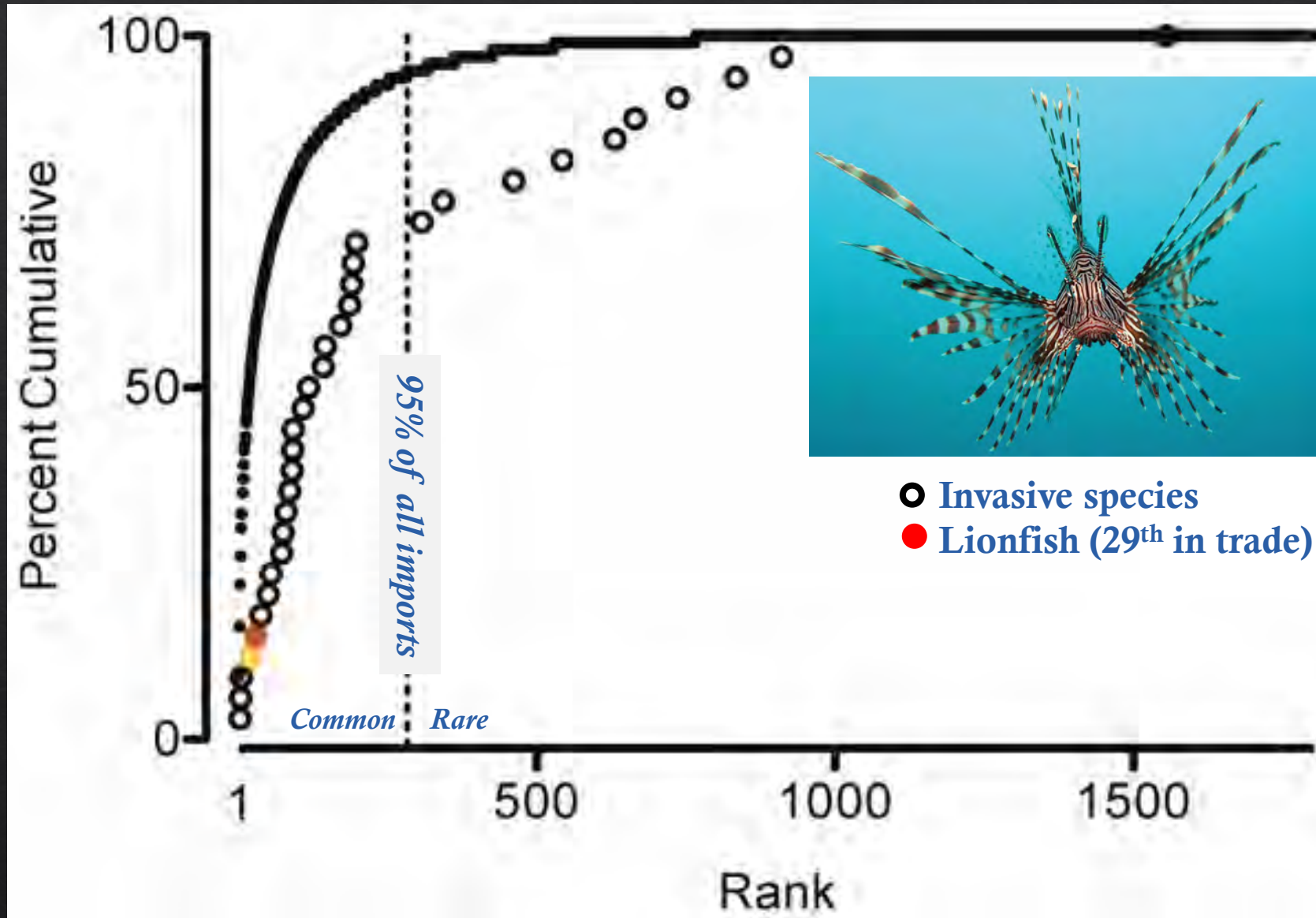
First published: 04 July 2008 | <https://doi.org/10.1111/j.1755-263X.2008.00014.x> | Citations: 44





Rhyne, A.L., Tlusty, M.F., Szczebak, J.T. and Holmberg, R.J., 2017. Expanding our understanding of the trade in marine aquarium animals. PeerJ 5: e2949.

Figure 6. Cumulative rank of marine aquarium fish and nonindigenous species in the United States.

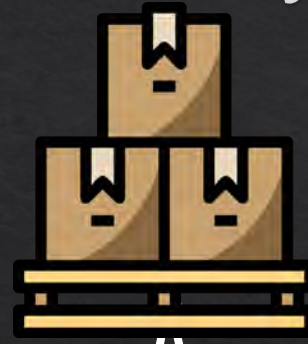


Rhyne AL, Tlusty MF, Schofield PJ, Kaufman L, Morris JA Jr, et al. (2012) Revealing the Appetite of the Marine Aquarium Fish Trade: The Volume and Biodiversity of Fish Imported into the United States. PLOS ONE 7(5): e35808.

<https://doi.org/10.1371/journal.pone.0035808>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0035808>

Current System



Declaration

Canada B3

US 3-177



Certificates

CITES

Phytosanitary

Health

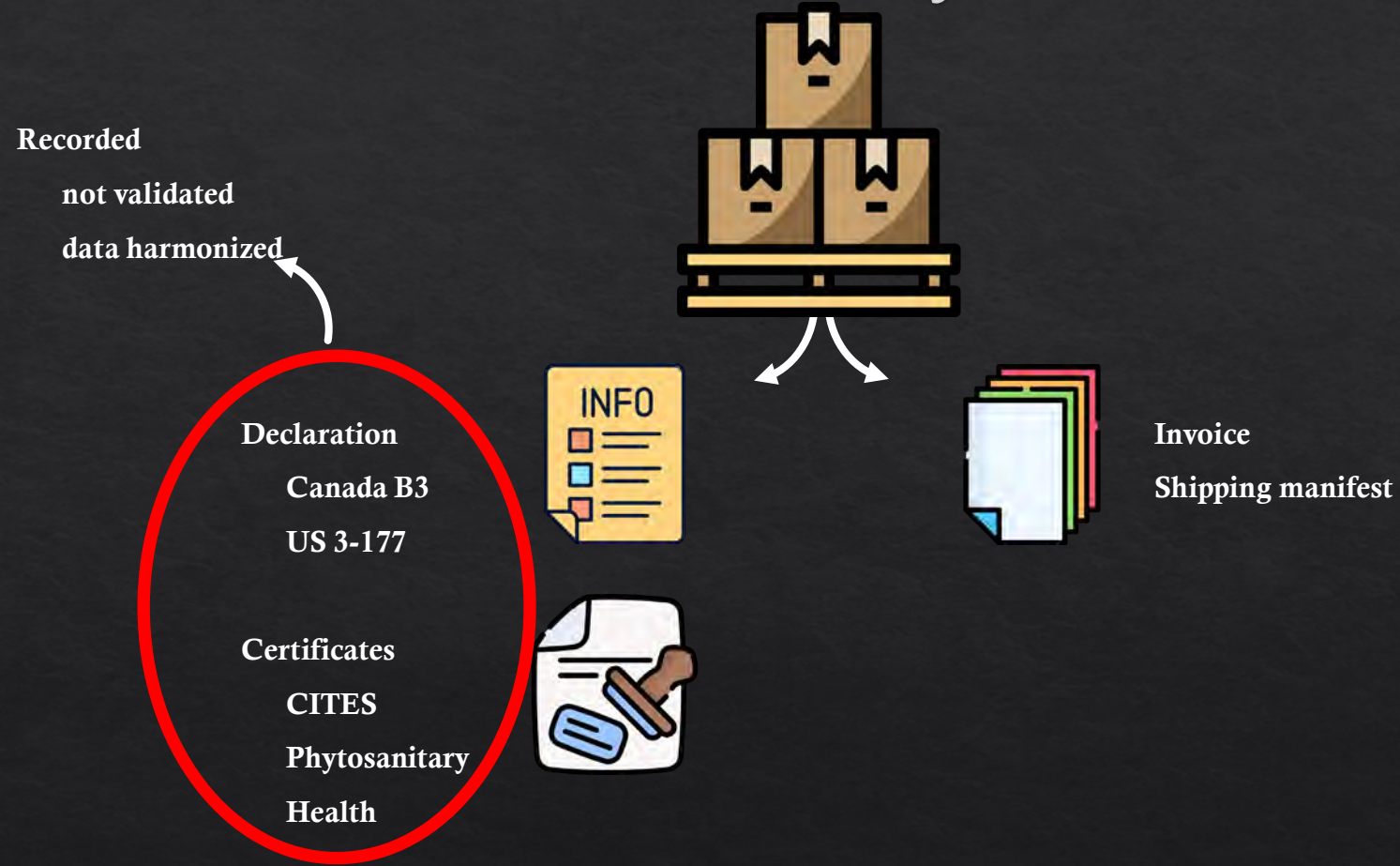


Invoice

Shipping manifest



Current System



U.S. drowning in unidentified fishes: Scope, implications, and regulation of live fish import

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First published: 04 July 2008 | <https://doi.org/10.1111/j.1755-263X.2008.00014.x> | Citations: 44



“poor record keeping at ports make it impossible to assess the diversity of fishes imported”

**U.S. FISH AND WILDLIFE SERVICE
DECLARATION FOR IMPORTATION
OR EXPORTATION OF
FISH OR WILDLIFE**

1. Date of Import/Export: (mm/dd/yyyy)
2. Import/Export License Number:
3. Indicate One: Import Export
4. Port of Clearance:
5. Purpose Code:
6. Customs Document Number (s)

7. Name of Carrier:
8. Air Waybill or Bill of Lading Number:
Master:
House:
9. Transportation Code:
License # _____ State or Province _____
10. Bonded Location for Inspection:
11. Number of Cartons Containing Wildlife:
12. Markings on Cartons Containing Wildlife:

13a. (Optional One) (Complete name/U.S. address/telephone number/e-mail address)
 U.S. Importer
 U.S. Exporter
Type Address Here
13b. Identifier Number: _____ ID Type: _____

14a. (Optional One) (Complete name/foreign address/telephone number/e-mail address)
 Foreign Importer
 Foreign Exporter
14b. Country Code _____
14c. Identifier Number: _____ ID Type: _____

15a. Customs Broker, Shipping Agent or Freight Forwarder:
(Complete business name/address/telephone and fax number/e-mail address)
Type Address Here
15b. Identifier Number: _____ ID Type: _____
15c. Contact Name: _____

Species Code (Official Use Only)	16a. Scientific Name 16b. Common Name	17a. Foreign CITES Permit Num. 17b. U.S. CITES Permit Num.	18a. Description Code 18b. Source	19a. Quantity/Units 19b. Total Monetary Value	20. Country of Origin of Animal	21. Venomous Live Wildlife Indicator <input type="checkbox"/> (Check if yes)
MATF	TROPICAL FISH (MARINE SPP.)		LIV W	438.00 NO \$ 592	ID	<input type="checkbox"/>
OLIN	OTHER LIVE INVERTS IN TROP FISH & OTHER SHIPMENTS		LIV W	85.00 NO \$ 83	ID	<input type="checkbox"/>
CRUS	CRUSTACEANS NA CRABS, LOBSTERS CRUSTACEANS		LIV W	6.00 NO \$ 1	ID	<input type="checkbox"/>
ACFO	ACROPORA FORMOSA STAGHORN CORAL	07301/TV/SATS-LN/2004	LIV C	250.00 NO \$ 1,078	ID	<input type="checkbox"/>
MONF	MONTIPORA FOLIOSA LEAF CORAL	07301/TV/SATS-LN/2004	LIV C	50.00 NO \$ 210	ID	<input type="checkbox"/>

Knowingly making a false statement in a Declaration for Importation or Exportation of Fish or Wildlife may subject the declarant to the penalty provided by 18 U.S.C. (100) and 16 U.S.C. 3372(d).

22. I certify under penalty of perjury that the information furnished is true and correct:
Signature: _____ Date: _____
Type or Print Name: _____

For Official Use Only
Action/Comments:
Wildlife Declared: Yes No
Wildlife Inspected: None / Partial / Full

See Reverse Side of this Form for Privacy Act Notice

Species Code	16a. Scientific Name 16b. Common Name	17a. Foreign CITES Permit Num. 17b. U.S. CITES Permit Num.	18a. Description Code 18b. Source	19a. Quantity/Units 19b. Total Monetary Value	20. Country of Origin of Animal
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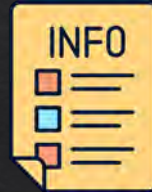


**Photo by Ret Talbot*

Current System



Declaration
US 3-177



Certificates
CITES



Invoice
Shipping manifest



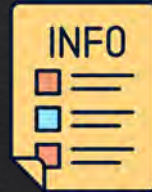
Current System

2011 US LEMIS data

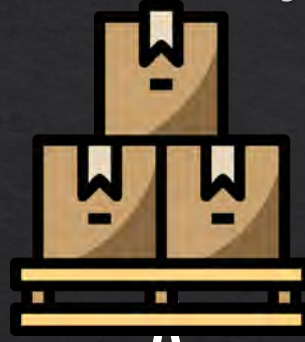
11,586,805 MATF

199 species codes

Declaration
US 3-177



Certificates
CITES



Invoice
Shipping manifest

Current System

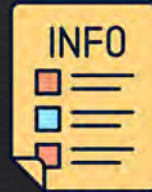
2011 US LEMIS data

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Declaration
US 3-177



Certificates
CITES



Invoice
Shipping manifest



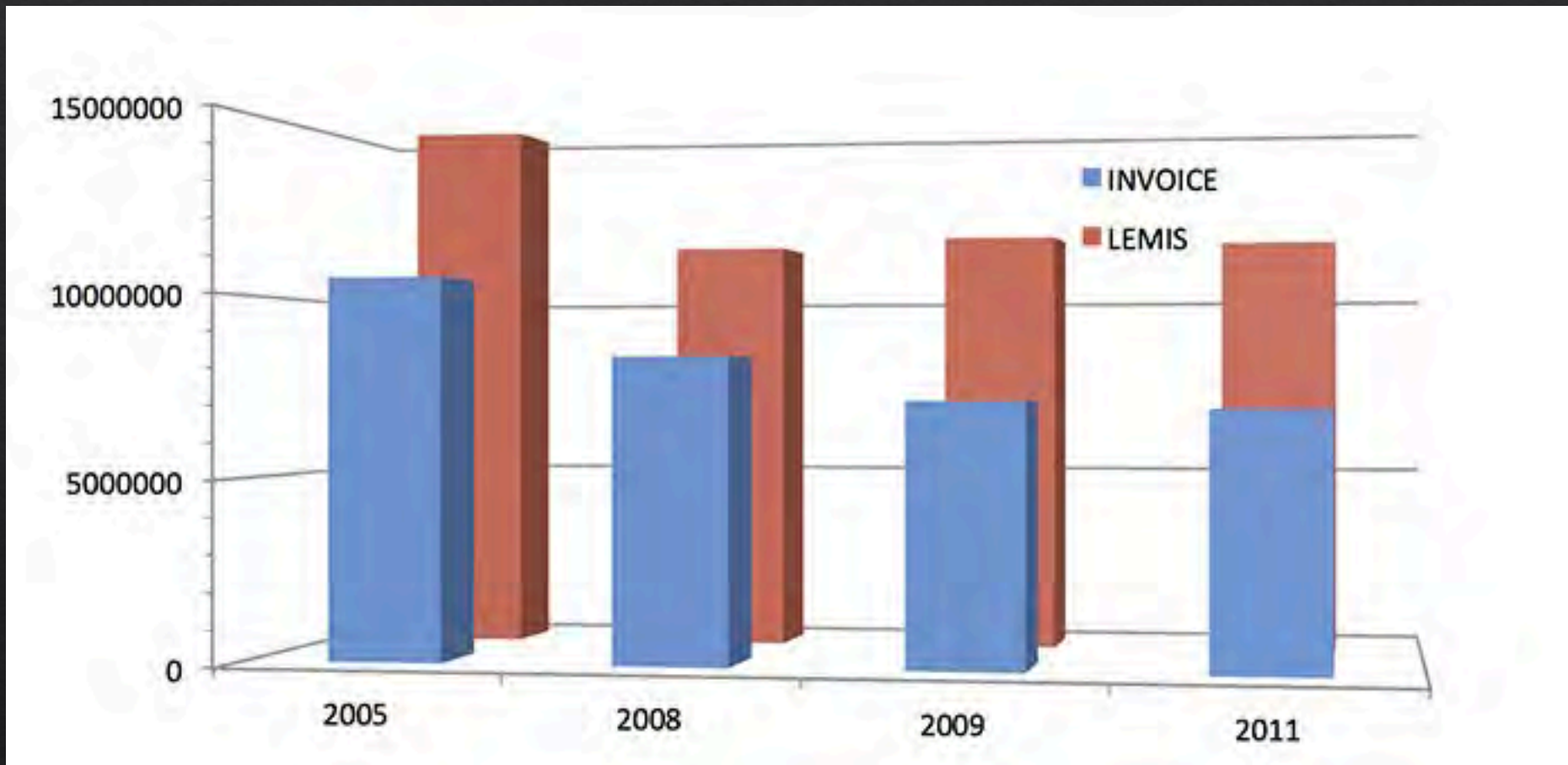
2011 US import invoice data

- 6,892,960 individual marine fish
- 1,798 species

www.aquariumtradedata.org

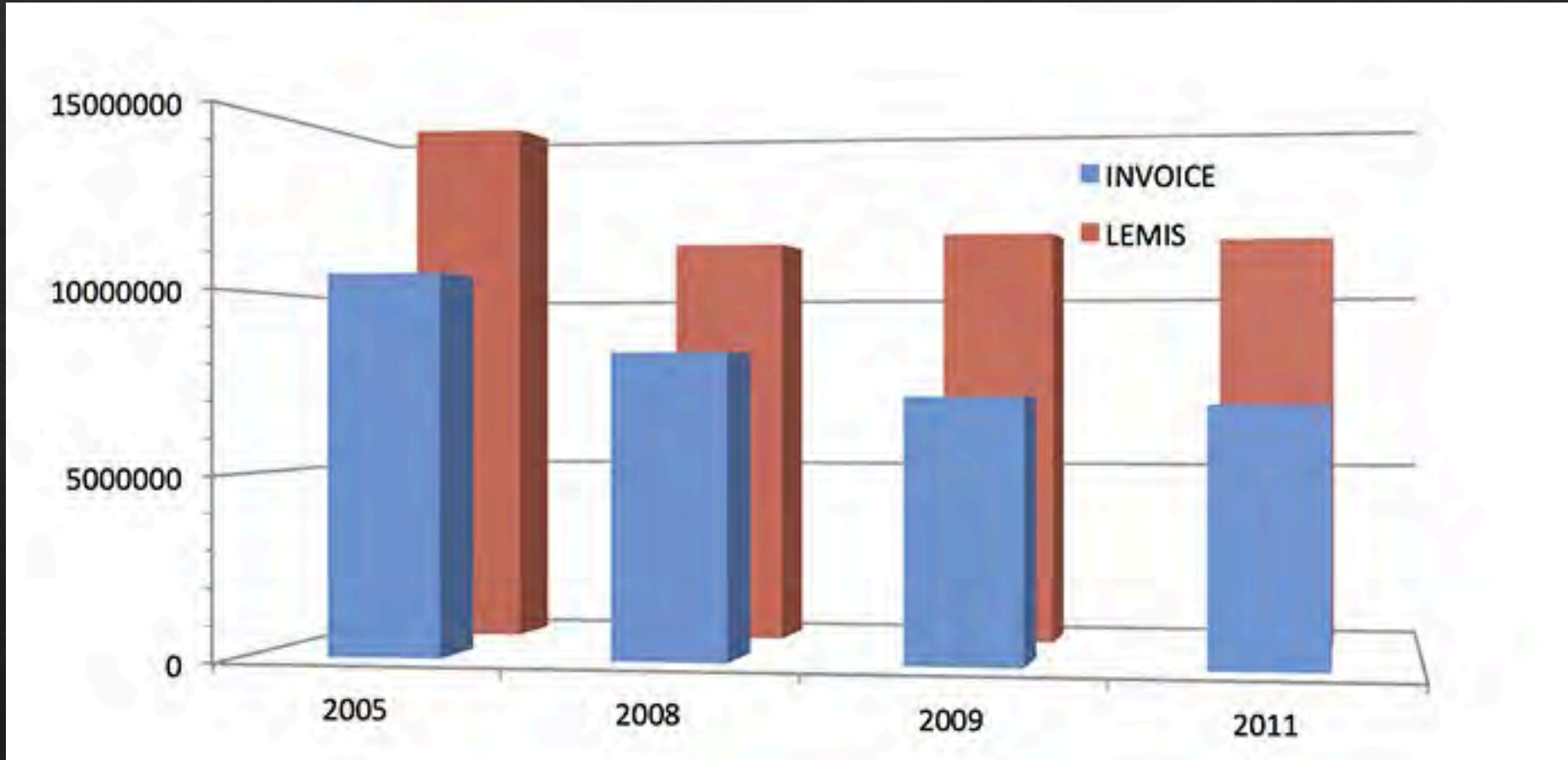
Fish imported to US

Declaration (LEMIS) vs invoice



Fish imported to US

Declaration (LEMIS) vs invoice



LEMIS was not developed to track biodiversity

New System



Declaration
US 3-177



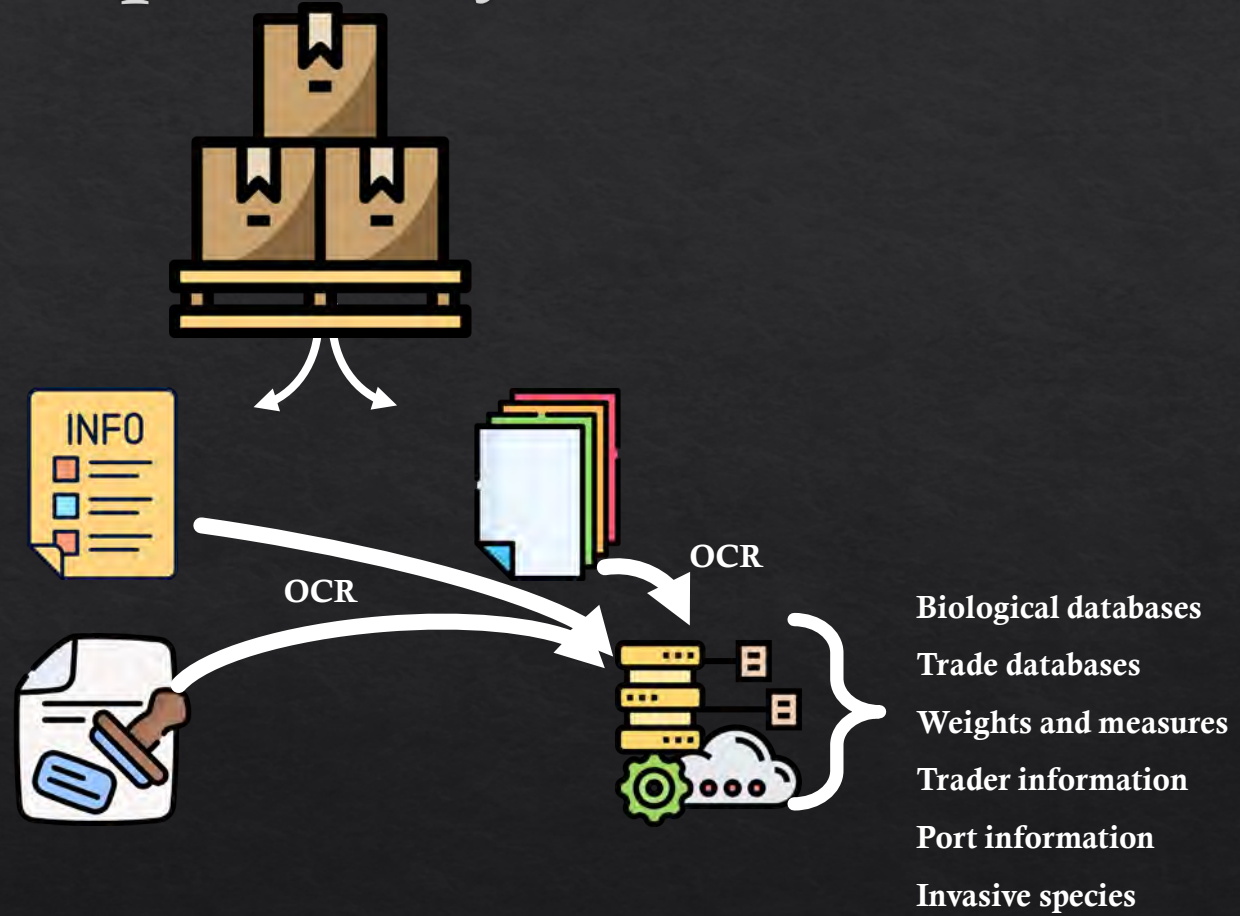
Certificates
CITES



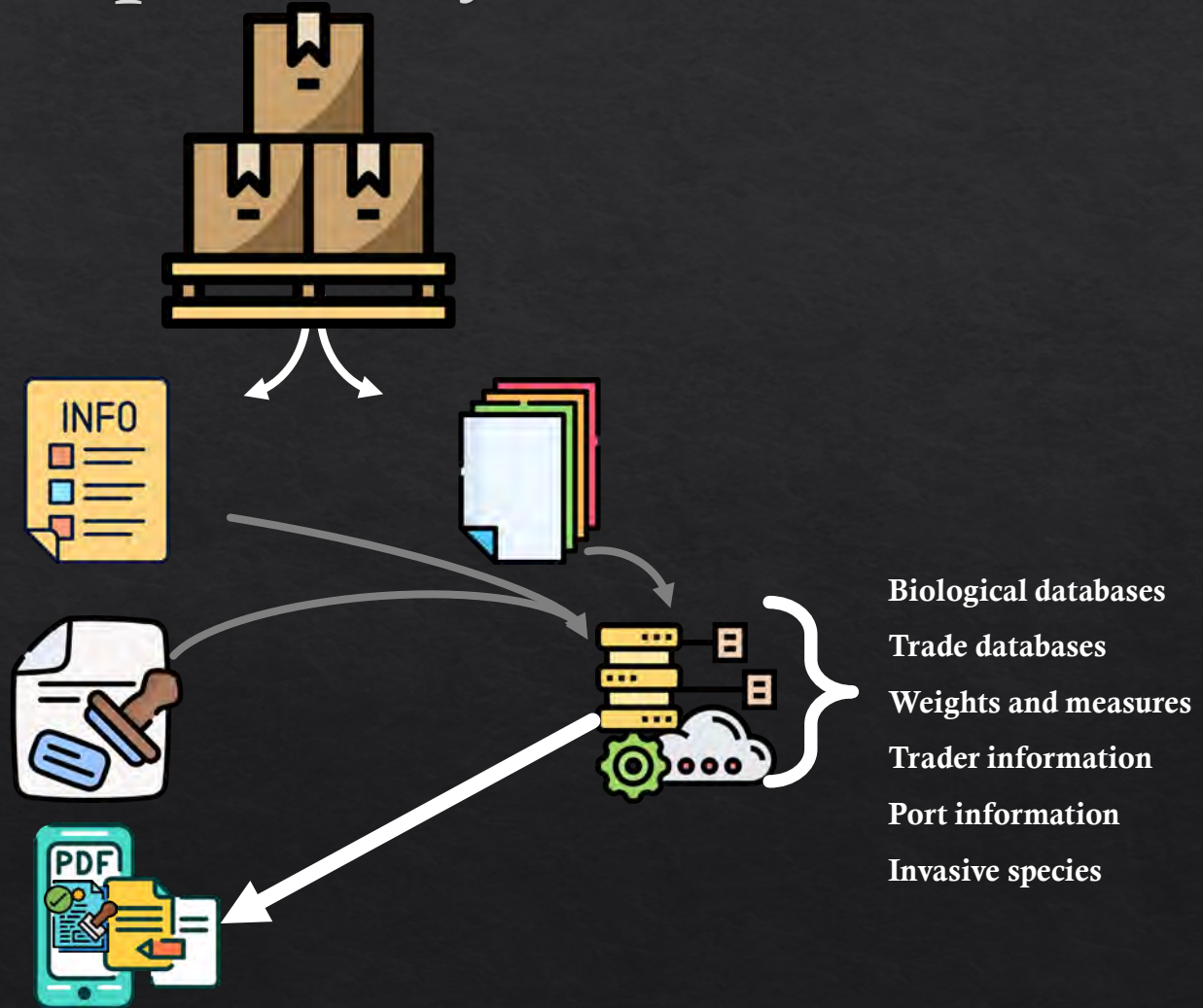
Invoice
Shipping manifest



Proposed System

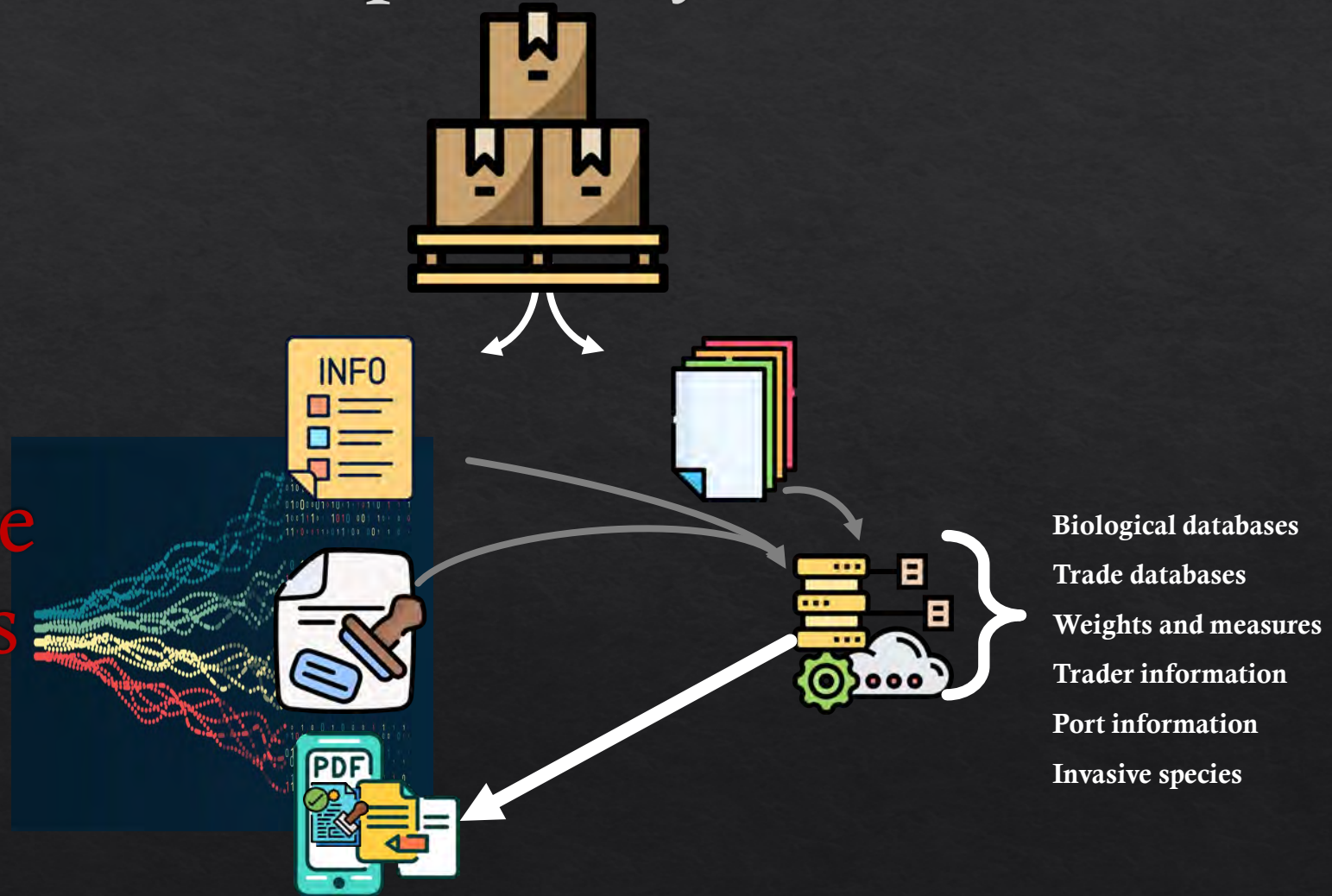


Proposed System



Proposed System

invasive
species
data





REPORT ON USE OF THE NATURE INTELLIGENCE SYSTEM:

Automated Screening of Commercial Import Documentation – Simulation

August 16, 2021

Updated December 13, 2021

Helen Gerson

Yasmina Remmal

Food, Plant and Animal Program



Collect invasive species data at trade bottlenecks

Customs for international

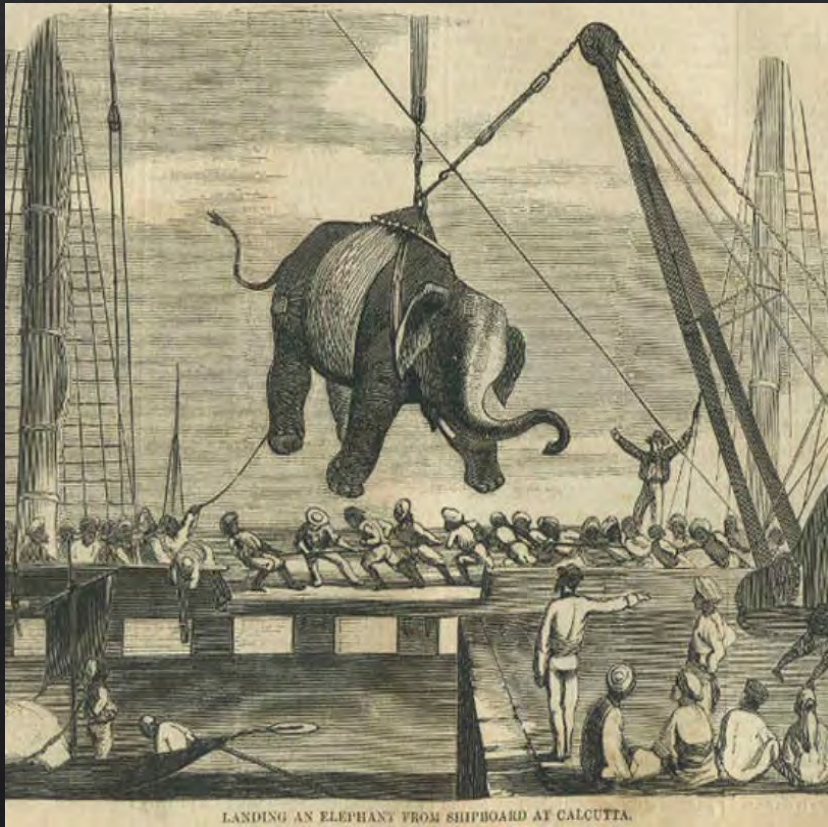
~Andy Rhyne



Ebay / online retailers for domestic

~Phill Cassey



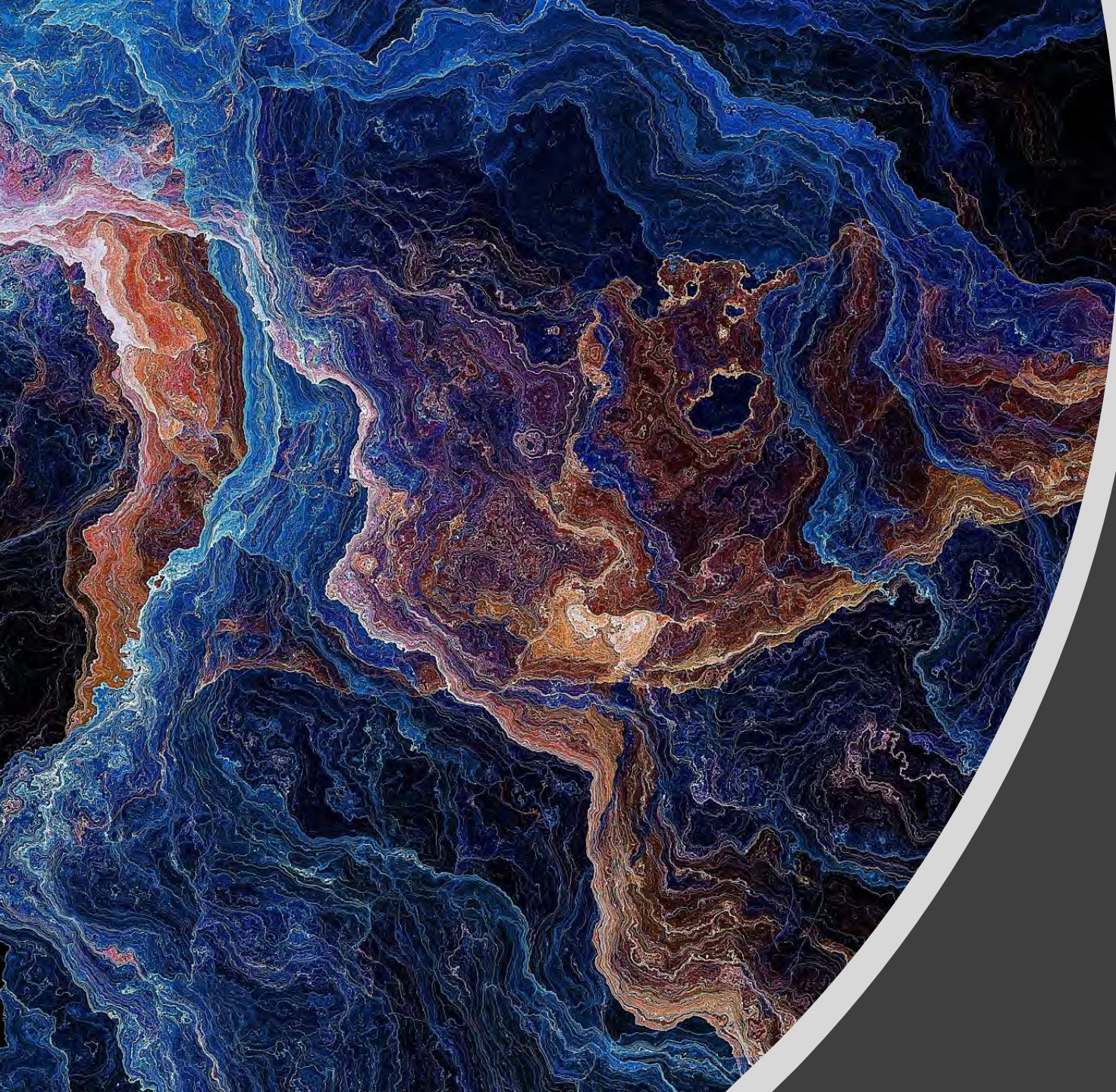


<https://diwerent.com/blog/thailands-amazing-wildlife-194>

Conclusions:

Improve data collection

- To species level
- Automated
- Flag invasive species
- Current trade
- Historical view as well



Work Groups

Modeling past successes

2012 workshop in Phoenix, Arizona to create a 6-page action plan to establish clear legal and regulatory approaches at the federal/national, regional, state, and local levels to minimize the expansion of invasive mussels through watercraft movements in the western United States.

Simple approach:

Who, What, Why, When, Metric for Success, Budget



A collage of informational graphics. At the top is a sign that says "CALL BEFORE YOU HAUL 1-844-311-4873". Below it is a sign that says "OVERSIZE LOAD". There are several circular callouts with text: "You Provide..." (listing waterbody origin, travel route, time frame, decontamination, hauler and boat owner contact info, salt waterbody, and est. time out of water); "What Happens After You Call?" (stating that the destination state will contact you to ensure your boat is inspected, and if necessary, decontaminated, before or upon arrival to its destination); "Why is This Important?" (stating that Call Before You Haul prevents unnecessary delays for you and your customers, and ensures you will not be violating pertaining to unlawful transport of invasive species); "Prevent Delays" (stating that aquatic invasive species hitchhike on boats, trailers, and motors in both visible and hidden locations, and that trained professionals will inspect and certify your boat to prevent costly delays); and "A commercial hauler..." (stating that a commercial hauler and the company driving a vessel is held liable for the contaminated lines, and that you should save the services, not the cargo, one toll-free west).



Work Groups

- Outreach and Education
- AIS Information Infrastructure and Access
- Voluntary Industry Standards
- Regulations
- Monitoring, Inspection, and Enforcement
- Labeling and Recordkeeping

Sign up for work groups:
bit.ly/3HPDdC5



Goal: Develop strategies and an implementation plan to address key challenges associated with 7 focal areas



Meet virtually 4x between March 2023-September 2023 (estimated 3 hours/mtg) – short homework between meetings



After 2nd meeting, reconvene for short virtual presentations to share progress made to date and key challenges



After 4th meeting, reconvene for 2nd summit to share strategies and implementation plans merged into one Action Plan

Task: Identify up to 10 key issues/gaps/challenges associated with your topic, prioritize those issues, and then develop a suite of tasks and subtasks to address those issues.

Work Group Template

AIS Information Infrastructure and Access							
Issue	Solutions to Address Issue	Lead	Participants	Timeline	Budget	Performance Metric	Status
Example: Ability to find lists of allowable, or restricted, aquatic plants and animals by state and province	1. Work with state agencies and Canadian provinces to achieve some level of uniformity in and access to allowable, or restricted species lists						
	a. Document the specific location of all allowable and restricted aquatic plants and animals in the states and provinces	Conservation Collaborations and Creative Resource Strategies, LLC	State and provincial agency staffs, AFWA	Nov-23	n/a	The URL of all state and provincial aquatic plant and animal lists are compiled.	A total of 15 states have provided URLs for their allowable or restricted species lists as of 4 Mar 2023.
	b. Create a one-stop shop location on the Internet where buyers, sellers, and others can obtain state and provincial allowable and restricted aquatic plant and animal lists. Note: This one-stop shop will link directly to state and provincial pages.	Conservation Collaborations and Creative Resource Strategies, LLC	State and provincial agency staffs, AFWA	24-Feb	n/a	Create a page on https://www.aisincommerce.org that includes hyperlinks to all state and provincial allowable and restricted species lists	https://www.aisincommerce.org has been created, and a page on the site will serve as the hyperlink repository for the state and provincial lists.
	c. Work with states and provinces to achieve, at least on a regional basis, some level of uniformity associated with the types of allowable and restricted species lists provided.	National Sea Grant Law Center, Conservation Collaborations, LLC and Creative Resource Strategies, LLC	State and provincial agency staffs, AFWA	24-Jun	n/a	State and provincial allowable and restricted species lists are more uniform in terms of	

Your toolbox



LITERATURE
REVIEW – BMPS



PRE-SUMMIT
SURVEY RESULTS



SUMMIT
POWERPOINTS



YOUR
EXPERIENCE

Tracking Progress

- Each workgroup will have a page on the AIS in Commerce website to share information and progress
 - Prioritize issues
 - Develop potential solutions

www.aisincommerce.org



Thank you, everyone!

Speakers and Participants

AQUATIC INVASIVE SPECIES IN COMMERCE DEVELOPING STRATEGIES TO MITIGATE RISK THE SUMMIT SPEAKER LINEUP



This project supported by:



Dr. Linda Walters
U Central Florida Professor

Dr. Linda Walters is a Pegasus Professor in the Department of Biology at the University of Central Florida, where she has been on the faculty for 26 years. Her marine conservation and restoration research is focused on Florida's coasts and estuaries and includes publications on invasive species, climate change, anthropogenic losses of foundational species, algal blooms, and plastic-free coastal restoration methods. In addition to research, Walters and her students are very active in the community through restoration projects, sharing marine biology at events, and writing children's books. To date, Walters has led the production of 3D book titles on marine conservation; all are shared at no cost for families and educators. To date, over 99,000 copies have been printed and distributed, including two books focused on reducing aquarium releases. Digital copies are available at: <https://stars.library.ucf.edu/ceelabbooks/>. Walters has her BS in Biology from Bates College, and a MS and PhD in Biology from the University of South Carolina.

Christine has been the CEO of PJAC since 2020. The Pet Industry Joint Advisory Council of Canada (PJAC) provides leadership and communication between all sectors of the pet industry through resources, training, and advocacy to promote the highest level of pet care. Since joining PJAC Canada in mid 2020, Christine has successfully raised the profile and understanding of the pet sector with all levels of government. PJAC has over 1,700 members and as part of the International Pet Advocacy Council (IPAC), Christine collaborates with over 20 other pet associations around the world to support responsible pet businesses in Canada and abroad. She also joined the Board of Directors of the Canadian Council on Invasive Species in 2022.



Christine Carriere
CEO - Pet Industry Joint Advisory Council of Canada



Gary Fish
Maine State Horticulturist

Gary Fish is the Maine State Horticulturist. He has a B.S. degree in Forest and Wildlife Management from the University of Maine, College of Forest Resources in 1982. Gary has been the State Horticulturist since 2015. He also served as Manager, Pesticide Programs for Board of Pesticides Control for 28 years. He has practiced off and on as a Licensed Professional Forester since 1985 at Kents Hill Forestry Services. Gary is the Former chair of the Arborist Board and worked as horticulturist for ChemLawn Services Corporation for 5 years, 1983-1988. Gary grew up in Farmington, Maine. He was an entomologist from birth and was inspired to love plants by his mother who always grew beautiful roses and rock gardens. Gary is a landscape and nature photographer. (Phish Photography on Etsy) <https://www.etsy.com/shop/phishphotography>

Stephanie received a B.A. in History from Penn State University and a joint J.D./Masters of Studies in Environmental Law from Vermont Law School. She is licensed to practice law in Pennsylvania and Mississippi. Stephanie has served as the Director of the NSGLC for more than 10 years and engages in a variety of legal research, education, and outreach activities related to ocean, coastal, and natural resources issues. Her research on natural resources, marine, and environmental law issues has been published in a variety of publications. Stephanie has conducted extensive research on marine and freshwater invasive species. Recent relevant publications include "U.S. Regulatory Framework for Genetic Biocontrol of Invasive Fish" in the journal *Biological Invasions* (September 2012); "Legislative and Regulatory Efforts to Minimize Expansion of Invasive Mussels through Watercraft Movements" in the *Arizona Journal of Environmental Law and Policy* (Summer 2013).



Stephanie Otts
National Sea Grant Law Center Director



Tim Campbell
Wisconsin Sea Grant AIS Program Manager

Tim Campbell is the aquatic invasive species program manager for the University of Wisconsin Sea Grant Institute and the National AIS Liaison for the NOAA Sea Grant Program and the USFWS. He supports AIS prevention outreach, communications, and program evaluation, and works to apply university and Sea Grant resources to AIS issues.

Dr. Michael Tlusty is an Associate Professor of Sustainability and Food Solutions at the University of Massachusetts Boston. He uses technological solutions to end the illegal wildlife trade, as well as to improve food production. He was part of the grand prize-winning team for the 2016 Wildlife Crime Tech Challenge and is currently funded to create disease sensors for aquaculture.



Michael Tlusty, PhD
University of Massachusetts - Boston



Kerry Wixted
Amphibian, Reptile, and Invasive Species Program Manager
Association of Fish and Wildlife Agencies

Kerry Wixted is the Amphibian, Reptile, and Invasive Species Program Manager for the Association of Fish and Wildlife Agencies.

Joe Hiduke is the Sales Manager at 5D Tropical and has been there for 15 years. 5D is one of the largest distributors of tropical fish in the country. 5D is a producer of ornamental fish, as well as an importer from all over the world, and supplies pet store chains, distributors, and independent retailers throughout the US. Prior to working in the ornamental fish trade Joe was the general manager of one of the largest reptile farms in the US. He is a graduate of the University of Florida in Animal Science and spent some time at the UF College of Veterinary Medicine in Pathobiology studying Cryptosporidium. Joe is currently serving on the Florida Fish & Wildlife Non-Native Fish and Wildlife Technical Assistance Group representing hobbyists/terrestrial pets a representative of the United States Association of Reptile Keepers, Florida. He has also participated in the Pet Advisory Network (formerly PJAC) Aquatics Committee. He was a contributing author to the National Reptile Improvement Plan, a proposal that came about due to the discovery of ticks known to be *Cowdria* vectors on imported reptiles.



Joe Hiduke
5D Tropical Sales Manager

Closing Remarks

- **The time is now** to engage everyone involved in reducing the spread of AIS in commerce.
- The scope and scale of these issues requires us to **work collaboratively to develop effective and efficient solutions.**
- **There is no one singular strategy** that can address these issues.
- **Everyone in the supply chain has a responsibility** to prevent the spread of AIS in commerce.
- **We need a disciplined approach to make progress** – we do not have to address all issues simultaneously.
- Examples of intentional fraud or illegal activities exist, but the **majority of people have positive intentions.**
- **We have great examples** of how industry, government, and citizens can work together to address AIS (e.g., watercraft vector).

Sign up for work groups:

bit.ly/3HPDdC5

