

Uninvited Guests: Aquatic Invasive Species & Threat to Ecosystems & Economies



*Margaret M. (Peg) Brady, DOC/NOAA Senior Policy
Liaison to NISC & ANSTF
The Canada Institute & Woodrow Wilson Center
8 May 2012*



Outline

- What is AN(I)S ?
- What are the pathways?
- What are the known ecosystem and economic impacts?
- What's being done?
- Actions underway
- Questions



What are ANS? (Note: often referred to as AIS)

- “non-native aquatic organisms (plants, animals, or pathogens) that impact the diversity or abundance of native species, the ecological stability of infested waters, and/or the commercial, agricultural, aquacultural or recreational activities dependent on such waters.”
 - *FROM THE NONINDIGENOUS AQUATIC NUISANCE PREVENTION AND CONTROL ACT OF 1990*

Pathways

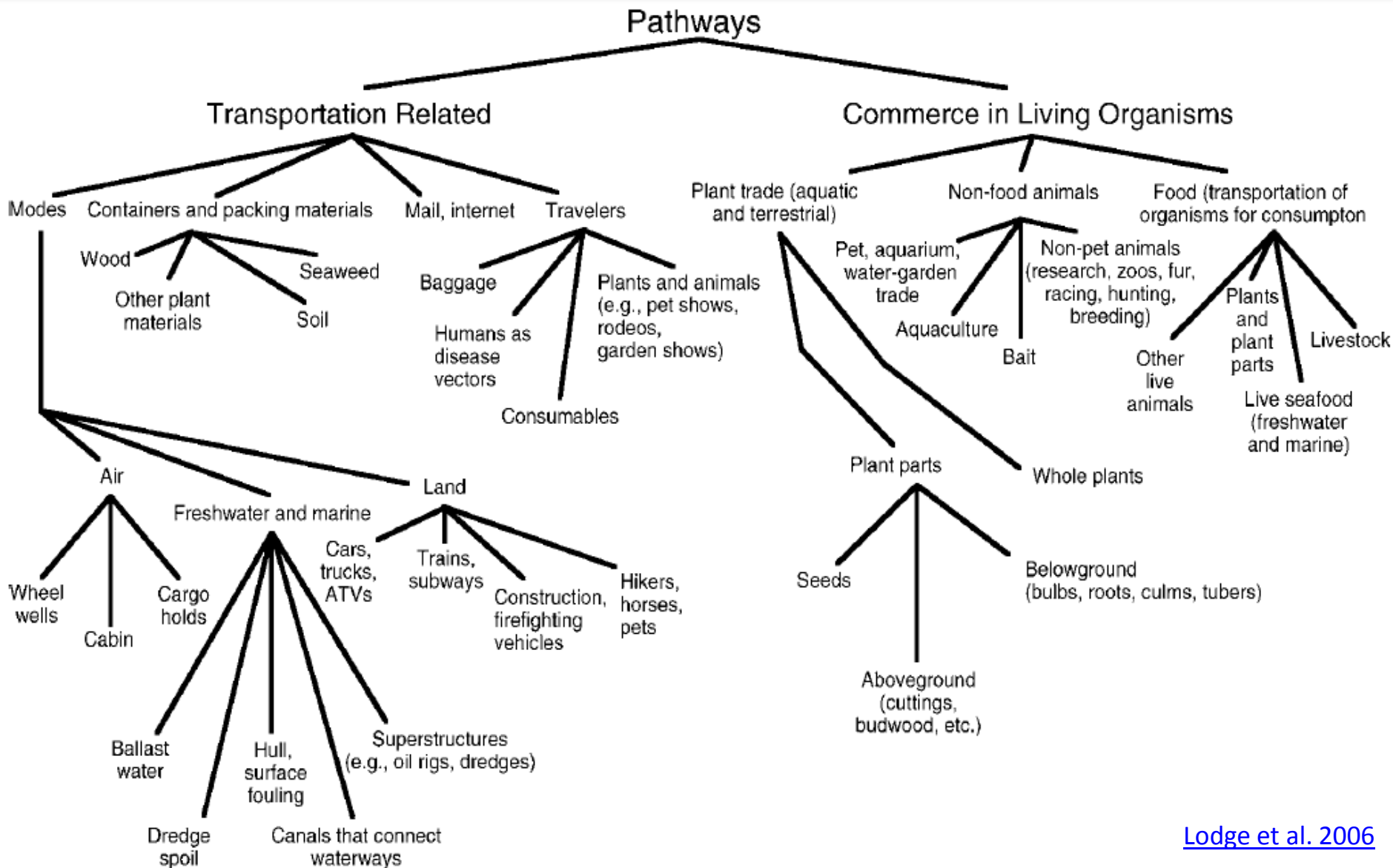
- Ship Ballast Water
- Ship Hull Fouling
- Aquaculture
- Recreational Activities
- Aquarium Releases
- Imported as Live Food
- Bait Bucket Releases/Imported Bait
- Stocking for Sportfishing
- Biological Controls
- Restoration



Keith Hayes – CSIRO Australia



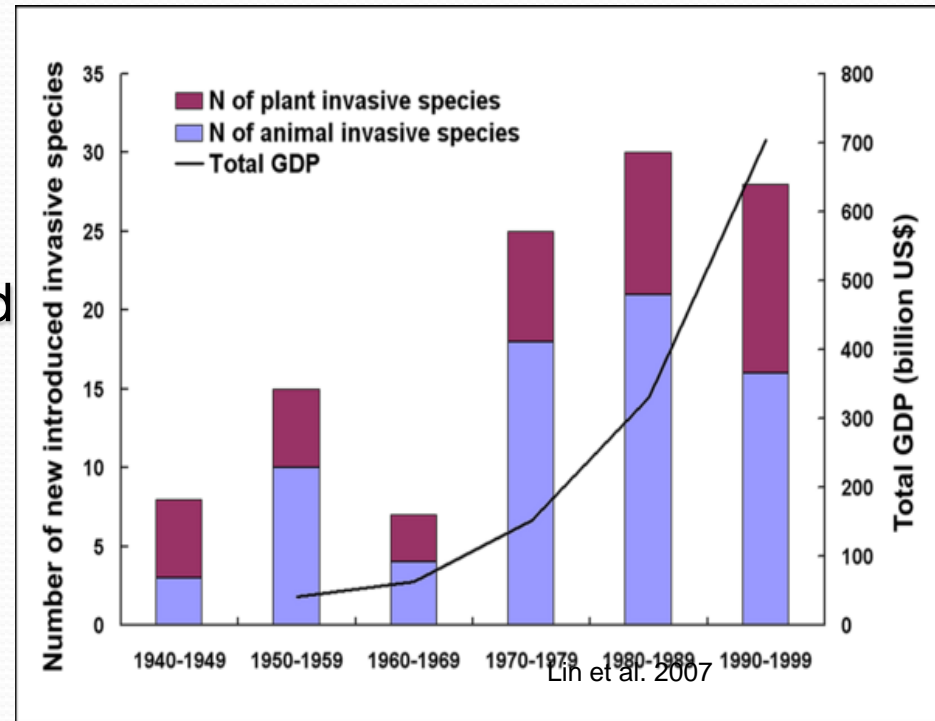
Introduction and Spread Pathways





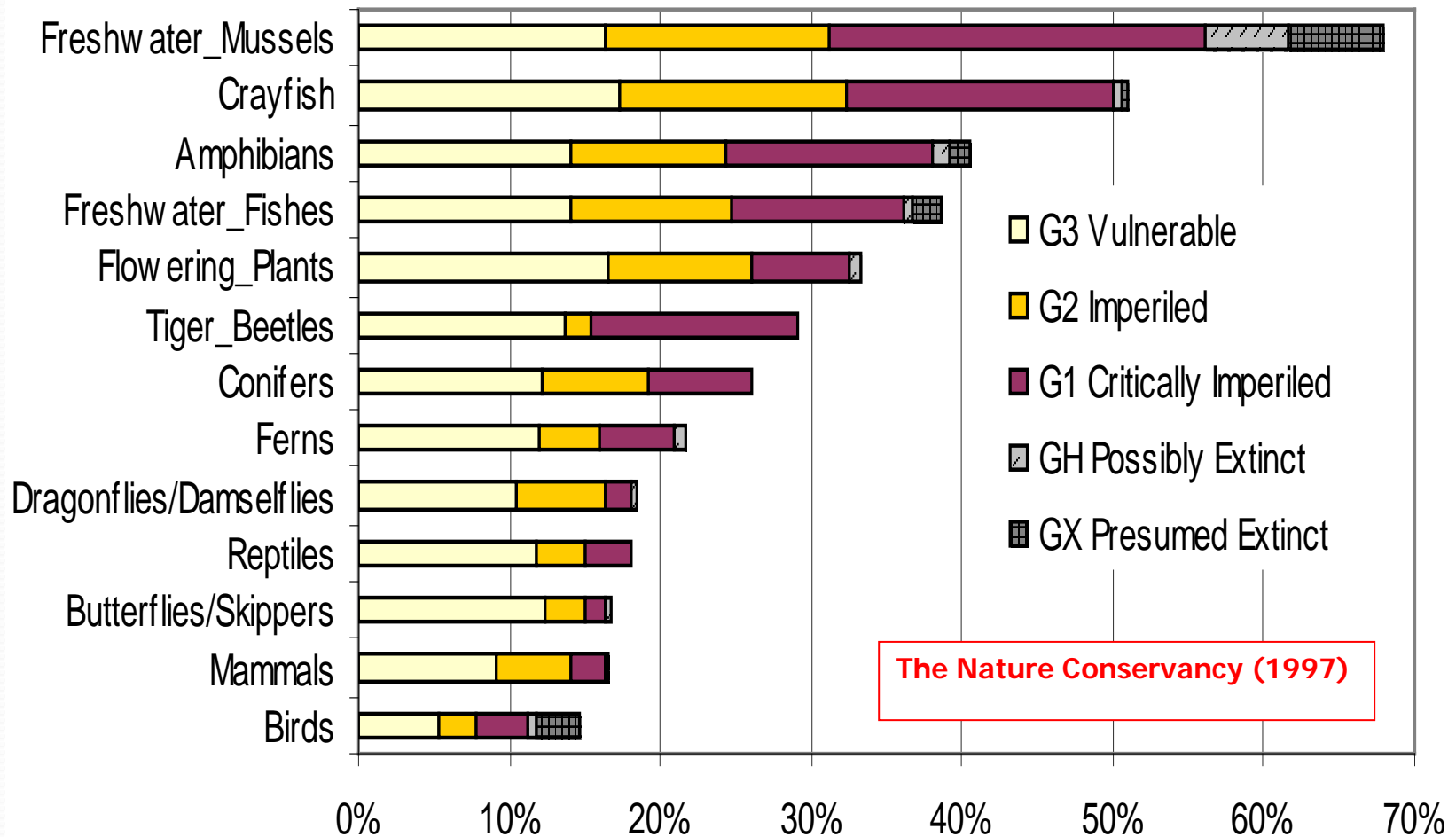
Impacts: Ecosystems & Economies

- Second only to habitat destruction as threat to global biodiversity and ecosystem integrity.
- Estimated U.S. annual cost associated with introduction of *some* aquatic invasive species (e.g. aquatic weeds, zebra mussels): ~ \$7.8 billion (*Pimental, 2005*).
- May exceed \$138 billion/year in the USA alone.
- Number/frequency of introductions is increasing globally.
- Most invasions linked to human activity (intentional & unintentional).
- Displace native species, change community structure and food webs (e.g. lionfish trophic impacts documented by NOAA in SE US coastal waters).

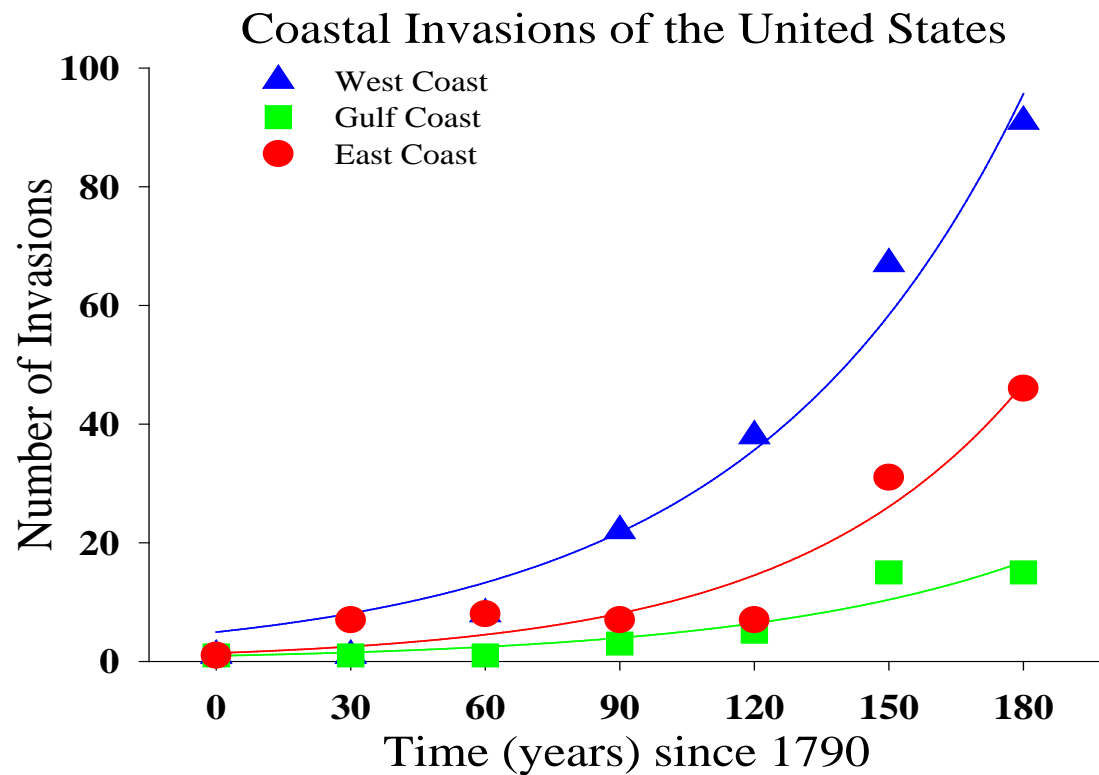




Top most imperiled fauna in North America



Increasing detection rates of coastal invasions in North America



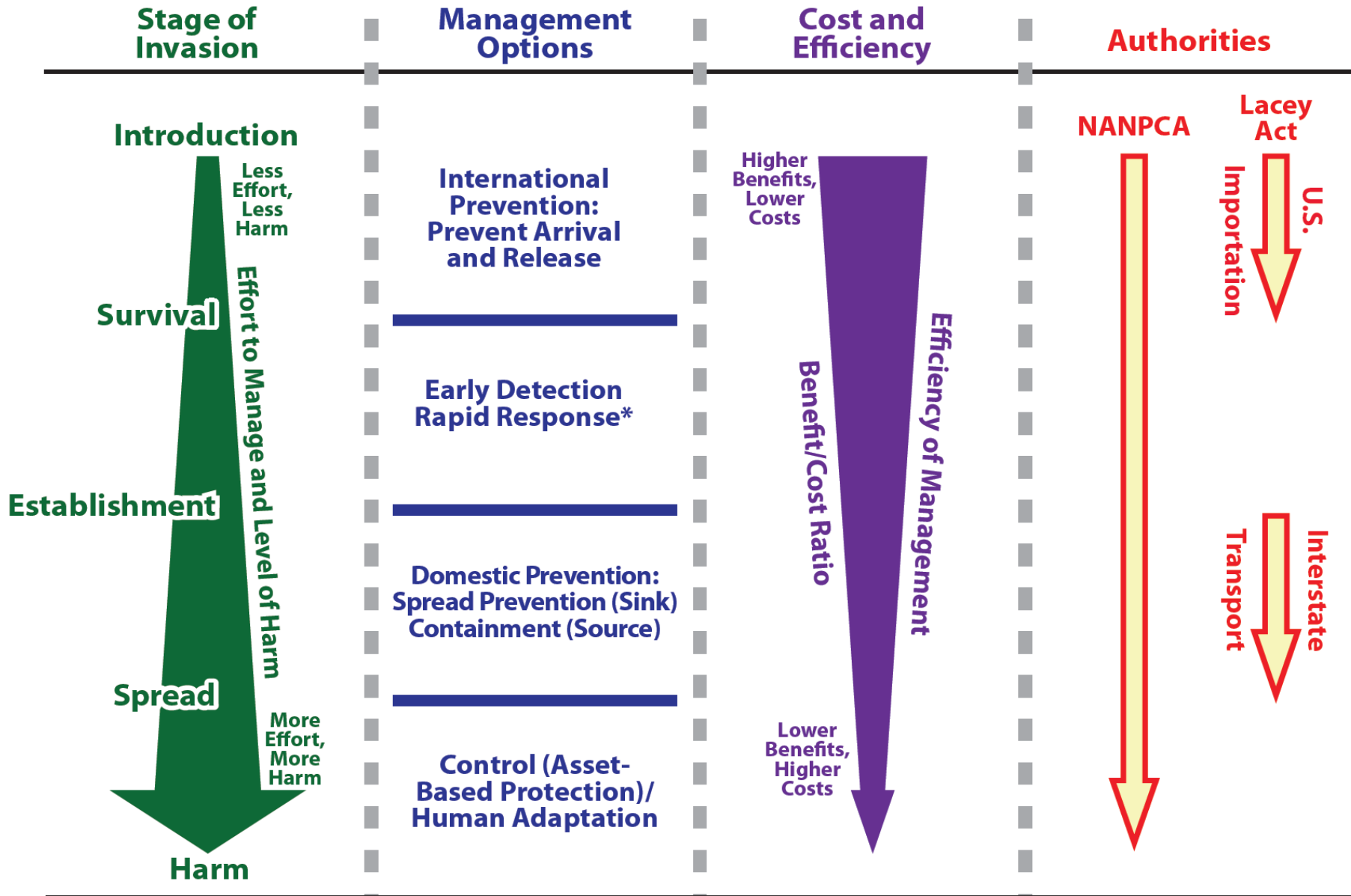
Ruiz et al 2000

Pathways – Road to Prevention



- Once established AIS are costly and nearly impossible to eradicate.
- Control: very expensive (e.g., ~\$15M per year for incomplete control of sea lamprey in Great Lakes).
- Prevention: often less costly than control & long-term management.
- Interdicting **pathways** is the method of choice for prevention, coupled with early detection and rapid response (EDRR).

Aspects of the Invasion Process



*Note: Early Detection and Rapid Response applies to both International and Domestic Prevention

Adapted from Lodge et. al. 2006

Graphic by Don MacLean, USFWS
April, 2012



What's being done?

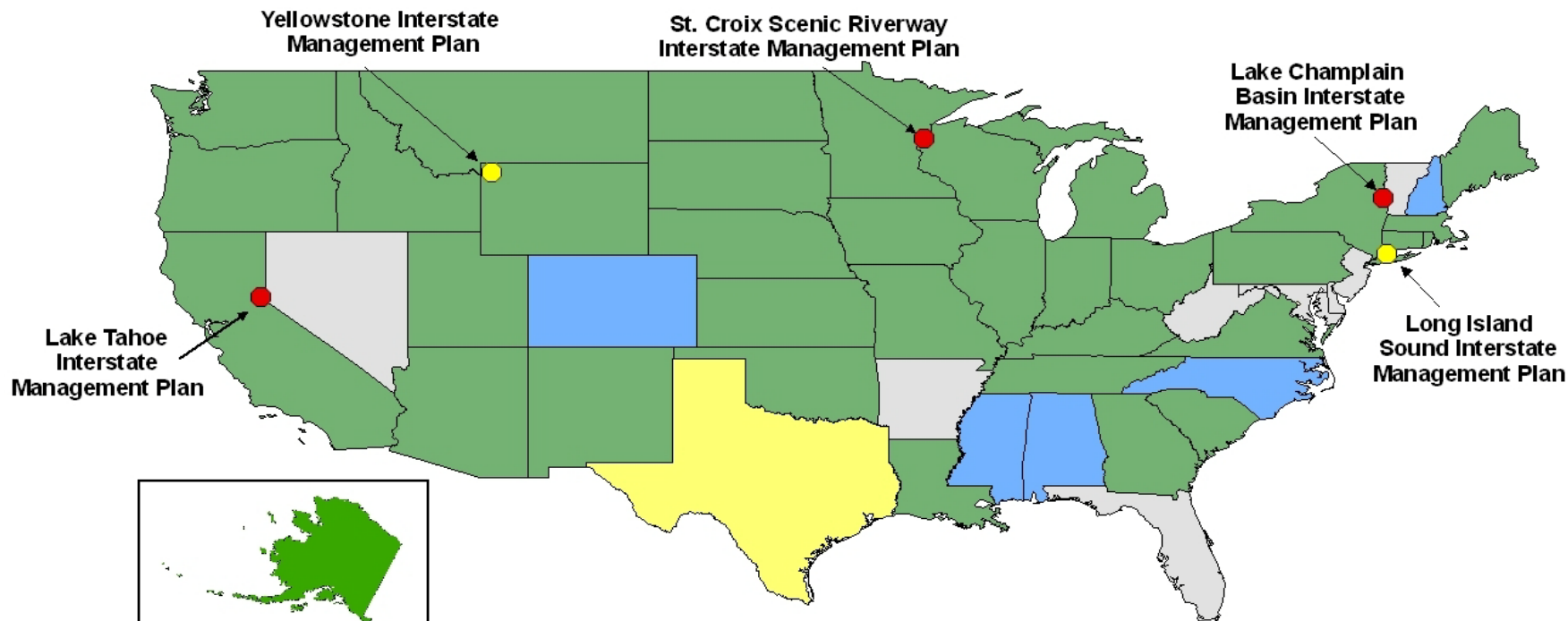


U.S. Federal Drivers: AIS

Non-indigenous Aquatic Nuisance Prevention and Control Act & National Invasive Species Act (1990 & 1996)

- First nationwide, comprehensive policy recognizing AIS as ecosystem threat.
- Requirements for prevention, control, management, outreach & education, and international cooperation.
- Established the Aquatic Nuisance Species Task Force co-chaired by NOAA and FWS.
- Role and scope of Regional Panels and State AIS Management Plans outlined.





State ANS Management Plans

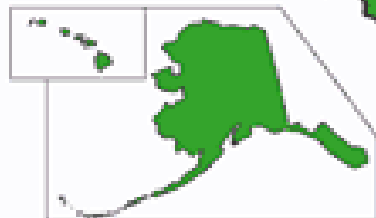
- States with Approved Plans
- States with Conditionally - Approved Plans
- States with Draft Plans
- States with Unknown Plan Status
- Approved Interstate Plans
- Draft Interstate Plans



The Regional Panels of the Aquatic Nuisance Species Task Force

Western

(Members include: AK, AZ, CA, CO, HI, ID, KS, MT, ND, NE, NM, NV, OK, OR, SD, TX, UT, WA, WY and Guam - Estab. 1997)



Great Lakes

(Members include: IL, IN, MI, MN, NY, PA, OH, WI - Estab. 1991)



Northeast

(Members include: CT, MA, ME, NH, NY, RI, VT - Estab. 2001)



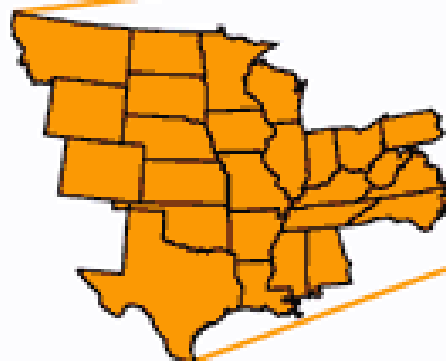
Mid-Atlantic

(Members include: DE, DC, MD, NC, NJ, NY, PA, VA, WV - Estab. 2003)



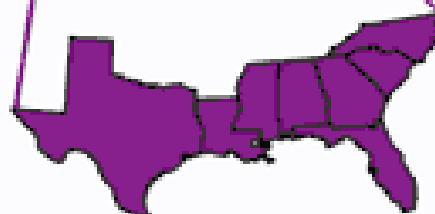
Mississippi River Basin

(Members include: AL, AR, CO, IA, IL, IN, KS, KY, LA, MN, MO, MS, MT, NC, ND, NE, OH, OK, PA, SD, TN, TX, VA, WI, WV, WY - Estab. 2002)



Gulf and South Atlantic

(Members include: AL, FL, GA, LA, MS, NC, SC, TX - Estab. 1999)



June, 2010
Graphics by Don MacLean, USFWS



2013-2017

ANSTF Strategic Goals

- ANSTF Coordination
- Prevention
- Early Detection and Rapid Response
- Control and Management
- Restoration
- Education and Outreach
- Research
- Funding



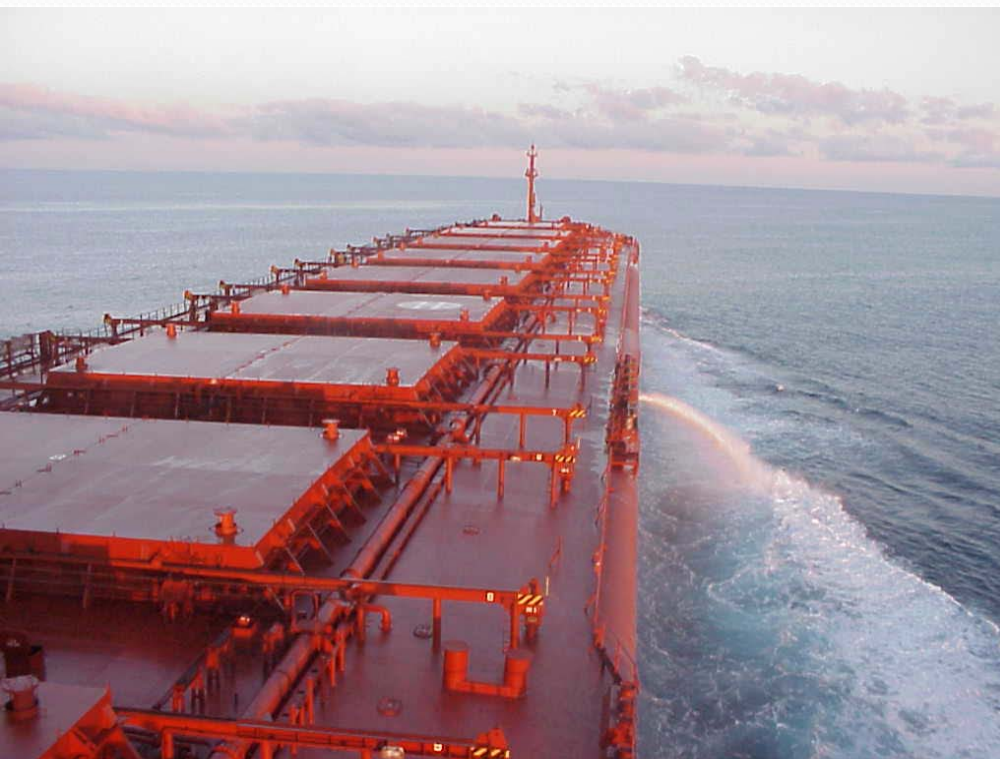
USCG Ballast Water Discharge Std. Finalized

(effective June 2012)

***Challenge: ~100,000 Arrivals to US Ports and Places
Annually (Overseas + Domestic)***

~ 50 million metric tons of BW/year from overseas arrivals

~130 million metric tons/year coastwise arrivals



Why a BW discharge standard?



Photo courtesy of SERC.

- In U.S. waters, over 60% of vessels can not exchange appropriately due to their routes (< 200 nm).
- Effectiveness of ballast water exchange varies.
- Provides a clearly defined benchmark for treatment technology development.
- Aids in verifying compliance with BWM requirements.



Brief Overview of USCG Rule: Essential Elements

The BW Discharge Standard rule:



Zebra mussel

- **Sets a concentration-based standard (# of organisms/volume of ballast water)**
- **Sets an implementation schedule, vessel applicability, legal and regulatory exemptions**
- **Harmonized with International Maritime Organization**
- **Be used to approve BW treatment technologies for:**
 - Biological Efficacy (testing requirements)**

NOAA Actions:

Great Lakes Restoration Initiative (GLRI)

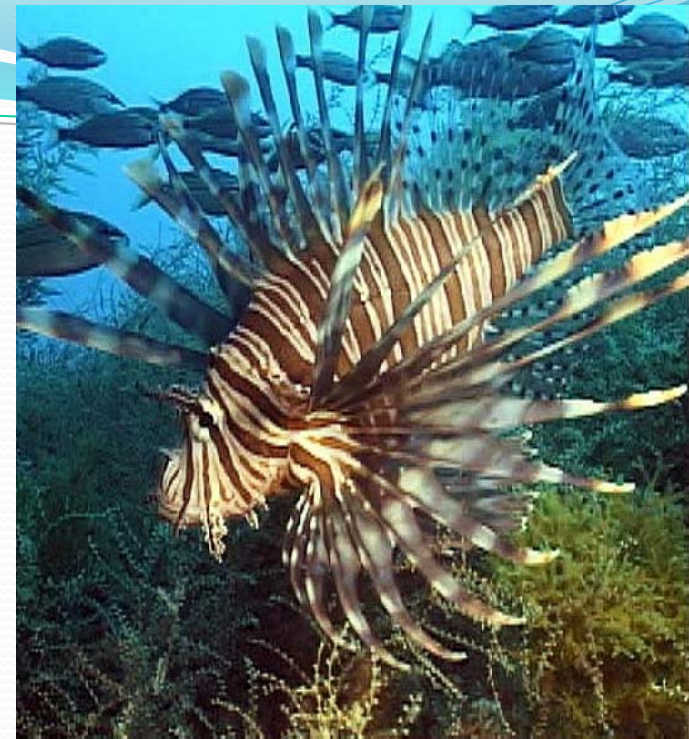


- Funding was received from the Environmental Protection Agency through President Obama's Great Lakes Restoration Initiative.
 - In 2010, NOAA awarded \$9.2 million to nine projects throughout the Great Lakes Region.
 - In 2011, NOAA awarded \$4.9 million to eight projects throughout the Great Lakes Region.
 - For 2012, NOAA is currently reviewing proposals, up to \$5 million is anticipated for Great Lakes coastal habitat restoration
-
- All GLRI projects include a Special Award Condition for Invasive Species: including development of an HACCP plan & post-project monitoring
 - For more information visit:
http://www.regions.noaa.gov/great_lakes/GLRI/Habitat/habitat.html



NOAA Lionfish Action Plan

The Indo-Pacific lionfish has become widely established within Atlantic and Caribbean waters and poses a significant threat to native coral reef communities. NOAA is the final stages of completing an action plan to respond to this invasion.



The goal of Plan is to understand and mitigate lionfish impacts on U.S. marine ecosystems and providing U.S. leadership to a Caribbean-wide response. To achieve this goal, the plan strives to:

- Identify the most critical actions needed to target management measures and minimize impacts from the invasion
- Develop implementation plans that include leads and supporting entities.

NOAA's actions

Hazard Analysis & Critical Control Point (HACCP) Planning to Prevent the Spread of Invasive Species: updating and revising the Hazard Analysis & Critical Control Point (HACCP) planning process to increase its benefit in preventing the spread of invasive species and continue to offer HACCP training sessions to staff and grant recipients.

Asian tiger shrimp sightings prompts scientific look at invasion concerns:

Researchers from the USGS and NOAA are working with state agencies from North Carolina to Texas to look into how Asian tiger shrimp from Indo-Pacific, Asian, and Australian waters reached U.S. waters, and what the increase in sightings means for native species. (http://www.noaanews.noaa.gov/stories2012/20120426_tigershrimp.html)



RUMORS OF A CHARLIE SHEEN
BOOZY WEEKLONG BENDER
WITH AN ASIAN CARP.
DETAILS AT 11.

IT'S THE ONLY WAY TO GET
THE INVASIVE SPECIES CRISIS
ON AMERICANS' RADAR SCREENS.

NEWS

Questions ?



Contact information: Peg.Brady@noaa.gov

ANSTF website: <http://www.anstaskforce.gov/>

NISC website: <http://www.invasivespecies.gov/>