

Invasives

Non-natives

Exotics

Invaders

Invasive Species

*A non-native plant or animal
deliberately or accidentally introduced
into a new habitat*

(EPA <http://www.epa.gov/bioiweb1/aquatic/exotic.html>)

Vectors

- All caused by humans:

- *Hitchhiker*

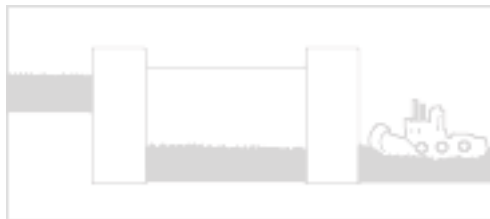
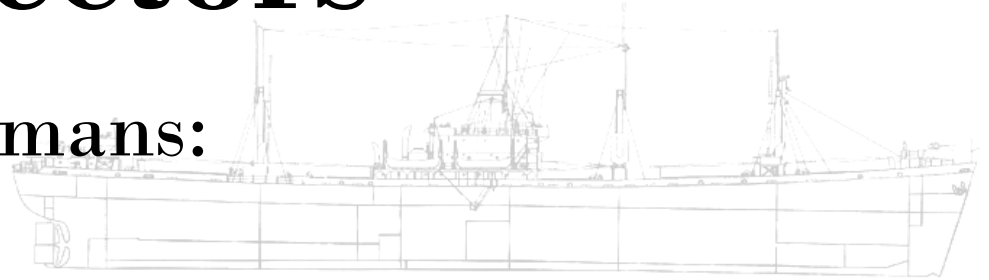
- *Aquarium trade*

- *Ballast water*

- *Bait release*

- *Intentional introduction*

- *Canals*



Impacts

- **Grows at fast rate**
 - due to lack of predators
- **Replace native species=loss of biodiversity**
- **Change an ecosystem**
- **Large economic cost**



Example: Northern Snakehead

- **Native distribution: China, Russia, Korea**
- **Present distribution: Meadow and Willow Lakes in Queens, NYC and Ridgebury Lake in Orange County, NY; also Maryland**
- **Vector: Intentional introduction**
- **Consequences: very aggressive, outcompetes native fishes for food and space**



Example: Round Goby

- Native distribution: Black and Caspian Sea areas of Eastern Europe
- Present distribution: Great Lakes; Mississippi River
- Vector: ballast water; working way along canals and rivers
- Consequences: very aggressive, outcompetes native fishes for food and space



Example: Purple Loosestrife

- Native distribution: Europe
- Present distribution: across much of Canada and the United States



Vector: intentional introduction; ballast water

Consequences: outcompetes native plants; reduces food and habitat for wildlife

Invasive Investigators of NYS

- Objective: to solve the mystery
 - what REAL invasive species are found in NYS
 - where those species are found in NYS
 - what vector they used to get there
- Process: ask questions
 - Players roll a die and move into different "rooms"
 - Ask questions to figure out what "player" did the crime and what "weapon" was used
 - Winner is person that guesses the mystery found in the confidential folder

Directions-Part I

- Each player will be dealt 3-4 cards face down
- Once you receive cards, check off what you have on note sheet
 - SECRETLY
 - Remember you are trying to solve a mystery
 - Then, place cards and note sheet face down

Eurasian Watermilfoil

- Aquatic plant
- Originally from Europe



European Green Crab

- Crustacean
- Originally from northern Europe



Zebra Mussel

- Mollusk
- Originally from Russia; Caspian Sea region



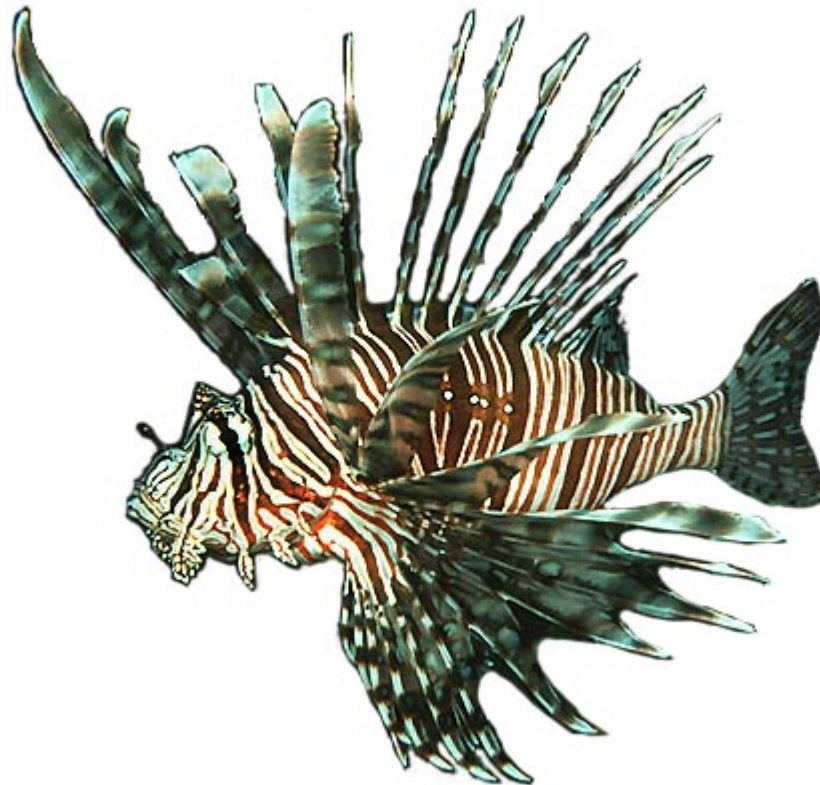
Sea Lamprey

- Jawless fish
- Originally from eastern and western Atlantic Ocean



Lionfish

- Bony fish
- Originally from Indo-Pacific



Water Chestnut

- Aquatic plant
- Originally from Eurasia and tropical Africa



Vectors

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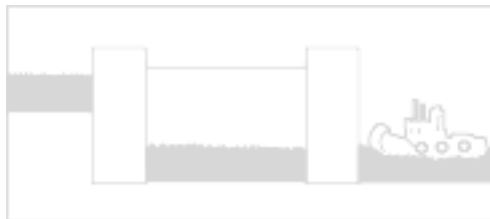
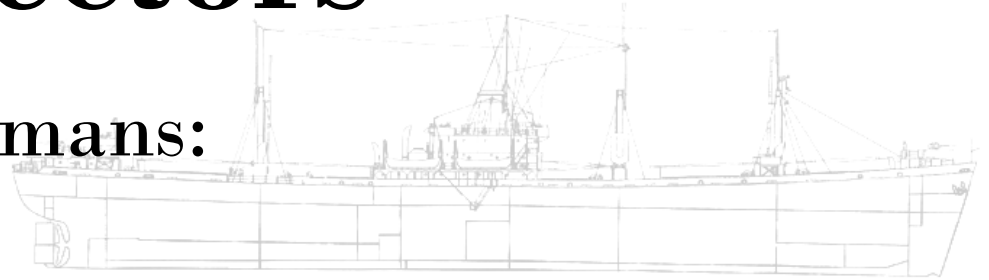
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Directions-Part II

- Pick your player
- Put ALL players in start box
- Red player goes first
 - All together practice

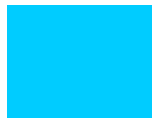
Remember trying to solve the mystery found in the confidential folder=what invasive species, where in NYS, and what vector

Invasive Investigators Key

Players



Eurasian watermilfoil



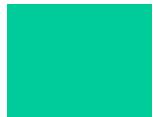
lionfish



European green crab



sea lamprey



water chestnut

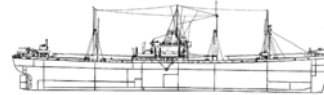


zebra mussel

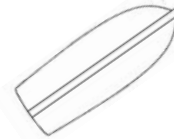
Vectors



Intentional introduction



Ballast water



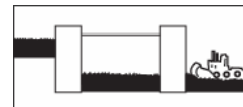
Hitchhiker



Aquarium trade



Bait release



Canals

What can you do?

- Do not release unwanted plants or animals into the wild
- Do not release unused bait
- Remove any plants or animals before transporting equipment



**STOP AQUATIC
HITCHHIKERS!**

References and Photos

- USGS: <http://biology.usgs.gov/invasive/>
- EPA: <http://www.epa.gov/bioiweb1/aquatic/exotic.html>
- Michigan Sea Grant: <http://www.miseagrant.umich.edu/ais/index.html>
- Minnesota Sea Grant:
http://www.seagrant.umn.edu/ais/zebramussels_threaten
- National Sea Grant Office:
<http://www.seagrant.noaa.gov/themesnpa/aquaticinvasivespecies.html>
- USDA National Agriculture Library:
<http://www.invasivespeciesinfo.gov/index.shtml>
- NYSDEC: <http://www.dec.ny.gov/animals/45470.html>