

An Alien Invasion Is Upon Us...



What are Alien Invasive Species?

- Non-native (a.k.a: exotic, alien) to a given ecosystem, and have been accidentally or deliberately introduced by *human activity*. Shown on the right is the Round Goby fish brought over from Europe and now abundant in the Great Lakes in quantities as great as 100 fish/cubic meter in Lakes Erie and Ontario.
- Invasive species are plants, animals and micro-organisms that spread when introduced outside of their natural distribution and cause serious and often irreversible damage to Canada's ecosystems, economy and society.
- According to the world Conservation Union, Invasive Alien Species are the second most significant threat to biodiversity after habitat loss.
- Invasive alien species can be predators, competitors, parasites, or diseases for our



How do they get here?

- New Invasive species are continually arriving in Canada due to:
 - -an increase in worldwide trade
 - -an increase in worldwide travel
 - -Decrease in the time it takes to transport
 - -increased of use of internet and mail orders

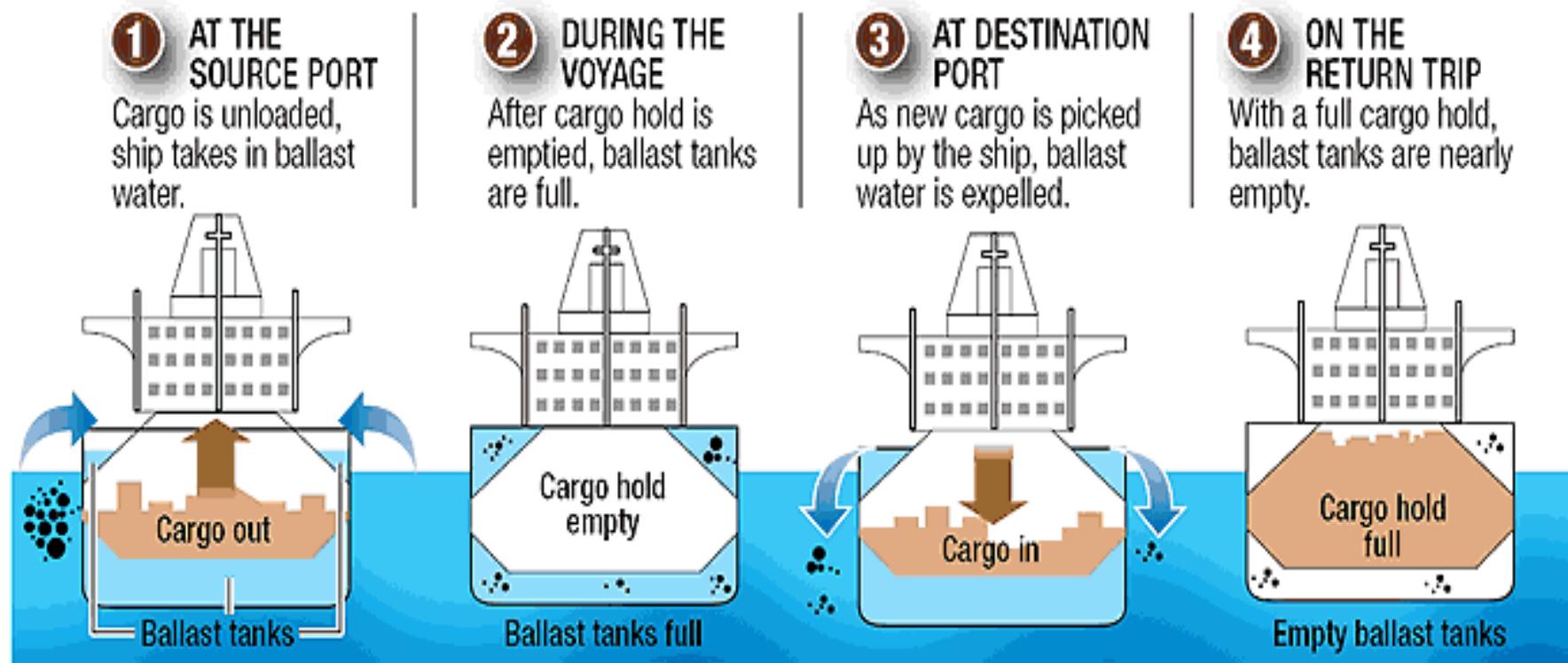


Seen above is the Rusty Crayfish brought to Canada by non-resident fishermen.

THE BALLAST WATER CYCLE

HOW INVASIVE SPECIES ARE INTRODUCED INTO THE GREAT LAKES

Ballast water is required to stabilize an empty ship on the open sea, but those tanks can hold more than water; they often also carry foreign species. The U.S. now requires oceangoing vessels bound for the Great Lakes to exchange their ballast at sea to expel – or kill with saltwater – any freshwater organisms that might have hitched a ride. But most ships that arrive in the lakes are loaded with cargo, don't carry ballast and are therefore exempt from the law. Even "empty" tanks can carry residual puddles and tons of muck, both of which can be teeming with life.



Source: International Maritime Organization

ALFRED ELICIERTO/aelicierto@journalsentinel.com

Issues with Invasive Species



- **Economic Harm**
 - -IAS cost Canada billions of dollars in lost income (ie: fish industry, logging, farming, management costs etc.)
- **Environmental Harm**
 - - threaten extinction, alter habitats and ecosystem functions such as nutrient cycling (ie: garlic mustard's soil toxins), soil degradation and erosion etc.
- **Social/Human Health**
 - -life threatening diseases, poisonous, lost incomes, reduced land values, private property damage

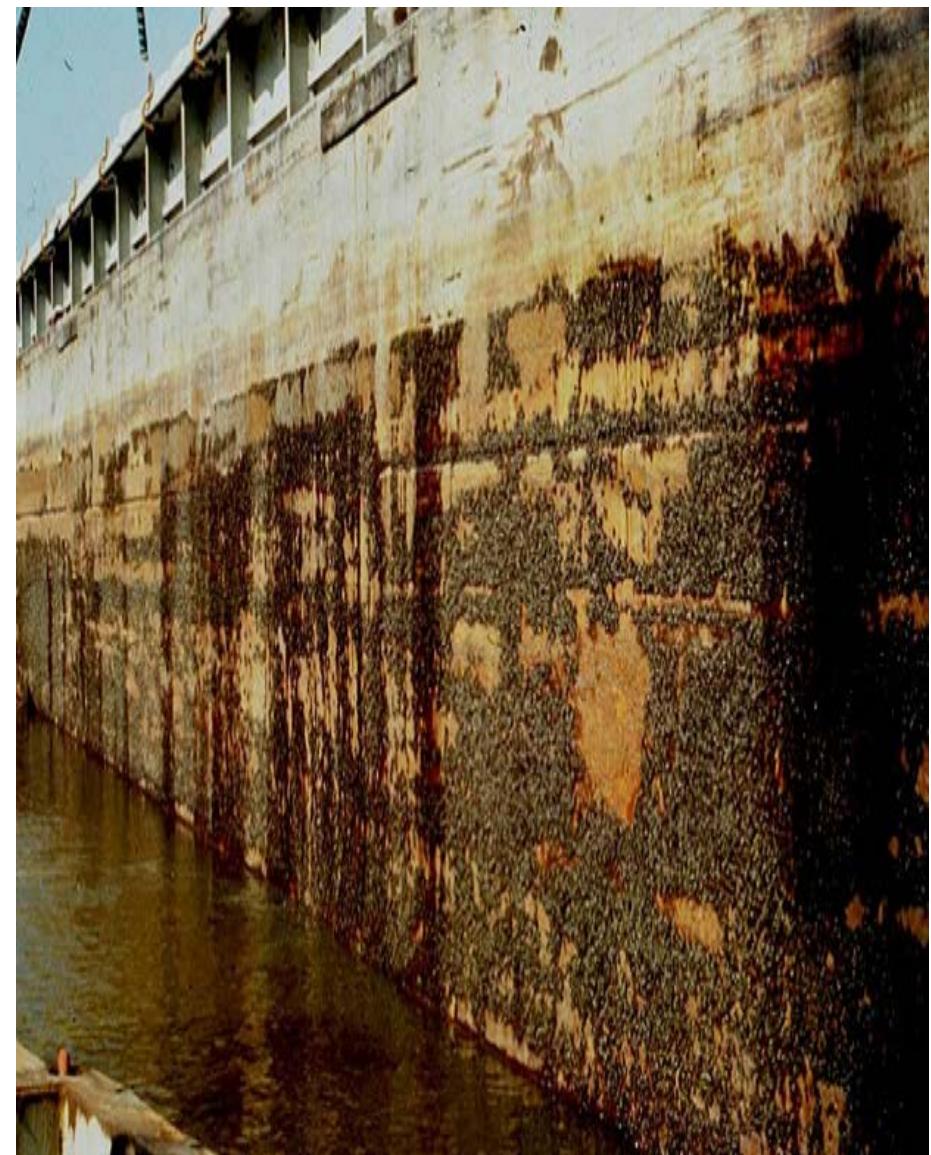
The Zebra Mussel

- Identified in Lake Erie in the early 90s by scientists
- Brought to the Great Lakes from the Caspian Sea in Asia in the ballast water of ships
- With no major competition their populations soared and they spread rapidly throughout the great lakes and all the way to the Gulf of Mexico by 1995



Problems with the Zebra Mussels

- They attach to any hard object. For example, water intake pipes are blocked and power generation, water treatment and freshwater supplies are impeded
- Native Pearly mussels cannot compete & their populations decline
- They attach to native mussels' hard outer shells and prevent them from filter feeding on the bottom of the lake & from moving to more ideal locations for feeding



The Upside of the Zebra Mussel!

They:

- Their discarded shells provide shelter to aquatic insects, snails, water mites etc.
- Provide food for water fowl such as the lesser scaup in the photo
- Have decreased the amount of algal growth caused from fertilizers
- Help filter pollutants out of the water (good news) but then get passed on to predators in the food chain (bad news- bioamplification)



Asian Long Horned Beetle



- Native to China and Korea, arrived in the late 90s and attacked hardwoods/ deciduous trees (ie: sugar maple)
- Adults are shiny black with white spots, long banded antennae with blue legs
- They have wings but can fly only short distances because of their size and weight
- Females chew many 'egg pits' to deposit their egg into the hole (1 egg/hole) reaching the inner bark
- Larvae feed off sap on inner bark then tunnel their way into the wood
- Adults emerge from tunnels and

Emerald Ash Borer



- Highly destructive beetle native to Asia
- First discovered in Windsor in 1992 and has since killed millions of ash trees in North America; found in Sault Ste. Marie (Queen Street)
- Spread through movement of wood and packing materials on cargo
- Adults lay eggs in tree and larvae eat trees from the inside out drilling holes to exit

Purple Loosestrife



- Beautiful but aggressive this plant was carried over here in the early 1800s on a European ship and was used as a medicinal herb for diarrhea, ulcers etc.
- Rapidly degrades wetlands causing habitat loss
- Found locally along Lake Huron waterfront ie: Lakeshore Drive

Garlic Mustard



- Is shade tolerant and lives in wooded areas
- Replaces natural flora
- Kills mycorrhizal fungi on tree roots that trees use for food and that are responsible for nutrient cycling; affects maple trees significantly
- Native to Sri Lanka, India and parts of Europe it was originally brought over for a culinary delight



More Local Invasive Species

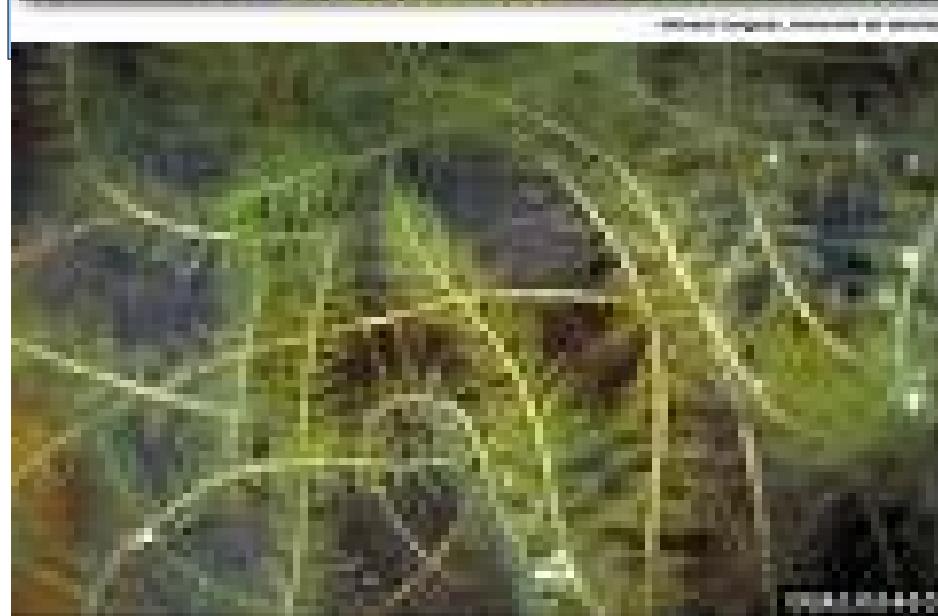
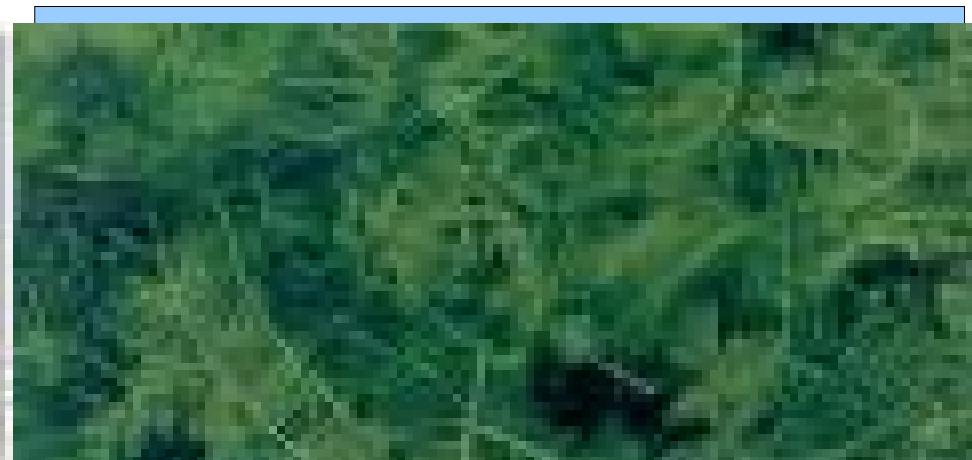


Phragmites

- Grows locally right at Bar River on Hwy.17 in clusters
- Can grow 15 feet tall
- Threaten marsh health- biodiversity, nutrients, habitat etc.
- Burn very easily



Eurasian Watermilfoil



Things you can do...

- Report sightings of invasive species the INVADING SPECIES HOTLINE at 1-800-563-7711
- Don't release aquarium animals or plants or live bait
- Clean recreational vehicles well after use to avoid transporting
- Clean your boots well after hiking etc.
- Verify that plants you purchase for your garden are not invasive- some garden shops actually sell them
- Do not move firewood
- Educate yourself

References & Helpful websites

www.davidsuzuki.org/Forests/Biodiversity/Importance.asp#Ecological

www.ec.gc.ca/eee-ias/default.asp?lang=En&n=98DB3ACF-0

www.invadingspecies.com

www.invasivespecies.gc.ca/english/view.asp?x=1

www.inspection.gc.ca/english/plaveg/invenv/invenve.shtmlwww.invasive.org/

www.algomau.ca/about-algoma-u/research/isri