

# HERE, THERE AND EVERYWHERE: ARE WE PREPARED FOR THE INVADERS?

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# What are they?

## *Alien Species*

- ❖ species introduced beyond their native range by human activity (intentionally or accidentally)



## *Invasive Alien Species*

- ❖ harmful alien species whose introduction or spread threatens the environment, the economy, or society



# Impacts

## Environmental

- change habitat
- alter food webs
- decrease biodiversity (competition, predation, disease)
- threaten species at risk
- disrupt ecosystem services





# Impacts

## Economic

### *Canada*

- \$187 million/year for agricultural, forestry and fishery sectors
- \$13.3-34.5 billion/year to natural resource sector

### *United States*

- \$120 billion/year

### *Global*

- \$1.4 trillion/year







# Impacts

## Human Health

- West Nile, Lyme disease, giant hogweed

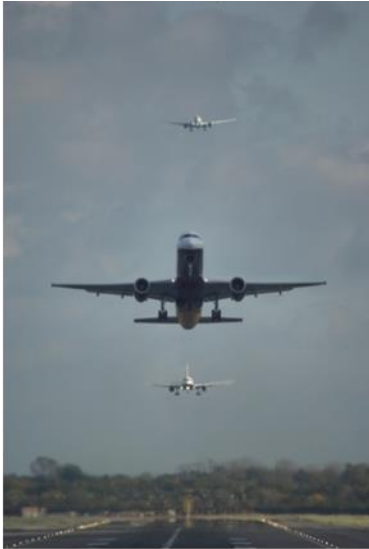
## Socio-cultural

- recreational and cultural pursuits
- nature appreciation
- spirituality





# Key Pathways and Vectors





# Unique Challenges

- ❖ “Self-regenerating pollution”
- ❖ Numerous species, pathways and vectors
- ❖ Predicting invasions
- ❖ Lag time between introduction and impacts
- ❖ Invasional meltdowns







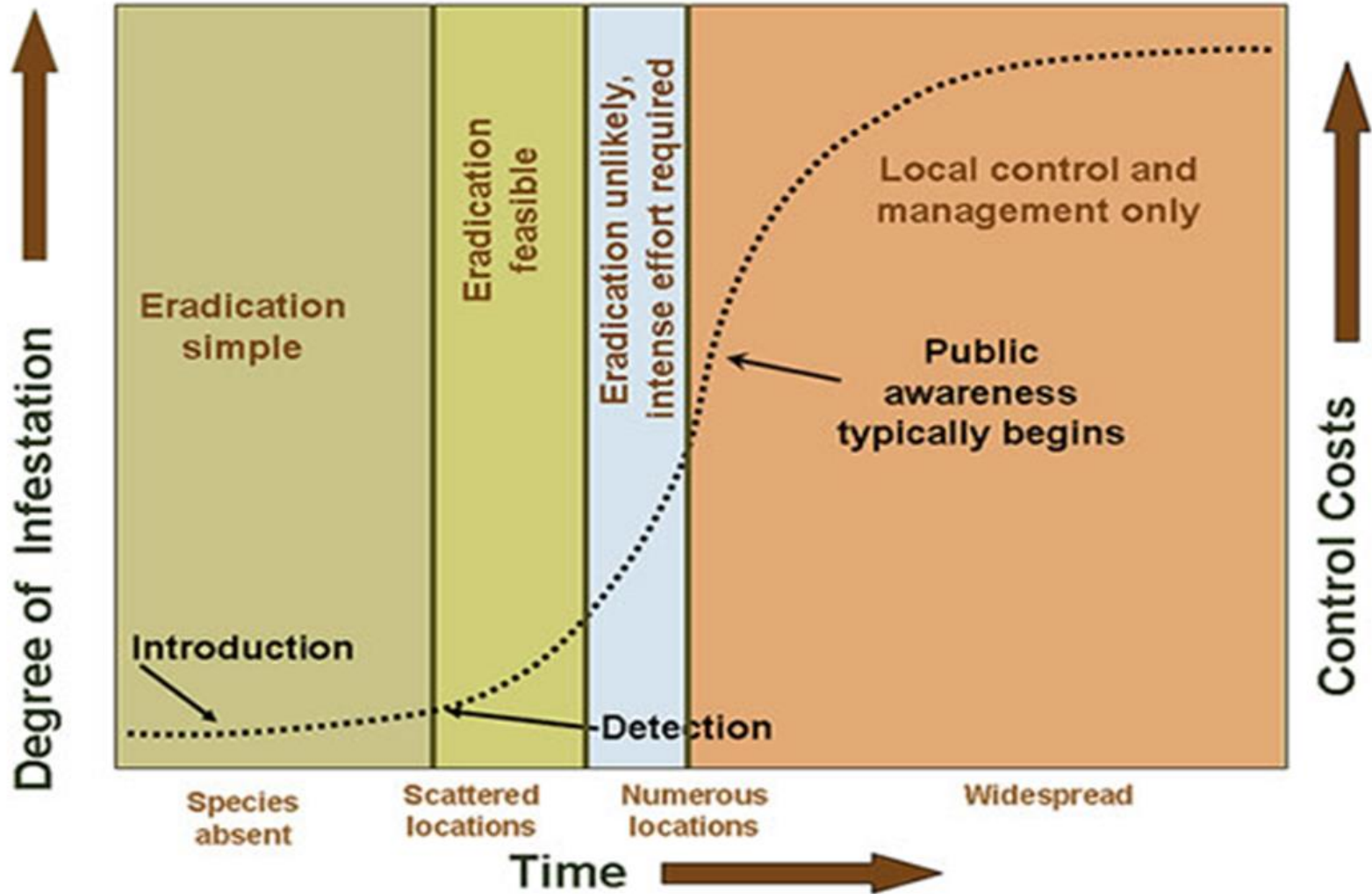
# And that's not all...







## Invasion Stages Through Time





# Situation in Ontario

- ✦ Highest number of invasive species
  - ~441 invasive plants
  - >180 aquatic invasive species
- ✦ Highest risk of invasion
- ✦ Up to 2/3 of species at risk threatened by invaders
- ✦ Total annual cost of zebra mussels: \$75-91 million
- ✦ >1 million trees killed by emerald ash borer in SW Ontario
- ✦ Algonquin Park: “besieged by invasive species”





# Some of the offenders







# Some of the offenders



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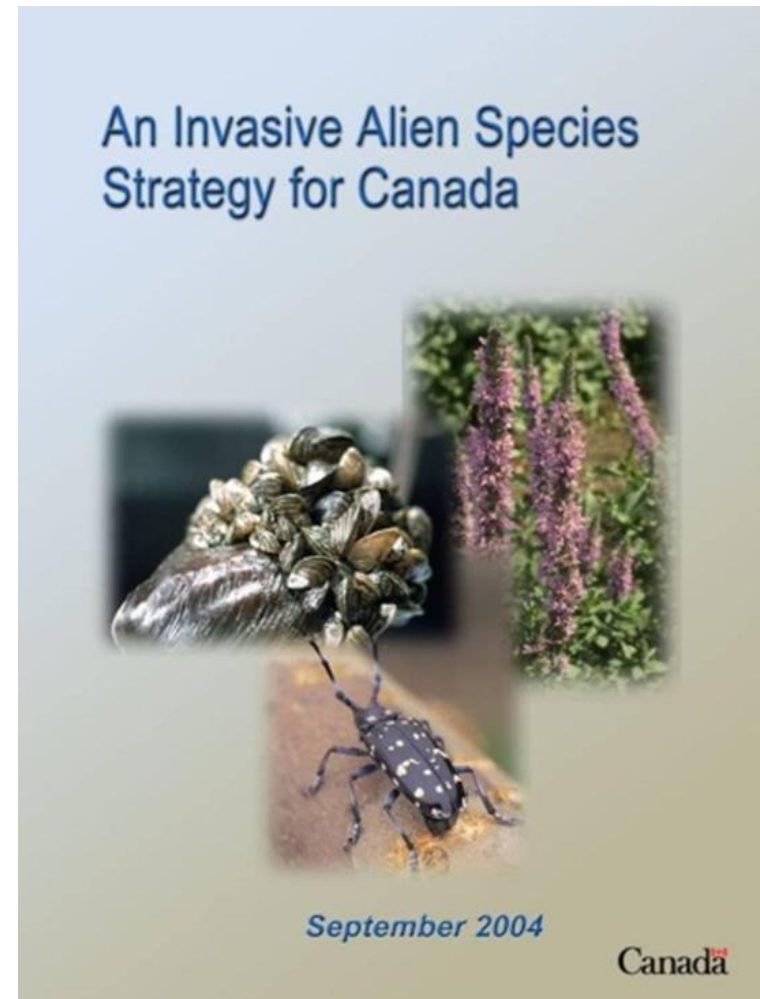
University of Wisconsin-Extension





# How are we tackling the problem?

- ❖ Policy and legislation
- ❖ Public awareness
- ❖ Stewardship





# Federal Legislation

## ❖ Aquatic Invasive Species Regulations (*Fisheries Act*)

- Illegal to import, possess, transport or release live Asian carp and snakeheads
- Illegal to possess, transport or release live round goby, rudd or ruffe
- Illegal to use any of these fish as bait
- Illegal to import zebra and quagga mussels





# Federal Legislation

- Ballast Water Control and Management Regulations (*Canada Shipping Act*)
  - Requires management of ballast water and sediment







# Provincial Legislation

## ❖ *Invasive Species Act*

- November 2016
- First and only dedicated legislation in Canada
- Framework for restricting possession, transfer, sale, release and propagation of invasive species
- Regulated list of species (prohibited and restricted)
- Carriers
- Control areas
- Prevention and Response Plans







# *Invasive Species Act*

## ❖ Prohibited Species

- Illegal to possess, transfer, buy, sell, release or propagate
- 3 invertebrates: golden mussel, killer shrimp, yabby
- 5 plants: Brazilian elodea, hydrilla, parrot feather, water chestnut, water soldier
- 8 fish: Asian carp, snakehead, stone moroko, wels catfish, zander





# *Invasive Species Act*

## ❖ Restricted Species

- Illegal to possess in provincial parks and conservation reserves
- Illegal to deposit or release anywhere
- 4 plants: dog-strangling vines, Japanese knotweed, phragmites



Janice Gilbert





# Strengthening the Act

## ◆ Regulated species

- Recommendation: establish advisory panels
- Recommendation: set triggers for listing



## ◆ Discretionary

- Recommendation: restrict known pathways (horticulture, boating, live bait)
- Recommendation: tackle invasive species in protected areas

## ◆ Reactive

- Recommendation: prohibit all non-native species

## ◆ Reporting

- Recommendation: report publicly on progress





# Public Awareness and Stewardship



[www.invadingspecies.com](http://www.invadingspecies.com)



## Butternut Canker

*Diplommatina desjardinsii* *sp. nov.*

Butternut canker is a fungus that infects and kills healthy butternut trees (*Juglans cinerea*) of any size or age. We don't know where the disease originated, but scientists believe it spread from Asia to North America. The effects of butternut canker were first noticed in the late 1960s.

The fungus usually kills trees quickly. Dissected areas called "cankers" develop under the bark and eventually surround the branches and main stem. The cankers restrict the flow of water and nutrients and "strangle" the tree. Fungal spores can be spread by splashing rainwater, by insects and birds, and by infected seeds, making the fungus hard to control.

Butternut canker kills most trees it infects. However, some trees have few symptoms and live much longer than most. Researchers believe these trees may be genetically resistant to butternut canker, so native environments may increase a tree's tolerance to the disease. These standing trees need to be protected to support the recovery of the species. They also provide valuable genetic information about butternut, as well as seeds for planting and use for grafting.

**Range**

In Canada, the butternut tree is found in southern Ontario, southeast Quebec and New Brunswick. Butternut canker has been reported throughout the entire native range of butternut in Canada and the United States. In some areas of the United States it has killed up to 70 per cent of the butternut population.

**Impacts of Butternut Canker**

- Butternut canker infects and kills healthy butternut trees.
- Loss of a diseased tree's canopy and vigor reduces the number and quality of seeds it produces.
- The butternut tree is one of at least 100 species of aquatic and terrestrial invading species in Ontario under the Endangered Species Act and in Canada under the Species at Risk Act.
- The commercial value of butternut can be decreased by the surface deterioration of the wood caused by the fungus.

ontario.ca/invadingspecies

ONTARIO'S INVADING SPECIES AWARENESS PROGRAM

About Us | Hit Squad | News Articles | Contact Us | Newsletter

Visit us on Facebook YouTube Search

Hotline 1-800-563-7711

Invaders Stop the Spread Get Involved Resources Partners Links

Report a Sighting

**NEW! A Landowners Guide to Managing and Controlling Invasive Plants in Ontario**

Download your copy today!

WELCOME TO THE INVADING SPECIES AWARENESS PROGRAM WEBSITE

Invading species are one of the greatest threats to the biodiversity of Ontario's waters and woodlands. Originating from other regions of the world, and in the absence of their natural predators or controls, invading species can have devastating effects on native species, habitats and ecosystems.

In 1992, the Ontario Federation of Anglers and Hunters, in partnership with the Ontario Ministry of Natural Resources, established the Invading Species Awareness Program in order to address the increasing threats posed by invading species in Ontario. Our objectives are to generate education and awareness of aquatic and terrestrial invading species, address key pathways contributing to invading species introductions and spread, and facilitate monitoring and tracking initiatives for the spread of new invaders found within Ontario.

**VIDEO VAULT**  
View All Videos

- Zebra Mussel**  
Zebra mussel life cycle, impacts, and how you can prevent their spread.
- Spiny Waterflea**  
Spiny waterflea life cycle, impacts, and how you can prevent their spread.
- Round Gobie**  
Round Gobie life cycle, impacts, and how to prevent their spread.
- Eurasian Water Milfoil**  
Eurasian water-milfoil life cycle, impacts, and how to prevent their spread.

**LATEST NEWS**

- LOWDPOs back with Invasive Species Program
- Common Reed becoming a pain in Simcoe County
- Liberals to reintroduce Invasive Species Act
- Pulling Out The Stops On Garlic Mustard
- See it, Map it Ontario Now has an Invasive Species App

More News >

## Making Waves!

PROTECTING ONTARIO'S AQUATIC HABITATS

GRADE 4 CURRICULUM KIT

# EDD MapS Ontario

Early Detection & Distribution Mapping System





# Public Awareness and Stewardship

**Ontario Invasive Plant Council**

OIPC Action | Who We Are | Partners and Supporters | Take Action | Information and resources

**What's New**

- The Ontario Phragmites Working Group (a committee of the OIPC) has a new website. Check it out here!
- The OIPC Board has elected its executive committee for the 2014-2016 term. Congratulations to vice Price, our new OIPC President, and Kari Toews, continuing to hold the position as OIPC Vice-President!
- This year's AGM was held Sept. 15/16 in partnership with the Society for Ecological Restoration Ontario. We had an inspiring and informative set of presentations and field trips.
- The OIPC has just completed its first children's activity book!! Check it out here.
- Two more Bufl®s have been added to the to the website! Check them out: Wild Parking and Invasive Honeyuckles.
- The OIPC has just completed two more Bufl®s! Check out our White Swallow Clover and European Black Ash! Bufl®s for details on identification, history, distribution, control and management of these two species.
- The OIPC has a new brochure! Download, print, share & learn more about the Invasive Plant Council.

Tweets by @OIPC1

**The Ontario Invasive Plant Council (OIPC) is a multi-sector, non-profit group committed to the collaboration of organizations and citizens in order to more effectively respond to the threat of invasive plants in Ontario.**

**2014 AGM and Conference - Another Success!**

Our annual event was a success...again!  
Some of the key presentation slide sets will be posted here soon.  
For more information and details on the Conference and meeting click here!

**Current opportunities to take action**

See our Calendar of Events... and add your upcoming event. [THIS WEEK!](#)

A Guide for Northern Ontario

**Beautiful Non-Invasive Plants for your Garden**

Spring 2014

## Look Before You Leave!

**Invasive Species may be joining you on vacation.**

When you load up for the cottage or a camping trip you could unknowingly be carrying stowaways (invasive species). An invasive species is a plant or animal that has been introduced to an area outside of its normal geographic range, and threatens the health of our natural areas by outcompeting native species for food and habitat.

- 1. Bikes:** Mud can carry seeds of invasive plants, such as Garlic Mustard and Dog-strangling Vine. Clean bikes thoroughly before moving them to new locations.
- 2. Pets:** Invasive seeds can be carried in fur and mud on pets. Remove seeds and mud from your pets.
- 3. Firewood:** Invasive insects like the Emerald Ash Borer and the Asian Longhorned Beetle can be carried in firewood. Buy firewood locally.
- 4. ATVs:** Mud on ATVs and trail equipment can harbor invasive plant seeds. Clean ATVs thoroughly before transport.
- 5. Boats:** Muddy boots can carry seeds and insects. Clean your boots before going to a new location.
- 6. Garden Plants:** Some ornamental plants may be invasive. Soil can also carry seeds of invasive plants, exotic earthworms, and European Fire Ants. Look for and use non-invasive plants in your garden.
- 7. Bait:** Improper disposal of bait can introduce new species. Know the rules for bait use in Ontario. Dispose of baitbin at least 10m from the water's edge, and dispose of wastes in the trash.
- 8. Watercrafts:** Boats and other watercraft can carry invasive plants and animals, such as Zebra Mussels, Spiny Water Fleas and European Earthworms. Inspect and clean your boat and motor before moving to a new waterbody.
- 9. Patio Furniture:** Lawn chairs and patio furniture can harbor invasive insects, such as European Earthworms, or the seeds of invasive plants. Clean your furniture before transporting it.

**Clean equipment before transport**  
**Garden with non-invasive plants**  
**Clean your pet after hiking**  
**Dispose of bait properly**  
**Buy firewood locally**  
**Inspect and clean your boat**

A Landowner's Guide to  
**Managing and Controlling Invasive Plants in Ontario**

Ontario

**Clean Equipment Protocol for Industry**

Inspecting and cleaning equipment for the purposes of invasive species prevention

Invasive Species

**Dog Strangling Vine**  
One of Ontario's Most **UN-WANTED** Invasive Plant Species

The Swallow-worts - *Veronica roscum* syn *Myrica roscum* C. Koenig  
Also: Dog-strangling Vine

Photo Credits: Kim Smith  
**LEAF & FLOWER**

Photo Credits: Greg Ross  
**INVASION**

**PROFILE**

Dog-strangling vine (DSV) is a perennial self-seeded vine-like plant that dies each season. It is a member of the milk originating from Eastern Europe, and is Canada approximately 120 years ago ( finding its way into our backyards and) at an alarming rate, as it produces seeds carried by the wind over great distances. DSV prefers disturbed areas like high roadways, utility and transport corridors, new plantations, nursery and perennial limestone quarries and abandoned pastures. In established DSV will quickly adjacent undisturbed areas, displacing the native plant species and altering the natural landscape.

**MUG SHOT**

Dog-strangling vine can grow 1-2 m (3-6 feet) in height with leaves that are 5-10 cm long. The leaves are oval in shape with a pointed tip and are arranged oppositely along the stem. They are glaucous on top and appear green in the early summer and yellow in the late summer.

DSV has visible flowers from late May to mid July. These flowers have five pinkish-purple colored petals that are 5-9 mm (0.2-0.4 inches) in length. Like other milkweed species, dog-strangling vine produces pods that split open lengthwise to disperse their seeds in the late summer. These pods are abundant in July and August and appear smooth

usually 4-7 cm (1.5-2.5 inches) long. The fruits of DSV when occur in pairs and are 4-6 cm (1.5-2 inches) long and 2 mm (0.2 inches) wide. The seeds are three or four in and spreading, giving them the ability to hold onto the soil firmly. Within the root structure, they have subterranean buds (rhizomes growing below the soil) which can produce several shoots. Without the support of brush, where DSV persists in open areas, it twice



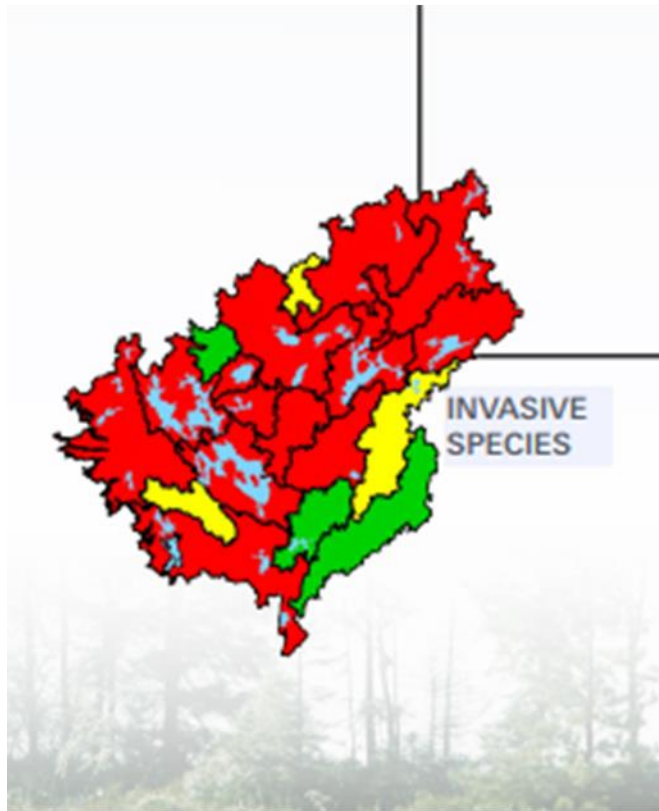
# Invasive Species in Muskoka







# Invasive Species in Muskoka



(Muskoka Watershed Council 2014)



(Minnesota Sea Grant)





# Some Good News...

- ❖ Ballast water regulations since 2006
- ❖ 100% inspection rate for St. Lawrence Seaway
- ❖ 96% compliance rate
- ❖ No new aquatic invasives to Great Lakes Basin!







# Some Good News...

- ❖ Purple loosestrife biocontrol since 1992
- ❖ Leaf-eating beetles
- ❖ 80% reduction in plants
- ❖ Re-establishment of native plants





# Some Good News...

- ❖ Sea Lamprey Control Program in Great Lakes since 1955
- ❖ Binational partnership
- ❖ Integrated approach: lampricides, barriers, traps, pheromones, alarm cues
- ❖ Population reduced by 90%
- ❖ Costs Canada and US \$22 million/year



Michigan State University Extension



Great Lakes Fishery Commission





# And Promising Developments

- ◆ Legislation in other jurisdictions
  - Alberta, Manitoba
- ◆ Sniffer dogs!



Alberta Environment and Parks





# What You Can Do

- ❖ Clean, drain, dry
- ❖ Don't let it loose (bait, garden plants, pets)
- ❖ Don't move firewood
- ❖ Plant native or non-invasive plants
- ❖ Detect, report and remove
- ❖ Spread the word, not the species!





Globe and Mail, August 20, 2014