

Aliens amongst us: 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

- Biodiversity
 - habitat change
 - competition
 - predation
 - disease
- Species at risk
- 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

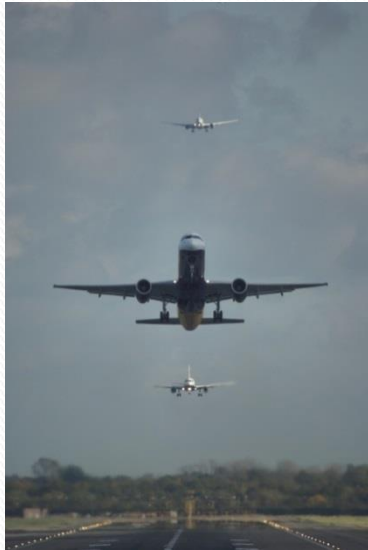


Impacts

- Human health
 - West Nile, Lyme disease, giant hogweed
- Socio-cultural
 - recreational and cultural pursuits
 - nature appreciation
 - spirituality



Key Pathways and Vectors

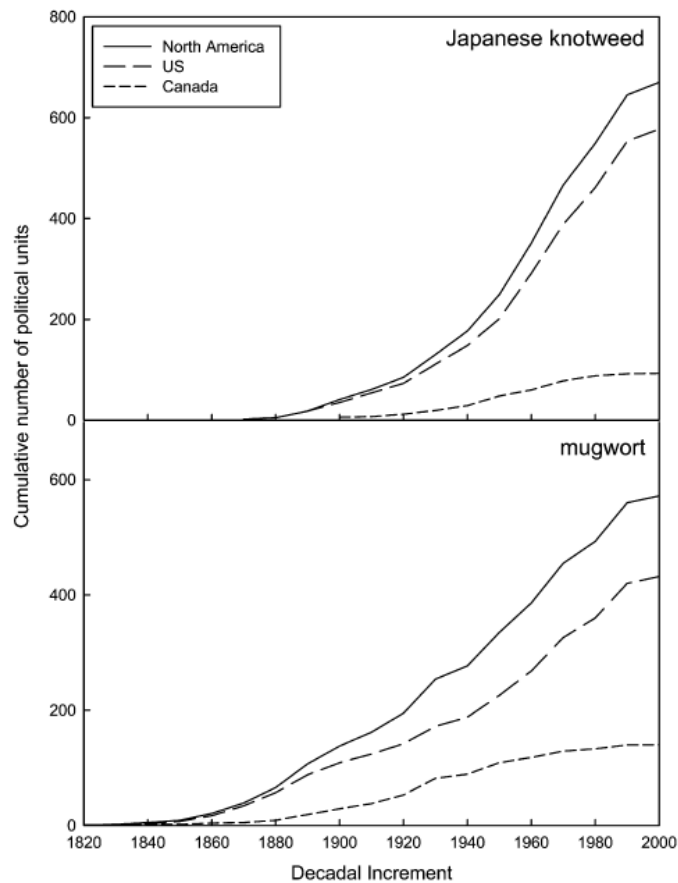


Unique Challenges

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

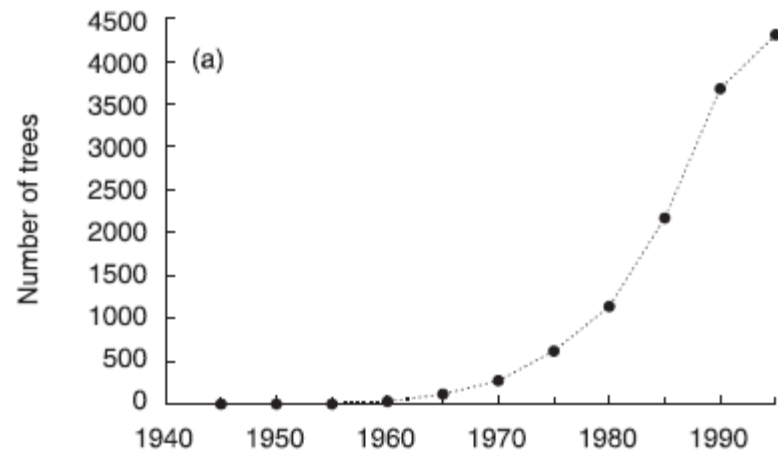


Lag Time



(Barney 2006)

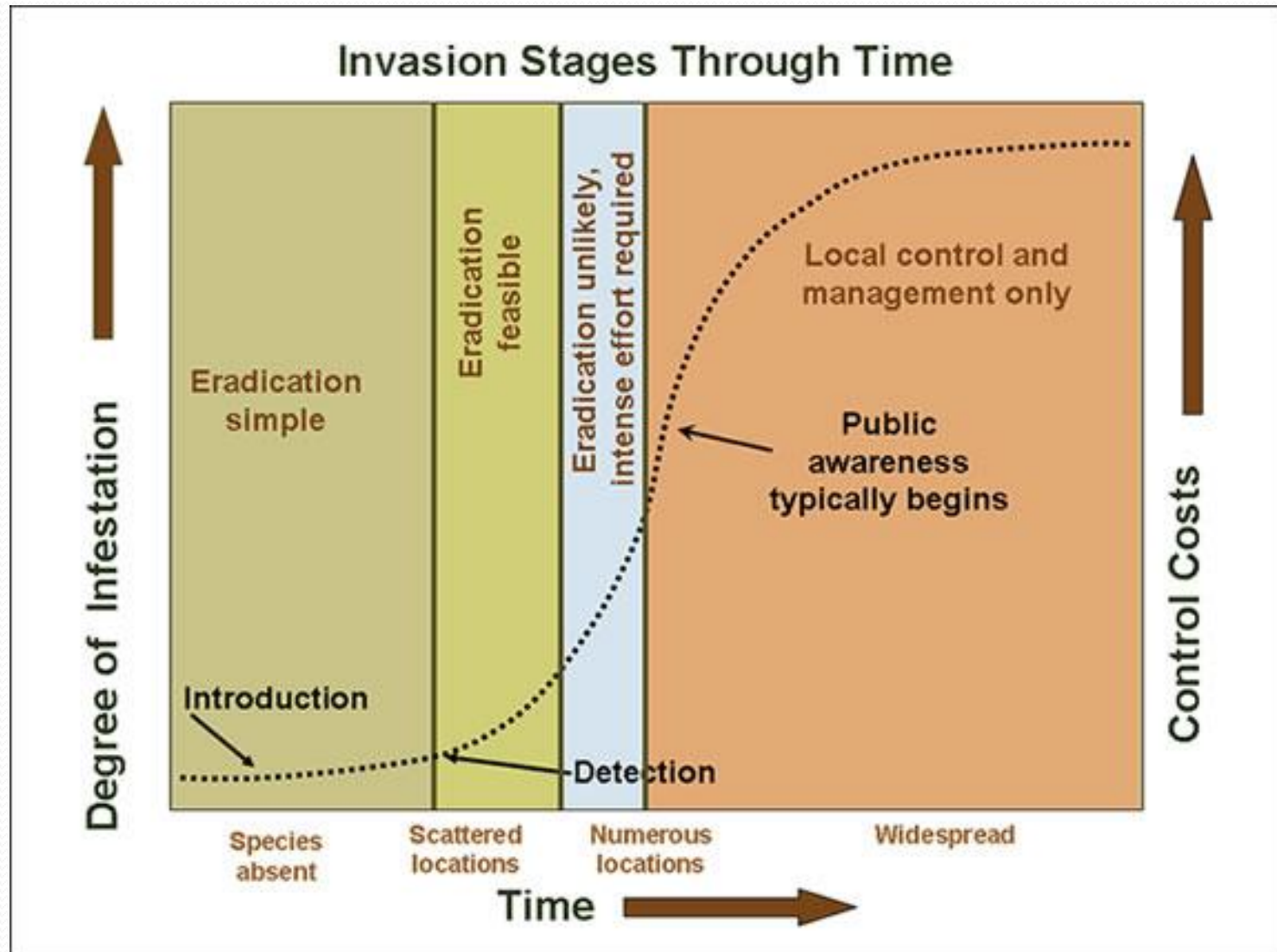
Norway maple

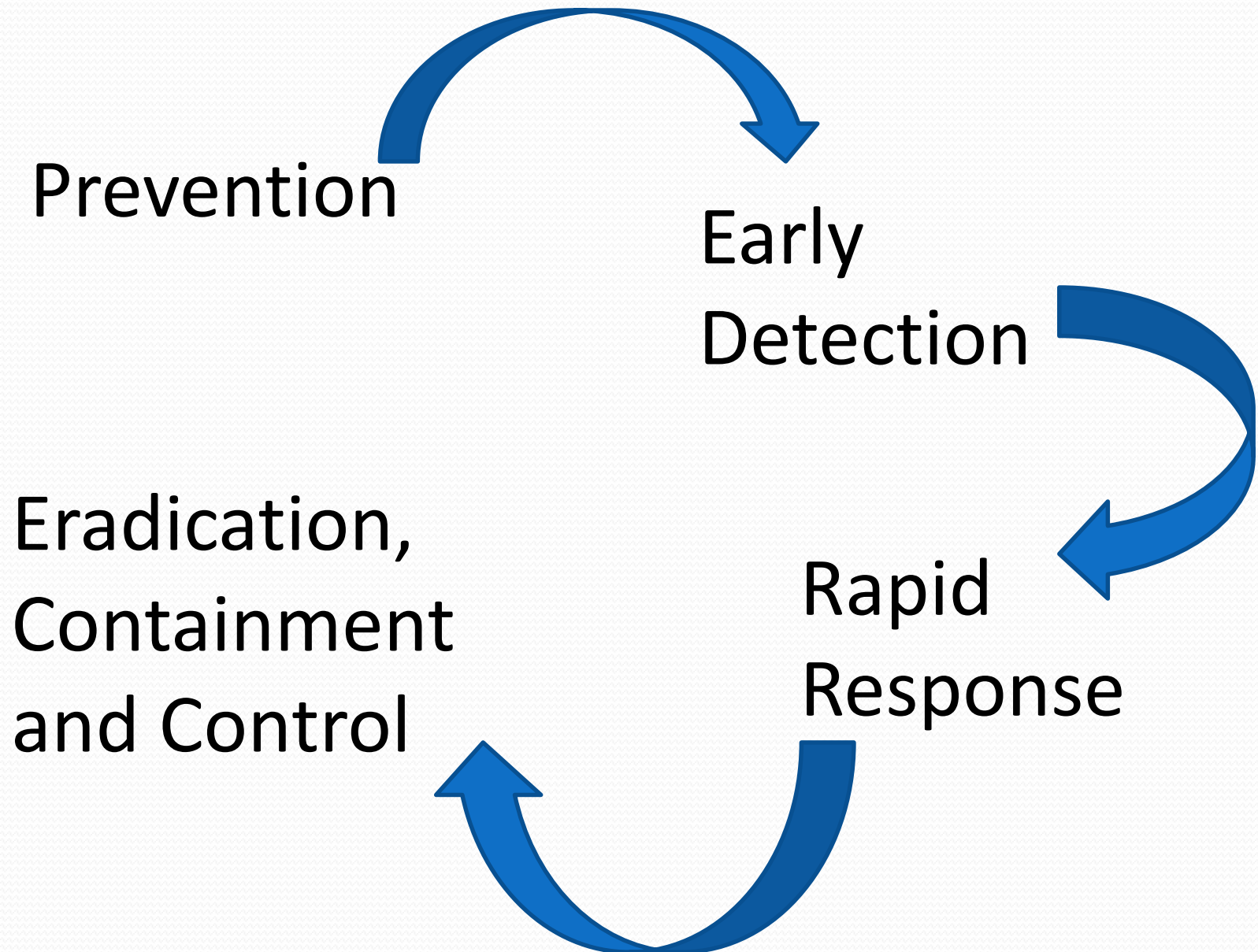


(Wangen and Webster 2006)

And that's not all...







Prevention

- Identify and assess:
 - risks
 - pathways and vectors
 - entry points
- Blacklists and bans
- Permits and licenses
- Interception, quarantine, treatment



Early Detection

- Monitor:
 - species
 - pathways and vectors
 - hotspots and hot times
- Notify:
 - experts
 - response teams



Rapid Response

- Readiness to act
- Resources and funding
- Identify and assess
- Determine feasibility of response
- Evaluate response options
- Act!



Eradication, Containment, Control

- Limit size and further spread
- Physical, chemical, biological options
- Often no precedent





Globe and Mail, August 20, 2014

An Invasive Alien Species Strategy for Canada



September 2004

Canada

ONTARIO INVASIVE SPECIES

STRATEGIC PLAN
2012



ontario.ca/invasivespecies

Ontario

Key Strategy Components

- Legislation and Regulation
 - framework of rules to support invasive species management
- Public Awareness and Stewardship
 - communicate problem
 - educate on how public can help
 - encourage behavioural change
 - lobby for change



Federal Laws

Law	Coverage	Provisions	Gaps
<i>Canada Shipping Act</i>	ballast water	requires ballast water management	
<i>Fisheries Act (ON Fishery Regs)</i>	live invasive fish	prohibits possession	
<i>Plant Protection Act</i>	plant pests	prohibits import and spread	
<i>Seeds Act</i>	noxious weed seeds	prohibits import	

Federal Laws

Law	Coverage	Provisions	Gaps
<i>Canada Shipping Act</i>	ballast water	requires ballast water management	-domestic movement -hull fouling
<i>Fisheries Act (ON Fishery Regs)</i>	live invasive fish	prohibits possession	-missing species -aquatic invasive plants
<i>Plant Protection Act</i>	plant pests	prohibits import and spread	-aquatic pests
<i>Seeds Act</i>	noxious weed seeds	prohibits import	-agricultural focus

Ontario Laws

Law	Coverage	Provisions	Gaps
<i>Fish and Wildlife Conservation Act</i>	live invasive fish	prohibits trade	
<i>Weed Control Act</i>	noxious weeds	requires destruction	
<i>Pesticides Act</i>	invasive species	exception to pesticide ban to control invasive species	

Ontario Laws

Law	Coverage	Provisions	Gaps
<i>Fish and Wildlife Conservation Act</i>	live invasive fish	-prohibits trade	-missing species
<i>Weed Control Act</i>	noxious weeds	-requires destruction	-only on agricultural and horticultural lands
<i>Pesticides Act</i>	invasive species	-exception to pesticide ban to control invasive species	-lengthy approval process



Promising Developments

- Federal

Aquatic Invasive Species Regulations

→ prevention, management, control

→ prohibitions on import, possession, transport, spread, release



Promising Developments

- Ontario

Invasive Species Act

→ significant and moderate threat
invasive species

→ prohibitions on import,
possession, transport, trade,
propagation, release



Public Awareness of Invasive Species

“few people are sufficiently aware of the nature and magnitude of the threat”

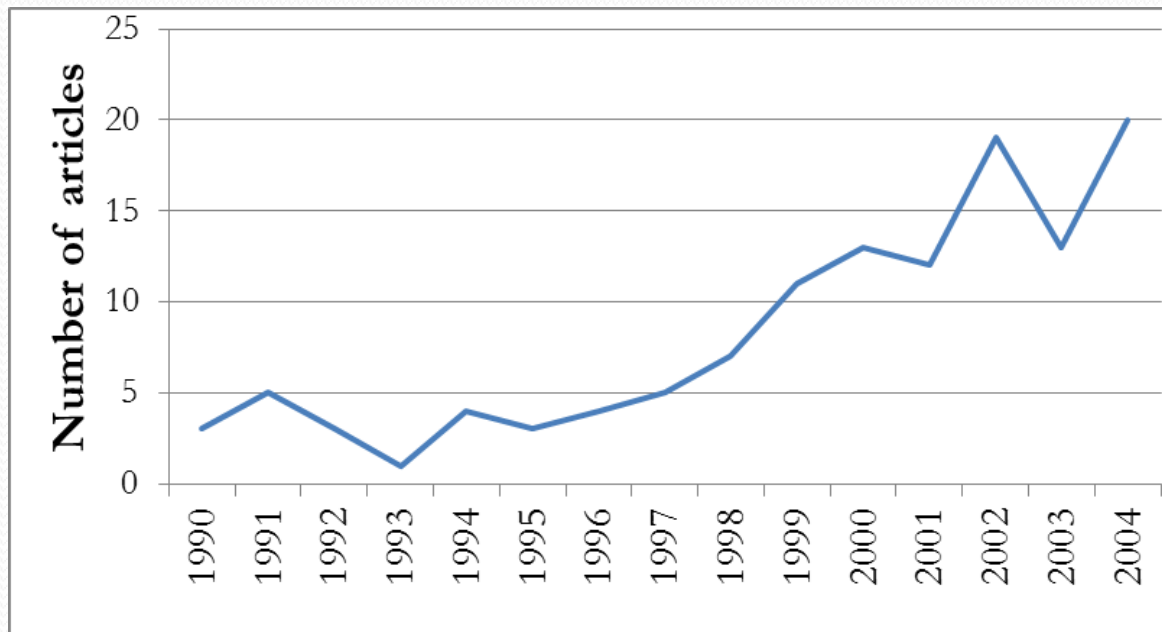
(Canadian Action Plan to Address the Threat of AIS, 2004)

“the general public...are largely unaware of the potential serious ecological and economic consequences”

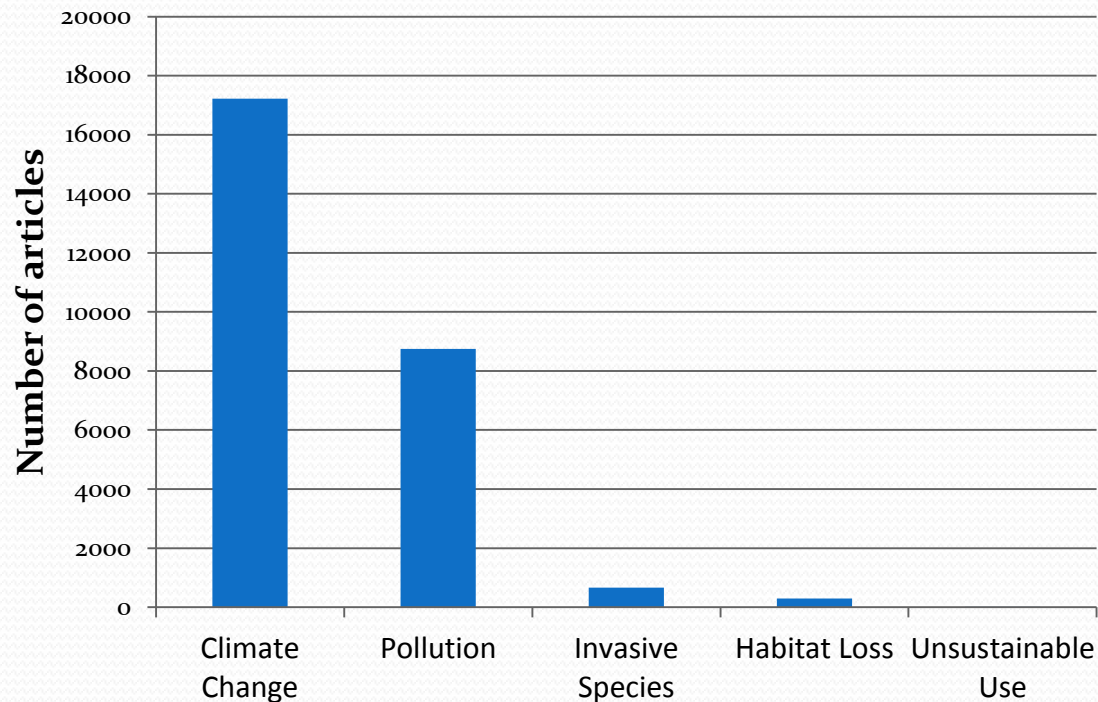
(Claudi et al. 2002)



Invasive Species Coverage in National Newspapers Increases Over Time



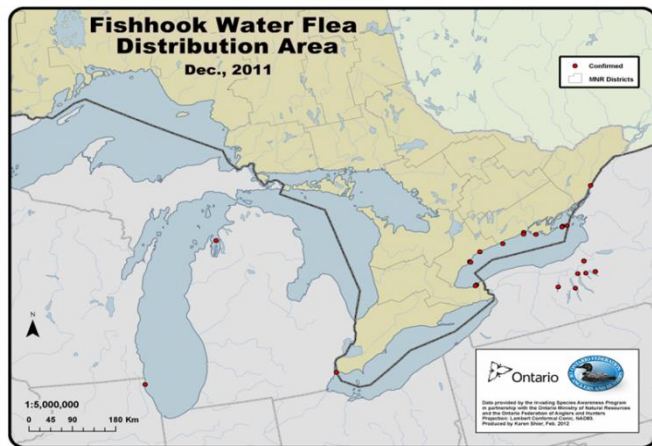
Coverage of major environmental issues in leading national newspapers 2009-2013



Public Awareness and Stewardship



www.invadingspecies.com



Butternut Canker

Ophiognomonia clavigignis-juglandacearum

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. Diseased 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 shagbark hickories, 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, or some environments may increase a tree's tolerance to the disease. These standing trees need to be retained to support the recovery of the species. They provide researchers with valuable genetic information about butternut, as well as seeds for planting and usage for grafting.

Range

In Canada, the butternut tree is found in southern Ontario, northwest 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 90 per cent of the butternut population.

Impacts of Butternut Canker

- Butternut canker infects and kills healthy butternut trees.
- Loss of a diseased tree system and vigor reduces the number and quality of seeds it produces.
- The butternut tree is now at risk in much of eastern North America. It is listed as an endangered 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 disfigurement of the wood caused by the fungus.

Young butternut showing established canker. The cankers cut off the flow of water and nutrients and can kill an otherwise healthy tree. Photo: Anne Orban, OMAF, Forest Services, Reproduction.

ontario.ca/invadingspecies

Making Waves!

PROTECTING ONTARIO'S AQUATIC HABITATS

GRADE 4 CURRICULUM KIT

EDD MapS Ontario

Early Detection & Distribution Mapping System



Public Awareness and Stewardship

www.ontarioinvasiveplants.ca

Ontario Invasive Plant Council

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

What's New

The Ontario Piraguites 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 Iola Price, our new OIPC President, and Kent Tait, continuing to hold his 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 booklet! Check it out here.

Two more BMPs have been added to the list to the website! Check them out. Wild Parsnip and Invasive Honeysuckles.

The OIPC has just completed two more BMPs! Check out our White Sweet Clover and European Black Alder BMPs 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:** [Help](#)

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. Boots** 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 live bait can introduce new species. Know the rules for bait use in Ontario. Dispose of baitfish at least 30m from the water's edge, and dispose of worms in the trash.
- 8. Watercraft** Boats and other watercraft can carry invasive plants and animals, such as Zebra Mussels, Spiny Water Fleas and European Eelworms. 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 Eelworms, or the seeds of invasive plants. Clean your furniture before transporting it.

Check 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

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

Cynanchum rossicum C. bauseae
The Swallow-worts
Alias: Dog-strangling vine

PROFILE
Dog-strangling vine (DSV) is a perennial, soft-stemmed vine-like plant that dies each season. It is a member of the milkweed family, originating from Eastern Europe, and in Canada approximately 120 years ago. Finding its way into our backyards and at an alarming rate, as it produces seed carried by the wind over great distances. DSV prefers disturbed areas like high-railways, utility and transport corridors, tree plantations, nurseries and perennial line-side quarries and abandoned post-colony is 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 (3-4 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 glossy in luster 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-mauve colored petals that are 5-8 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 often occur in pairs and are 4-6 cm (1.5-2 inches) long and 5 mm (0.2 inches) wide. The roots are fibrous or thread like and spreading, giving them the ability to hold onto the soil firmly. Within the root structure, they have subterranean buds (buds growing below the soil) which can produce several shoots. Without the support of buds, where DSV persists in open areas, it is less

LEAF & FLOWER
Photo Credit: Lee Laid

INVASION
Photo Credit: Greg Ales

Back
Forward
Folios
Save as...
Print...
Translate to English
View page source
View page info
Rotate clockwise
Rotate counterclockwise
Inspect element

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



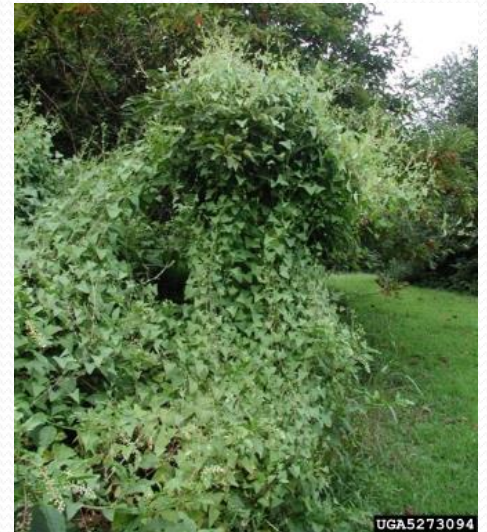
Clean Equipment Protocol for Industry

Inspecting and cleaning equipment for the purposes of invasive species prevention



Invasive Species on the Radar

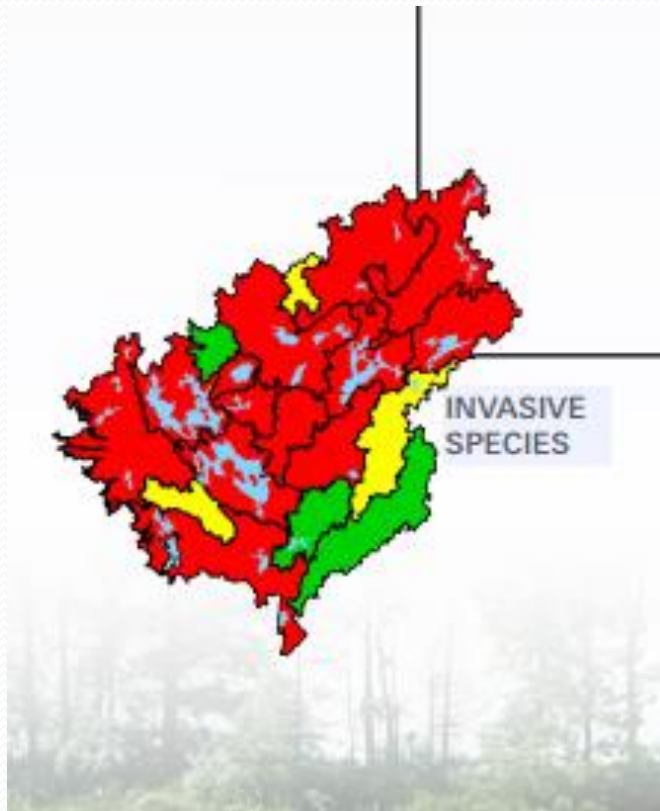
- So many species, pathways, vectors
- No clear targets
- Lag times
- Impacts spread among many
- Different views on what's invasive



Invasive Species in Muskoka



Invasive Species in Muskoka



(Muskoka Watershed Council 2014)



(Minnesota Sea Grant)



Some Good News...

- Ballast water regulations introduced in 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 loosestrife
- Re-establishment of native plants



Conclusions

- Legislation, Public Awareness and Stewardship all essential tools in tackling invasive species
- Current legislation lacks power
- Public awareness generally low
- But not for lack of effort...



What You Can Do

- Clean, drain, dry
- Don't let it loose
- Don't move firewood
- Plant native or non-invasive plants
- Be a citizen scientist
- Support invasive species legislation
- Spread the word, not the species!

