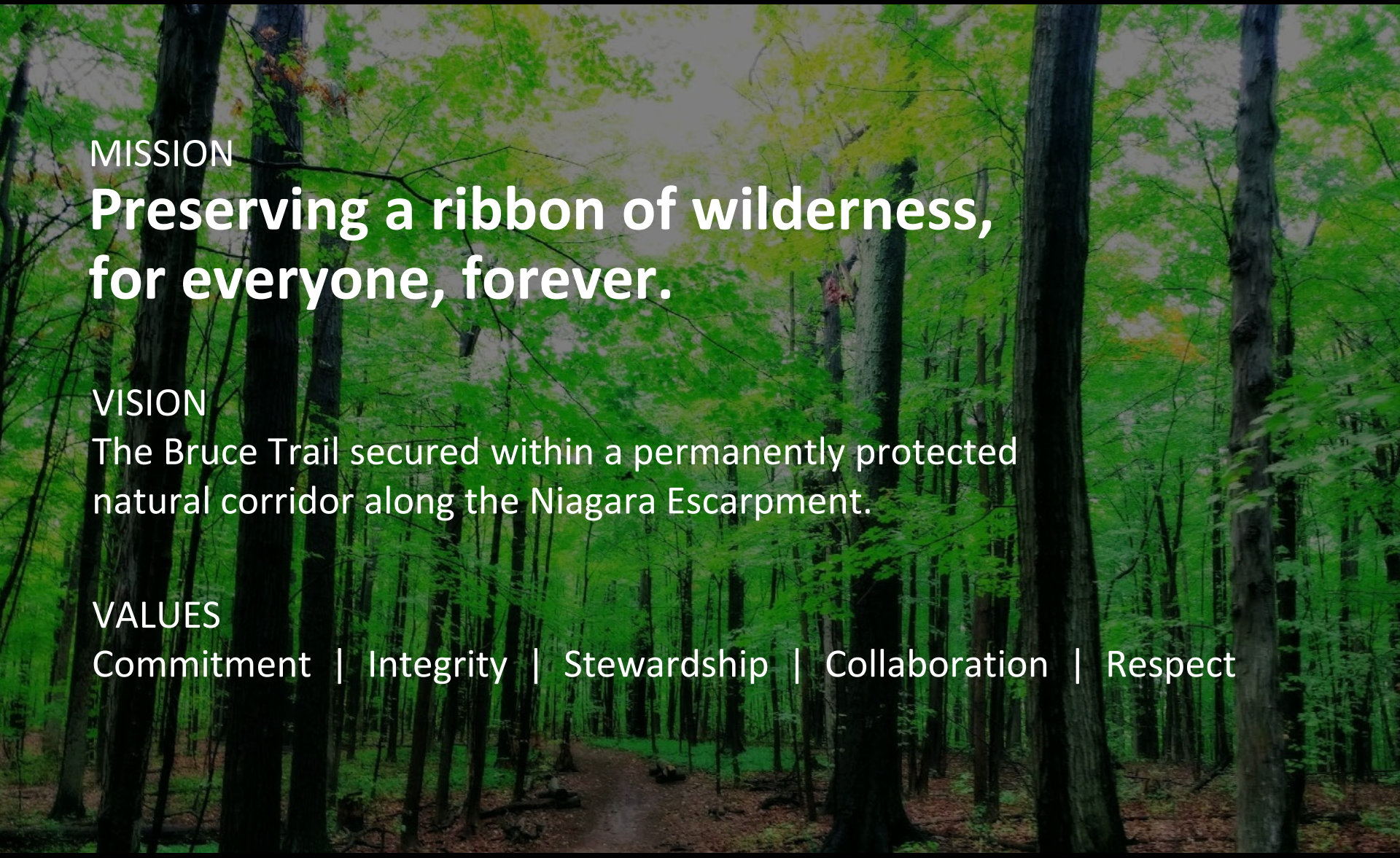
Bruce Trail CONSERVANCY

Invasive Species Webinar: Plants, Pests and Pathogens

Hosted by Mara McHaffie and Lyndsey Wilkerson

March 10th 2022



MISSION

Preserving a ribbon of wilderness, for everyone, forever.

VISION

The Bruce Trail secured within a permanently protected natural corridor along the Niagara Escarpment.

VALUES

Commitment | Integrity | Stewardship | Collaboration | Respect

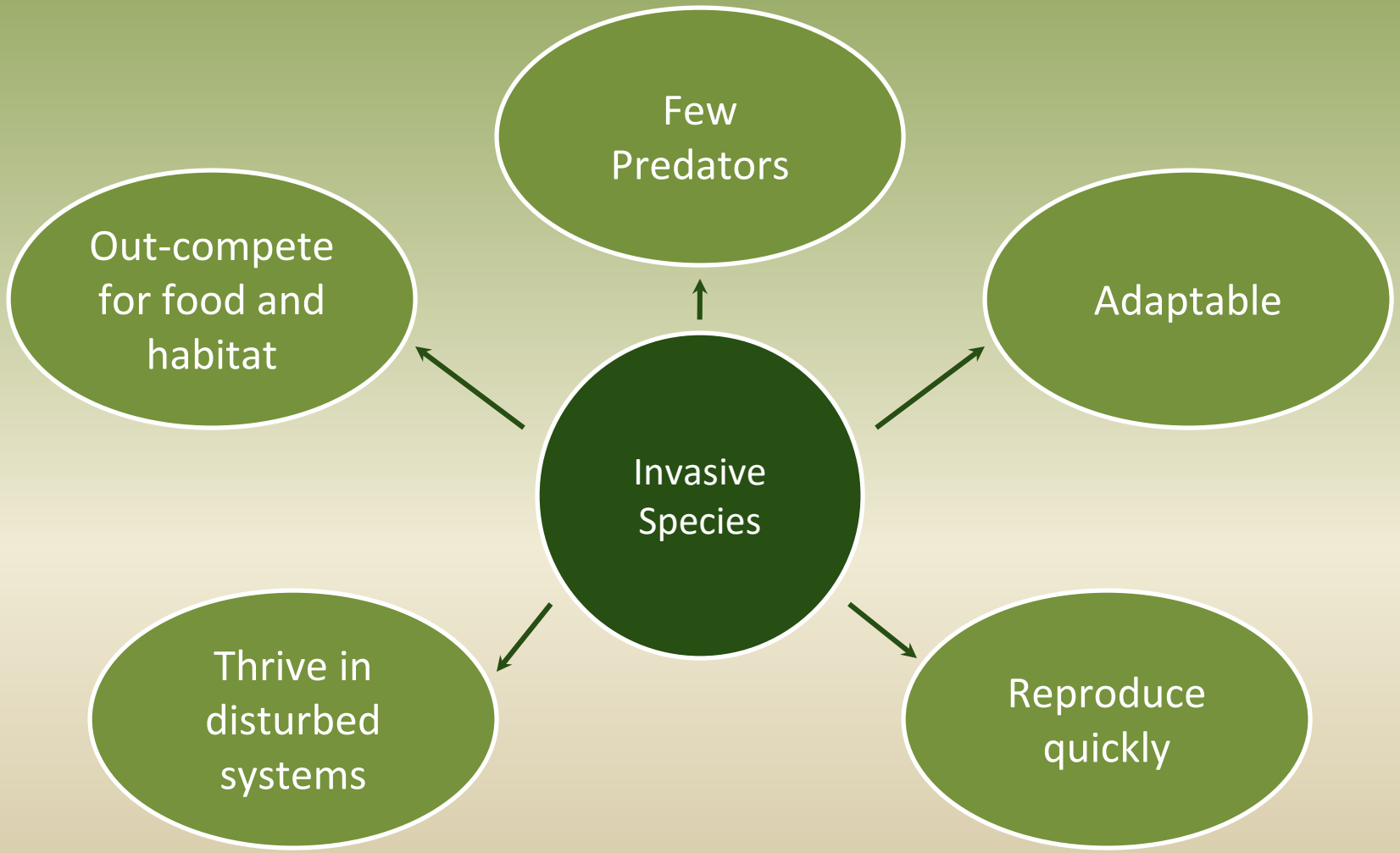
What is an Invasive Species?

Native: A species that has existed in an area for a long time period (thousands of years) and has evolved in the presence of the local environment and in tandem with other native species

Non-native: A species that has been introduced to an area outside of its native range, often by humans (either intentionally or by accident)

Invasive: A non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

What Makes a Species Invasive?



Invasive Species and the BTC

- Invasive species are one of the top threats to biodiversity
- Managing invasive species is part of the BTC's work to conserve and steward the 'ribbon of wilderness' along the Niagara Escarpment

THE MAIN OFFENDERS!

Garlic Mustard *(Alliaria petiolata)*

- Native to Europe
- Introduced by early settlers as an edible herb
- Found on roadsides, waste places, woodlands, forests, trail edges
- Shade tolerant
- Produces thousands of seeds per plant and seeds may be viable in the soil for up to 5 years

Alliaria petiolata (Natural Area Consultants/UGA0002039/V.Nuzzo)

Garlic Mustard-ID

- 1st year - kidney shaped leaves with scalloped edges
- 2nd year - triangular sharply toothed leaves and white flowers with 4 petals clustered at the top of each stem
- Grows up to 1 m tall with seed pods that reach upwards and contain up to 16 seeds
- New leaves emit garlic smell when crushed, fades as the plant matures.

Garlic Mustard - Impacts

- Displaces native woodland understory plants
- Produces chemicals that may affect the health of nearby native plants
- Roots contain sinigrin which interfere with the function of the beneficial relationship between native soil fungi and many native plants

Garlic Mustard - Control

- Pull out plants, with root system, prior to full seed pod development (May - June)
- Use black garbage bags and set in sun for 1-2 weeks to kill seeds then place in garbage (not compost)
- Cut when flowering – repeat cutting likely required 2 - 4 weeks later
- Cover with a dark tarp for up to two years for small monoculture patches – requires replanting
- 2-5 years of treatments (minimum) will be necessary to deplete seed banks

Dog-strangling Vine (*Cynanchum rossicum*)

- Member of the milkweed family, from Eastern Europe and introduced to Canada in late 1800s
- Perennial vine that can grow 1-2m in height by twining up trees and plants
- Can invade prairies, alvars, shorelines, conifer plantations, meadows and forests

DSV - ID

- Vine of up to 2 metres in length
- Opposite leaves with rounded bases and smooth edges tapering to sharp point
- Clusters of small star-shaped pink to red-brown 5 petaled flowers at stem tips
- Thin pointy seed pods develop in late summer that dry and reveal fluffy white seeds

DSV - Impacts

- Forms dense colonies and out-competes native vegetation
- Reduces habitat for wildlife
- Can confuse native insects that rely on milkweeds, like the Monarch butterfly
- Prevents forest regeneration
- Impacts on agriculture and recreation

DSV - Control

- Young plants in loose soil can be pulled and small populations can be dug out, but entire root system must be removed
- Cover small populations with tarp for 2 years – re-planting required
- Mowing or cutting of seed heads – short-term solution to reduce spread
- Herbicide application by licensed professional

European Buckthorn (*Rhamnus cathartica*)

- A small tree native to Europe and Asia, introduced to Canada in late 1800s, often as a windbreak along farm fields
- Rapidly growing, aggressive plant
- Invades both dry and moist habitats; fields, fencerows, clearings, forests, and slopes
- Leaves emerge in early spring and are maintained until very late fall

Buckthorn - ID

- Finely toothed, often glossy, “Egg-shaped” leaves with abrupt point at tip, with 3-5 leaf veins curving towards tip
- Opposite to Sub-opposite branching pattern – leaves/branches grow (almost) opposite each other
- Short thorn in-between buds at branch tips
- Clusters of small 4-petaled green flowers in spring – becoming purple-black berries in fall
- Brown/dull grey bark with light lenticels (spots), smooth and shiny when young, becoming rough with age – orange inner bark

Buckthorn - Impacts

- Very shade tolerant, can colonize the understory to the exclusion of other plants
- Leaves dense shade and blocks out sunlight for other species
- Seed has laxative effect on wildlife – helping spread species widely
- Can increase nitrogen in the soil and prevent other species from growing

Buckthorn - Control

- Small saplings can be hand pulled
- Larger trees can use weed wrench
- Ideally pull before berries form
- If possible ‘hang’ trees upside down so roots can’t touch soil – if not possible stack in piles
- Herbicide application by licensed professional – cut trees that aren’t treated WILL re-sprout
- Seeds can remain viable in soil for up to 5 years

Giant Hogweed (*Heracleum mantegazzianum*)

- Introduced from southwest Asia and planted as a horticultural species in the early 1900's
- In the Carrot/Parsley family and closely related to native Cow Parsnip
- Is 'Monocarpic' – dies after flowering
- Escaped along roadsides, streambanks, fields and waste areas

Giant Hogweed - ID

- Up to 5 metres in height
- Large deeply incised coarsely toothed leaves up to 1.5 metres wide
- Stem is bristly, with distinct purple spots on a hollow green trunk
- Umbrella shaped clusters of small white flowers at the top

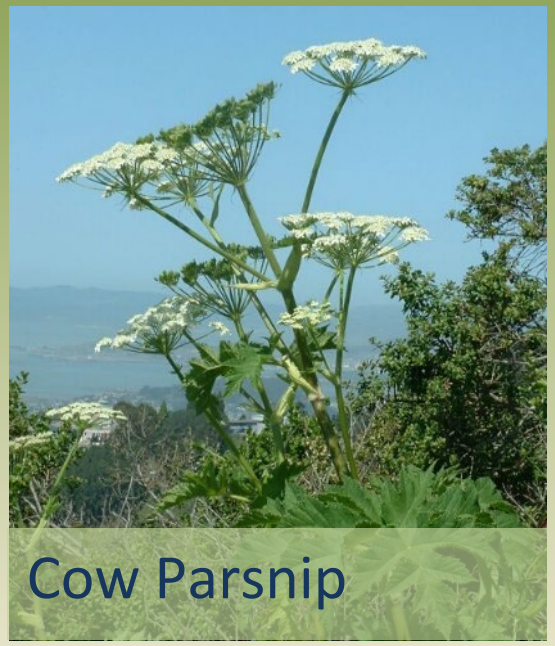
Giant Hogweed - Impacts

- Reproduces by seed, a single plant can produce up to 100,000 seeds.
- The hair on the stems and leaves contain a watery sap with toxins called flourocoumarins
- Can increase the skin's sensitivity to sunlight and may result in severe burns and blisters and temporary or permanent blindness if it comes in contact with the eyes

Giant Hogweed - Control

- Employ a professional!
- Pre-flower leaves can be sprayed with herbicide by licensed professional
- Flower heads can be cut and bagged – left in sun and put in garbage
- Protective gear should always be worn and washed immediately – goggles, waterproof long sleeved top and long pants, gloves, rubber boots
- If contact with sap occurs try not to expose area to sun, wash as soon as possible with soap and water

Giant Hogweed Look-alikes



Cow Parsnip

Wild Parsnip

Anjelica

Queen Anne’s Lace

Honeysuckles (*Lonicera*)

- Several species of invasive honeysuckle
- Intentionally introduced from Europe and Asia in 1800s as ornamental plants and to prevent soil erosion
- Form dense thickets in forest understories and open areas

Honeysuckle - ID

- Multi-stemmed shrub with light brown bark
- Leaves in pairs with smooth edges
- Showy white or pink flowers
- Bright red/orange berries in multiples of 2
- The invasive species have hollow stems

Honeysuckle - Impacts

- Forms dense thickets that shade out native plants, reducing plant diversity
- Berries considered to be less nutritious for native songbirds
- Reduces nesting success of robins and wood thrushes

Photo by bquail (from inaturalist.org)

Honeysuckle - Control

- Small individuals can be pulled by hand or with a weed wrench (fall is the best time)
- Larger plants can be cut or ‘girdled’ and a herbicide can be applied to the wound by a licensed applicator
- Repeated mowing or clipping can work but requires repeated effort over several years

Photo by Gary Hall

Japanese Stiltgrass *(Microstegium vimineum)*

- A new invader! Has only been recently recorded in Ontario
- Introduced to North America from Asia in early 1900s
- Found in moist forests, ditches, trail and stream edges

Map from inaturalist.org

Japanese Stiltgrass - ID

- Small bamboo-like grass that sprawls over the ground to form a mat
- Leaves are ~7cm long and have smooth edges and a silvery midvein
- Turns purple-brown in the fall
- 1-3 greenish flower ‘spikes’

Photo by matthewsheik (via inaturalist.org)

Japanese Stiltgrass - Impacts

- Forms a dense groundcover that outcompetes native species and reduces overall biodiversity
- May release chemicals that prevent native seed germination
- Loss of common forest ground cover species reduces habitat and food sources for wildlife

Photo by inlow (via inaturalist.org)

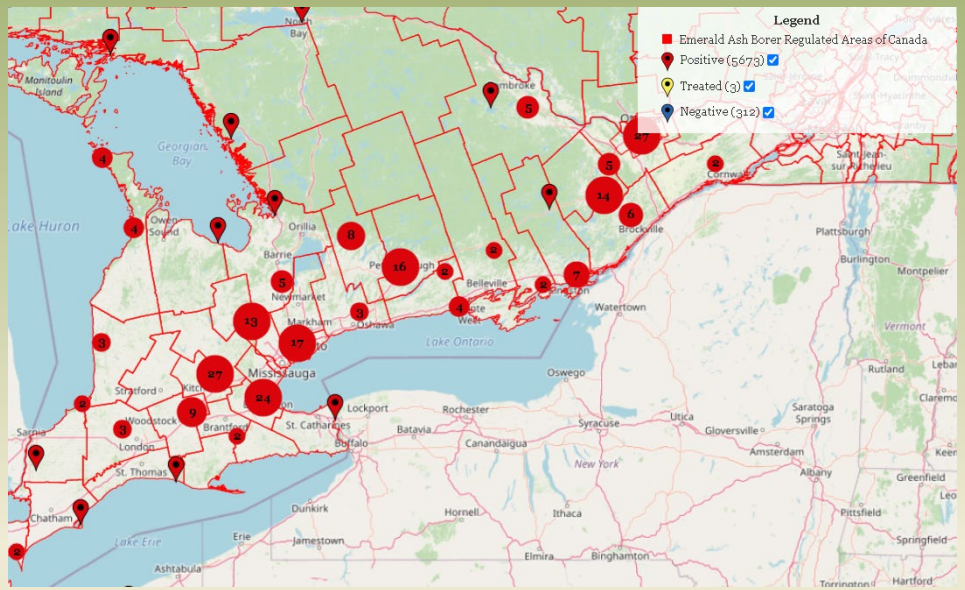
Japanese Stiltgrass - Control

- Hand-pulling in late summer is effective for small populations
- Mowing in late summer/fall while plants are flowering
- Mulching and re-seeding with native species
- Herbicide application for control of large populations

Photo by Matthew Beziat (via inaturalist.org)

Emerald Ash Borer (*Agrilus planipennis)*

- Native to parts of Asia
- First detected in Ontario in 2002
- Feeds on all ash species
- Once a tree is infected, mortality is nearly 100%
- Killed millions of trees already
- Range is rapidly expanding in Ontario
- No known natural enemies



map courtesy of http://www.eddmaps.org

Emerald Ash Borer - ID

Adults:
- Bright, metallic green beetle
- 8-14mm long

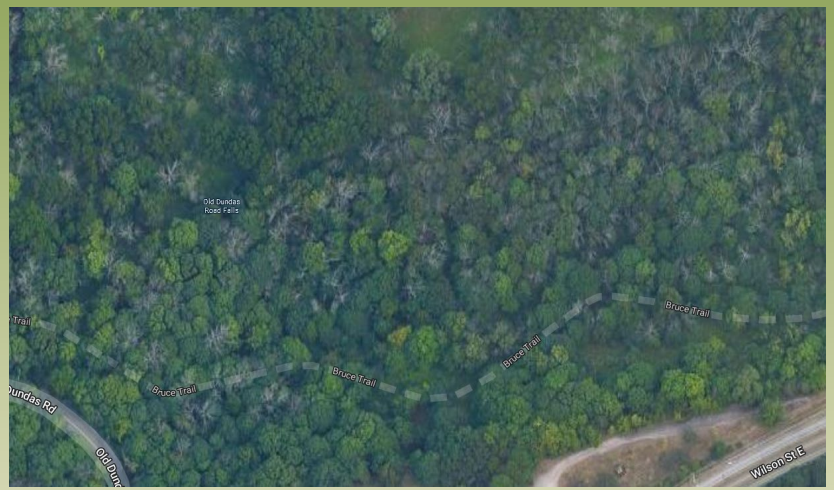
Pupae:
- Creamy white
- 10-15mm long

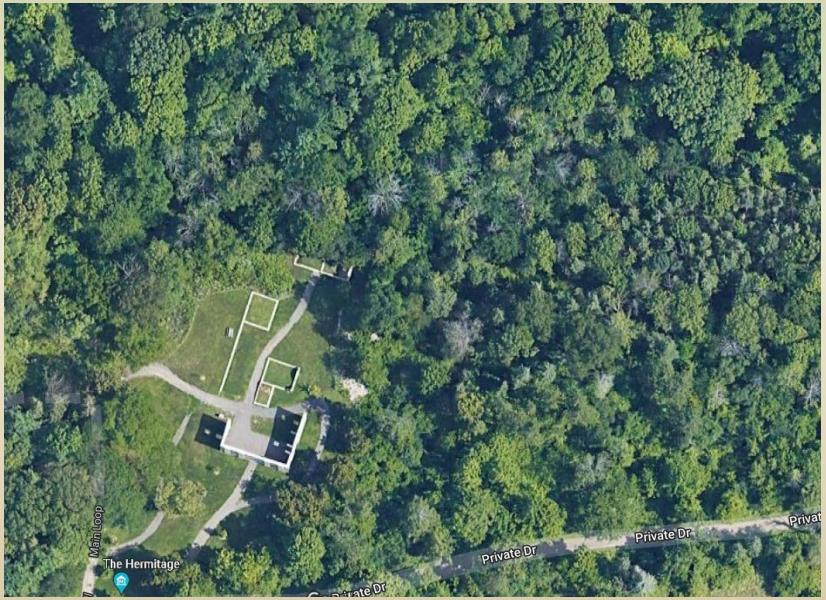
Larvae:
- Creamy white body with a brown head, 25-32mm long
- Fork like appendage on the tip of the abdomen

Evidence on Trees:
- D shaped exit holes on the bark
- Bark deformities
- Crown dieback

Emerald Ash Borer - Impacts

- Major economic and environmental threat
- Has killed 99% of ash trees in its path
- Altered the tree canopy by up to 25% in some areas
- Can open up canopy space for other invasive species i.e. buckthorn
- Dead trees pose a severe risk to hikers





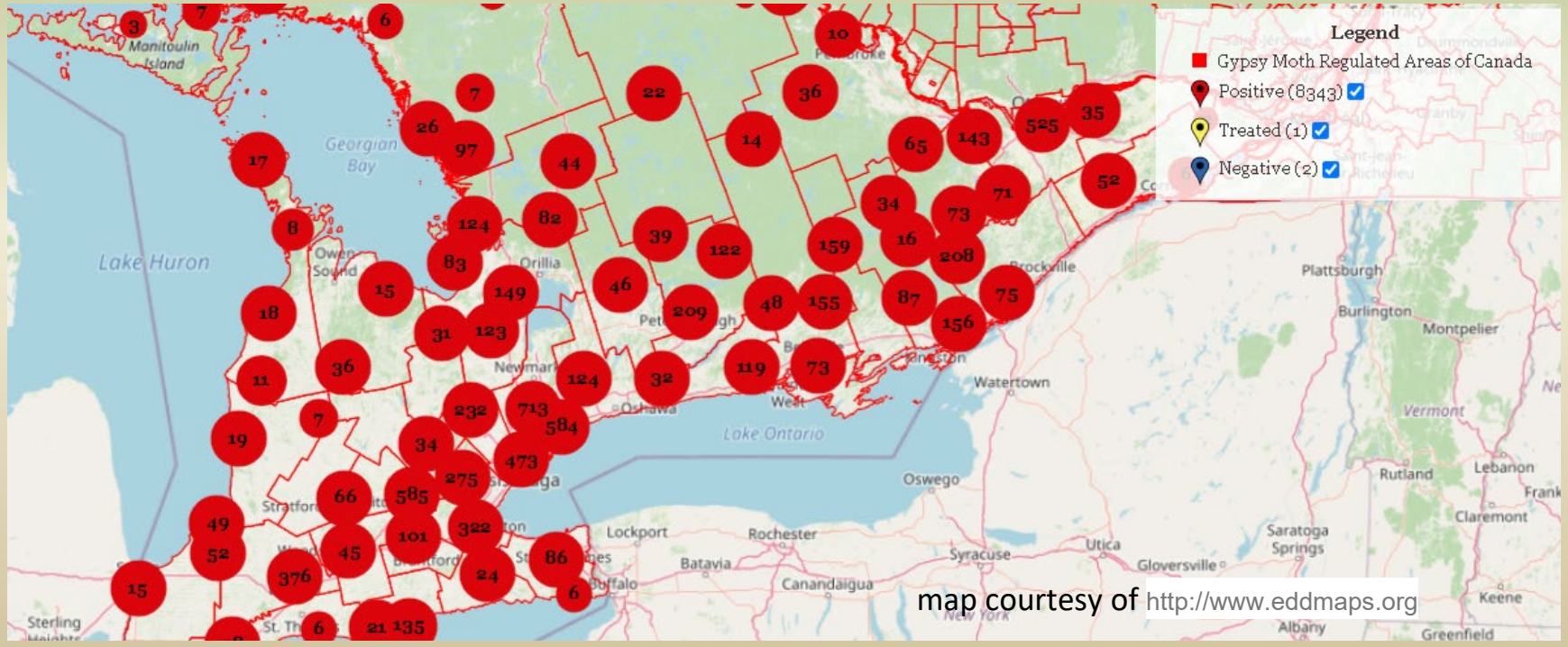
images courtesy of google maps

Emerald Ash Borer- Control

- Has a max of a 15km flight range
- Spreads rapidly through human assistance - don't move infected firewood, logs, etc.
- Report sightings to OMNRF
- Trees can be protected from attack by injection with a registered insecticide
- Blue ash seems to have some resistance
- BTC currently doing damage control removing hazard trees along the Trail

Spongy Moth *(Lymatria dispar)*

- Previously known as “Gypsy Moth” or LDD
- New common name is “spongy moth” for the spongy egg masses it lays on trees
- Native to Europe, Asia and North Africa
- Feeds primarily on oaks, hardwoods and sometimes spruce



Spongy Moth - ID

Adults:

- Males are light brown, 2.5cm wingspan
- Females white in colour, 5mm wingspan

Eggs:

- Orange-ish colour, spongy, felt like in appearance, 2-8cm long

Larvae:

- 6-7cm long
- Yellow, grey or black with long wispy hairs
- Five pairs of blue spots then six pairs of red spots after the head

Evidence on Trees:

- Caterpillars evident on lower bark as they ascend the tree
- Leaves with holes or defoliated trees
- Caterpillar scat on sidewalks

Spongy Moth - Impacts

- Can lay 500-1,000 eggs
- Larvae climb the trees once hatched and feed on canopy leaves (usually overnight)
- Can defoliate an entire tree or tree canopies in an area
- Defoliation results in the dieback of twigs and branches
- Can make affected trees more vulnerable to other pests and diseases
- Repeated defoliation can stress trees and lead to mortality
- Direct contact with caterpillars can cause a rash or skin irritation

Photo by Jakob Mueller (via iNaturalist.org)

Spongy Moth - Control

Small Scale:

- Examine household items such as outdoor furniture, camping equipment, and firewood for caterpillars or egg masses
- Hand removal of egg masses by scraping them off and either crushing them or submersing eggs into a bleach/water mix
- Don’t transport wood/firewood
- Burlap banding or pheromone traps

Large Scale:

- Aerial suppression

Butternut Canker

(Ophiognomonia clavigignenti-juglandacearum)

- A fungus that can infect and kill healthy butternut trees
- First detected in North America in the 1960s and now exists throughout the butternut's range
- Spores spread through raindrops and on birds, insects and seeds
- Spores enter the tree through buds and openings in the bark

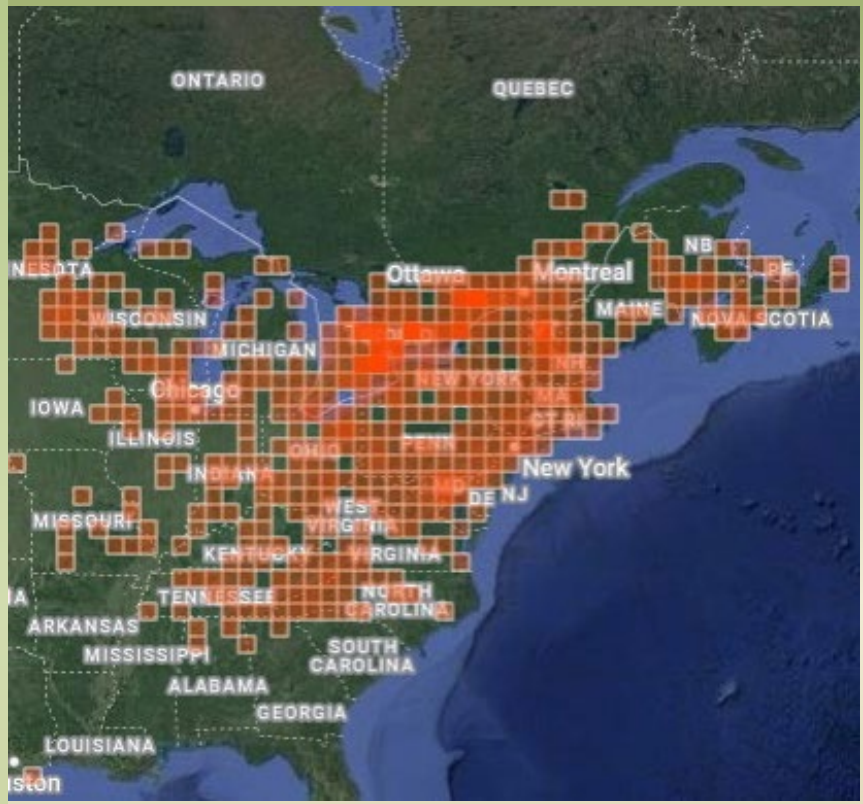
Butternut Canker- ID

- Produces ‘cankers’ that look like sunken, sooty black wounds on the bark of the tree
- Tree will look unhealthy, with dying and leafless branches
- Black fluid oozes through cracks in the bark in spring, leavy black stains
- Bark may be missing or peeling around the cankers
- Small branches may sprout from the trunk near the base

Photo by Ryan Korosi

Butternut Canker- Impact

- ‘Strangles’ the tree by disrupting the flow of water and nutrients
- Quickly kills butternut trees of all ages, even if they’re otherwise healthy
- Butternut is now listed as an Endangered Species in Canada
- Loss of butternut means a decrease in forest diversity and loss of food for wildlife



Map from inaturalist.org

Butternut Canker- Control

- There is no known treatment or control for the canker
- Some trees appear to be less affected by the disease - they may be genetically resistant or be in an environment that helps them resist
- Apparently resistant trees are being studied and used as seed sources to maintain the butternut population

Dutch Elm Disease *(Ophiostoma spp.)*

- Highly infectious fungal disease
- Native to Asia and Europe
- First detected in Eastern Canada in 1940s
- Wide-scale elm death in 1970s and 1980s
- Spread by various bark beetles and through root grafts

Dutch Elm Disease - ID

- Elm trees have simple, oval shaped leaves with jagged, ‘double-toothed’ edges
- Infected trees show wilting/yellowing of leaves and leaves may drop early
- Small branches may sprout from near the base of the trunk
- Exposed wood of branches will show brown streaks
- Exposed wood may show beetle galleries

Photo by Sam Buciarelli (via inaturalist.org)

Dutch Elm Disease - Impact

- Fungus damages the vascular tissue (vessels) of the tree, disrupting water and nutrient flow and causing death in 1-3 years
- Widespread elm death - loss of 95% of American elm population
- American Elm and Rock Elm are the most susceptible while Red Elm is less affected
- Reduction in forest diversity and loss of urban tree canopy

Dutch Elm Disease - Control

- A fungicide is available to treat individual trees but isn't practical for large-scale use
- Prune infected branches
- Elm Recovery Project led by GRIPP at the University of Guelph to propagate resistant varieties
- 100 trees planted in our nature reserves in 2021

Pop Quiz!

What is the BTC doing about it?

- Invasive species strategy - outlines priority areas and species
- Invasive species mapping
- Boot brush stations and public education
- Invasive species volunteer ‘pull parties’
- Larger restoration projects - include invasive species management and other activities like re-planting

What is the BTC doing about it?

Invasive Species Strategy

Priorities:

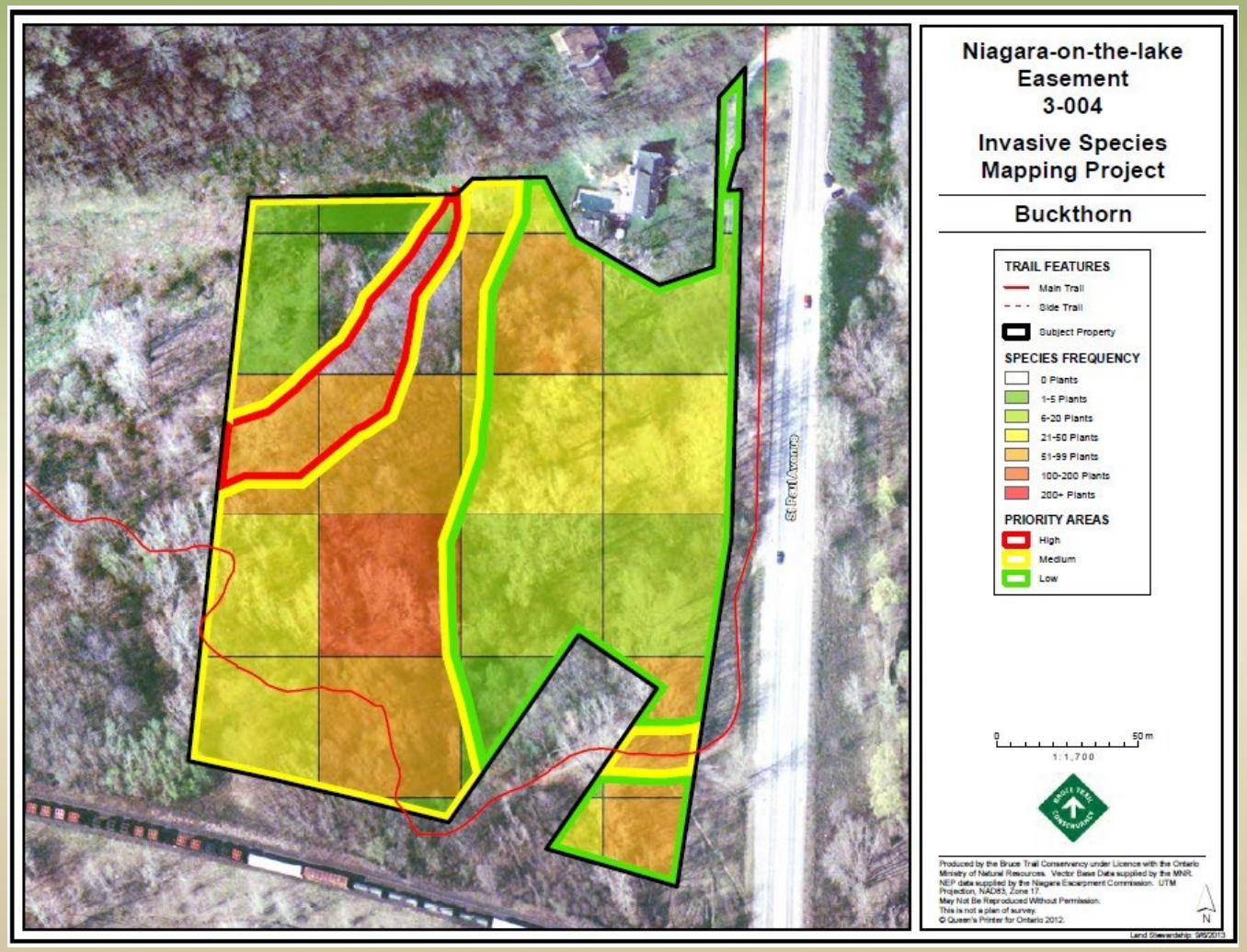
- Health & safety of trail users and volunteers
- Areas with rare/sensitive species and ecosystems
- Areas with high native biodiversity and ecosystem function
- Areas along pathways of spread (e.g. the Trail!)

Strategy - where to start:

- Early invasions
- 'Satellite' populations
- From low concentration to high concentration (outside-in)

What is the BTC doing about it?

Mapping



What is the BTC doing about it?

Boot Brushes & Education

- Boot brushes can be used when entering and exiting an area
- Trail Etiquette
  - Stay on trail
  - Leave plants, flowers and seeds where they are
  - Clean clothes and pets after hiking

What is the BTC doing about it?

Pull Parties & Restoration

- Work parties organized by Clubs - generally focus on a particular species on a BTC nature reserve
- We often get help from partner organizations and companies
- BTC staff ecologists implement restoration projects that involve invasive species management and replanting of native species

What is the BTC doing about it?

Landowner Stewardship Program

- A voluntary program available to landowners who allow the Bruce Trail to cross their property,
- Helps support private landowners who want to maintain the unique environmental values of their property, like wildlife habitat, sensitive natural areas, or rare species.
- The BTC is able to provide guidance and financial support and assist with planning and implementing habitat restoration projects on the property

What is the BTC doing about it?

Before and After

Before

After

What can you do about it?

- Report sightings via iNaturalist
- Volunteer for invasive species ‘pull parties’
- Manage invasive species on your property
- Stay on the Trail
- Use boot brush stations where available and clean your clothes and pets after hiking
- Don’t transport firewood
- Don’t plant invasive species

Resources

iNaturalist

Ontario Invasive Plant Council

Invasive Species Centre

Ontario's Invading Species Awareness Program

'Grow Me Instead' Guide

Your local Bruce Trail Club

Landowner Stewardship Program

Questions?


MISSION
Preserving a ribbon of wilderness, for everyone, forever.
VISION
The Bruce Trail secured within a permanently protected natural corridor along the Niagara Escarpment.
brucetrail.org
TheBruceTrailConservancy
@brucetrail_btc
Rated top environmental charity in Canada for 2020 by Maclean's