

Invasive Phragmites

Description and Pathways of Spread

- Invasive perennial wetland reed
- Similar to a rare native species
- Native to Eurasia
- Name derived from the Greek term *phragma* = fence, hedge, or screen
- Introduced along the eastern seaboard, possibly as a seed contaminant in soil ballast in the 1800s
- Agriculture and Agri-food Canada “worst” invasive species in Canada 2005)
- Occasionally sold in the horticultural industry
- Height can reach up to 5 m
- Creates dense monocultures, up to 100% Phragmites
- Stem rigid, beige or tan (under leaf sheath)
- Leaves at 45 degree angle from stem
- Leaves blue-green in colour
- Seedheads dense, large



Photo by: Ron Reinholt

Invasive Phragmites -Pathways of Spread



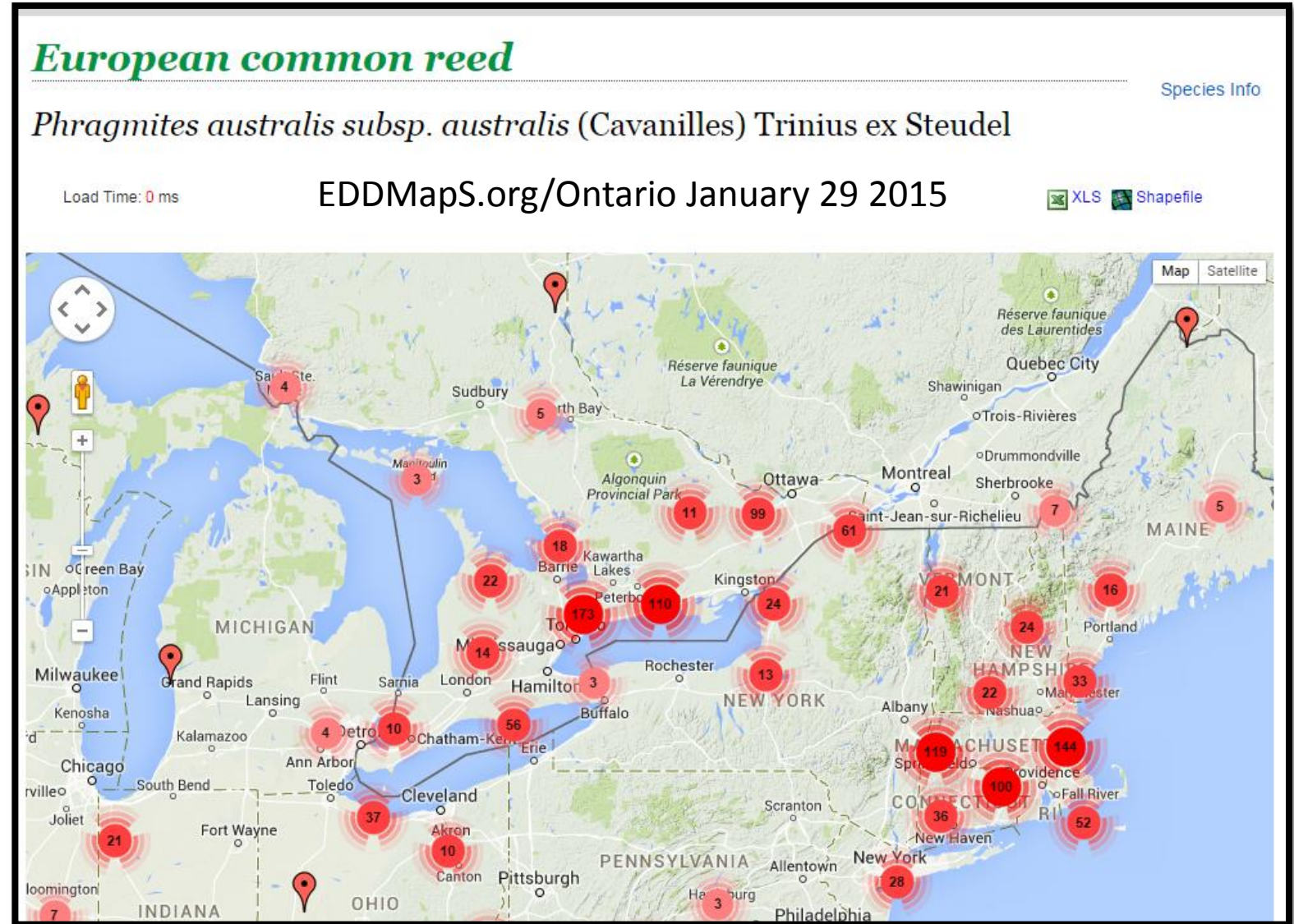
Photo courtesy of Matt Smith

- Reproduces via seed, stolons, rhizomes
- Seeds via mud on boots, pets, tires, or equipment and carried to new areas
- Soil contaminant
- Contaminant in municipal mulch or compost
- Horticulture
- Water, air or animal movement

Phragmites – Habitat and Distribution

Wide range

- Wetlands, streambanks, lake shores, wet fields, ditches, roadsides
- Survives brackish environments
- Prefers areas of standing water
- Roots can grow to extreme depths
- Survives low water areas
- Thrives in disturbed habitats
- Found on every continent except Antarctica



Invasive Phragmites-Impacts

- Loss of biodiversity and species richness
- Loss of habitat
- Changes in hydrology
- Changes in nutrient cycling
- Increased fire hazard
- Economic and social



Photos courtesy of
Janice Gilbert

Invasive vs. Native Phragmites

Native is *Phragmites australis* subsp. *americanus*

- Not taller than 2m
- Sparse stands
- Stem flexible, reddish-brown under leaf sheath
- Leaves at 30 degree angle from stem
- Leaves yellow-green
- Seedheads sparse, small

Native *Phragmites* (left) and Invasive *Phragmites* (right)



Invasive *Phragmites* (top leaf) and native *Phragmites* (lower leaf)



Native *Phragmites* seedhead (top) and invasive *Phragmites* seedhead (bottom)



Photos by: Erin Sanders, Janice Gilbert

Giant Hogweed – *Heracleum mantegazzianum*

What is it?

Biennial or perennial member of the parsley family
Native to Caucasus region of Europe/Southwest Asia
First introduced in late 1800's
First record in Ontario in 1949

Pathway of Introduction and Spread

Horticultural trade – as a garden curiosity
Water spread

Habitat

Moist, rich soil – along riverbanks and stream sides
Roadsides, trail sides, forest edges, agricultural land



Giant Hogweed – *Heracleum mantegazzianum*

Impacts

Threat to human health – sap contains toxins that cause photodermatitis and can result in severe burns

Out competes native vegetation by shading it out and forming dense stands
Hinders recreational activities



Jan Samanek, State Phytosanitary Administration, Bugwood.org

Giant Hogweed – First Year Description

First year plants grow in a large basal rosette form



Photo credit: Gord Jopling

Leaves are deeply incised and serrated



Photo credit: MVC

Leaves can reach widths of 1.5m across



Photo credit: John Benham

Giant Hogweed – Second/Third Year Description



The white flowers grow in umbels – each umbel can produce up to 20,000 seeds



Stem is hollow, and bristly with purple splotches

Second or third year plants grow large flowering stalk reaching heights of 5m (15 ft)



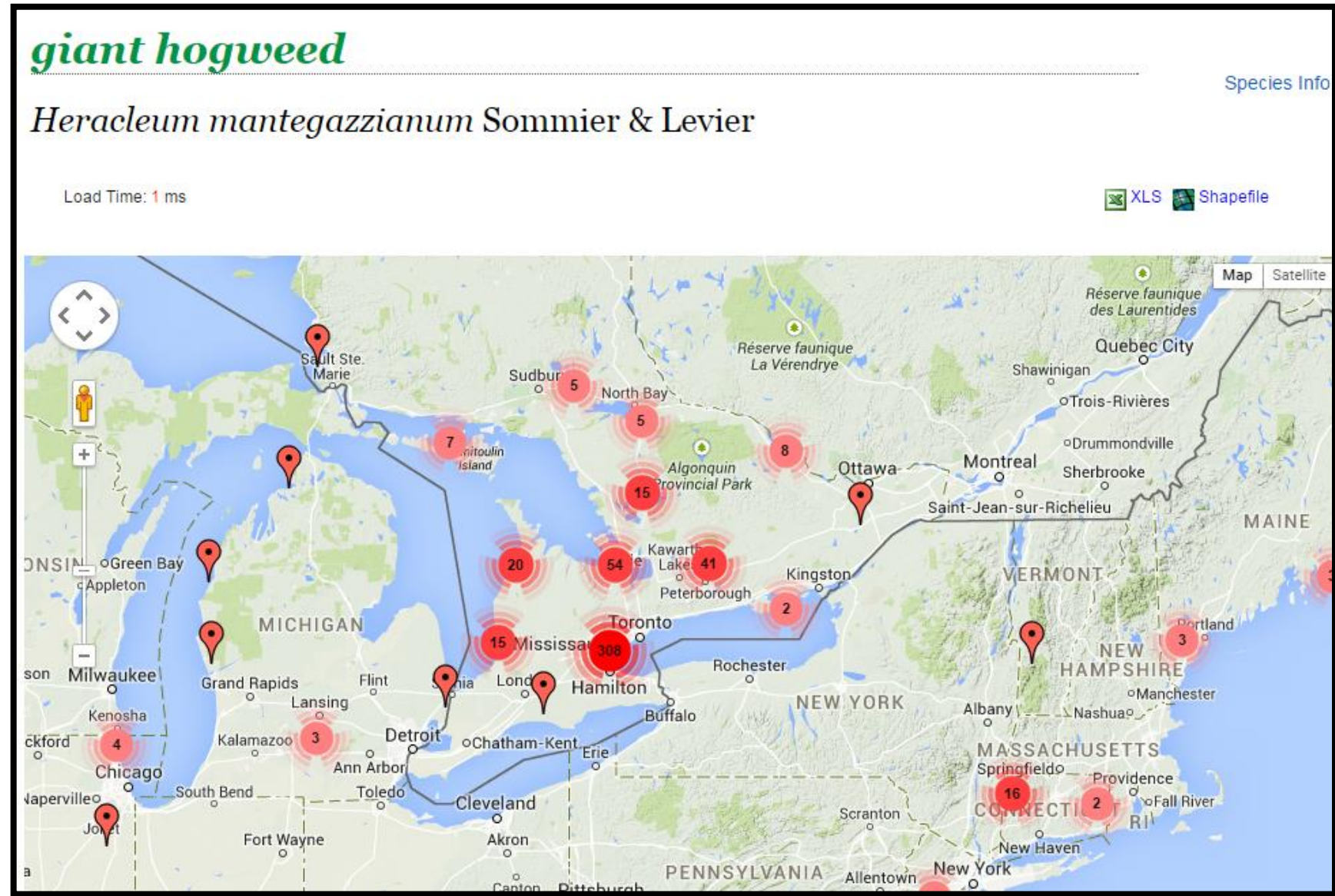
Seeds are oval shaped

Giant Hogweed – Distribution

Scattered distribution across southern and central Ontario, as far north as Kapuskasing.

Large population along 16 Mile creek in Oakville, ON.

Also invasive in Europe.



Giant Hogweed – Similar Species



Photo credit: Stephen Lea



Photo credit: UNH



Photo credit: B. Douglas



Photo credit: DEC NY

Cow Parsnip (*Heracleum maximum*)

- No purple splotches on the stem
- Hair on stem is downy, not bristly
- Leaves are not as sharply serrated
- Native to Ontario

Angelica (*Angelica sinensis*)

- Globular flower umbels
- Purple Stem
- Compound leaves
- Native to Ontario

THESE PLANTS ARE COMMONLY CONFUSED, DO YOU KNOW THE SPECIES?

WHICH ONE IS NATIVE AND WHICH ONE IS INVASIVE?

This one's
native!



Cow Parsnip (*Heracleum maximum*)

Rob Routledge, Sault College, Bugwood.org.



Giant Hogweed (*Heracleum mantegazzianum*)

Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Wild Parsnip (*Pastinaca sativa*)

Description and Pathways of Spread

- Biennial, occasionally perennial herb growing 0.5-1.5 m tall
- Originates in Eurasia
- First year plant forms a low, spindly rosette (whorl) of leaves; in the second year the plant forms a flower stalk.
- Leaves consist of 2-5 pairs of compound, sharply toothed leaves with mitten-shaped side leaflets and a diamond-shaped terminal leaflet.
- Small, yellow-green flowers are produced in umbrella-shaped flower clusters that are 10-20 cm wide.
- Seeds are flat and round.
- Brought to North America by European settlers and grown for its edible root.
- Seeds are spread by wind and water, mowing or other outdoor equipment.
- May escape from cultivated fields and spread to natural areas.

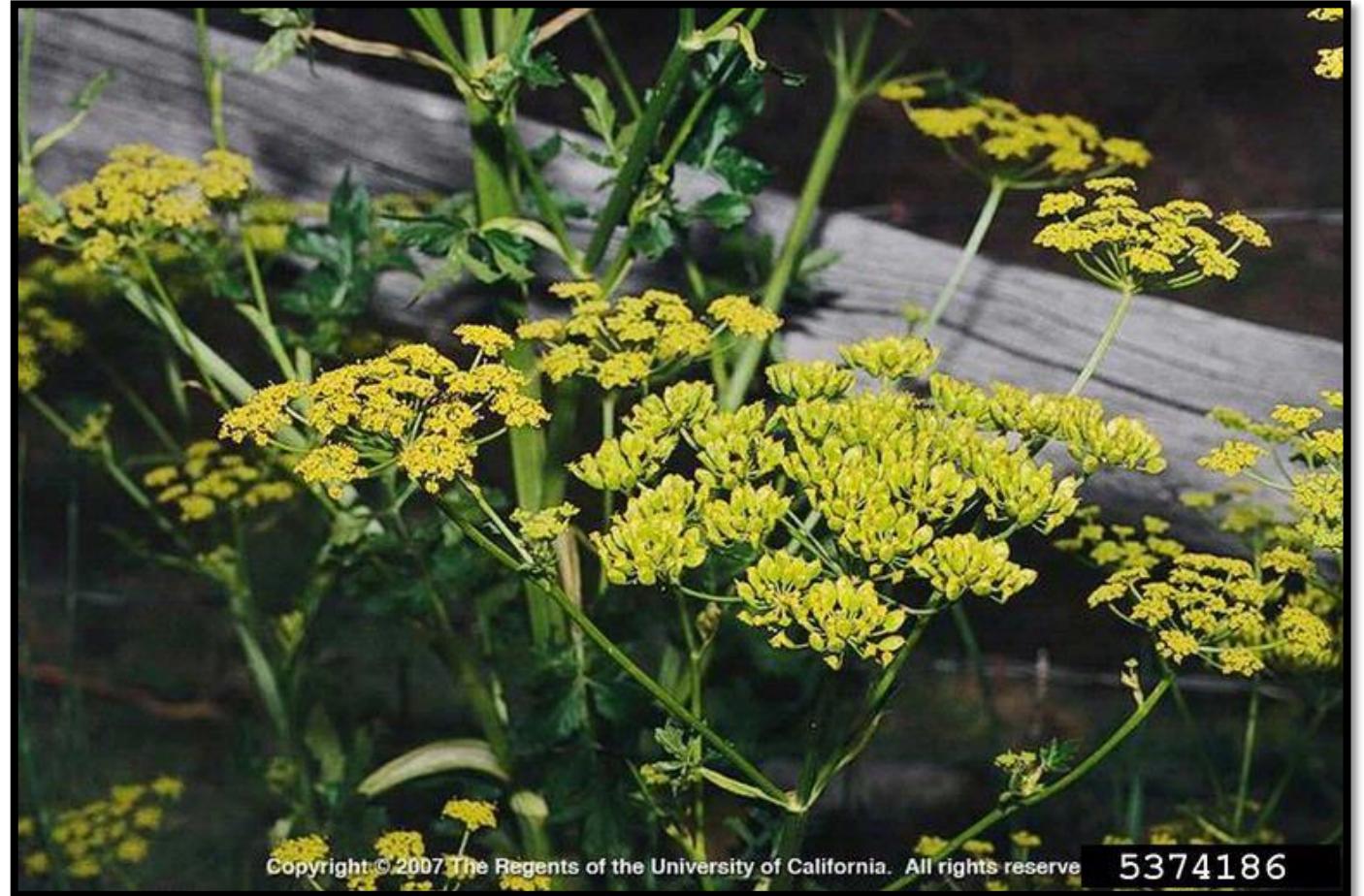


John Cardina, The Ohio State University, Bugwood.org

Wild Parsnip (*Pastinaca sativa*)



Ohio State Weed Lab Archive, The Ohio State University, Bugwood.org



Leaves and Flowers – typical growth habit

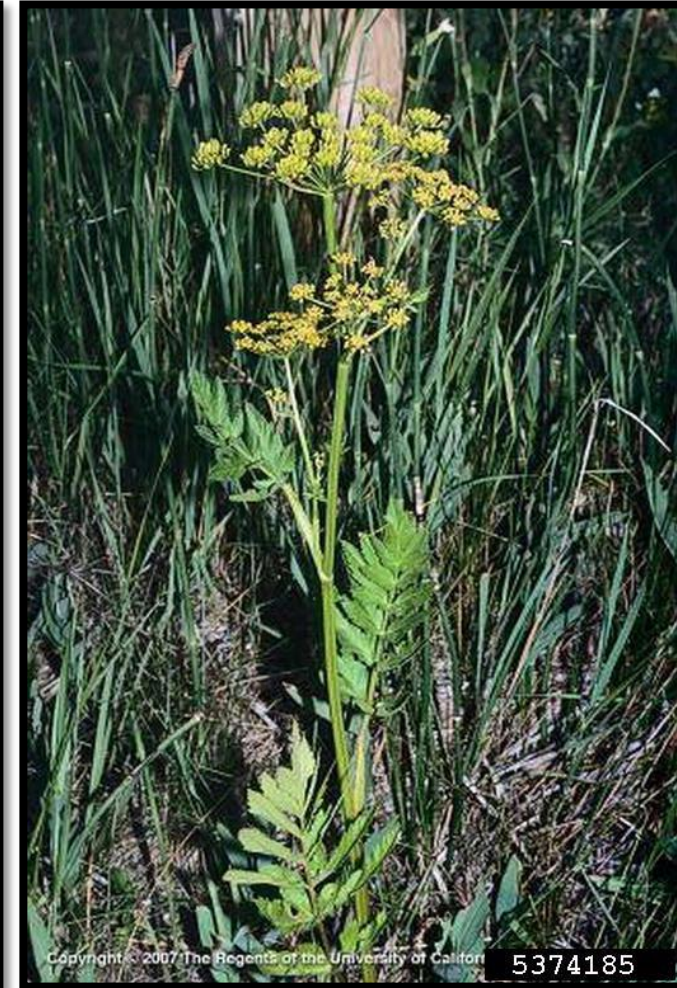
Wild Parsnip (*Pastinaca sativa*)

Impacts

- Forms dense stands that outcompete native plants.
- Stems, leaves and flowers contain chemicals that can cause human skin to blister severely when exposed to sunlight (photodermatitis).
- Wear protective clothing, gloves, and eye wear when working around or with this plant.
- May reduce the quality and saleability of agricultural forage crops such as hay, oats and alfalfa, because the chemical compounds that are present in the plant reduce weight gain and fertility in livestock that eat it.



Leslie J. Mehrhoff, University of Connecticut, Bugwood.org



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Wild Parsnip (*Pastinaca sativa*)

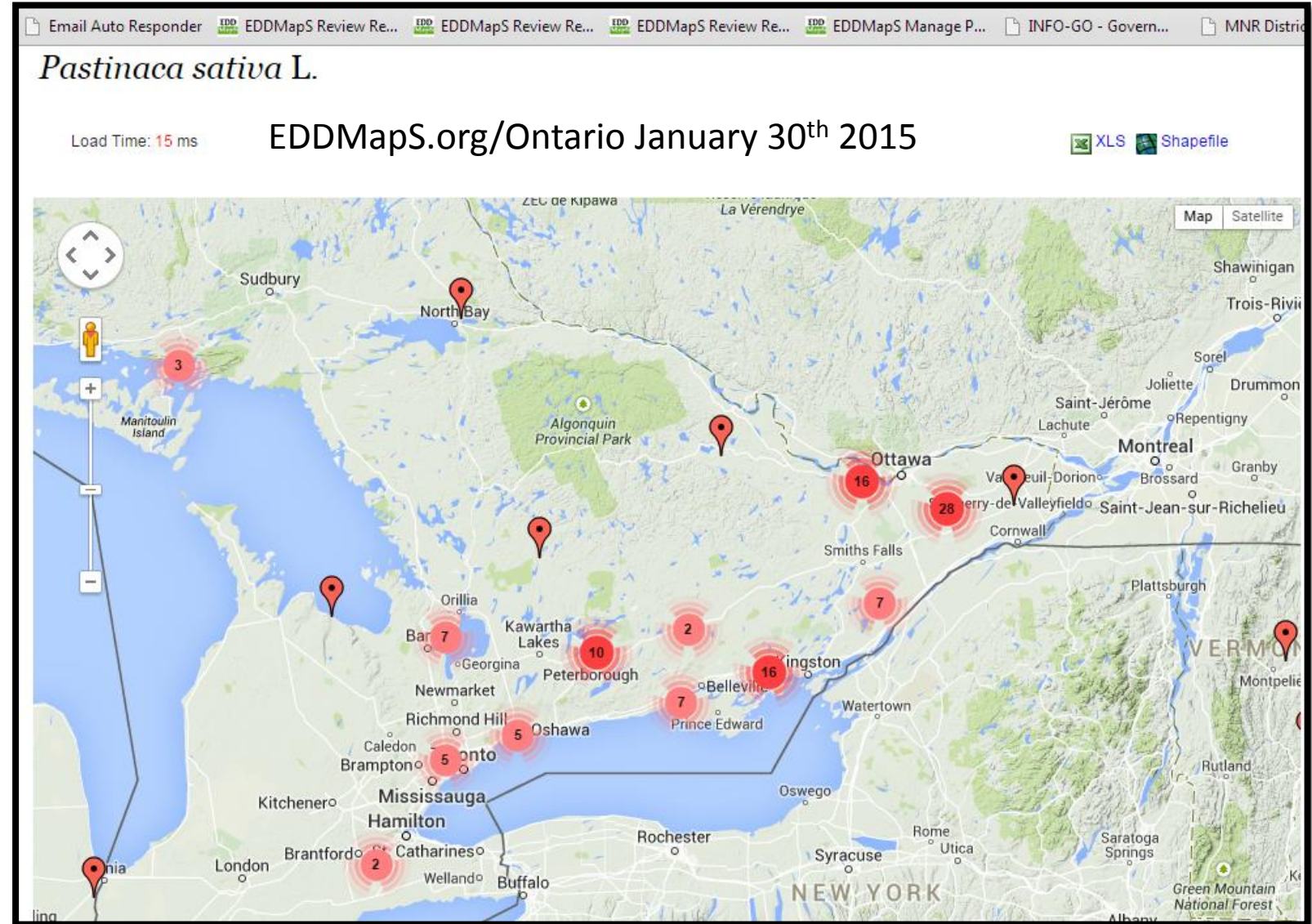
Distribution and Habitat

In Ontario: found in eastern and southern parts of the province.

In Canada: reported in every province and territory except Nunavut.

In the United States: reported in every state except Mississippi, Alabama, Georgia and Florida.

Grows in disturbed areas such as abandoned yards, waste clumps, meadows, open fields, roadsides and railway embankments.



Other
Invaders

American Bittersweet (native) compared to Oriental Bittersweet (INVASIVE)



Native Bittersweet
(Celastrus scandens)
produces berries at the
terminal ends of stems,
and have fruit capsules
that are orange, with
orange fruit inside.



Invasive Bittersweet
(Celastrus orbiculatus)
produces berries along
the stems, at the leaf
axis, and have fruit
capsules that are yellow,
with orange fruit inside.





Adult (magnified)



Egg sacs and adult



Crawler Stage



Infested Hemlock branch

- Hemlock woolly adelgid (*Adelges tsugae*), is an invasive insect that can damage and kill eastern North American hemlock species.
- The adelgid is very tiny, less than 1mm in length.
- In North America there are only female HWA, which reproduce asexually.

Photos: top left: Kelly Oten, North Carolina Forest Service. Centre: Ashley Lamb, Virginia Polytechnic Institute and State University. Far right: USDA Forest Service Southern Research Station Archive, USDA Forest Service, SRS. Far left: Lorraine Graney, Bartlett Tree Experts. All from Bugwood.org

PREVENTING the Spread

Stay on trails

Avoid travelling off-trail and in areas known to have common buckthorn or other invasive species

Stop the spread

Inspect, clean and remove mud, seeds and plant parts from clothing, pets (horses), vehicles (including bicycles), and equipment such as mowers and tools. Clean vehicles and equipment in an area where plant seeds or parts aren't likely to spread

Keep it natural

Try to avoid disturbing soil and never remove native plants from natural areas. This leaves the soil bare and vulnerable to invasive species.

Use native species

Try to use local native species in your garden. Never use DSV in your garden or hedgerows. Encourage your local garden centre to sell non-invasive or native plants.

Watch for it

Monitor hedges, property lines, fence lines and trails. Early detection of invasive plants can increase the success of control and removal efforts

REPORT IT!

www.eddmaps.org/Ontario

Invading Species Hotline 1-800-563-7711

Look Before You Leave!

Invasive Species may be joining you on vacation.

You could unknowingly be carrying stowaways (invasive species) to your favourite natural area.

- ① **Watercraft** – ✓ *Inspect and clean your boat & motor.*
✓ *Dispose of bait properly.*
- ② **Pets** – ✓ *Groom your pets after hiking.*
- ③ **Firewood** – ✓ *Buy firewood locally.*
- ④ **Plants** – ✓ *Garden with non-Invasive plants.*
- ⑤ **Hiking Gear/ATV's/Bikes**
– ✓ *Clean mud, seeds & plant parts before transport.*



How to Use EDDMapS to Report Invasive Species in Ontario

EDD MapS Ontario

Early Detection & Distribution Mapping System

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Emily Johnston, Ontario Federation of Anglers and Hunters

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sign out

Report Invasive Species Sightings in Ontario

AQUATIC PLANTS

HERBS/FORBS

GRASSES

SHRUBS

TREES

VINES

FISH

INVERTEBRATES

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THE UNIVERSITY OF GEORGIA
CENTER FOR INVASIVE SPECIES
ECOSYSTEM HEALTH

Website Developed by: The University of Georgia Center for Invasive Species and Ecosystem Health
2360 Rainwater Road
Tifton, GA 31793-5766
Contact Us
www.bugwood.org



ONTARIO FEDERATION
OF ANGLERS AND HUNTERS



Invasive
Species
Centre
Catalyst for research and response



ONTARIO'S
INVADING SPECIES
AWARENESS PROGRAM



Ontario

Why Use This Tool?

- A key component in an invasive species Early Detection & Rapid Response (EDRR) program is the development of species distribution maps.
- Entering and tracking locations of invasives can identify the “leading edge” of invasive species heading our way.
- This gives each of us a chance to implement Early Detection & Rapid Response programs in our area. These EDRR programs allow us to stop or minimize an invasive species before it becomes a problem and allows land managers and agencies to prioritize control needs and strategies while populations are still small.
- The Early Detection & Distribution Mapping System, or EDDMapS, is a web-based mapping system for invasive species distribution that is fast and easy to use and doesn't require GIS experience or software.



First Time User: Register

- First time only: Register as an EDDMapS user.
- Go to the EDDMapS website:
www.eddmaps.org/Ontario
- Click “Join Now”



Choose Your Species

Choose the specific species you are reporting from the drop down list.

Note: Species are listed in alphabetical order by scientific name, although the common name is also listed.

You can click on the Species Information tab and then on Subject Name and the list will then alphabetize by common name.

A screenshot of the EDD MapS Ontario website. The page title is "Report an Invasive Species Occurrence". The form includes a "Species:" dropdown menu with a list of species, a "Habitat:" dropdown menu, a "Jurisdiction:" dropdown menu, and fields for "Latitude:", "Longitude:", and "Location:". A red arrow points to the "Species:" dropdown menu. The "Location:" field contains the text "Unnamed Road, Cochrane, Unorganized, North Part, ON P0L, Canada". The "Latitude:" and "Longitude:" fields have instructions: "Must be expressed in Decimal Degrees (XX.XXXX) and DATUM NAD83/WGS84." The "Description:" field is empty. The website header includes "EDD MapS Ontario", "Early Detection & Distribution Mapping System", and navigation links: "Report Sightings", "Distribution Maps", "Species Information", "Tools", "My EDDMaps", "sign out", "About", "Partners", "Contact". The footer includes "Microsoft Outlook", "Report an Invasive A...", and "Microsoft Excel".

When Did You See It?

- Select the date the species was observed on by clicking the calendar, (1) and then clicking on the day (2).
- Tip: You can use the arrows on either side of the month and year to change the month.

EDD MapS Ontario
Early Detection & Distribution Mapping System

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Report an Invasive Species Occurrence

Please provide as much information about the sighting as possible.

Species: rusty crayfish - *Orconectes rusticus* (Girard, 1859)

Observation:

Observation Date: 09/13/2013 (?)

Method Used: September 2013

Protocol Used: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Location:

Jurisdiction: Select One

Habitat: Select One (?)

Latitude:
Must be expressed in Decimal Degrees (XXXXXX) and DATUM NAD83/WGS84.

Longitude:
Must be expressed in Decimal Degrees (XXXXXX) and DATUM NAD83/WGS84.

[Jump to Point](#)

Unnamed Road, Cochrane, Unorganized, North Part, ON, R0L, Canada

Map | Satellite



How Was It Identified?

Choose the method used to determine the species.

For most public reporters, this will be “photograph” or “observation”.

In our example, “Observation” was chosen because the reporter is a known expert on crayfish.



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Report Sightings Distribution Maps Species Information Tools My EDDMapS

Report an Invasive Species Occurrence

Please provide as much information about the sighting as possible.

Species:
rusty crayfish - Orconectes rusticus (Girard, 1852)

Observation:
Observation Date: 09/13/2013
Habitat: Select One (?)

Method Used: Select One
Protocol Used: Observation

Location:
Jurisdiction: Select One
Latitude:
Longitude:
Jump to Point

Map Satellite

A large red arrow points from the top right towards the 'Observation' option in the 'Method Used' dropdown menu, highlighting the selection process.

Where is the Geographical Location?

Here there are two options:

1. You can choose the Jurisdiction from the drop down menu.

OR

2. Enter the Latitude and Longitude coordinates from your GPS device.

A screenshot of a web form for data entry. The form has sections for "Species:", "Observation:", "Location:", and "Location Description:". The "Species:" section has a dropdown menu with "rusty crayfish - Orconectes rusticus (Girard, 1852)" selected. The "Observation:" section has fields for "Observation Date:" (12/02/2013), "Method Used:" (Observation), "Protocol Used:" (Angler Diary), and "Habitat:" (Select One). The "Location:" section has a dropdown menu for "Jurisdiction:" and a text input for "Latitude:" (43.64777). Below the latitude input is a note: "Must be expressed in Decimal Degrees (XXXXXX) and DATUM NAD83/WGS84." There is also a "Longitude:" input field with the value "-80.28141" and a similar note. A "Jump to Point" button is below the longitude field. The "Location Description:" section has a text area with the message "Cannot determine address at this location." To the right of the form is a Google Map showing a red pin. Two large red arrows are overlaid on the form: one labeled "2" points to the "Jurisdiction:" dropdown, and another labeled "1" points to the "Latitude:" input field. At the bottom of the map area, it says "Lat/Long Conversion Tools:".

Species:

rusty crayfish - Orconectes rusticus (Girard, 1852)

Observation:

Observation Date: 12/02/2013 (?)

Method Used: Observation

Protocol Used: Angler Diary

Habitat: Select One (?)

Location:

Jurisdiction:

Latitude: 43.64777

Must be expressed in Decimal Degrees (XXXXXX) and DATUM NAD83/WGS84.

Longitude: -80.28141

Must be expressed in Decimal Degrees (XXXXXX) and DATUM NAD83/WGS84.

Jump to Point

Location Description:

Cannot determine address at this location.

Map Satellite

Google

Map data ©2013 Google Terms of Use

Marker status: Click and drag the marker.

Lat/Long Conversion Tools:

Where is the Geographical Location?

In this example we have chosen the City of Kawartha Lakes as our jurisdiction.

Clicking on a specific jurisdiction will automatically show the location in the Google map to the bottom right of your screen.



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Early Detection & Distribution Mapping System

Report Sightings | Distribution Maps | Species Information | Tools | My EDDMapS | sign out

Welcome:
Emily Johnston, Ontario Federation of Anglers and Hunters

Report an Invasive Species Occurrence

Please provide as much information about the sighting as possible.

Species:
rusty crayfish - *Orconectes rusticus* (Girard, 1852)

Observation Date:
City of Brockville
City of Burlington
City of Cambridge
City of Clarence-Rockland
City of Cornwall
City of Dryden
City of Elliot Lake
City of Greater Sudbury
City of Guelph
City of Hamilton
City of Kawartha Lakes
City of Kenora
City of Kingston
City of Kitchener
City of London
City of Mississauga
City of Niagara Falls
City of North Bay
City of Orillia
City of Oshawa
City of Peterborough

Method Used:
City of Kawartha Lakes

Protocol Used:
City of Kawartha Lakes

Location:
City of Kawartha Lakes

Jurisdiction:
Select One

Latitude:
Must be expressed in Decimal Degrees (XX.XXXX) and DATUM NAD83/WGS84.

Longitude:
Must be expressed in Decimal Degrees (XX.XXXX) and DATUM NAD83/WGS84.

Jump to Point

Location Description:
Unnamed Road, Cochrane, Unorganized, North Part, ON P0L, Canada

Map | Satellite

Canada
Manitoba
Ontario
Quebec
Winnipeg

Upload Photos **TIPS**

- ❖ Good quality photos are KEY to confirming the species that you wish to report.
- ❖ Be sure to include any easily identifiable characteristics of the species. For example, with plants, leaf shape and arrangement, flowers, fruit, roots, and unique features like thorns should be documented.
- ❖ Try to include something in the picture that gives an indication of size. (ex. A coin, tube of lip balm, or measuring tape) This is especially important when reporting invasive fish species.
- ❖ Images showing the habit of the species, (such as a large zebra mussel infestation on a dock for instance), are also appropriate when included with close-up images.
- ❖ Take photos with the sun behind you.



Upload Photos

1

Upload Images with Your Report:

For verification purposes, take at least two digital images, a close up of the species and one of the site.

Image: No file chosen (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: No file chosen (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: No file chosen (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: No file chosen (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: No file chosen (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Additional Information:

Open

Look in: Keene_4corners

My Recent Documents

Desktop

My Documents

My Computer

My Network Places

Dimensions: 3264 x 2448
Date Picture Taken: 09/21/2013 4:27 PM
Camera Model: DSC-W210
Type: JPG File
Size: 2.75 MB

File name:

Files of type: All Files

☐ Open as read-only

1. Click "Chose File"
2. Find the image you want to use on your computer and double click it.
3. Click open, file name will appear beside the "Choose File" button.

4. Note file names and sizes.
(Pictures must be less than 4MB each)

Note: You can add photo credits or information about the photo in the box below beside "Caption".



Upload Images with Your Report:

For verification purposes, take at least two digital images, a close up of the species and one of the site.

Image: Emily_Japan...ed 005.jpg (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: Emily_Japan...ed 006.jpg (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: Emily_Japan...ed 008.jpg (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: Emily_Japan...ed 010.jpg (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Image: No file chosen (jpg, < 4 mb)

Caption:

(provide as much detail as possible, include credit if image is not yours)

Upload Photos

1. In this example, the reporter is uploading 4 pictures with credits.

2. In the “Comments” section, notes on the location and the infestation are added.

3. This reporter works with Invasive Species, and so a sample was collected and pressed for a teaching herbarium, currently located at the reporter’s home.

4. Click “Report”

A screenshot of a web form for reporting invasive species. The form is titled "Upload Photos" and contains several sections. Step 1 points to the "Image" upload section, which has four entries, each with a "Choose File" button and a "Caption" field. Step 2 points to the "Additional Information:" section, which contains a text area for comments. Step 3 points to the "Comments / Habitat information / Conditions, etc.:" section, which contains a text area for additional details. Step 4 points to the "Report" button at the bottom right of the form. The form also includes a "Location of Specimen" field and a "Specimen" field with radio buttons for "Yes" and "No".

Upload Report

The data is now entered into EDDMapS and your images are uploaded.

A unique Record ID number is given to each report.

Congratulations! You have successfully completed an entry into EDDMapS.



A screenshot of the EDD MapS Ontario website. The header includes the logo "EDD MapS Ontario" and the text "Early Detection & Distribution Mapping System". A navigation bar contains links: "Report Sightings", "Distribution Maps", "Species Information", "Tools", "My EDDMapS", and a "sign out" button. The main content area displays a "Thank You for Your Submission" message, stating that the report has been forwarded to the OFAH/OMNR Invading Species Awareness Program. It provides the "Your Record ID is 3109822" and includes links to "View this Record in EDDMapS", "Manage Your Records", and "Return to Submission Form". A large red arrow points to the Record ID. The footer contains contact information for The University of Georgia Center for Invasive Species and Ecosystem Health, including the address "2360 Rainwater Road, Tifton, GA 31793-5766" and the website "www.bugwood.org". Logos for the University of Georgia, Invasive Species Centre, Ontario Federation of Anglers and Hunters, and the Ontario government are also present.

Manage Your Reports

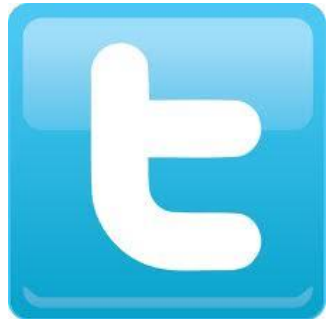
- ❖ Be sure to go to your personal EDDMapS page, (My EDDMapS).
- ❖ This is where you can keep track of “Your Stats”; view, revisit or edit the data you have entered; view or edit your profile, as well as set up and manage alerts for invasive species.



Questions?



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www.invadingspecies.com

1-800-563-7711



Partners



www.invadingspecies.com

1-800-563-7711



Invasive
Species
Centre

Catalyst for research and response



www.ontarioinvasiveplants.ca

