Mapping invasive plants in the St. Lawrence Valley

NYS GeoCON 2019 – Syracuse, NY

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Outline

- Apology
- Background on purple loosestrife
- Data Collection 2017-2019
- Goals for Analysis
- Next Steps

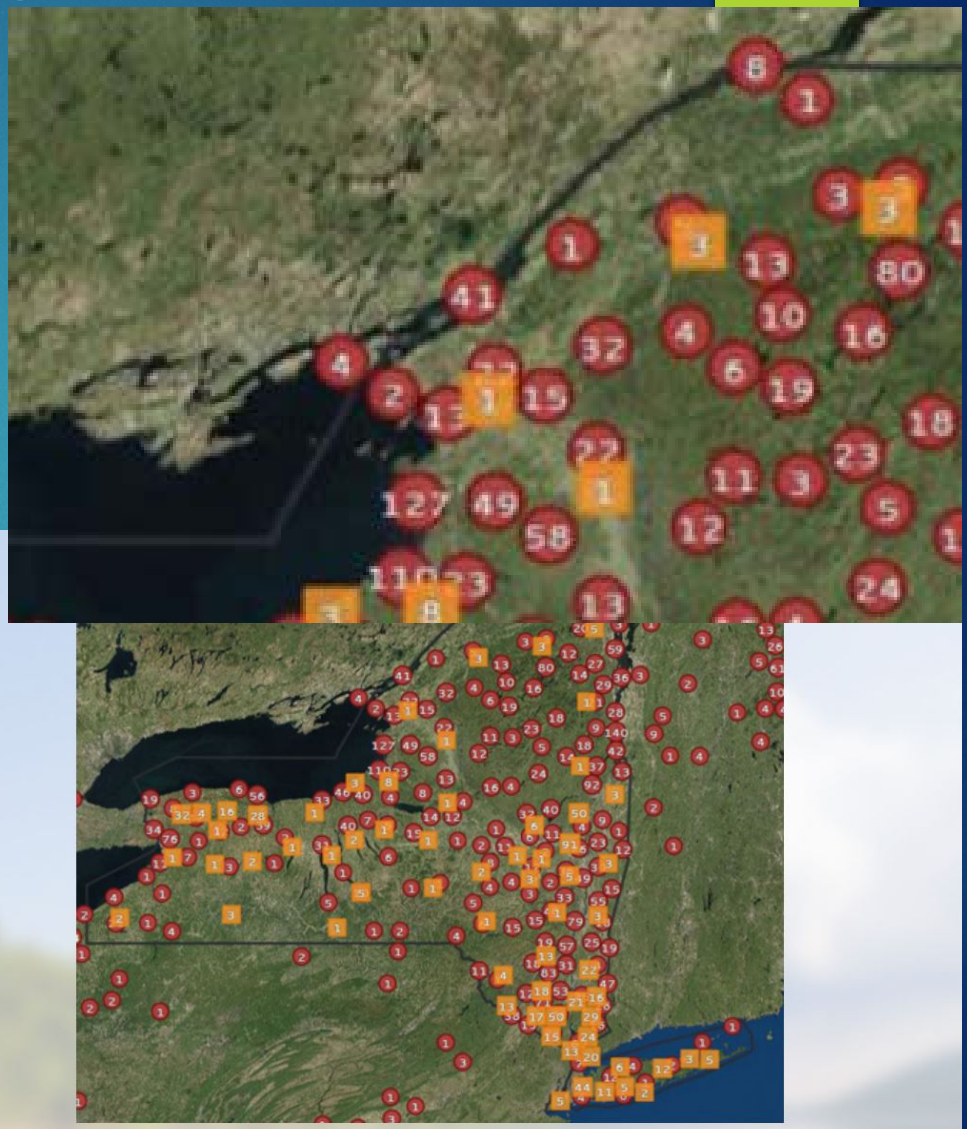
I’m sorry

Purple Loosestrife

- Introduced in the early 1980s, Eurasian origin.
- Distributed in “wildflower” seed packs until the 1980s (check today)
- Grows in most habitats, but invasive in wetlands.

Starting research

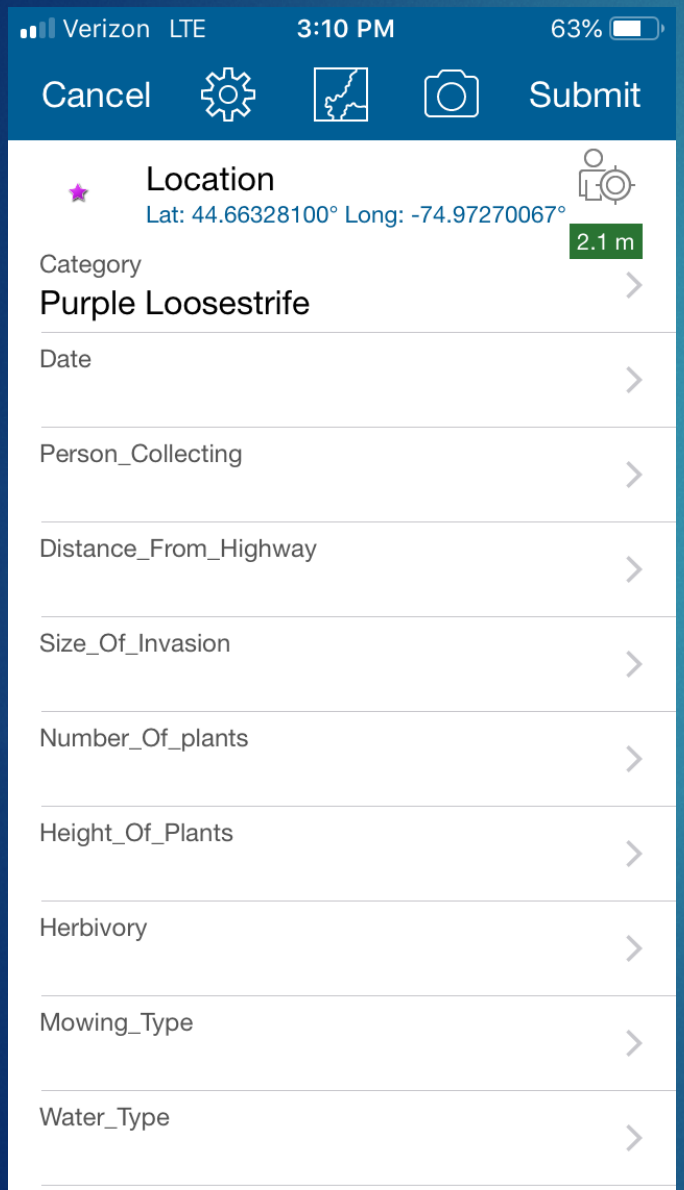
- Upper and Lower Lakes sparked an idea in 2012
- 2017- Funded by the New York Power Authority's St. Lawrence River Research and Education Fund



Purple loosestrife range in NY. Yellow squares are unconfirmed sightings; red circles are confirmed sightings.

(*Map: imapinvasives.org/nyimi/ accessed Dec.. 2015*)

2017



- Collector App
  - **Point data** – 2017 & 2018
  - ArcGIS for Developers to custom create layer into AGOL
  - Collected all other plants in just "comments" section

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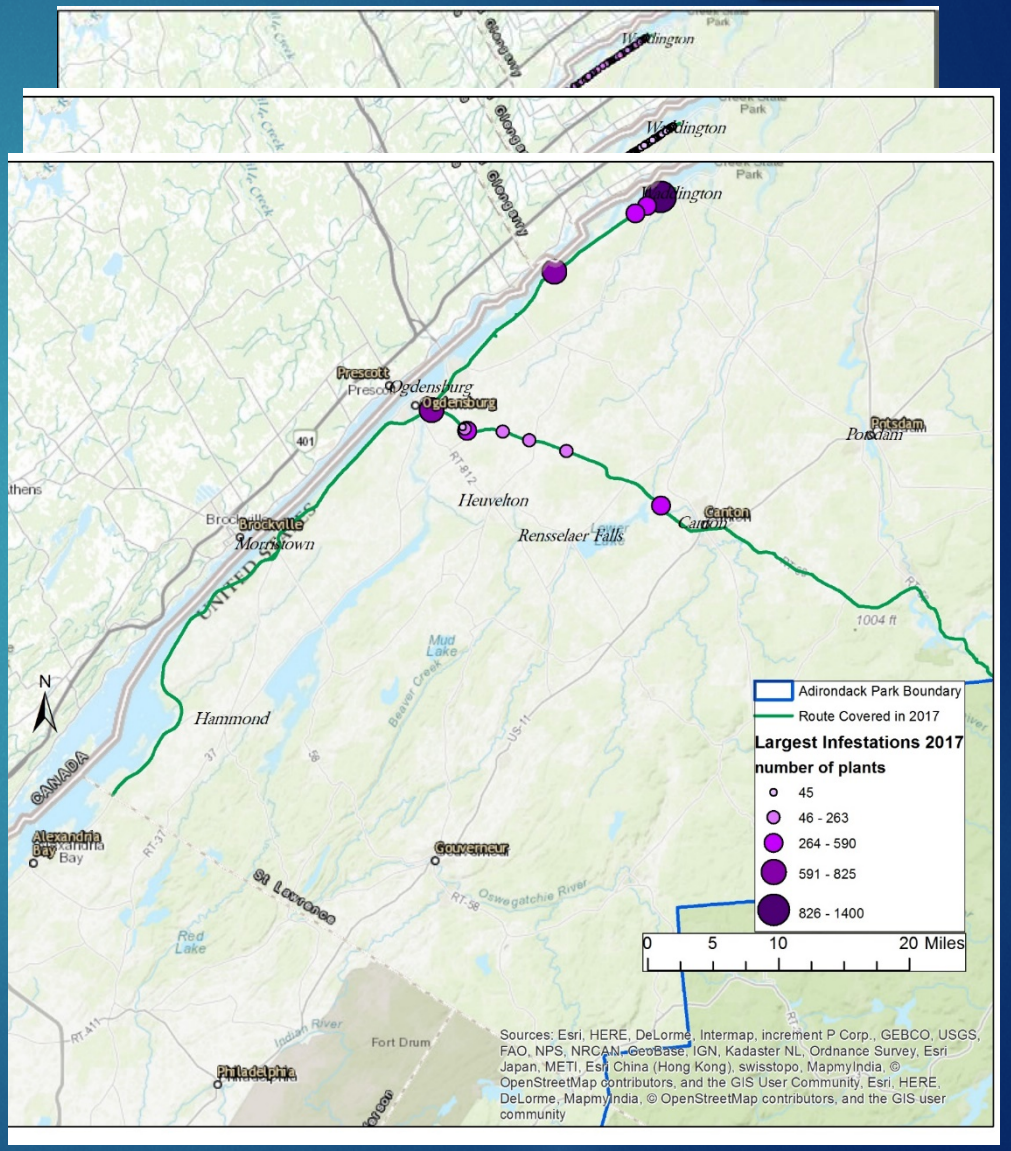
2017 Findings

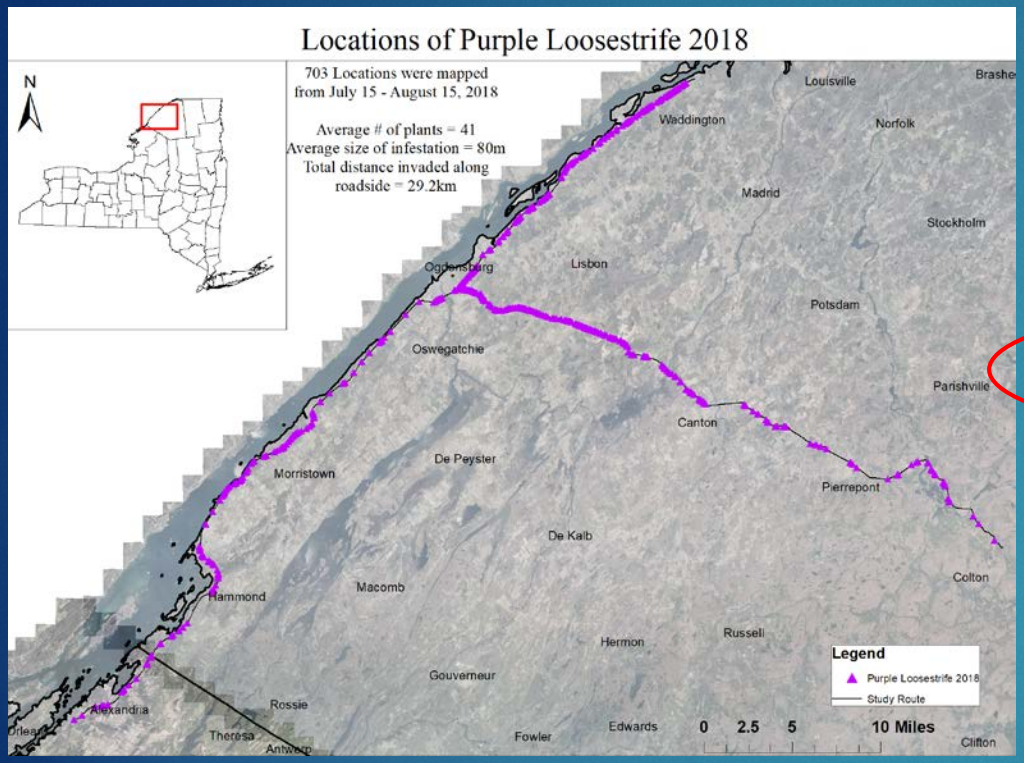
	2017
Purple Loosestrife	700 sites
Average size of Infestation	41.8m
Total Distance Invaded	29.24km
Average # of plants	71
Total Number of Plants	49693



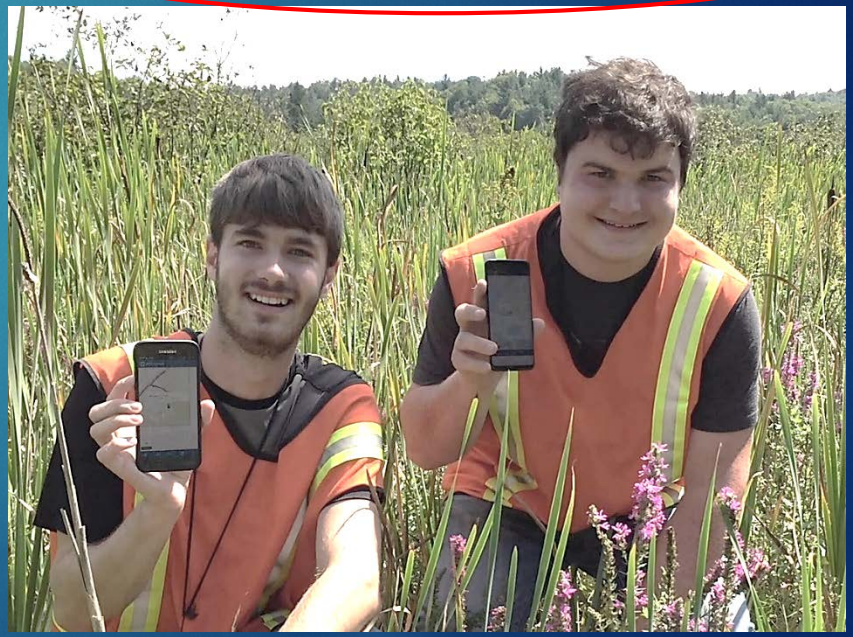
2018 Changes

- Repeat monitoring and really examine the other species of plants found WITH purple loosestrife
- Set up DROP-DOWN fields
- See if a biological control would be possible.

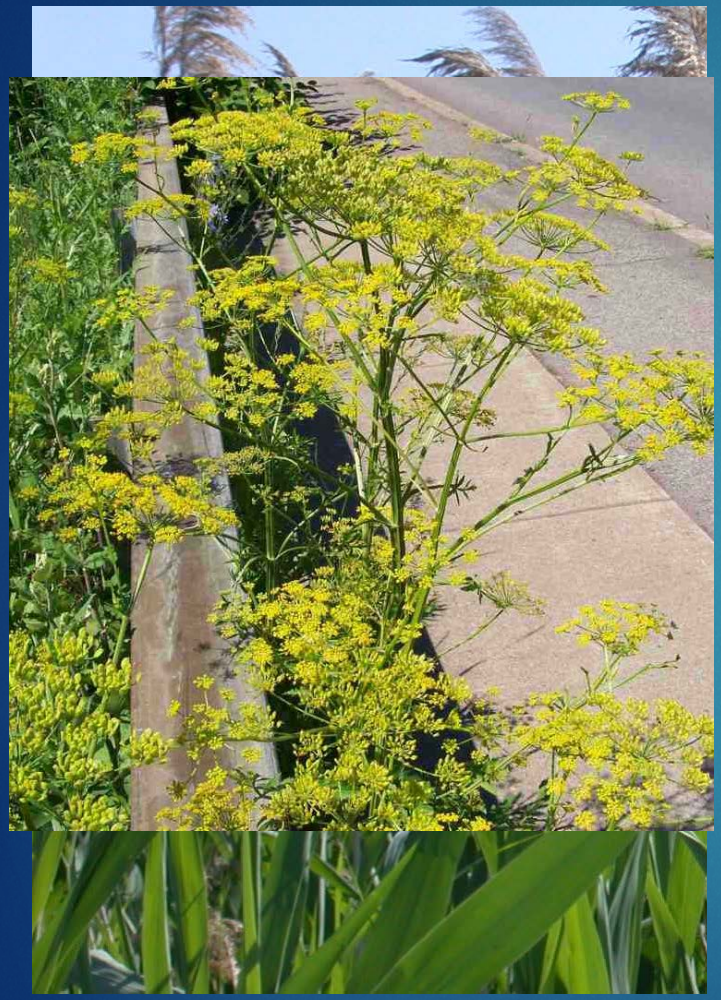
2018 Data Collection

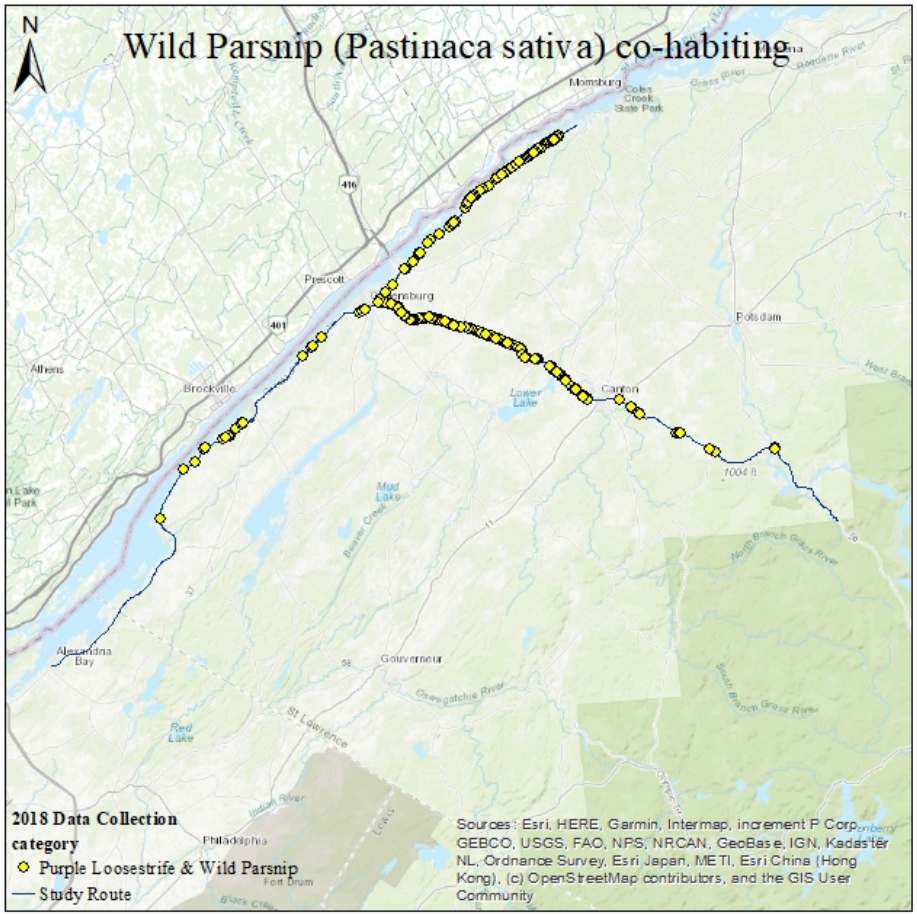


	2017	2018
Purple Loosestrife	700 sites	703 sites
Average size of Infestation	41.8m	41.7m
Total Distance Invaded	29.24km	29.29km
Average # of plants	71	80
Total Number of Plants	49693	56540

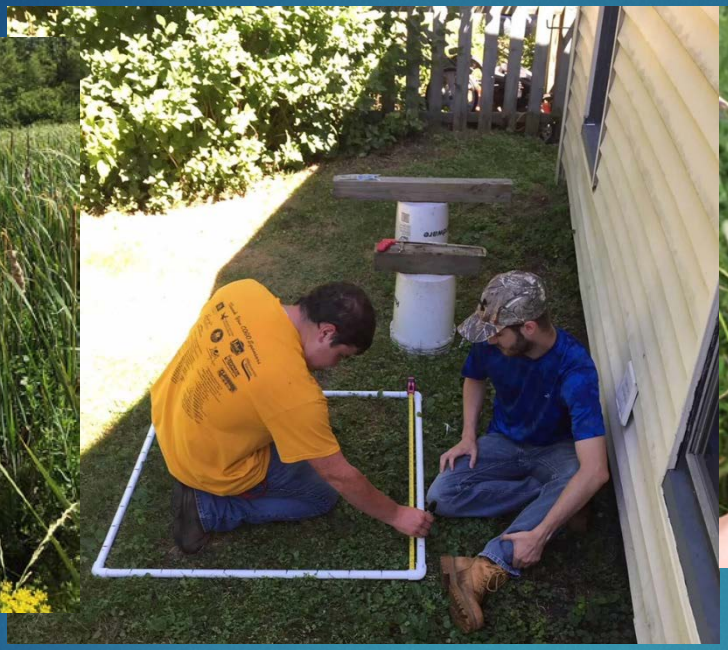


Other plants





2018 *Galerucella* Beetles



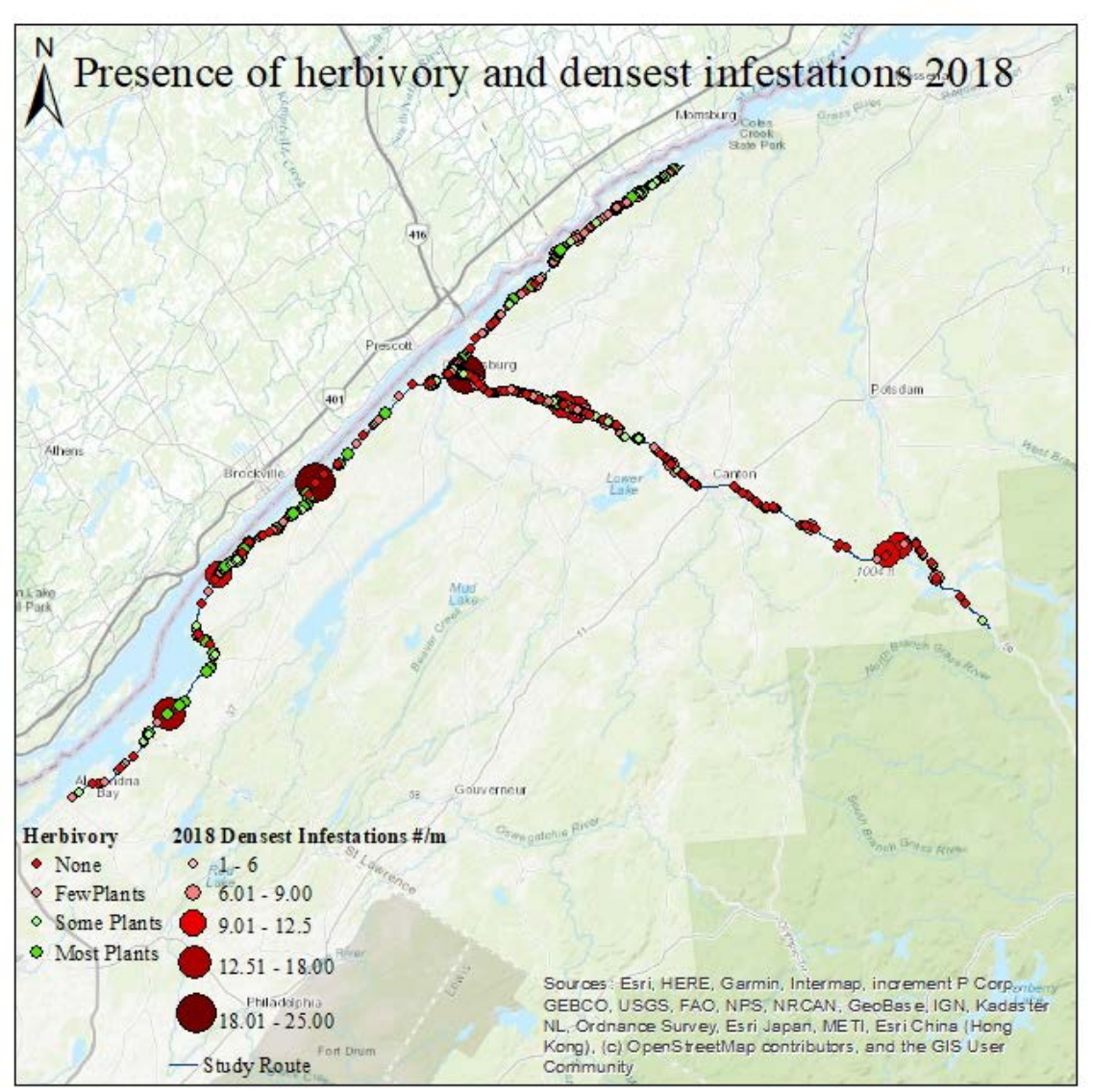
- 4 sites at Upper and Lower Lakes Wildlife Management Area (no beetles found on one side of the road).
- DEC caught 1100 beetles for us to release in 2018

Beetle Monitoring

- Bernd Blossey at Cornell has been studying these beetles for 25 years. They have an established protocol for monitoring for beetles.
- Created another collector layer for field collection
  - 42 different fields – some with preset answers/ranges

- site_name, site_address, date, investigator, weather, beetles_present, number_of_beetles, percent_pl, percent_cattails, percent_leaf area removed, total_pl_stems, total_cattail stems, height_of 1, 2, 3, 4, 5 tallest PL inflorescences 1, 2, 3, 4, 5, length of primary inflorescence 1, 2, 3, 4, 5, other_plant 1, 2, 3, 4, 5, percent other plan 1, 2, 3, 4, 5, GlobalID , CreationDate, Creator, EditDate, Editor

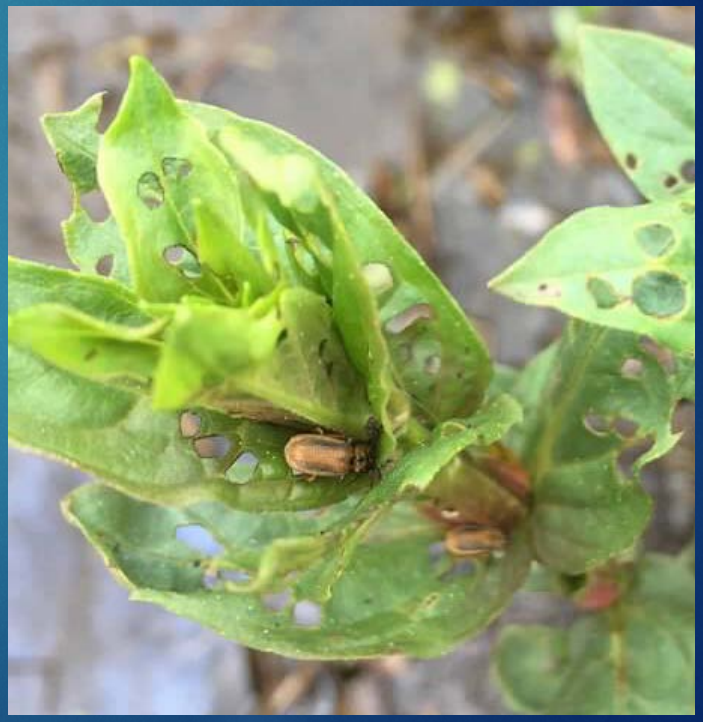
Beetles 2018



Herbivory was measured at each infestation. Very preliminary analyses show the general absence of herbivory (and thus beetles) in the largest infestations).

2019 goals

- Repeat mapping to confirm data, monitor spread
  - Collected using LINE data instead of points
  - Hard to collect point data solo
- Start a beetle hatchery



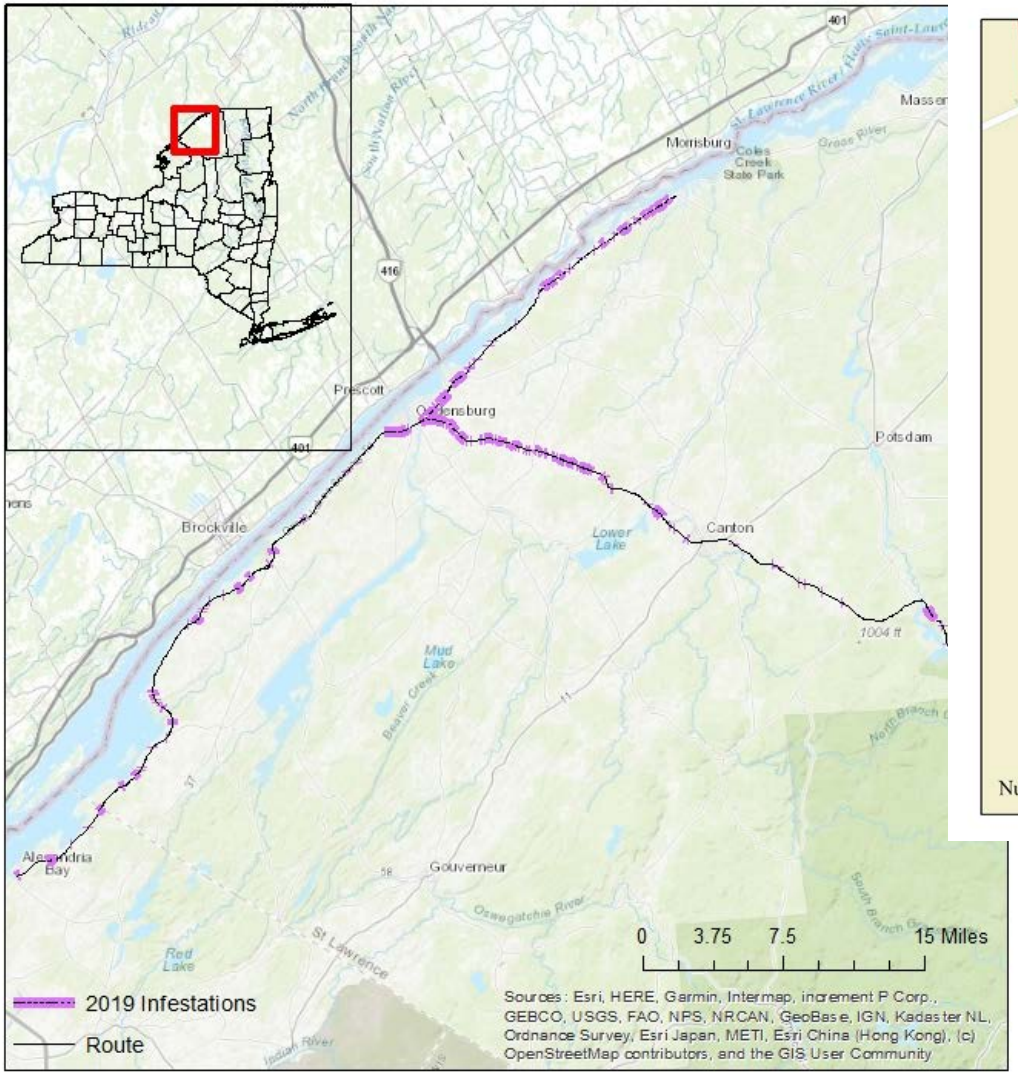
Plots to measure efficient management

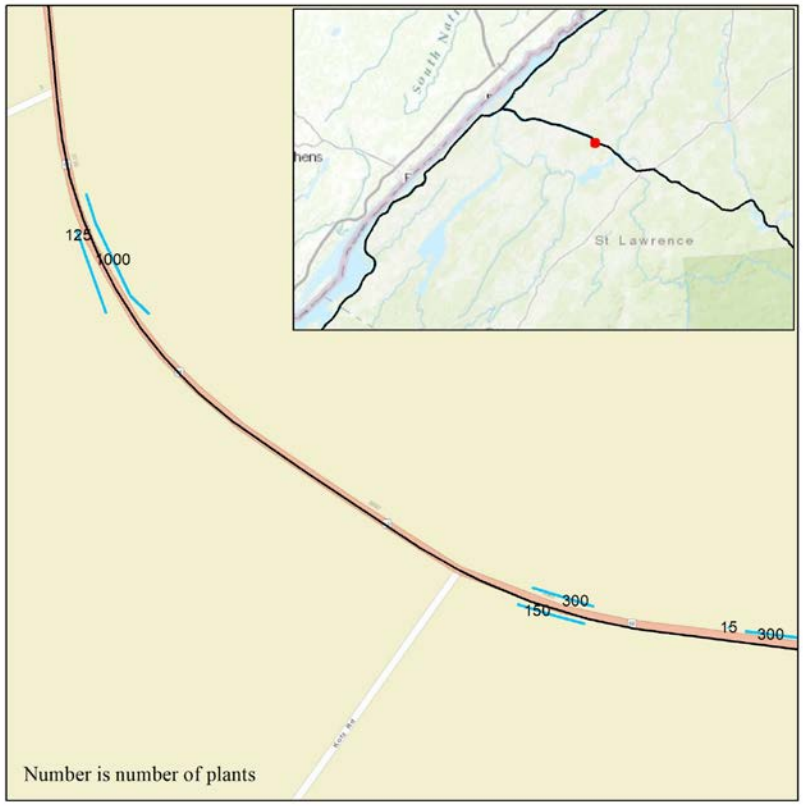
Established 4 sites of 5 treatments:

1. Control
2. Cut flowers
3. Cut plants
4. Dig up roots
5. Add beetles

Will return next year

2019 Monitoring Data



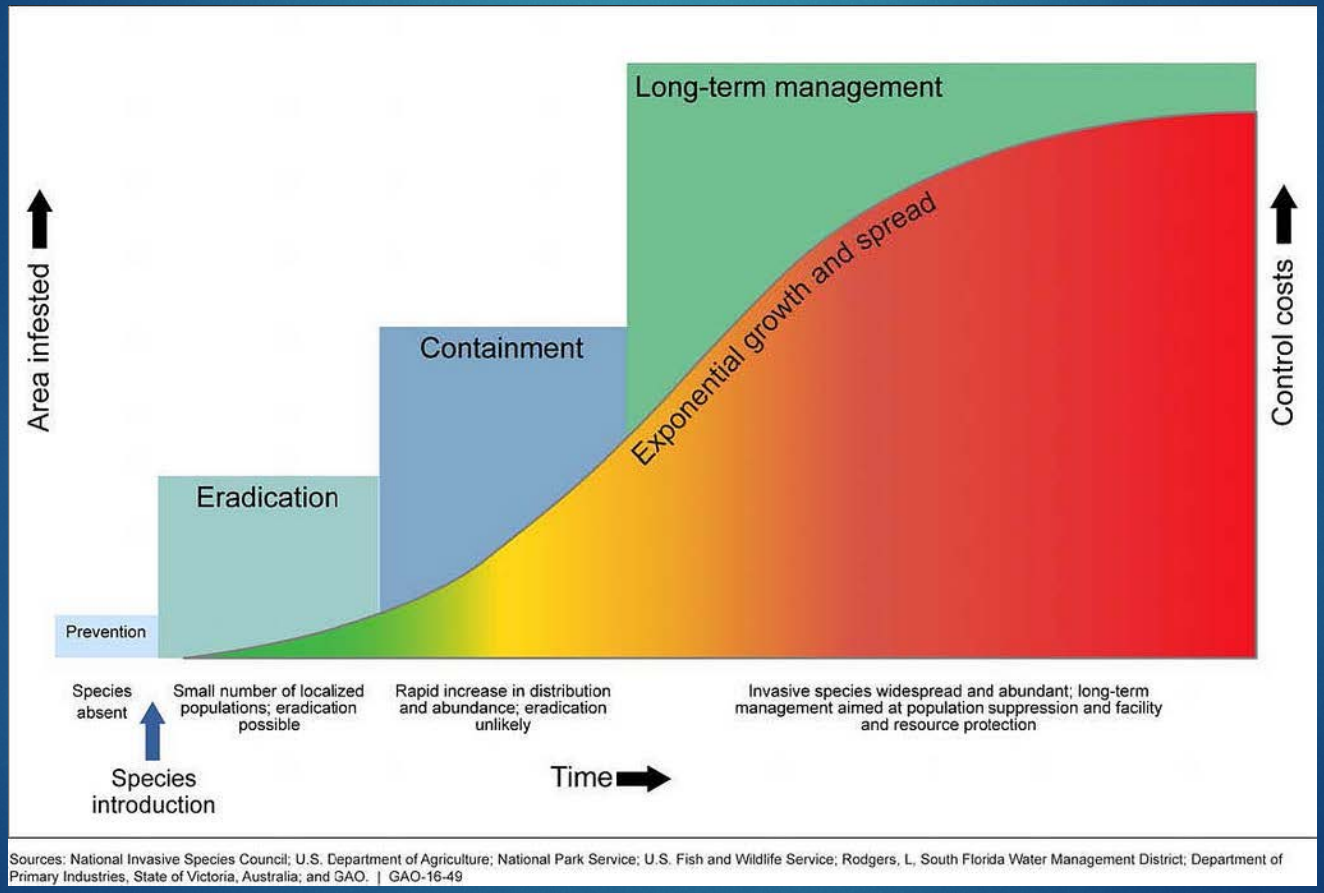


Results

Year	2019	2018	2017
Max # Plants	3500	3000	3100
Largest Infestation Size	1011	743	1600
Average Infestation Size	74.78	41.95	41.66
Total Distance (km)	36.5	29.45	29.01
Avg. Density	3.08	1.93	1.19

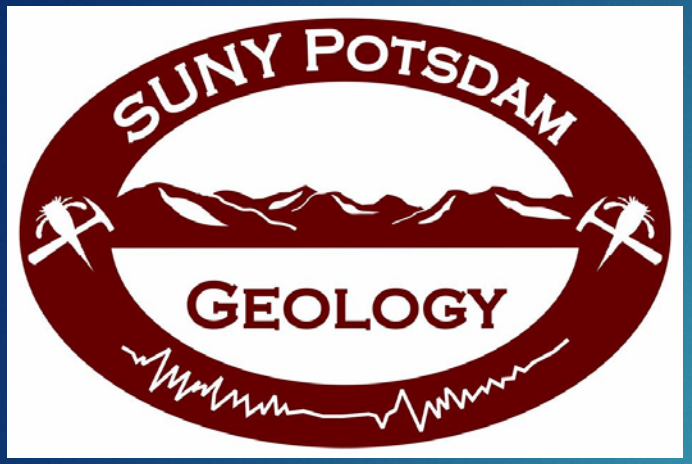
We did find some results – mostly as proof of concept, particularly the first two years. Still unsure if the changes in 2019 are real or artifacts

Where do we go from here?



What's next?

- PROCESS DRONE IMAGERY
- Analyze 2019 mapping data – still doing post-processing
- Examine changes in beetle areas from 2018-2019
- Prepare for 2020 beetle hatchery
  - Grants
- Prepare for 2020 examination of plots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THANK YOU!

St. Lawrence - Eastern Lake Ontario
SLELO
PRISM
Partnership For
Regional Invasive
Species Management

St. Lawrence River Research&Education Fund

iMapInvasives
Sharing information for strategic management

Questions?