

Saint Regis Mohawk Tribe



Response and Adaptation to the Ecological Impacts of EAB on the Akwesasne Mohawk Territory



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ReLeaf Conference, July 21-23, 2022, Watertown NY.

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Outline

- Background
- Surveillance and Outreach
- *Xylotrechus adspersus*
- EAB Delimitation Survey
- Silvicultural Treatments
- Bio-control Strategies
- Systemic Tree Injections
- Tree Planting
- Tree Removals

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Background

- Monitoring for EAB originally began in 2012 using purple prism traps.
- EAB was first discovered in Akwesasne in 2017. Insect found in a Lindgren funnel trap deployed in the north-west section of the Territory.
- Akwesasne Mohawk Territory EAB Response Plan was completed.
- EAB delimitation survey was immediately started and completed by the end of 2018.
- Additional monitoring traps were deployed across the Territory.



[USDA APHIS | Emerald Ash Borer Beetle](https://aphis.usda.gov/emerald-ash-borer)aphis.usda.gov

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Surveillance and Outreach

- A total of 22 sites monitored for EAB since the discovery of EAB in 2017.
- Lindgren funnel traps with z-3-hexanol lure and propylene glycol currently being used as the entrapment material.
- Four other species being monitored on 7 sites: Exotic bark beetles, Oak ambrosia beetle, Asian defoliating moths, and European Cherry fruit fly.

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Surveillance and Outreach

Exotic bark beetles

Pine Shoot Beetle (*Tomicus piniperda*)

- Originating in Europe, North Africa and Asia and first discovered in the United States in 1992 in a Christmas tree plantation in Ohio.
- It attacks both the trunks and growing shoots of pines, especially Scotch pine.



UGA2165079

<https://tidcf.nrcan.gc.ca/en/insects/factsheet/1000093>

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Surveillance and Outreach

Oak ambrosia beetle (Platypus quercivorus)

- Widely distributed in Asia, India, Indonesia, Japan, Papua New Guinea and Taiwan.
- Do not attack healthy trees that are vigorous. They attack stressed, dying, and recently dead hosts.
- Beetles bore into the heartwood and inoculate the galleries with fungi. They feed on this symbiotic fungus, which blocks the xylem vessels of the tree, often resulting in death.



5541203

<https://www.forestryimages.org/browse/subthumb.cfm?sub=10989#>

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Surveillance and Outreach

Asian Defoliator Moths

Asian spongy moth (*Lymantria dispar asiatica*)

- Found throughout temperate Asia, Russia, Korea, Mongolia and China.
- Feed upon more than 600 species of plants including alder, ash, beech, birch, chestnut, elm, hornbeam, linden, maple, oak, poplar, sumac, trembling aspen, walnut, willow, fruit trees, and certain conifers, including some cedars, Douglas fir, hemlock, juniper, larch, pine, redwood, and spruce.
- Can fly up to 40 kilometers.



<http://download.ceris.purdue.edu/file/3034>

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Surveillance and Outreach

Cherry fruit fly

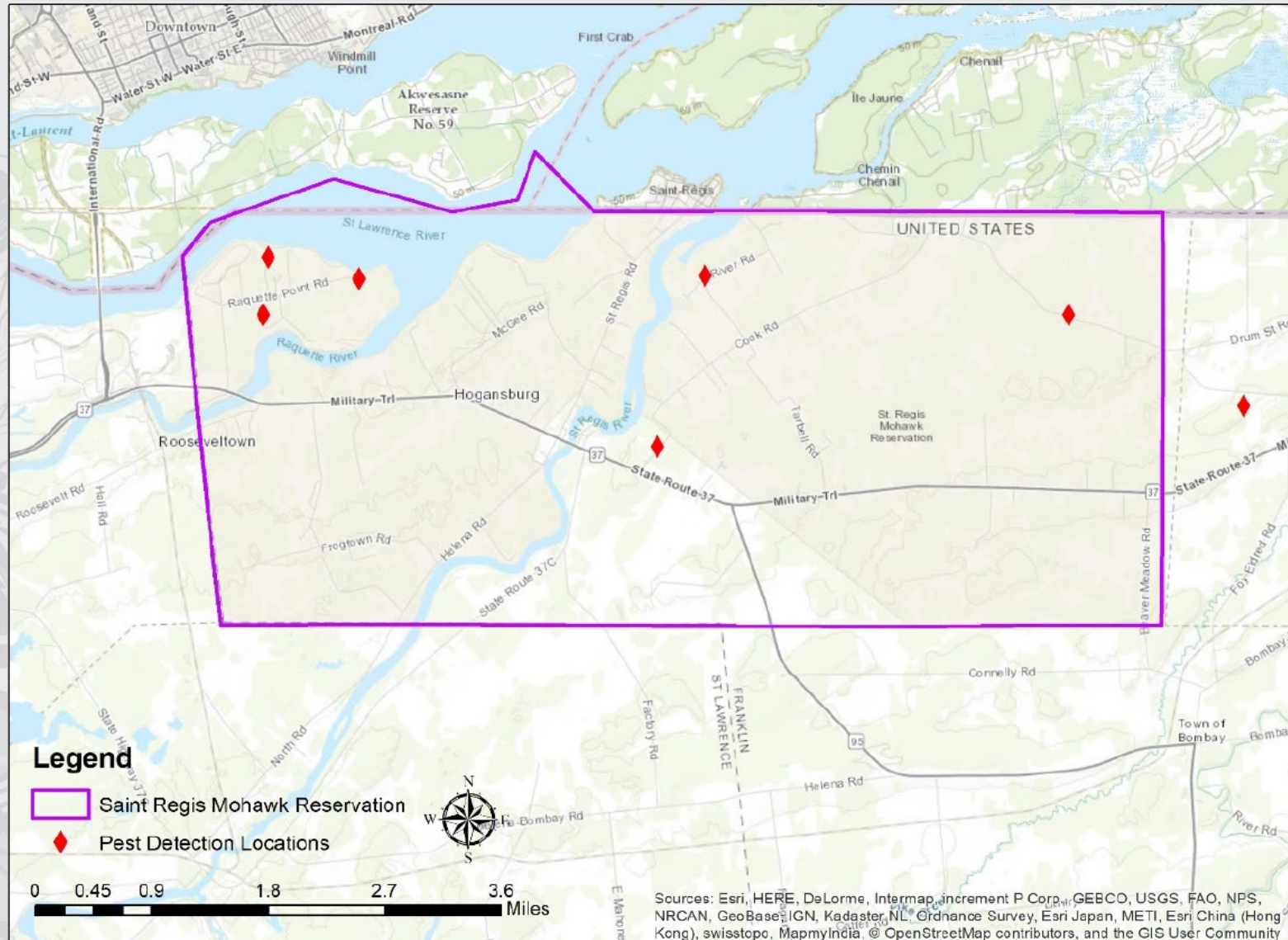
- First found in 2017 along the Niagara River in New York state.
- Threat to commercial cherry production if it becomes established and spreads to other parts of the US.



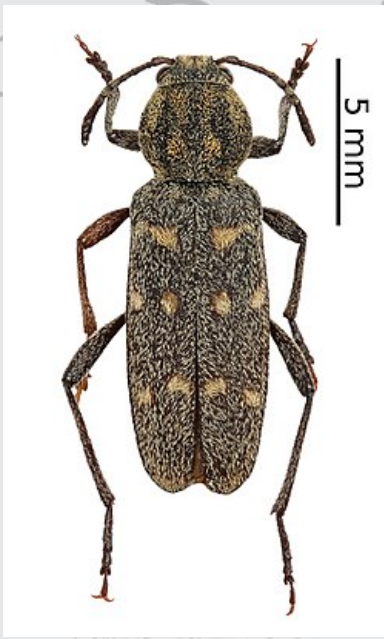
<https://extension.usu.edu/pests/research/european-cherry-fruit-fly>

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Surveillance and Outreach

Xylotrechus adpersus

- Found in EAB Lindgren trap by Tribal staff in 2021.
- First US detection; not yet found in Canada.
- Originating in the eastern Palearctic region, and has been reported in Russia, Japan, China, Mongolia, North Korea, and Kazakhstan.
- Feed on willow species of trees and shrubs.
- A total of 13 cross-vane panel traps have been deployed this summer across the Mohawk Territory, focusing on the area where the insect was found and other shoreline areas containing willow tree species.
- Shoreline assessment project scheduled to begin in spring 2023.



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EAB Delimitation Survey

- In 2018, an EAB delimitation survey was completed on the Territory to determine the extent and severity of the infestation in Akwesasne. This survey used sentinel trees (200) as a detection tool to map out the location and population densities of EAB on the Territory.
- Selected ash trees are girdled causing them to give off a signal that EAB finds attractive.
- If EAB is present, they will deposit their eggs on the ash tree and the larvae will grow in the bark layers creating galleries. The tree is cut down in the fall and inspected for larva and galleries.



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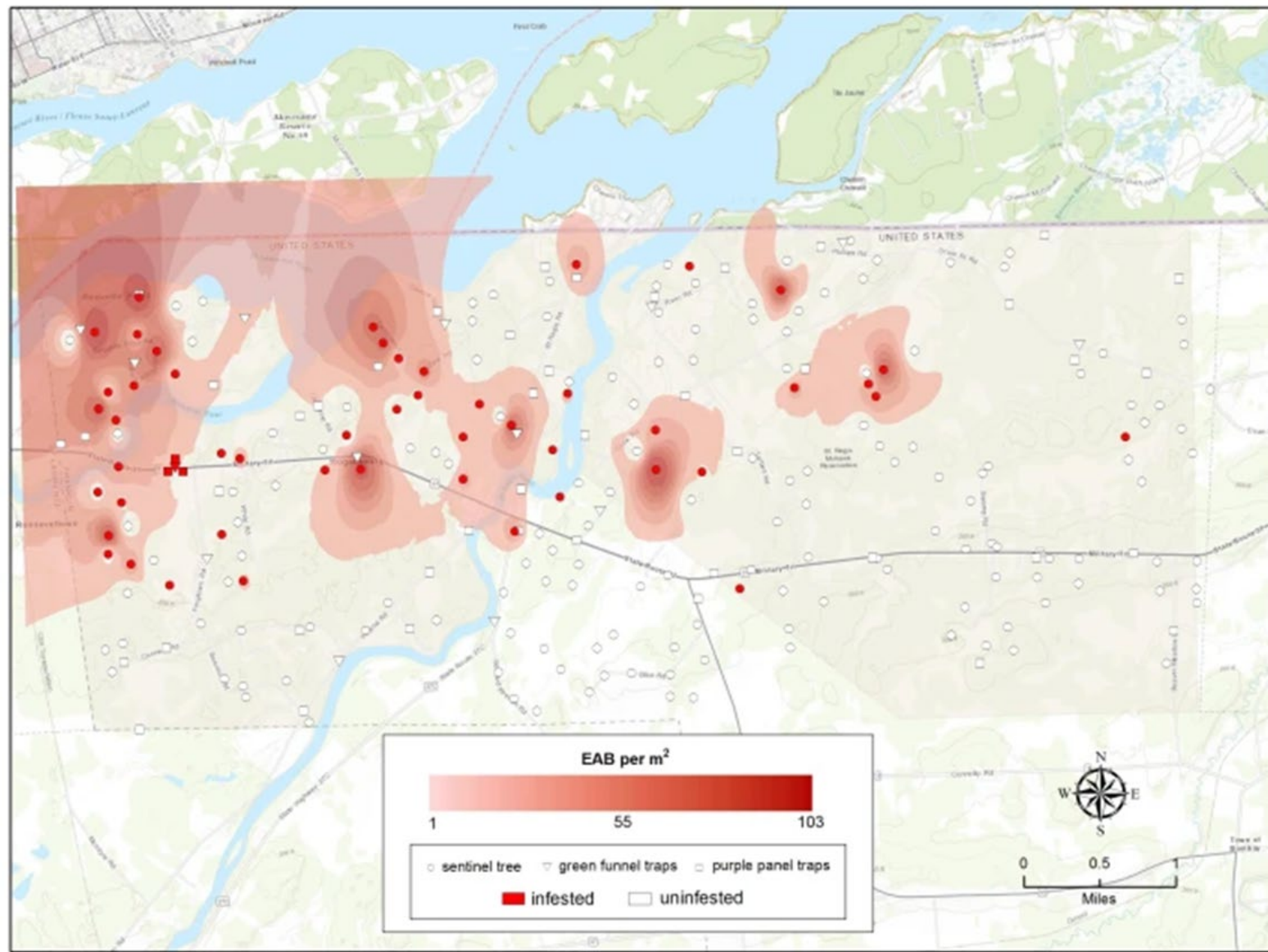
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Silvicultural Treatments

- Treatments completed in several black ash stands in Brasher State Forest.
- Crop tree release method to help release black ash seed trees and natural regeneration.
- Low impact logging techniques utilized (Snowdog, RTV, etc.)
- Work in partnership with NYSDEC and the Akwesasne Task Force on the Environment (ATFE).
- Stove wood for community members.



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Bio-control Strategies

- Two sites were selected in 2021: Brasher State Forest and a community member's property on the Territory.
- Sites and release trees are pre-selected as per criteria.
- Over 5000 parasitoids were released in 2021.
- First release in 2022 occurred on July 8th and will continue weekly thereafter for approximately 6 weeks.
- Data entered in APHIS's MapBioControl database.
- Monitoring of parasitoid population set to begin in 2025.
- Three species of parasitic wasps are being released:

Spathius galinae

Tetrastichus planipennisi

Oobius agrili



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Bio-control Strategies

Spathius galinae

- Originally from Russia.
- Parasitizes EAB larvae in ash trees with female drilling through the bark laying an average of 8 eggs on the outside of its host. The hatching parasitoid larvae feed and develop on the EAB larva, causing its death. The cycle is repeated 1-2 times each summer and fall.
- Long ovipositor allows it to parasitize EAB larvae in large diameter ash trees up to ~58 cm(23 inches) in DBH.

M. Barrett

Spathius galinae



https://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/eab-field-release-guidelines.pdf

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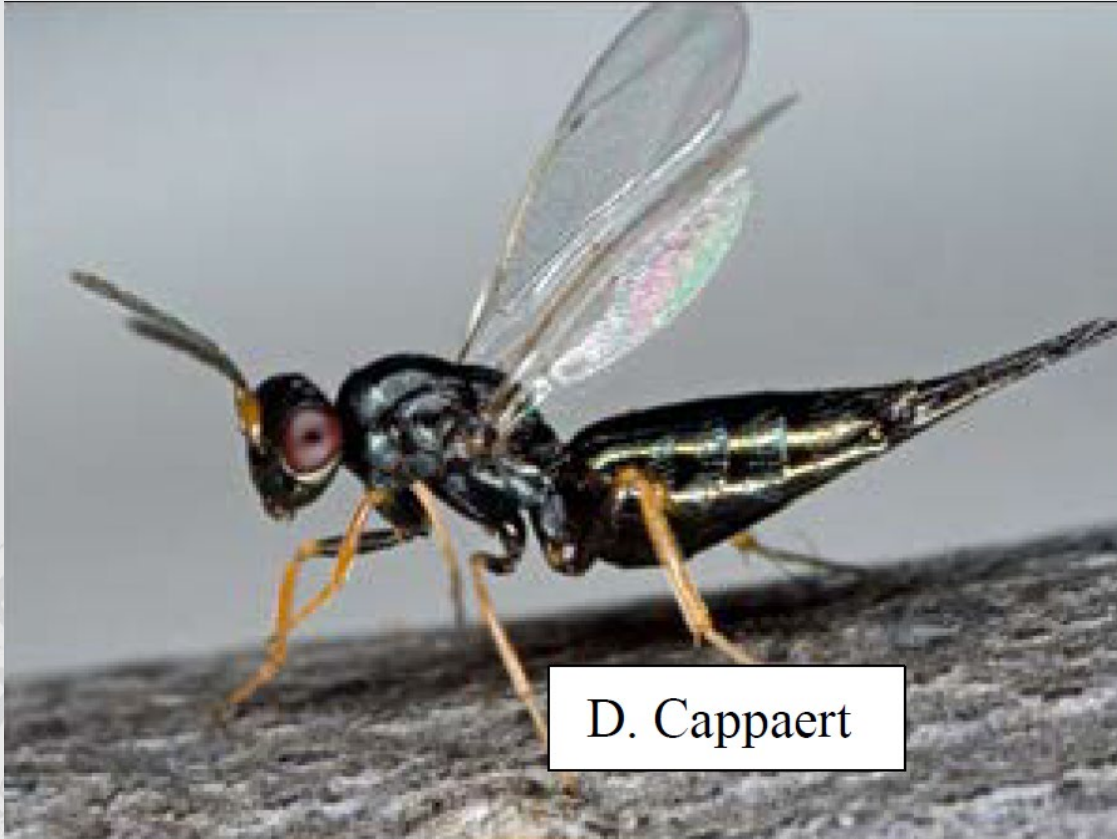
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Bio-control Strategies

Tetrastichus planipennisi

- Originally from China.
- Female parasitoid lays eggs inside EAB larvae where the parasitoid larvae grow, eventually killing their host.
- Completes several generations each year, and one EAB larva can produce up to 130 *Tetrastichus* adults.
- Due to short ovipositor, they are more successful in parasitizing EAB larvae in small diameter ash sapling and trees up to ~ 15 cm (6 inches) in DBH.



D. Cappaert

https://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/eab-field-release-guidelines.pdf

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Bio-control Strategies

Oobius agrili

- Parasitizes EAB eggs laid during the summer by injecting its own egg inside where it will hatch, grow, and kill the host egg.
- Females reproduce without mating.
- Adult parasitizes up to ~80 EAB eggs during its lifetime.
- Spend the winter as larvae inside EAB eggs and emerge as adults the following spring.



https://www.aphis.usda.gov/plant_health/plant_pest_info/emerald_ash_b/downloads/eab-field-release-guidelines.pdf

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Systemic Tree Injections

- Injection sites for 2021 included: Brasher, Bombay, and Raymondville state forests and several Tribal and community members properties.
- Over 100 seed trees were injected in 2021 and an additional 100 trees are anticipated in 2022.
- Arborjet injection system with Tree-age G4 insecticide (Emamectin Benzoate).
- Amount of insecticide required is based on tree DBH and species of insect.
- Protection lasts for up to 3 years.
- Costly method



https://www.friendsofthewildflowergarden.org/pages/plants/ash_green.html



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Tree planting

Urban and Community Forest Restoration Project

- Project focused on enhancing tree cover on tribal properties such as parks and community spaces.
- Approximately 1300 trees were planted between 2019 and 2022.
- Native-only species were planted such as Sugar maple, White cedar, and Serviceberry.
- Survival rate of 65% in fall of 2020, largely as a result drought-like conditions experienced in 2020.
- Replacement trees were planted in 2021.



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Tree planting

Ash Loss Canopy Restoration Project

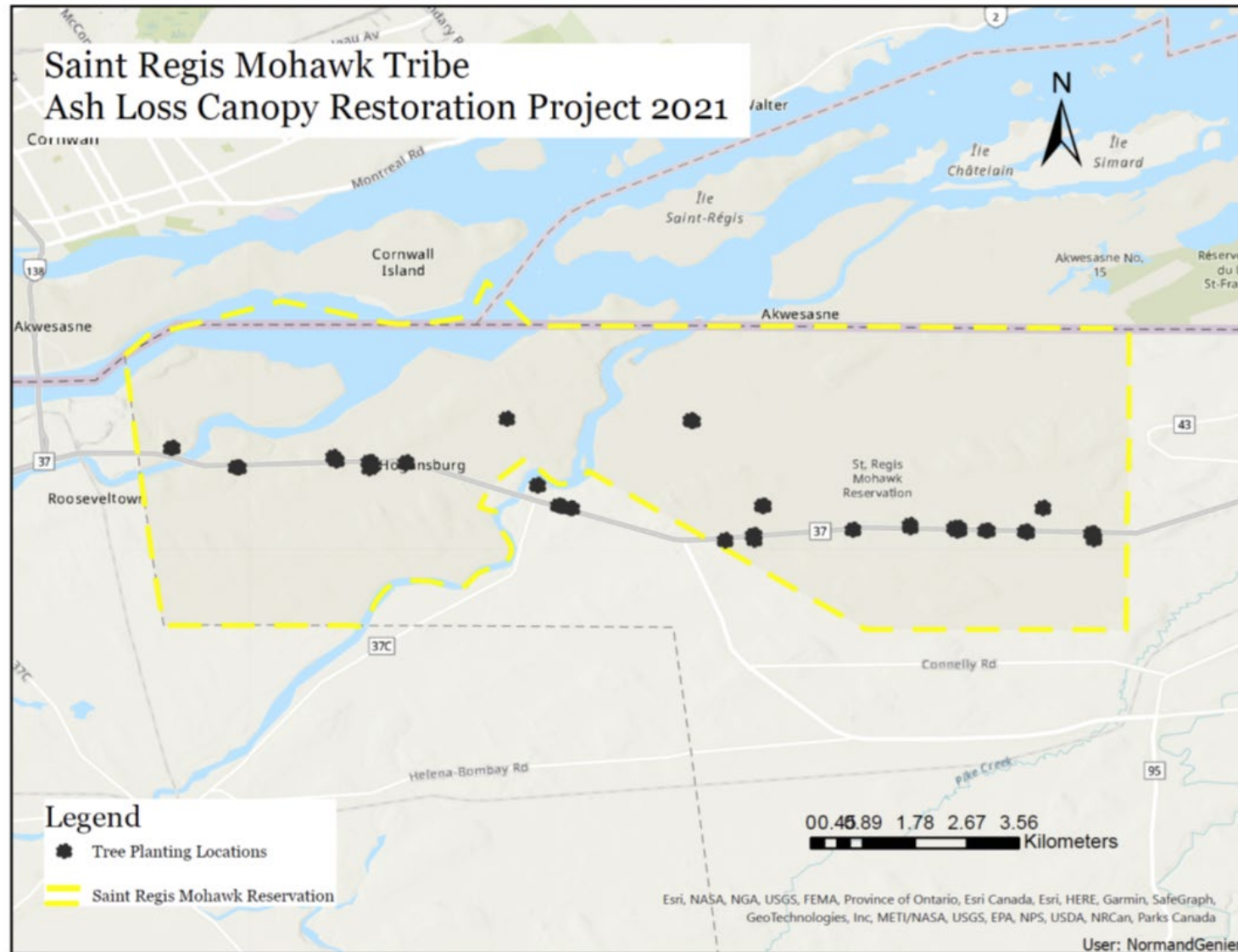
- Project focused on restoring tree canopy in areas most affected by ash tree removals.
- Site assessment results (i.e. soil texture, drainage, etc.), homeowner's preferences, and recommendations from National Grid helped determine the type of species for each site.
- Approximately 300 trees were planted between 2021 and 2022.
- Native-only species were planted such as American sycamore, Honey locust, and Highbush cranberry.



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<https://silvlib.cfans.umn.edu/content/underplanting-anticipation-bottomland-ash-mortality-state-wi>

Tree planting

Underplanting of black ash stands

- Species selection based on natural regeneration established on previous project sites.
- Native-only species such Tamarack, Black spruce, White cedar, White pine and Swamp White oak are being considered.
- Underplanting of selective sites is expected to commence in spring 2023.

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Tree Removals

Hazard Tree Program

- The focus of this program is to assist the elderly and disabled with the assessment and possible removal of hazard trees.
- Hazardous tree is defined as a tree with structural defects likely to cause failure of all or part of the tree, which could strike a “target.” A target can be a vehicle, building, or a place where people gather such as a park bench, picnic table, street or backyard.
- Approximately 16 hazard trees will be removed in 2022.
- Need will increase as ash mortality begins to increase.



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Nia:wen / Thank you

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