St. Lawrence County Right-of-Way Ash and Hazard Tree Assessment Project

Project Description

The purpose of the ash and hazard tree inventory along St. Lawrence County road right-of-way's (ROW's) is to create a database of ash trees that will become a hazard to public safety and a liability to municipalities after the inevitable infestation of the emerald ash borer. All species of ash trees are susceptible to EAB with a 99.8% mortality rate. Once ash trees are infested, they become extremally hazardous very quickly, losing 80% of their structural integrity within 3-5 years. Infested ash trees are also susceptible to catastrophic failure or "Ash Snap" in which the entire tree has the potential to snap off at the base and collapse. Because of this, it is important to take a prioritized, preemptive approach in removing ash trees before they become too dangerous to do so. The inventory will help facilitate realistic management of EAB by prioritizing removals, identifying trees to potentially treat, and budgeting requirements for either treatment or removal.

The roadside inventory took place in the summer months of June-August 2019 to allow for proper tree health assessment and hazard level allocation. The inventory was completed by personnel with dendrology or equivalent tree identification training and hazard tree assessment experience. Data was collected by visual inspection and ocular estimations to the nearest 2-inch DBH (Diameter at breast height) Class and recorded on a laptop using QGIS software and a BU-353S4 USB powered GPS.

Project Goal

Preemptively mitigate impacts of the Emerald Ash Borer for public safety and accessibility along 574 miles of County Routes in St. Lawrence County. Inventory ash trees and hazard trees that occur along county right-of-way's and/or are within striking distance of roadways to create a database of future and current hazardous trees. From the information collected, develop a response plan based on hazard assessments, future budget requirements, prioritized scheduled removals, treatment, etc.

Data was collected on all ash trees and dead/dying trees within county right of ways (ROW's) and within striking distance of county routes. Data was generated for individual trees under the parameters of:

Single Tree Data Collection (Point Shapefile)

Data Collected:

- **Location**
  (Latitude, longitude in decimal degrees)

- **Species** (only fill in if something other than ash species, otherwise leave blank `NULL')

- **DBH** (ocular estimation from vehicle to the nearest 2-inch diameter class)

- **Hazard Rating** (8 points)
  Failure potential*: (low-1, medium-2, high-3, severe-4)* a healthy ash tree within striking distance would receive a medium (2) failure potential rating

  Size of tree (DBH)*: (<6''-1, 6-18''-2, 18-30''-3, >30''-4)*

- **Is the tree near powerlines?**
  (yes-1, no-leave blank `NULL')

- **Is the tree near a house?**
  (yes-1, no- leave blank `NULL')

- **Hazard Level** (Total points)
  (out of 10 possible points = hazard rating/need for removal)

- **Comments**
  e.g. (dead, 50% dieback, lean, uprooted, etc.)

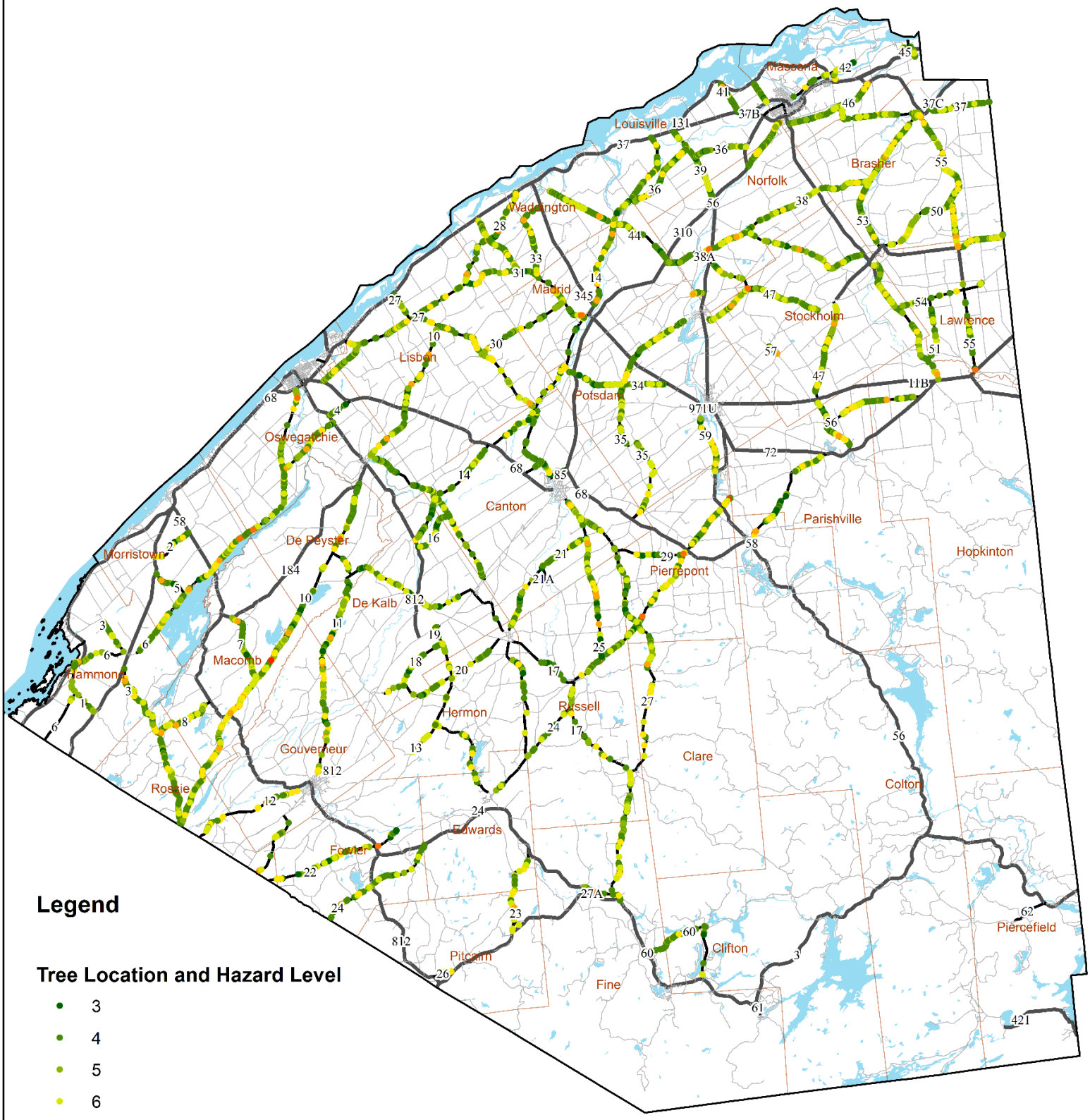
Project Results

A total of **14,630 trees** were found to be ash and/or hazard trees on 571 miles of county routes within St. Lawrence County. These are trees that will be a hazard after becoming infested or are currently a hazard due to dead or dying status. These trees occur on an average of **25.6 trees per mile**, covering approx. 1,950 square miles of land mass in St. Lawrence County. Removal of these trees would be an estimated **$9,374.13 per mile**. The project inventoried 571 miles of 3,120 total miles of roadways in St. Lawrence County. This is a 18.3% sample with a 99% confidence interval and a 4.87% margin of error. The inventory took 229 hours to complete with a total of 2,217 miles traveled, averaging **2.5 hours per mile** inventoried.

Ash Trees occured at a rate of 20.7 trees per mile totaling 11,856 trees, while hazard trees occurred at a rate of 5.5 trees per mile, with a total of 3,144 trees either dead or dying. From an ecological perspective, the 11,856 ash trees would supply an estimated 1.9 million sq. ft of phloem area for EAB and could produce 18.5 million adult beetles.

Additional information and breakdowns of inventoried trees are as follows:

St. Lawrence County Right of Way Ash and Hazard Tree Inventory



Number of Dead/Dying Trees: **3,144**

Number of Trees Per Hazard Level

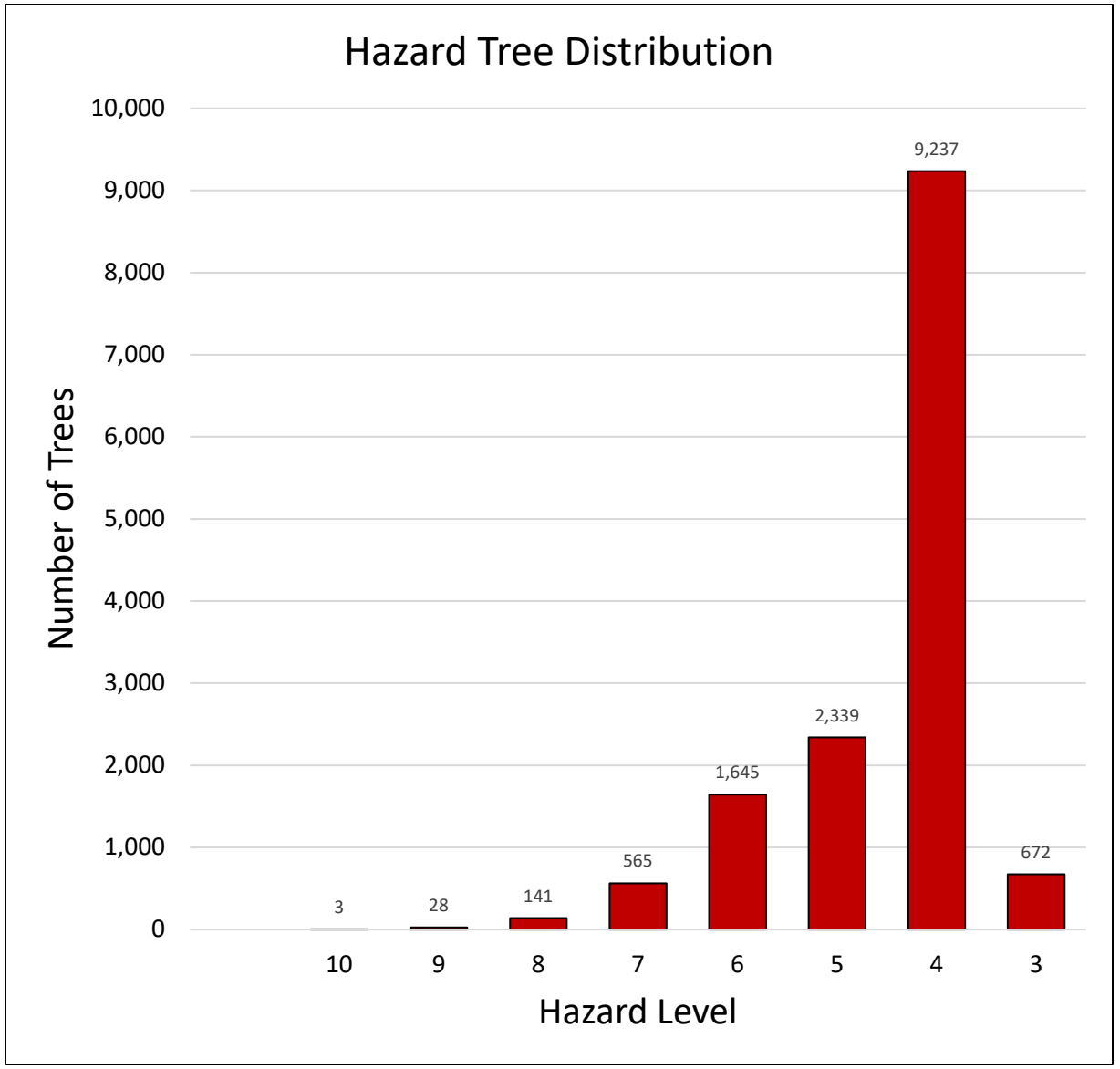
Hazard Level	Number of trees
10	3
9	28
8	141
7	565
6	1,645
5	2,339
4	9,237
3	672

Number of Trees Near Powerlines and Buildings

Powerlines	Building/House
1,004	529

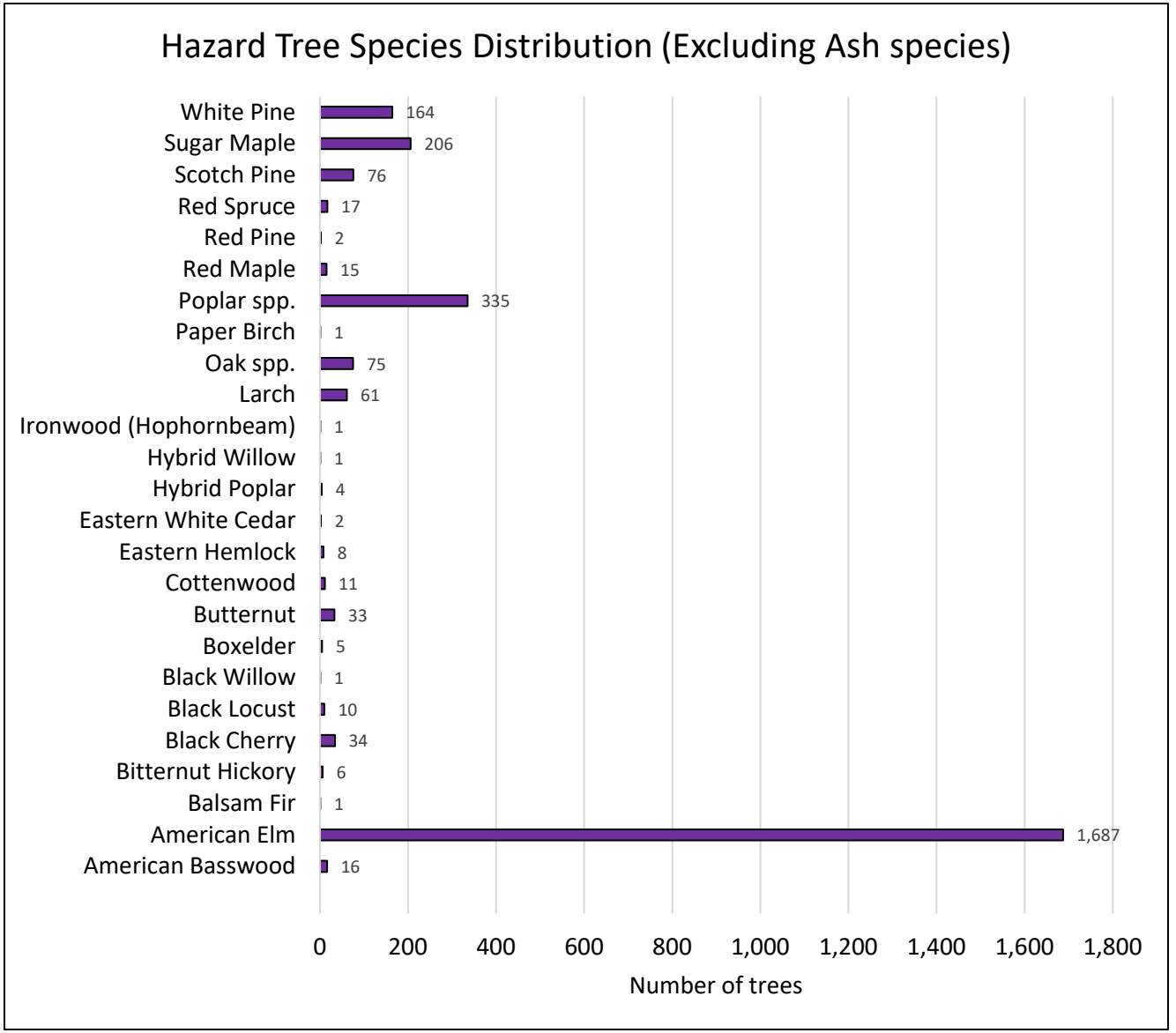
Number of Dead, Dying, Damaged Trees

Dead	50% dieback
2,952	182
Infested	**Uprooted**
6	2
Struck by Lighting	
2	



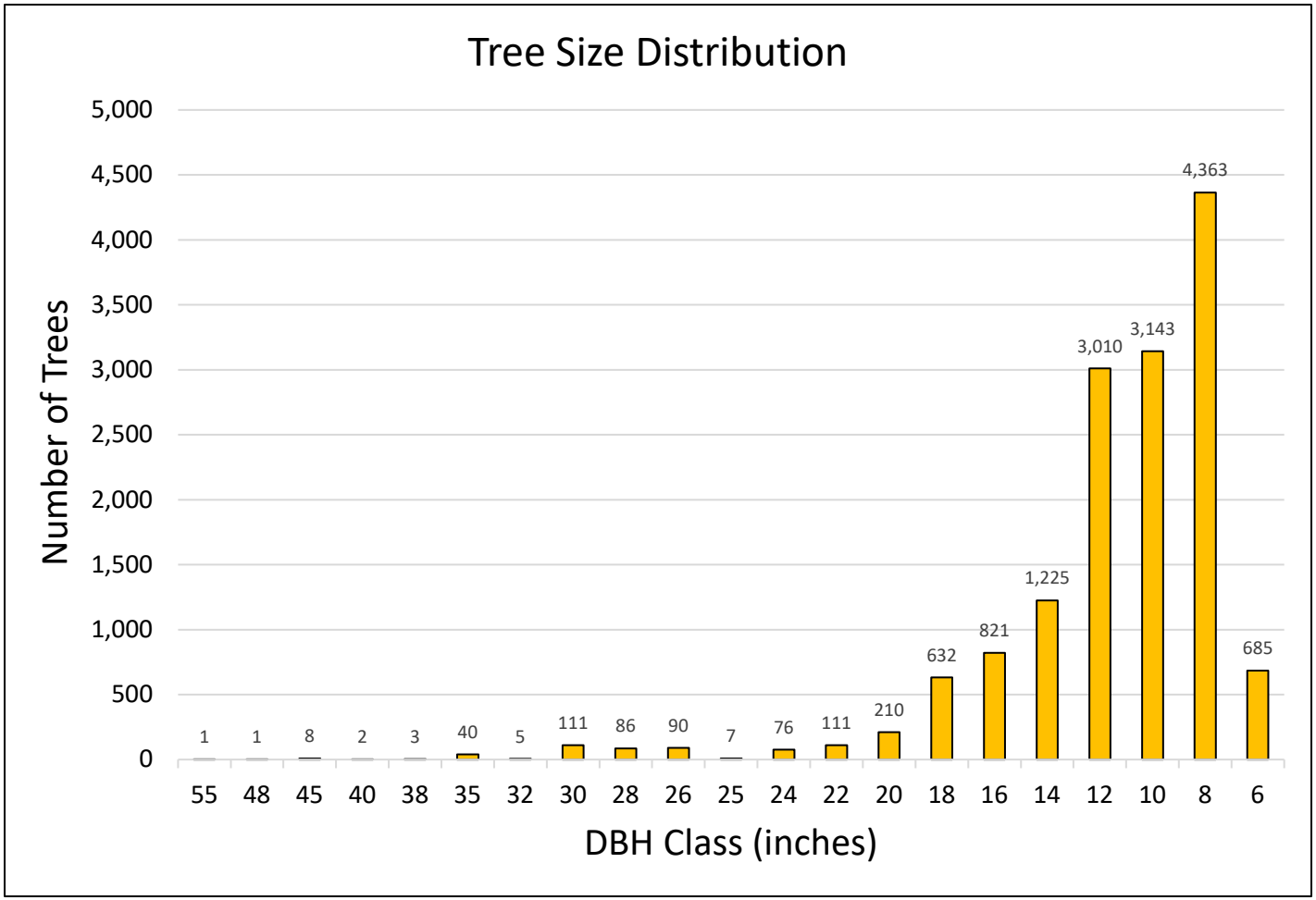
Species Distribution

Tree Species	Number of Trees
American Basswood	16
American Elm	1,687
Balsam Fir	1
Bitternut Hickory	6
Black Cherry	34
Black Locust	10
Black Willow	1
Boxelder	5
Butternut	33
Cottonwood	11
Eastern Hemlock	8
Eastern White Cedar	2
Hybrid Poplar	4
Hybrid Willow	1
Ironwood (Hophornbeam)	1
Larch	61
Oak spp.	75
Paper Birch	1
Poplar spp.	335
Red Maple	15
Red Pine	2
Red Spruce	17
Scotch Pine	76
Sugar Maple	206
White Pine	164
Total:	**2,772**
Total Ash spp.	11,856



Average DBH: **11.4**

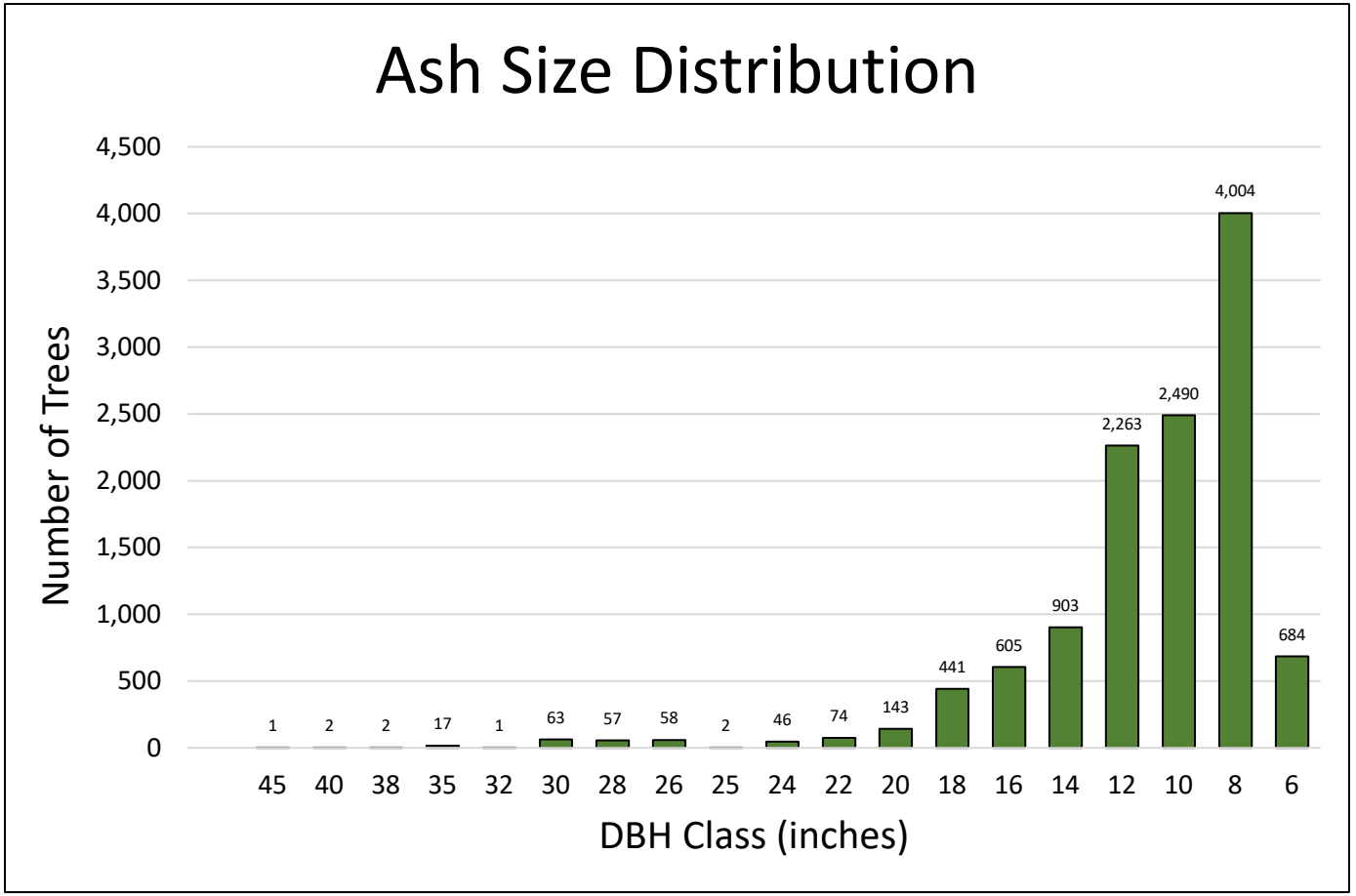
Number of Trees Per DBH Class	
DBH Class	Number of Trees
55	1
48	1
45	8
40	2
38	3
35	40
32	5
30	111
28	86
26	90
25	7
24	76
22	111
20	210
18	632
16	821
14	1,225
12	3,010
10	3,143
8	4,363
6	685



Total Number of Ash: **11,856**

Number of Trees Per DBH Class

DBH Class	Number of Trees
45	1
40	2
38	2
35	17
32	1
30	63
28	57
26	58
25	2
24	46
22	74
20	143
18	441
16	605
14	903
12	2,263
10	2,490
8	4,004
6	684



*Ash species account for over 80% of all trees surveyed

Number of Trees Per DBH Class		Arbor Pro Estimate Estimated Removal Cost:	Urban Tree Alliance Estimate Estimated Removal Cost:
DBH Class	Number of Trees		
55	1	$1,850.00	$4,964.00
48	1	$1,850.00	$4,025.00
45	8	$14,800.00	$29,152.00
40	2	$2,940.00	$6,080.00
38	3	$4,410.00	$8,427.00
35	40	$45,600.00	$99,000.00
32	5	$5,700.00	$10,780.00
30	111	$93,795.00	$216,672.00
28	86	$72,670.00	$150,930.00
26	90	$76,050.00	$140,940.00
25	7	$5,915.00	$10,318.00
24	76	$39,900.00	$105,184.00
22	111	$58,275.00	$134,310.00
20	210	$110,250.00	$219,450.00
18	632	$224,360.00	$561,848.00
16	821	$291,455.00	$608,361.00
14	1,225	$434,875.00	$738,675.00
12	3,010	$662,200.00	$1,432,760.00
10	3,143	$691,460.00	$1,128,337.00
8	4,363	$959,860.00	$1,112,565.00
6	685	$71,925.00	$112,340.00
		$3,870,140.00	**$6,835,118.00**

Average Total Removal Cost: **$5,352,629.00**

Prioritizing Actions/Removals

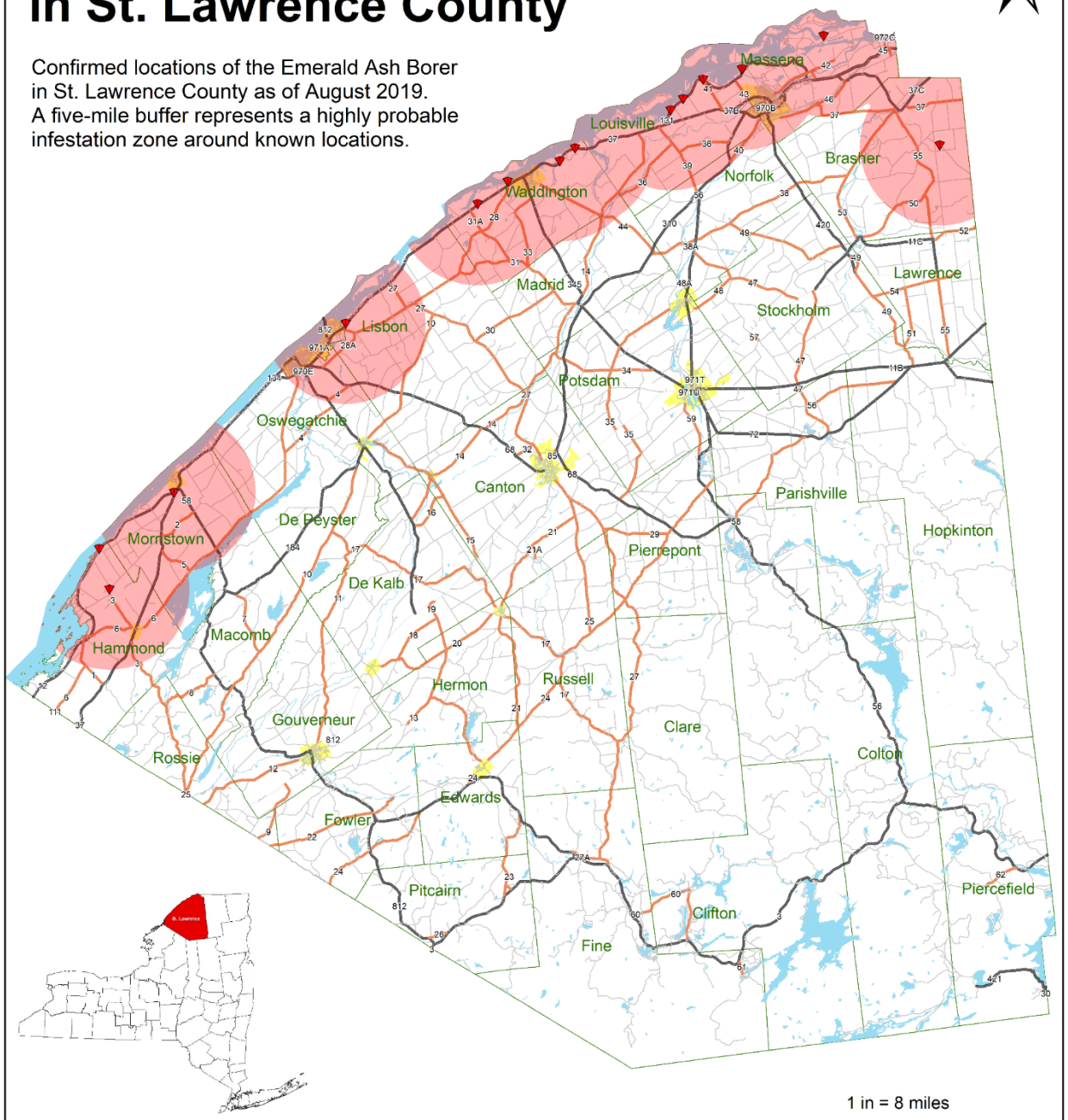
In order to prioritize removals and attempt to stay ahead of EAB, removals would need to be focused around known EAB infestations.

EAB can naturally spread anywhere from ½ mile to 3 miles per year depending on Ash density, EAB population size, topography, etc. Ash trees die within 3-5 years after infestation depending on EAB population density, tree vigor, site conditions, etc.

Because removing trees before they become infested is the safest option, trees would need to be removed 2 miles away from know EAB infestations to account for the annual spread of EAB and tree mortality.

Known Locations of EAB in St. Lawrence County

Confirmed locations of the Emerald Ash Borer in St. Lawrence County as of August 2019.
A five-mile buffer represents a highly probable infestation zone around known locations.



Legend

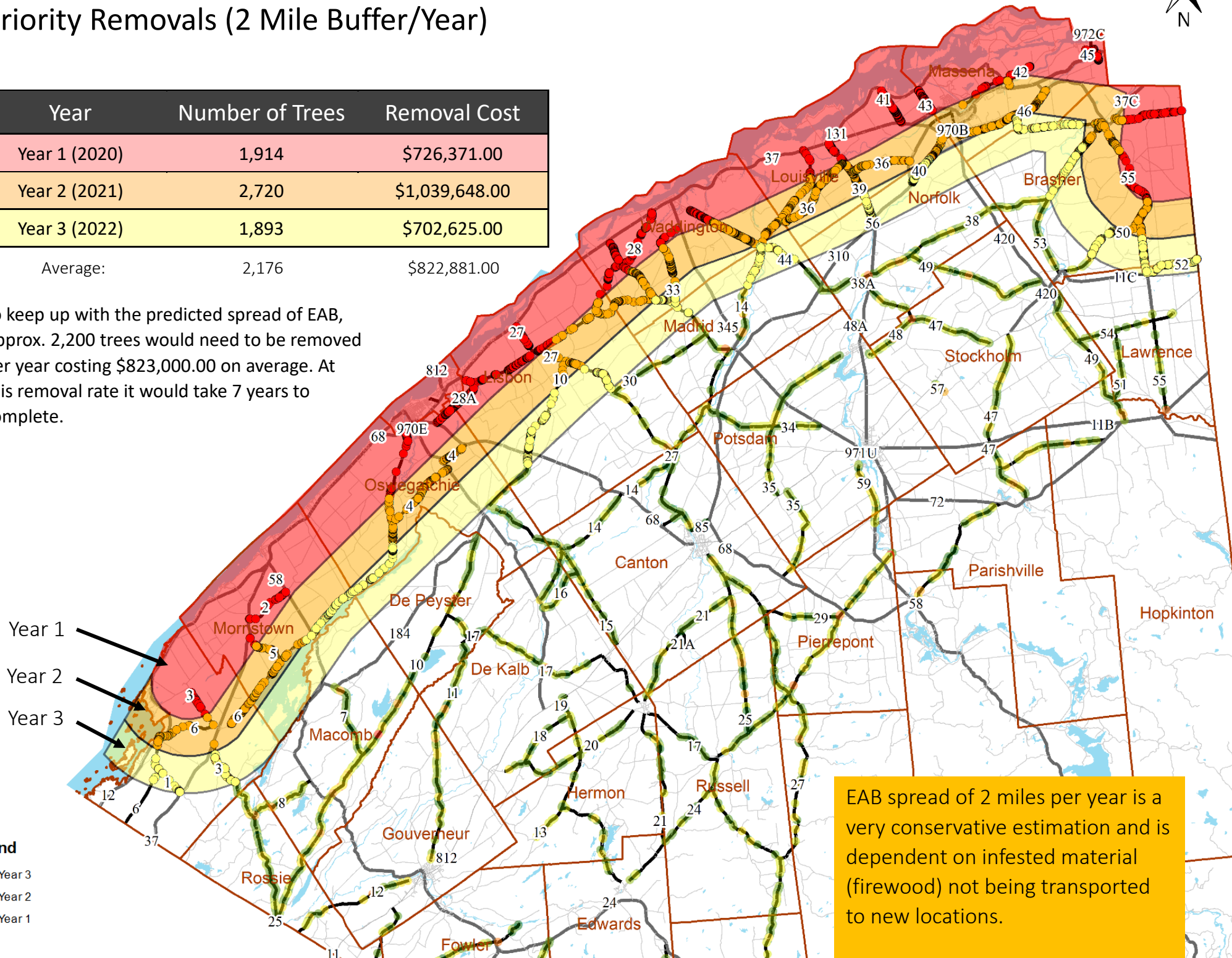
EAB
Local Roads
County Route
State Highway
EAB Locations
Villages

Map by: St. Lawrence County Soil and Water Conservation District
Data source: iMap Invasives
www.imapinvasives.org/

Priority Removals (2 Mile Buffer/Year)

Year	Number of Trees	Removal Cost
Year 1 (2020)	1,914	$726,371.00
Year 2 (2021)	2,720	$1,039,648.00
Year 3 (2022)	1,893	$702,625.00
Average:	2,176	$822,881.00

To keep up with the predicted spread of EAB, Approx. 2,200 trees would need to be removed per year costing $823,000.00 on average. At this removal rate it would take 7 years to complete.



EAB spread of 2 miles per year is a very conservative estimation and is dependent on infested material (firewood) not being transported to new locations.