

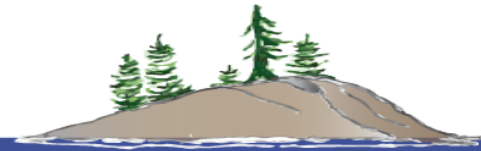
Invasive Hand Harvesting Upper Saranac Lake

NYSFOLA
May, 2018



Partners

Upper Saranac Foundation
It still is, and always will be, about Water Quality



Adirondack Watershed Institute of



Paul Smith's College
THE COLLEGE OF THE ADIRONDACKS®



Upper Saranac Lake

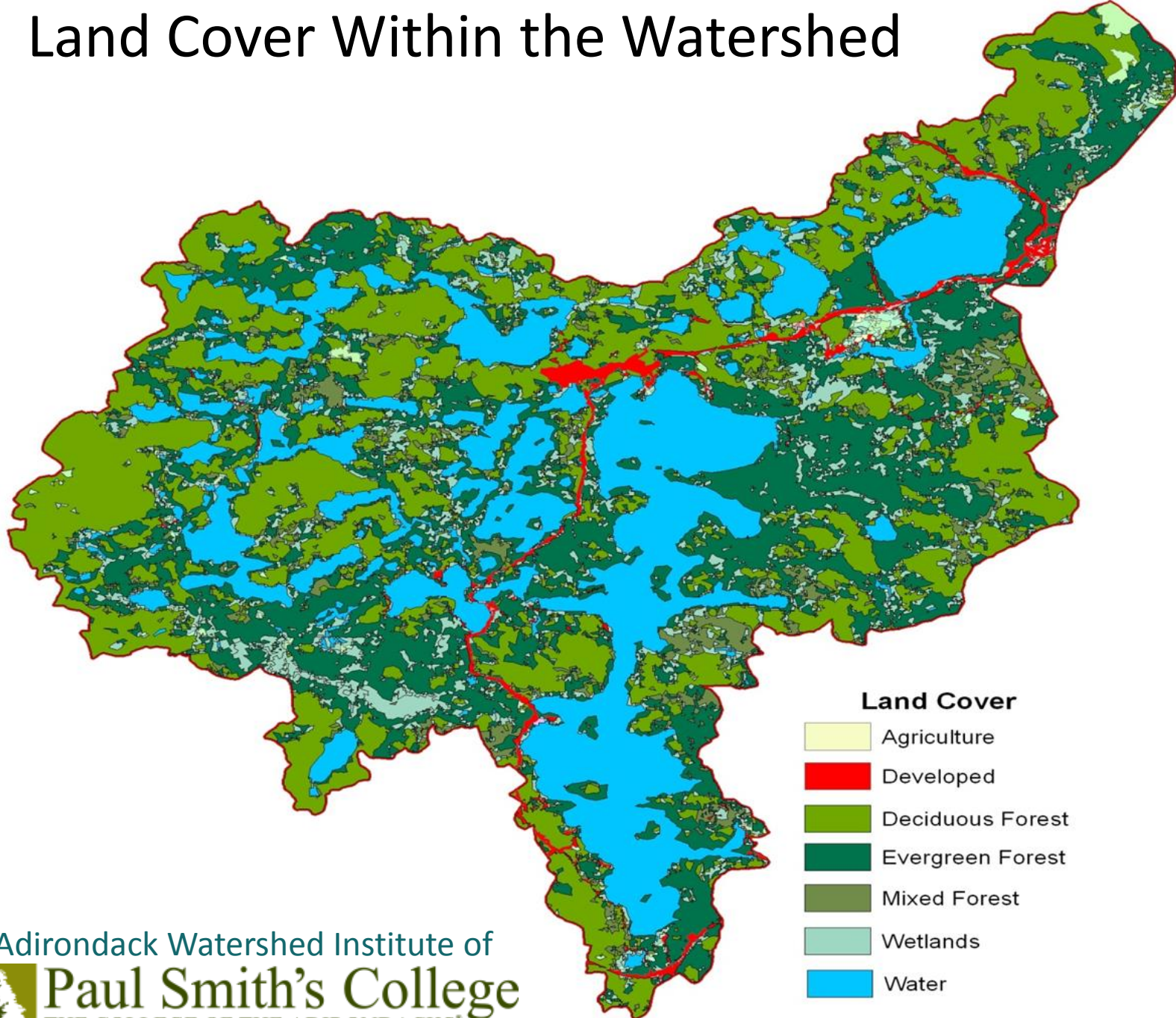


Upper Saranac Lake



- 7.8 miles long
- 2.0 miles wide
- 5,200 acre waterbody
- 18 islands
- 4,843 acres (1,200 littoral acres)
- 47 miles shoreline
- 40(+)% state land
- 103 ' max depth
- 28' average depth

Land Cover Within the Watershed



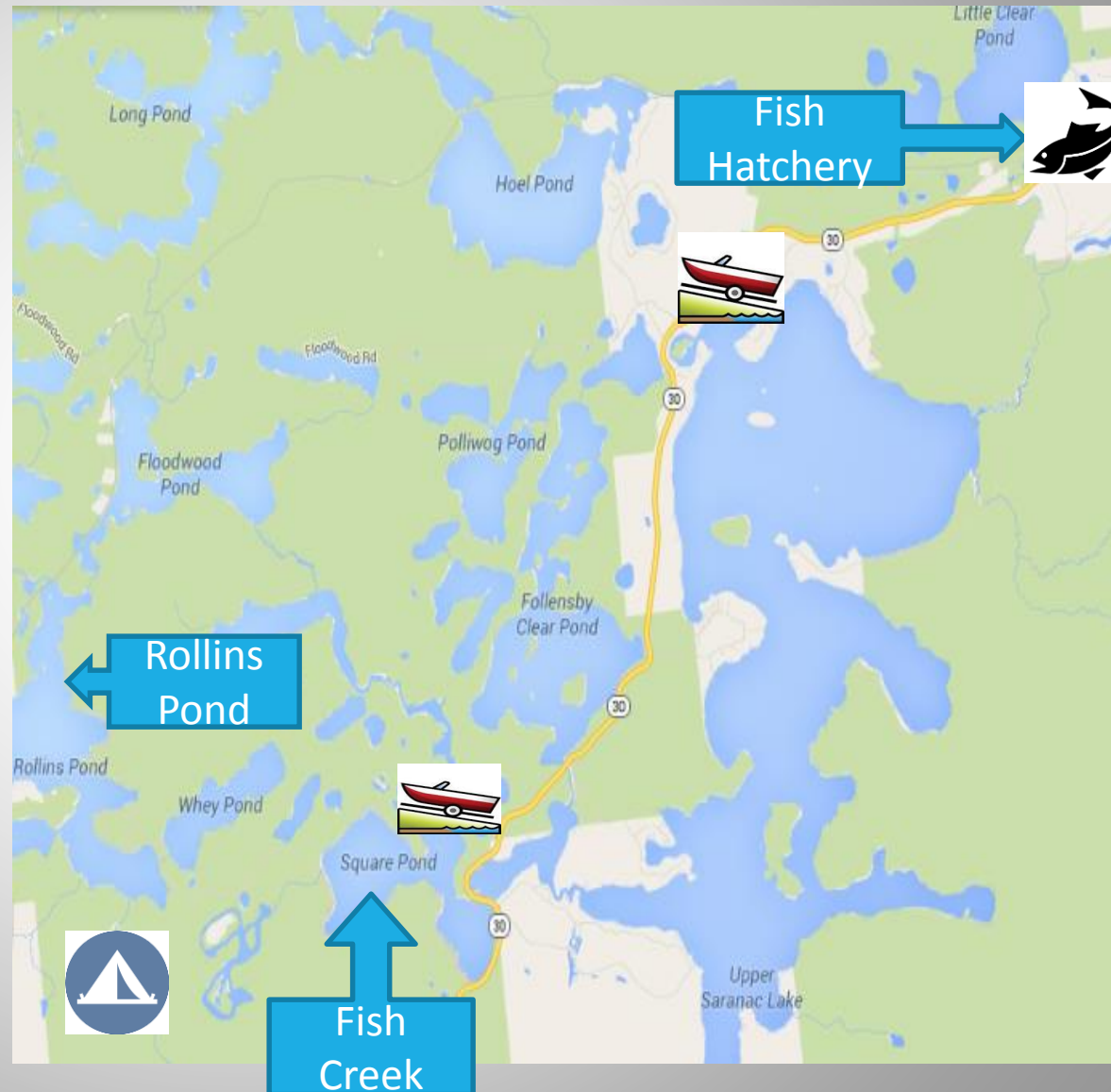
History of USL





Lakes Influences

- NYSDEC
- Campgrounds
 - Fish Creek
 - Rollins Pond
- Fish Hatchery
- Boat Access Sites
 - 2 trailered
 - 1 car-top



1 Lake / 2 Organizations

Upper Saranac Lake Association

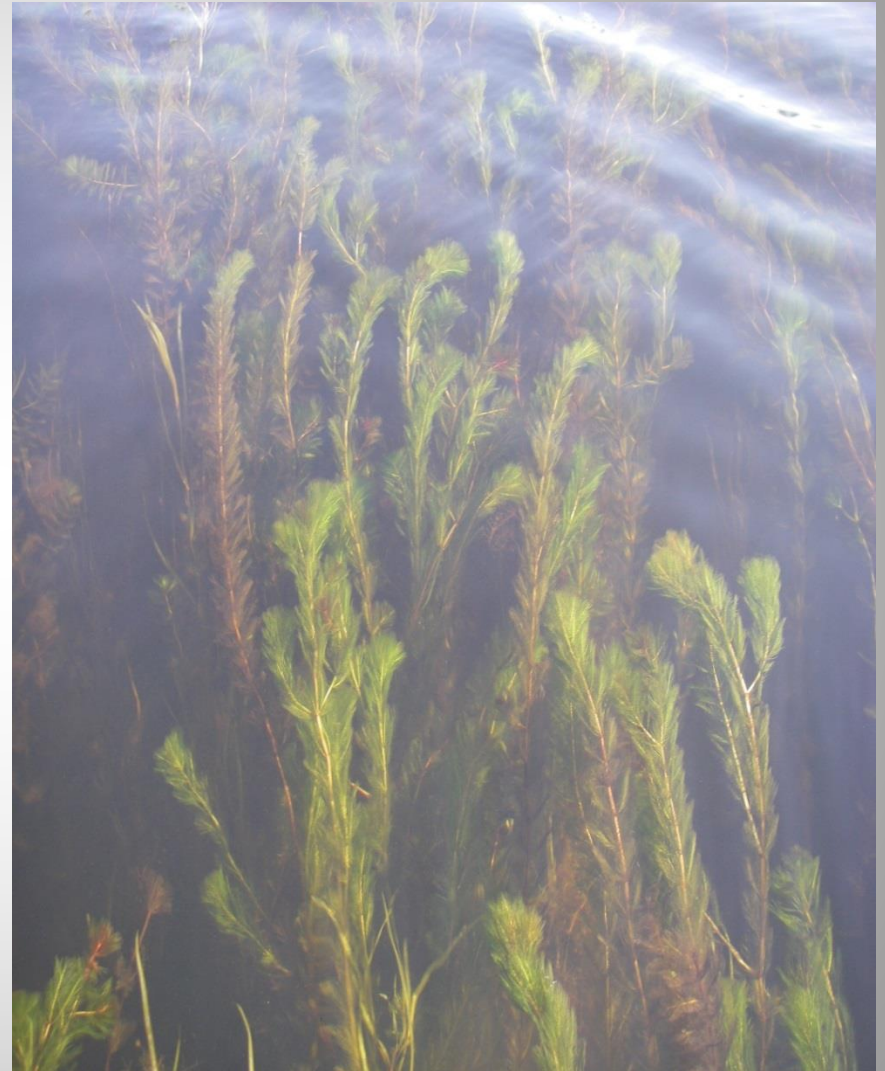
- Established in 1901
- Shore Owners Association
- 580 members
- Optional Yearly Membership \$45
- Social Organization
- Recreation
- Outreach
- Cultural affairs

Upper Saranac Foundation

- Established in 1989
- Charitable 501 (c) (3) for fundraising
- Purchased Dam to rebuild / maintaining
- Purchased land for Preservation
- Invasive prevention and harvesting
- Funding lake science / water quality testing/Monitoring
- Lake Manager

Invasive Milfoil

- Eurasian Water Milfoil discovered in USL 1996
- Limited control efforts 1999 to 2003(annual investment \$60 to 70K)
- 2004 - \$1.5 million raised from lake community for 3 yr. intensive control program
- 2007-2017 Maintenance
- Variable-Leaf in 2014



How Milfoil is Managed

Identifying Milfoil

- Rapid Response
 - Shore owners educated on invasives
 - Many eyes monitoring the lake
 - Contact Lake Manager for confirmation
- Lake Manager
 - Surface spotting
 - Invasive Marked
 - Mapped
 - Divers respond
 - Harvest Marked locations
- Divers Inspect Known Areas



Harvesting

Hand Harvesting

Invasive Solutions Dive Co.

Floating air compressor

“Hookah scuba system”



Three member team

2 divers -hand harvesting removing plant by it roots

1 top water- safety, disposal, fragment collection



Bagged

Removed



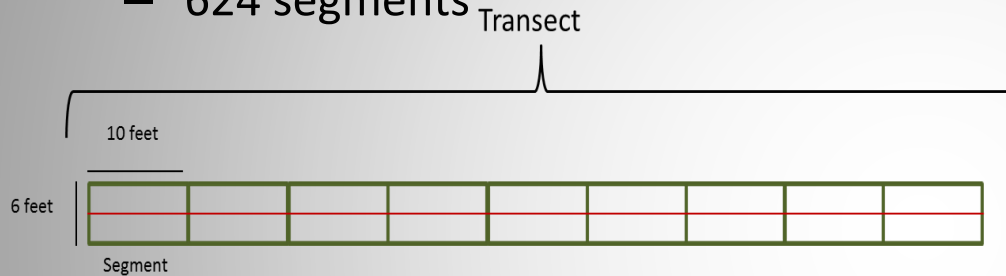
Monitoring Progress

- Transect Sites - managed USL vs non managed areas adjacent waters
 - Aquatic Watershed Institute –AWI
- Lbs. Harvested / Plant Count vs Diver hrs. and cost
 - Invasive Solutions Dive Company
- Surface Spotting and Rapid Response
 - Lake Manager – USF

Transect Monitoring

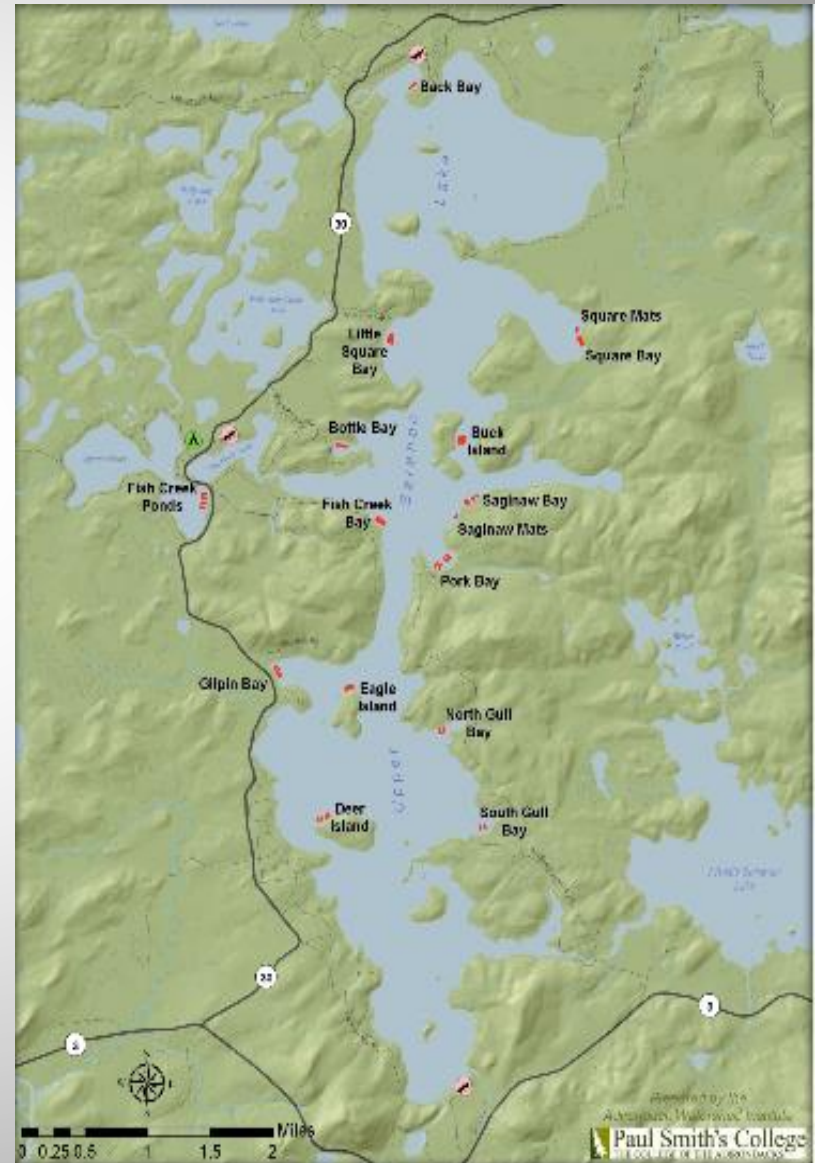
Plant Monitoring Sites

- 16 permanent transect locations
 - 4 transects/ site
 - 10' increments from 3-15' deep
 - 624 segments

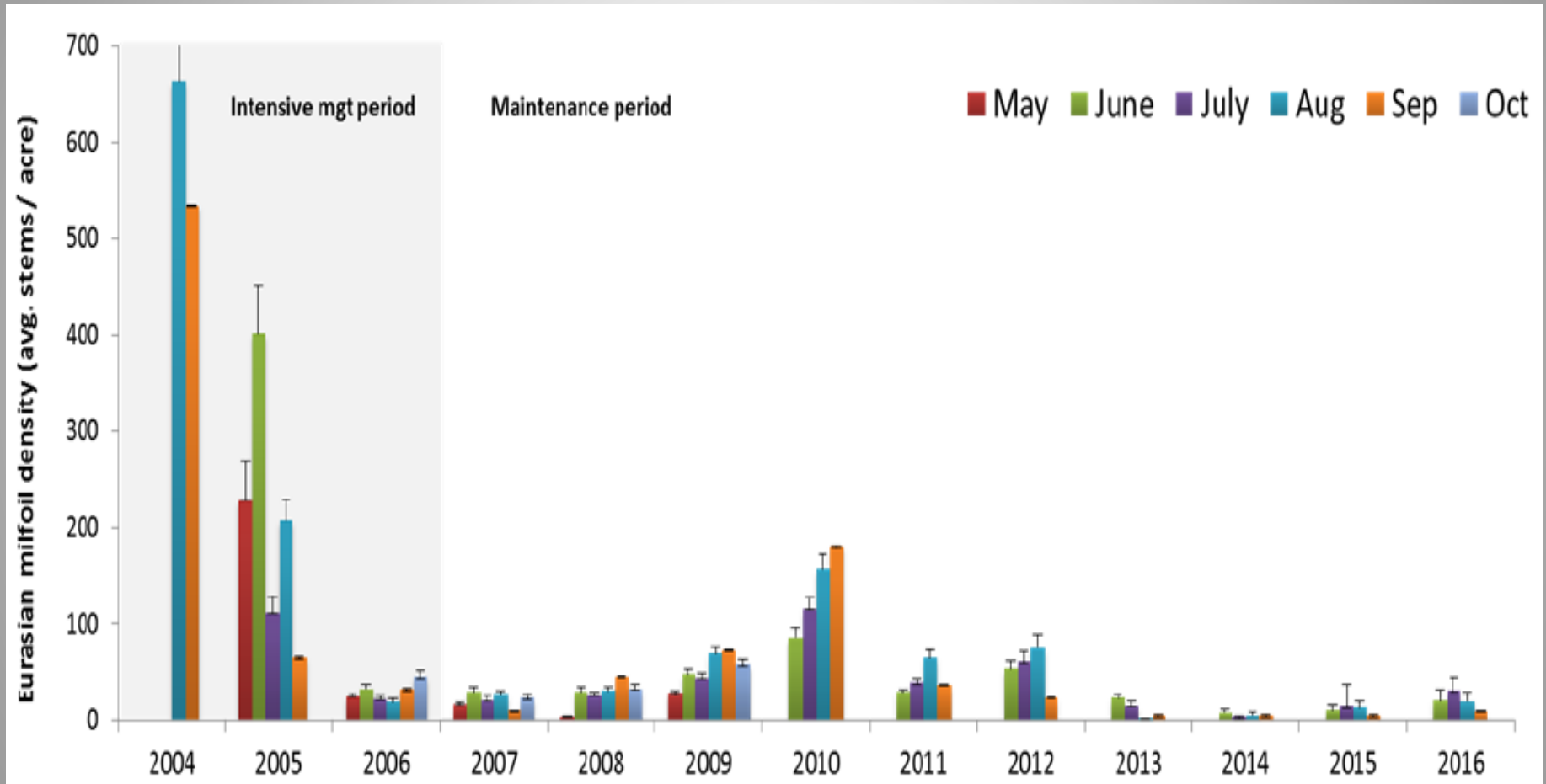


- Monitor the presence and abundance of aquatic plants
 - Milfoil density in stems / acre
- Data recorded monthly
- All but 1 is in managed harvested area - Fish Creek (for reference)

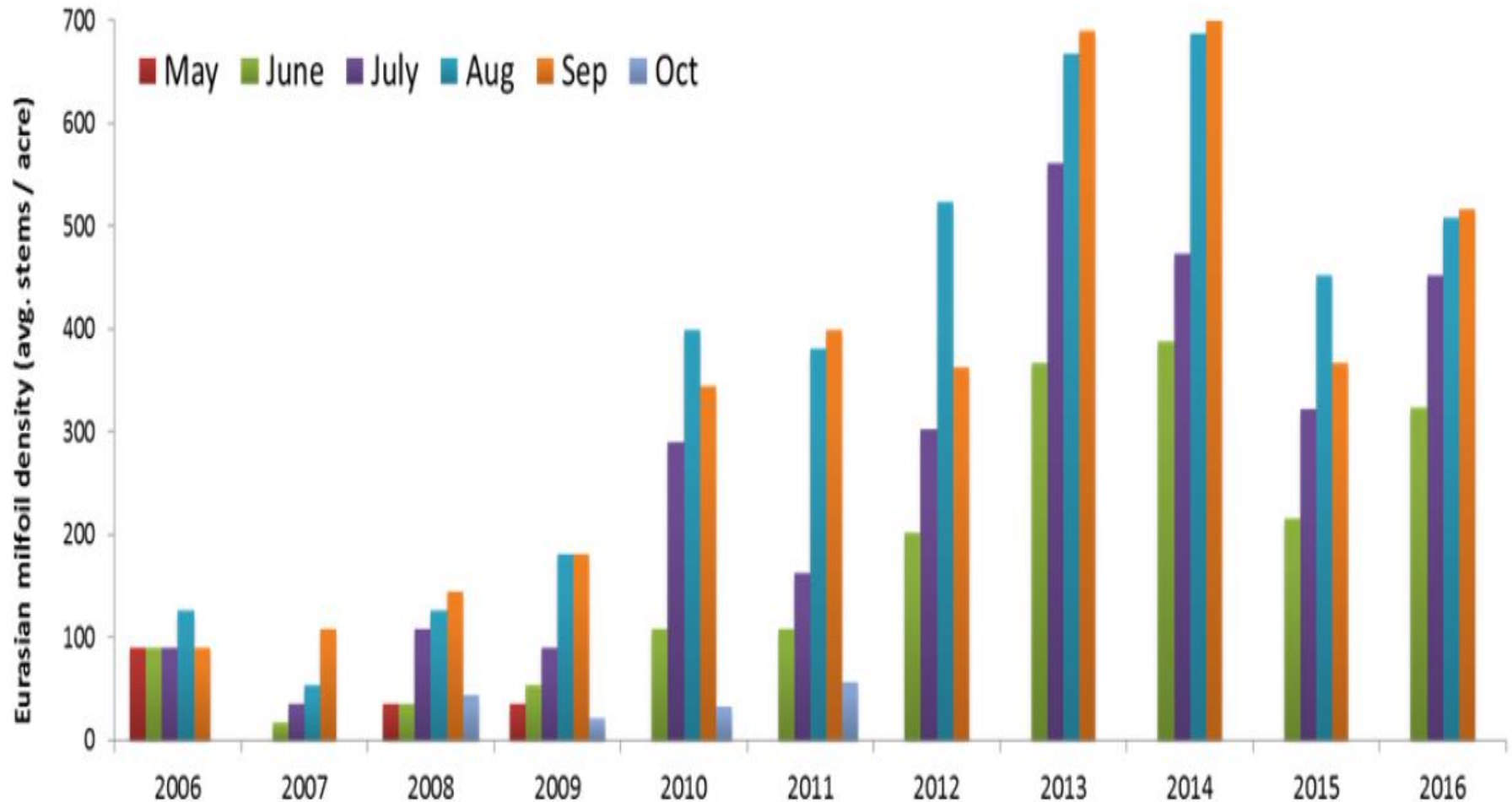
Transect Locations



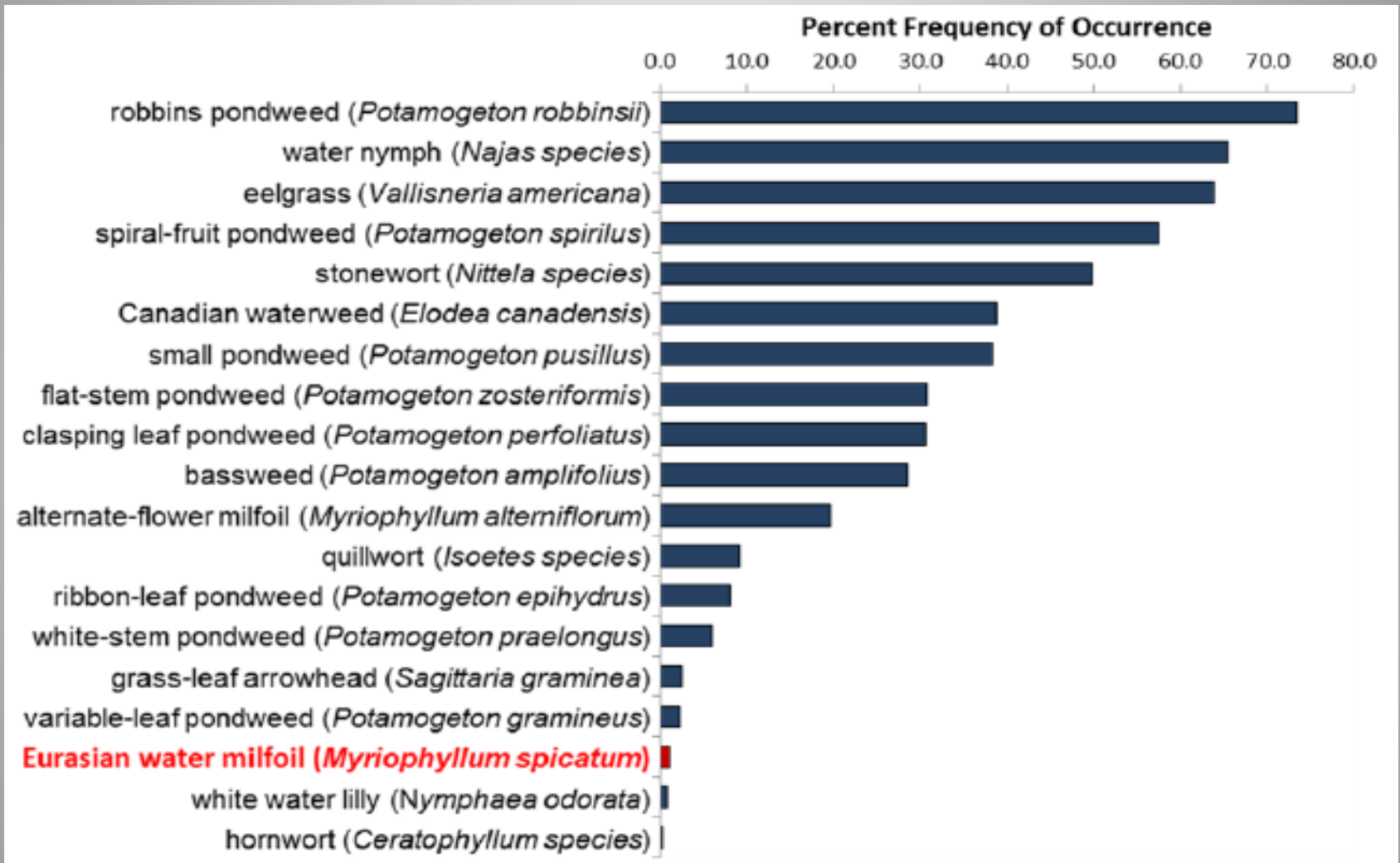
Average density of Eurasian water-milfoil for Upper Saranac Lake transect sites from 2004 to 2016



Average density of Eurasian water-milfoil at the unmanaged Fish Creek location, 2006-2016



Frequency of aquatic plant species occurrences - USL

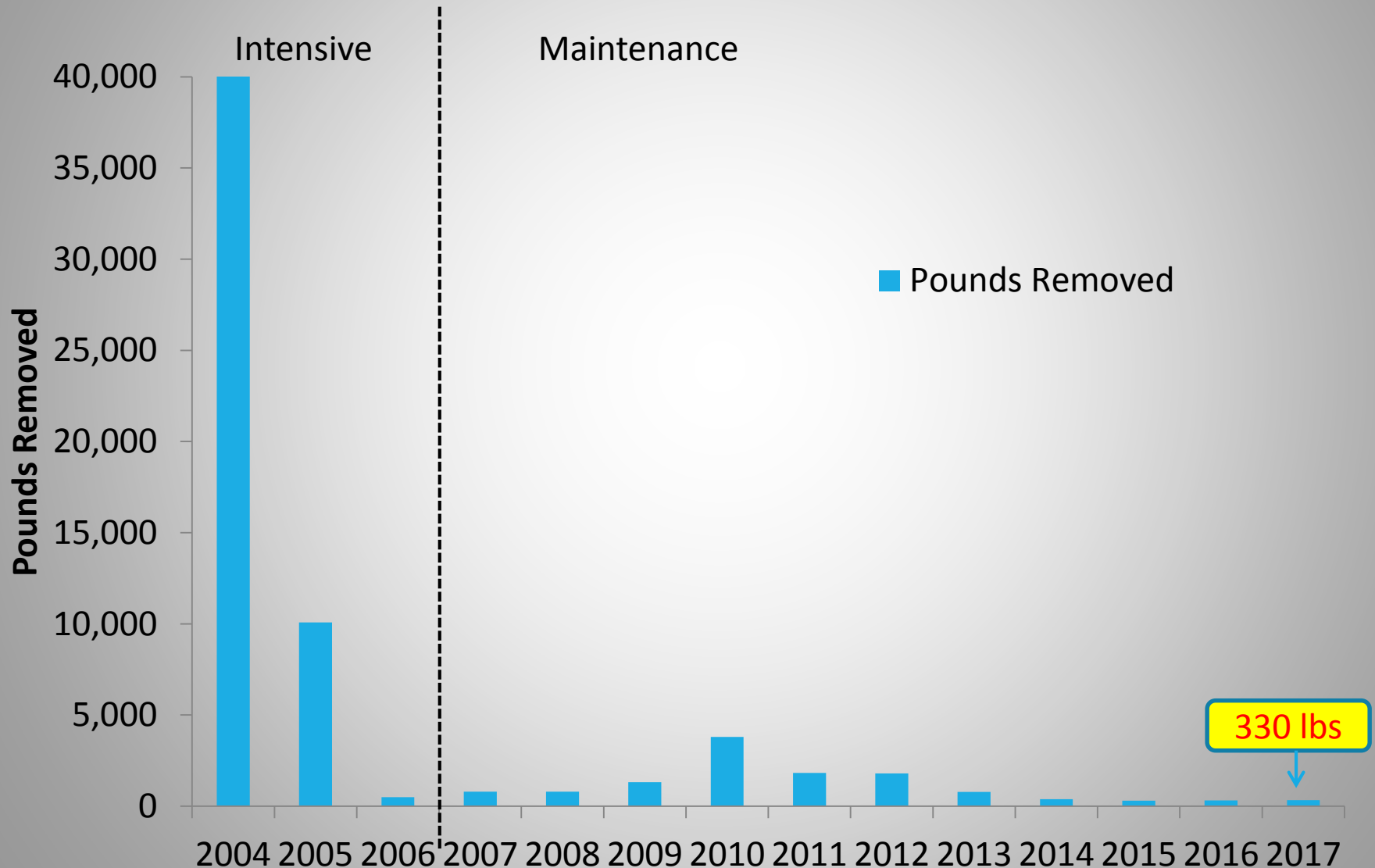


August, 2016. Non Native species are indicated in red.

Paul Smith's College Adirondack Watershed Institute

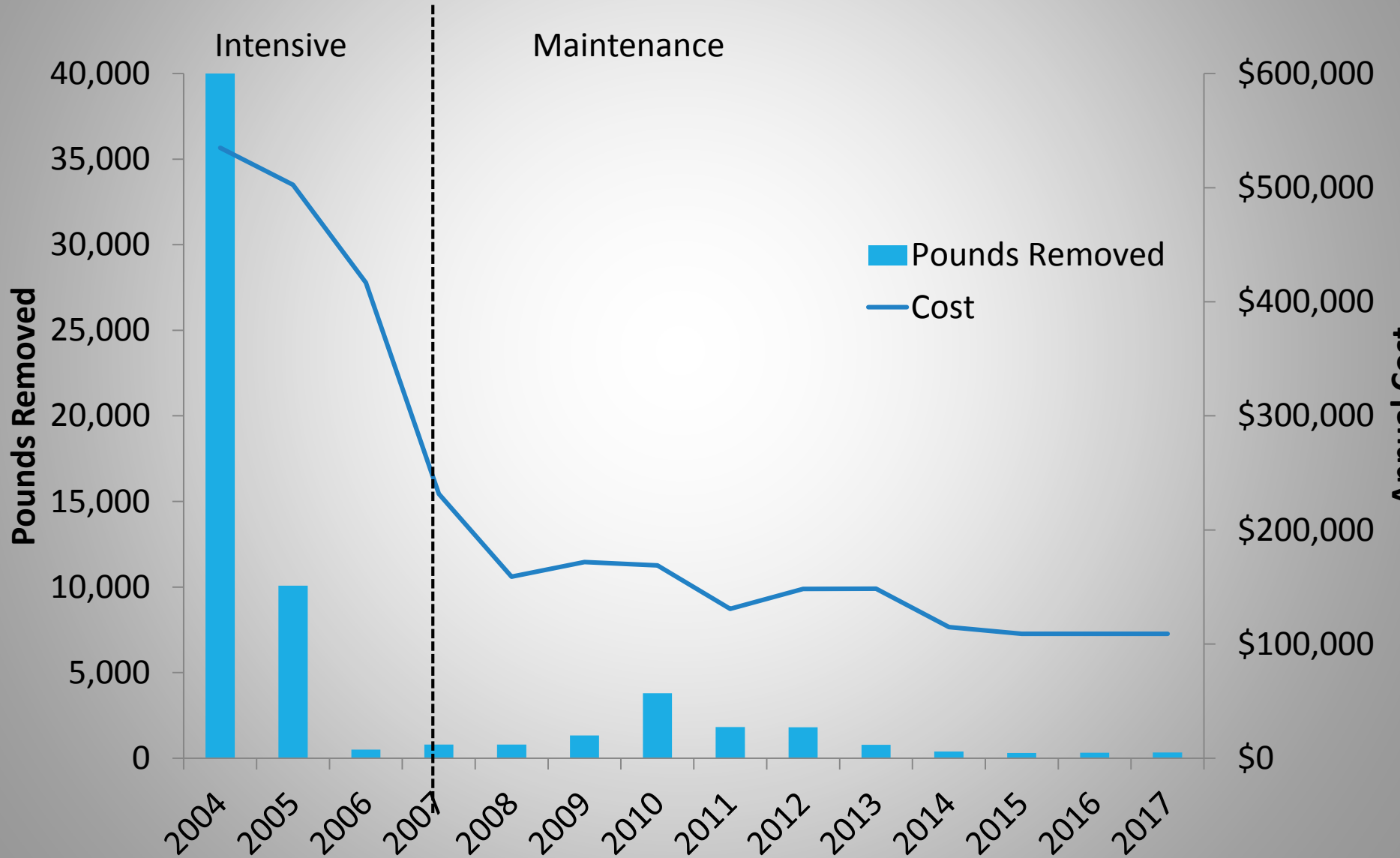
USL - Milfoil Harvesting Operational Results

EWM removed and annual cost

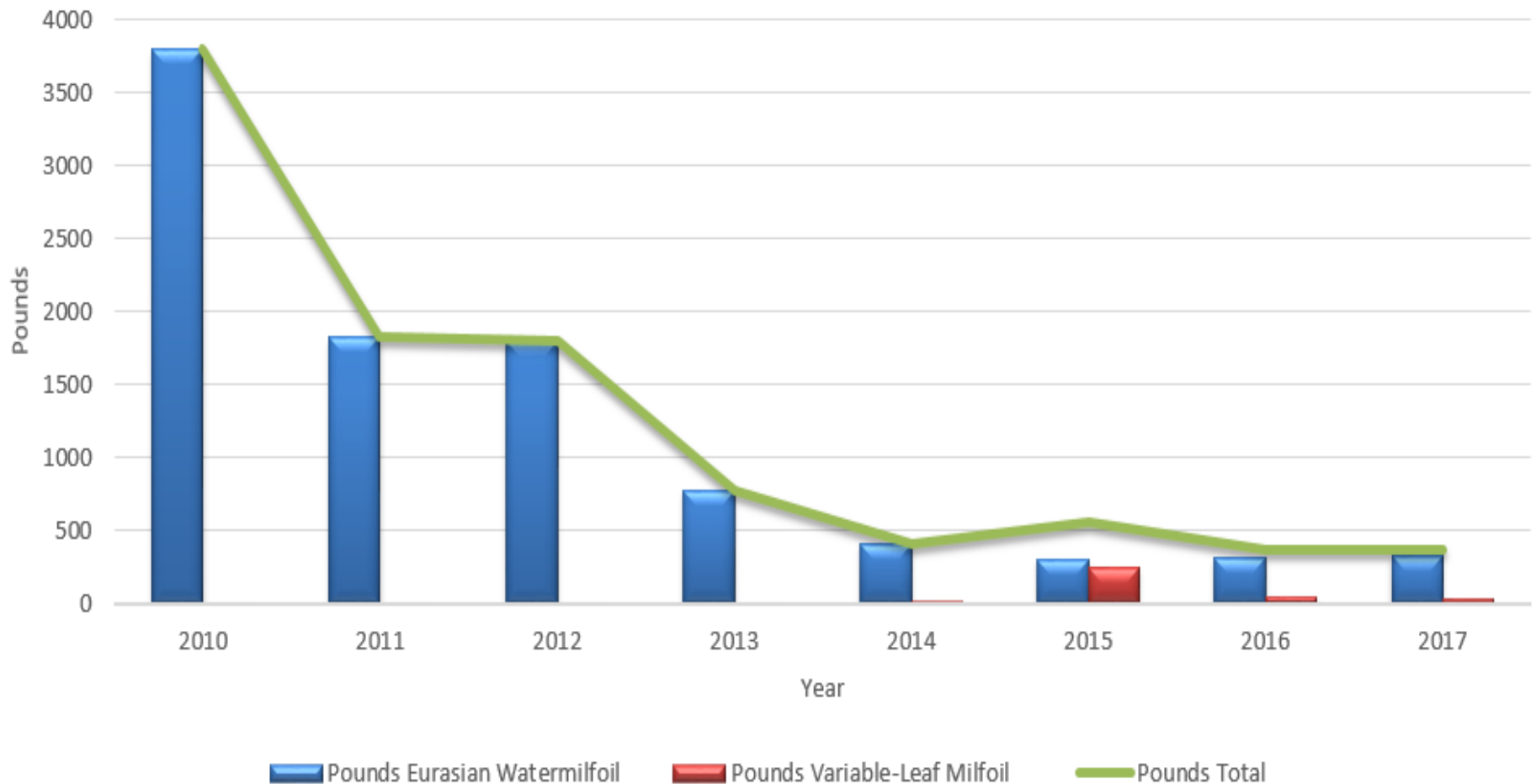


USL - Milfoil Harvesting Operational Results

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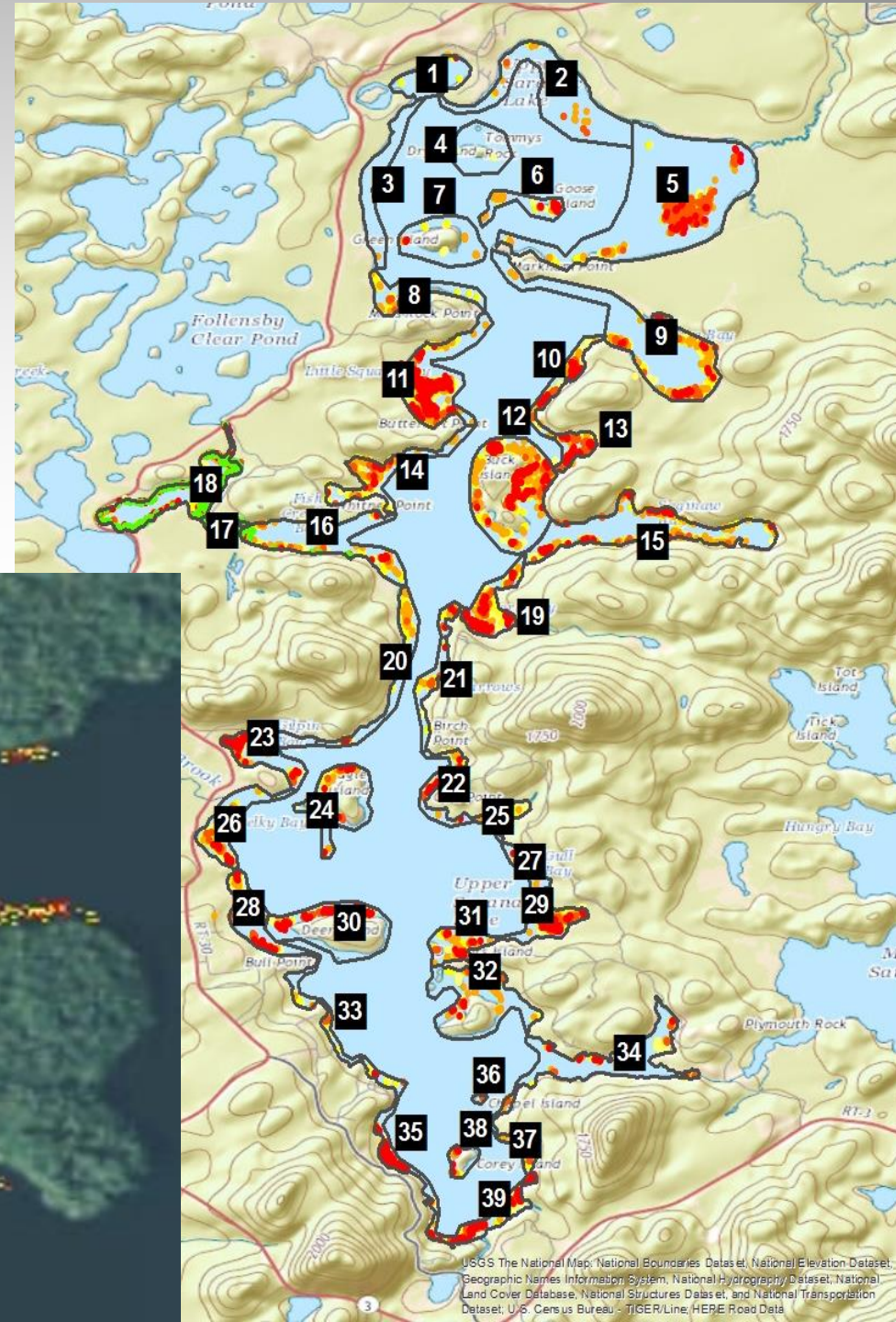
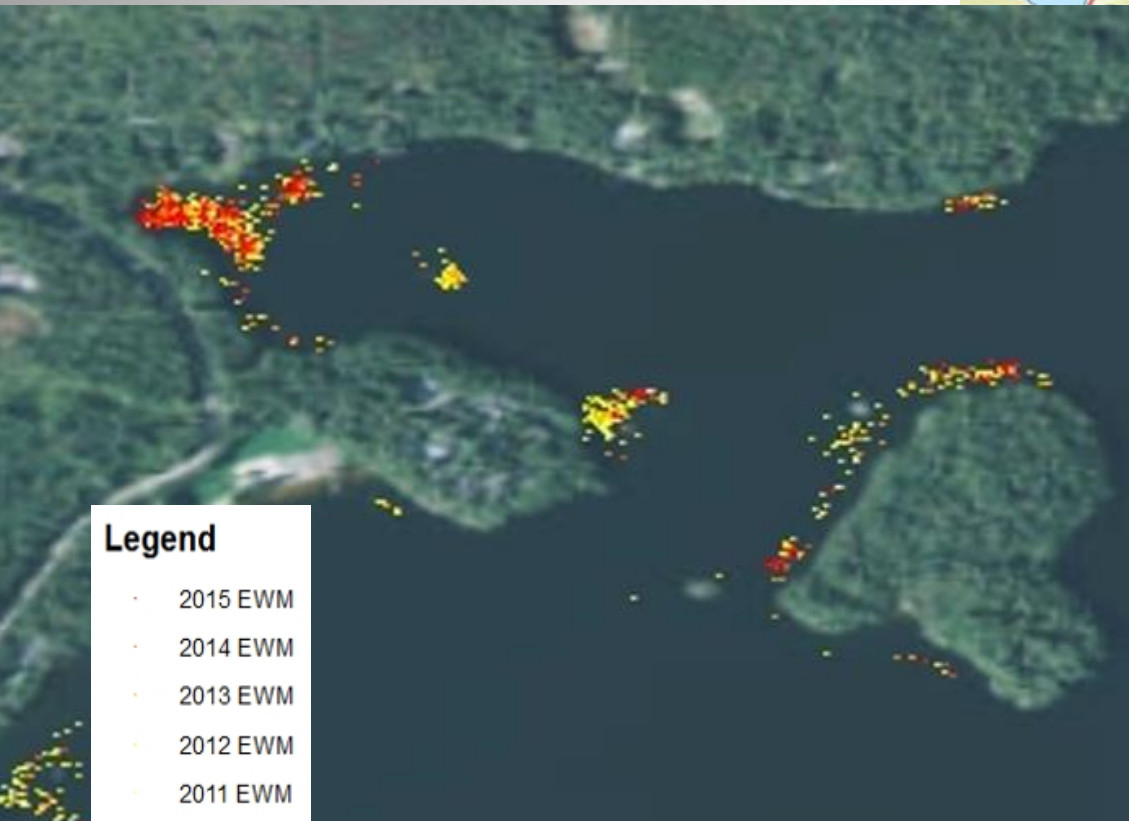


Eurasian Watermilfoil and Variable-Leaf Milfoil found and removed from USL 2010 - 2017



Invasive Zones

- 39 management zones
- Each plant GPSed and mapped
- Recorded overtime



Invasive Zones Plant Tally

- Monitor lbs. removes
- Individual Plant counts

Upper Saranac Lake Plant Totals						
	2015 EWM	2016 EWM	2017 EWM	2015 VLM	2016 VLM	2017 VLM
1 Back Bay	0	0	0	0	0	0
2 Saranac Inn Point - Marlboro Club	0	4	0	0	0	0
3 College Row	0	15	0	0	0	0
4 Tommy's Rock - Dry Island	0	0	0	0	0	0
5 North Basin - North Markham Point	44	305	1009	0	0	0
6 Goose Island - Rockpile	30	57	20	0	0	0
7 Green Island - Rockpile	1	14	9	0	0	0
8 Green Bay - Moss Rock Point	0	9	5	0	0	0
9 South Markham Point - Square Bay	31	212	422	0	0	0
10 Square Bay Divot - Point North of Buck Island	78	82	91	0	1	0
11 Little Square Bay	1,327	1,427	1690	0	0	0
12 Buck Island	478	442	913	0	9	1
13 Buck Island Bay	25	252	167	0	0	2
14 Whitney Point - Bottleneck Bay - Butternut Point	21	175	266	0	0	7
15 Saginaw Bay	104	617	504	0	0	0
16 Fish Creek Bay	72	176	35	63	19	36
17 Fish Creek Channel	34	2	0	553	112	163
18 Fish Creek Pond - Spider Creek	291	152	122	1861	523	217*
19 Pork Bay	437	172	162	0	0	0
20 Narrows West	2	31	14	0	0	0
21 Narrows East	0	30	11	0	0	0
22 Birch Point - Gull Point	4	25	117	0	0	0
23 Gilpin Bay	253	160	146	0	0	0
24 Eagle Island - Rockpile	88	74	39	0	0	0
25 North Gull Bay	40	27	68	0	0	0
26 Pelky Bay	88	26	6	0	0	0
27 Gull Bay Connector	8	0	0	0	0	0
28 Bungalow Bay	59	17	40	0	0	0
29 South Gull Bay	256	406	116	0	0	0
30 Deer Island	123	107	72	0	0	0
31 Doctors Island area	132	74	130	0	0	0
32 Birch Island area	57	27	4	0	0	0
33 Bull Point to Sekon Point	1	0	0	0	0	0
34 Bartlett Carry Bay	23	13	41	0	0	0
35 Sekon Point to South of Wenona	388	276	179	0	0	0
36 Chapel Island	0	94	3	0	0	0
37 East South Basin to Bartlett Carry Bay entrance	130	82	58	0	0	0
38 Corey's Island	28	29	3	0	0	0
39 South Basin	421	559	314	0	0	0
	EWM Plant total			VLM Plant Total		
	2015	2016	2017	2015	2016	2017*
Total number of plants	5,074	6,278	6,776	2477	664	426
Total bags	12.3	12.75	13.23	9.23	2.25	1.34
Total weight (1 bag = 25lbs)	307.50	318.75	330.75	205.8	56.25	33.5
* 1.5 bags (37.5 lbs) harvested on 7/13/17 not included in total						

13 years of Milfoil Progress

	2004	2017
Stems/acre	600	10.2
Amount Removed	18 tons	330 pounds
Annual Cost	\$535,000	\$109,000
Cost /littoral acre	\$450	\$91

Take Home Message

- EWM density has significantly decreased since it was discovered
- Monitoring methods are consistent with each other, all indicating success
- EWM considered rare plant occurring in 1% of 588 study segments on USL
- We feel we are ahead of growth because we get to the plants and harvest them prior to the plants maturing and fragmenting.
- Early action followed by persistence is paying off

Challenges

- Funding - We have been so successful (milfoil isn't impeding recreation, or floating up on peoples shoreline) so donors feel the problem is over and don't need to contribute.
- Finding the balance between harvesting hrs. and staying ahead of growth.
- Represent stable harvest rates, indicates we may have reached the lowest threshold for sustainable management.
- Are we ready for the next invasive?

Upper Saranac Foundation

It still is, and always will be, about Water Quality



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