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®

Aquatic Invasive Management, LLC.
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
- 103 ‘ max depth
- 28’ average depth

40(+) % state land
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 its 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)
Average density of Eurasian water-milfoil for Upper Saranac Lake transect sites from 2004 to 2016

Paul Smith’s College Adirondack Watershed Institute
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

Pounds Removed

Intensive Maintenance

Pounds Removed


330 lbs
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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Bay</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Saranac Inn Point - Marlboro Club</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>College Row</td>
<td>0</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tommy's Rock - Dry Island</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North Basin - North Markham Point</td>
<td>44</td>
<td>305</td>
<td>1009</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Goose Island - Rockpile</td>
<td>30</td>
<td>57</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Green Island - Rockpile</td>
<td>1</td>
<td>14</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Green Bay - Moss Rock Point</td>
<td>0</td>
<td>9</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South Markham Point - Square Bay</td>
<td>31</td>
<td>212</td>
<td>422</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Square Bay Divot - North of Buck Island</td>
<td>78</td>
<td>82</td>
<td>91</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Little Square Bay</td>
<td>1,327</td>
<td>1,427</td>
<td>1,690</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Buck Island</td>
<td>478</td>
<td>442</td>
<td>913</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Buck Island Bay</td>
<td>25</td>
<td>252</td>
<td>167</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Whitney Point - Bottleneck Bay - Butternut Point</td>
<td>21</td>
<td>175</td>
<td>266</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Saginaw Bay</td>
<td>104</td>
<td>617</td>
<td>504</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fish Creek Bay</td>
<td>72</td>
<td>176</td>
<td>35</td>
<td>63</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td>Fish Creek Channel</td>
<td>34</td>
<td>2</td>
<td>0</td>
<td>553</td>
<td>112</td>
<td>163</td>
</tr>
<tr>
<td>Fish Creek Pond - Spider Creek</td>
<td>291</td>
<td>152</td>
<td>122</td>
<td>1,861</td>
<td>523</td>
<td>217*</td>
</tr>
<tr>
<td>Pork Bay</td>
<td>437</td>
<td>172</td>
<td>162</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Narrow West</td>
<td>2</td>
<td>31</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Narrow East</td>
<td>0</td>
<td>30</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Birch Point - Gulf Point</td>
<td>4</td>
<td>25</td>
<td>117</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gilpin Bay</td>
<td>253</td>
<td>160</td>
<td>146</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eagle Island - Rockpile</td>
<td>88</td>
<td>74</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>North Gulf Bay</td>
<td>40</td>
<td>27</td>
<td>68</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pelky Bay</td>
<td>88</td>
<td>26</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Gull Bay Connector</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bungalow Bay</td>
<td>59</td>
<td>17</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South Gulf Bay</td>
<td>256</td>
<td>406</td>
<td>116</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Deer Island</td>
<td>123</td>
<td>107</td>
<td>72</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Doctors Island area</td>
<td>132</td>
<td>74</td>
<td>130</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Birch Island area</td>
<td>57</td>
<td>27</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bull Point to Sekon Point</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bartlett Carry Bay</td>
<td>23</td>
<td>13</td>
<td>41</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sekon Point to South of Wenona</td>
<td>398</td>
<td>276</td>
<td>179</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chapel Island</td>
<td>0</td>
<td>94</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>East South Basin to Bartlett Carry Bay entrance</td>
<td>130</td>
<td>82</td>
<td>58</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Corey's Island</td>
<td>28</td>
<td>29</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>South Basin</td>
<td>421</td>
<td>559</td>
<td>314</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EWM Plant total</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of plants</td>
<td>5,074</td>
<td>6,278</td>
<td>6,776</td>
</tr>
<tr>
<td>Total bags</td>
<td>12.3</td>
<td>12.75</td>
<td>13.23</td>
</tr>
<tr>
<td>Total weight (1 bag = 25 lbs)</td>
<td>307.50</td>
<td>318.75</td>
<td>330.75</td>
</tr>
</tbody>
</table>

* 1.5 bags (37.5 lbs) harvested on 7/13/17 not included in total
13 years of Milfoil Progress

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stems/acre</td>
<td>600</td>
<td>10.2</td>
</tr>
<tr>
<td>Amount Removed</td>
<td>18 tons</td>
<td>330 pounds</td>
</tr>
<tr>
<td>Annual Cost</td>
<td>$535,000</td>
<td>$109,000</td>
</tr>
<tr>
<td>Cost/littoral acre</td>
<td>$450</td>
<td>$91</td>
</tr>
</tbody>
</table>
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?
Guy Middleton
Lake Manager
Upper Saranac Foundation
PO Box 564
Saranac Lake, NY 12983
lakemanager@usfoundation.net
518 796-1052